Asset inflation in the Netherlands: assessment, economic risks and monetary policy implications

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Introduction

In recent times, equity and house prices in the Netherlands have soared. By late 1997 the AEX index of the Amsterdam Exchanges hovered around the 900 mark, having started the year at 634, reaching a maximum of 1011 on 7th August. House prices went up some 10% in 1996, a rate of increase that continued in the first half of 1997. This has led many to wonder whether in the early months of 1997 the Netherlands was subject to asset inflation. Asset inflation (or an asset bubble) occurs when the prices of financial assets rise above their underlying or intrinsic value.

This article addresses that question and discusses the economic risks and monetary policy consequences of asset inflation. Section 1 looks at the fundamentals that determine the intrinsic value of equities and houses. On the basis of this analytical approach, Section 2 examines whether the recent price rises in the Dutch financial markets are inflationary in nature or whether they can be attributed to improved fundamentals. Subsequently, Section 3 describes the economic risks of asset inflation for the Netherlands. As was shown dramatically by the 1929 Wall Street crash and the ensuing global depression, a bursting asset bubble may prompt a financial crisis and a collapse in economic activity. There is now consensus that central banks can mitigate the adverse effects of a bursting bubble by easing monetary policy. A more intriguing policy question, which is addressed in Section 4, is whether a central bank should wait until the bubble has actually burst, or whether it should play a more active role in preventing bubbles from arising in the first place.

1. The intrinsic value of equity and houses

1.1 Definition of asset inflation

Asset inflation occurs when the prices of financial assets (represented by P_t) are rising even though they are already above their intrinsic or underlying value (V_t):[1]

$$dP_t / dt > 0 \text{ and } P_t > V_t \qquad (1)$$

Hence, to establish asset inflation, the intrinsic value of equities and houses must be first determined.

1.2 Equities

In finance theory, the intrinsic value of equity (V_t) is determined on the basis of the net present value of total expected future income. The calculation is usually based on the Gordon model,

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1 If $dP_t / dt > 0$ but $P_t < V_t$, equity or house prices are on the increase but moving towards equilibrium.

which assumes that dividend payments D increase by a constant growth rate g from time t, and that the equity is held for an infinite period of time.[2]

It then follows that:

$$V_t = \frac{D_t}{r - g} \tag{2}$$

where r is the required stock market return.[3] Equation (2) applies to individual stocks as well as to equity portfolios, such as the portfolio of 25 active equities underlying the Dutch AEX stock market index.

The Capital Asset Pricing Model (CAPM) shows that the required stock market return r is the sum of the risk-free interest rate (the minimum remuneration for making capital available) and a risk premium. The latter depends on the degree of market risk to which the equity or equity portfolio is subject (the so-called beta) as well as the degree of risk aversion (which determines the required remuneration per risk unit).[4]

Accordingly, the intrinsic value of an equity or of an equity portfolio is determined in part by three non-observable variables (viz. growth expectations, the market risk involved in the equity, and the degree of risk aversion), which are known to vary over time. Historical data may thus give a wrong impression of the current situation, making it impossible to pinpoint the exact intrinsic value of an equity or an equity portfolio.

For the same reasons, it is also impossible to determine the precise underlying value of the price-earnings (P/E) ratio, which is often used by investors in practice. To determine the underlying P/E ratio the following assumptions are required (see French and Poterba (1991), p. 354): a firm reinvests a fraction k of its profits E and this investment achieves a supernormal return of r^* (that is one which exceeds r, the required stock market return) during period T. The firm's profits then increase by rate g, which equals kr^*. The remaining profits of $(1\text{-}k)E$ are paid out as dividends. The intrinsic value of the P/E-ratio is then

$$P/E = [1+kT(r^*- r)] / r = [1+T(g-kr)] / r \tag{3}$$

which again depends on the non-observable values of the expected growth of profits g and the required stock market return r.[5] In addition, P/E ratios may differ considerably between countries and industries.[6] For these reasons, it is impossible to ascertain unequivocally whether increases in certain

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2 Obviously, as the Gordon model is a simplification of reality, it is used here solely to indicate that growth expectations and the rate of return required by market participants determine the intrinsic value of equities. More realistic models would call for a more complex presentation, without providing substantial new insights.

3 The growth rate g and required market return r should both be either in nominal or in real (i.e., inflation-adjusted) terms.

4 The Arbitrage Pricing Theory (APT) gives a similar definition of required market return. Unlike the CAPM model's abstract concept of market risk, the APT model distinguishes between separate risk factors, such as disappointing growth and inflation, so that r is the sum of the risk-free interest rate and various risk premia (relating to the various risk factors). These risk premia are ultimately determined, as in the CAPM model, by the degree of risk entailed in the equity and the extent of risk aversion.

5 If an infinite time horizon is assumed, $P/E = (1\text{-}k) / (r\text{-}kr^*) = (1\text{-}k) / (r\text{-}g)$, in accordance with equation (2). It appears, furthermore, that if no profits are retained (i.e. if $k = 0$), $P/E = 1/r$, then $E/P = D/P = r$; in other words, the dividend equals the required stock market return if all profits are disbursed.

6 For example, French and Poterba (1991) show that, by comparison with the United States, Japan has high P/E ratios which are partly accounted for by differences in accounting methods and tax rules.

P/E ratios reflect improved fundamentals or asset inflation.

Despite these shortcomings, equation (3) does provide a rough method for ascertaining asset inflation. On the basis of the *actual* P/E ratio and a reasonable assumption regarding the required stock market return, the *implicit* growth rate of profits can be calculated. It is then possible to gauge whether this implicit growth rate is realistic, given the cyclical situation.[7] Section 2 applies this method to the Netherlands.

1.3 Real estate

Real estate may be seen as a financial asset, but most house-owners consider it a (durable) consumer good. Unlike other markets for consumer durables, however, the housing market is characterised by an almost completely inelastic short-term supply curve, which implies that virtually every change in demand will lead to a change in prices. Demand changes may stem from real economic or monetary factors. If house prices are pushed above their intrinsic value by monetary factors such as overly generous mortgage lending, one speaks of asset inflation.

The intrinsic value of houses in the Netherlands may have risen due to the following real causes: (1) weak supply because housebuilding has not kept pace with the increasing number of households; (2) an increasing quality of houses; and (3) growing demand for home ownership because it has become cheaper to own a home than to rent one. Section 2 will examine whether these real factors can account for the recent house price rises in the Netherlands or whether there is evidence of asset inflation.[8]

2. Is the Netherlands subject to asset inflation?

2.1 Introduction

Following the above discussion of the fundamental determinants of the intrinsic value of equity and houses, this section deals with the question whether the Netherlands is currently facing asset inflation. The next section assesses whether the recent rises in the P/E ratios of equities can reasonably be attributed to a lower required stock market return and/or a higher expected profit growth. If that is not the case, there is an indication of asset inflation. Movements in house prices are then reviewed in the light of developments in (1) the supply of houses, (2) the quality of owner-occupied dwellings and (3) the cost of home-ownership as compared to rents.

2.2 Equities

Dutch equity market developments

Figure 1 shows that the stock exchange boom until last August was an international phenomenon, but that the Dutch index has recently gone up much more markedly than those of the United States, Japan, the United Kingdom and Germany. The relatively low level of (risk-free) capital

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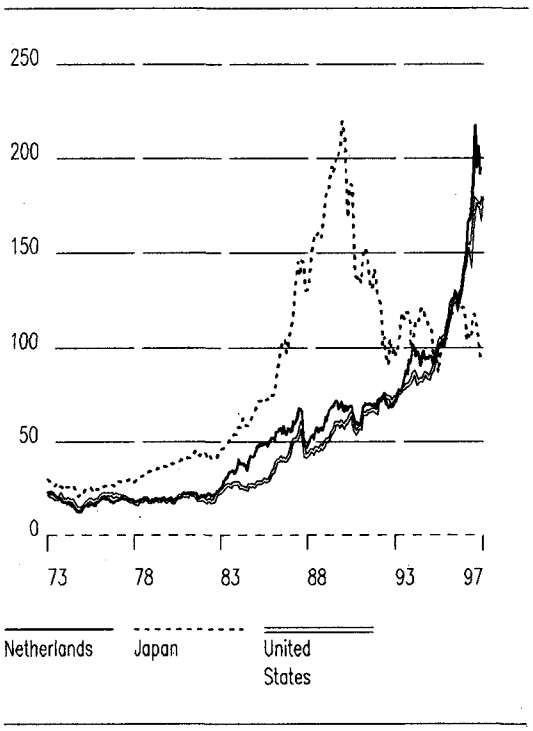
[7] Historical experience indicates that P/E ratios usually peak during the early stages of cyclical upturn because of the potential for above-average growth in the medium term (see, for instance, BIS (1997), p.72).

[8] If a house is considered an investment object, its intrinsic value is also determined by rents and mortgage rates. The analysis of asset inflation therefore does not disregard essential information when houses are viewed solely as consumer durables.

Figure 1

International stock market indices

1995 = 100, monthly figures



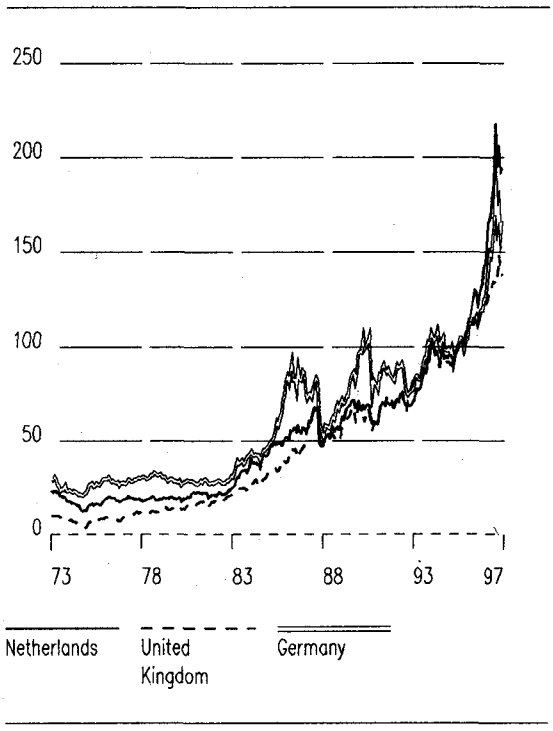


Figure 2

Long-term interest rate and stock market index

Monthly figures

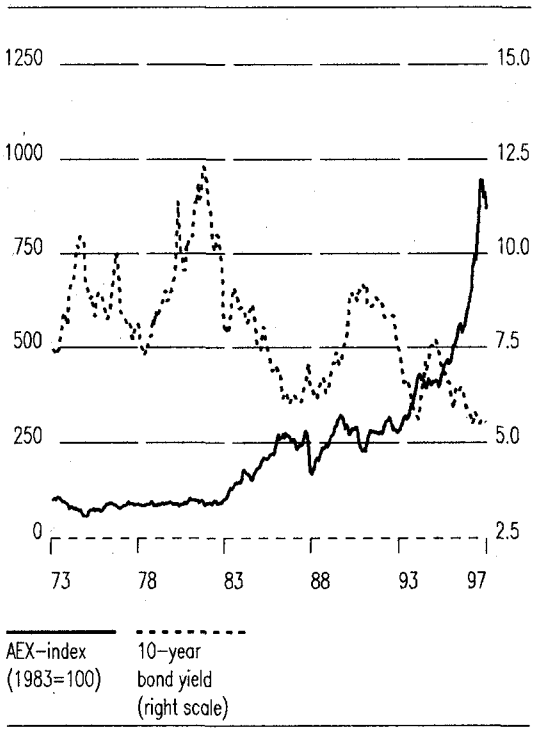
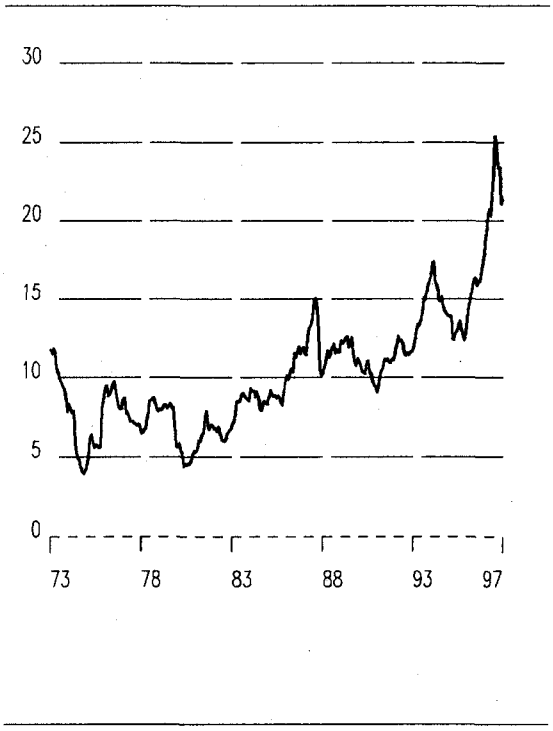


Figure 3

Price/earnings ratio of the Dutch stock market

Monthly figures



Source: For Figures 1 and 3, Datastream.

market rates seems to explain part of the Dutch equity price rises (Figure 2). In the analysis below, we will focus on P/E ratios to see whether a combination of higher expected profit growth and lower risk premium can complete the explanation. Figure 3 shows that the P/E ratio has been undergoing a trend rise since the mid-1970s which has been considerably faster in 1996 and 1997 than in previous years. For that reason we will focus on the developments in the P/E ratio since 1995.

Assumptions made and data used in the analysis

An implicit expected growth rate of profits can be calculated by using equation (3) and the realised P/E ratio and by making a reasonable assumption on the required market return r. An assessment is then made as to whether this calculated implicit rate is realistic by comparing it to a benchmark of 7% annual real profit growth. This profit growth would be realised in the Netherlands in the next ten years if GDP expands at a rate of 3% (2.7% over the past ten years) and if the profit ratio gradually increases from 8.7% (realised in 1996) to 12.4% (the maximum in the past decade).[9] This profit benchmark is exceptionally high since the Dutch economy is currently in a mature phase of the business cycle. We have deliberately chosen such a high benchmark: if the actual expected profit growth should be even higher to explain the increase in the P/E ratio, we have quite a clear indication of asset inflation.

Our calculations assume that supernormal returns can be realised during ten years (so $T = 10$, as in French and Poterba (1991)). The reinvestment rate was calculated using actual figures on the Dutch P/E ratio and the dividend/price (D/P) ratio, viz. $k = [1\text{-}P/E * D/P]$. Our reasonable assumption for the real required market return was the interest rate on the latest ten-year central government loan minus an expected inflation rate of 2%[10] plus a risk premium of 6.5% (see De Haan (1997) and Poll (1996)). However, as equities could be a more customary form of savings today than in the past, risk premia below 6.5% were also looked at. Table 1 summarises the data used.

Table 1

Data used in the calculations

	1995	1996	1997	
			7th August (max.)	18th Dec. (last)
P/E ratio	13.0	18.6	26.4	21.3
Reinvestment rate	59.3%	52.0%	52.2%	55.5%
Real risk-free interest rate	4.9%	4.2%	3.6%	3.3%

Results

The calculated implicit expected profit growth figures are presented in Table 2. If the required risk premium in the period 1995-97 had remained at its average past value of 6.5%, the expected profit growth would have needed to be between 11.6% (1995) and 22% (1997) to justify the actual values of the P/E ratio. Though such growth figures could conceivably be realised in the course of a single year, there is no question of them being realised for a period of ten years. So the next step

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9 The profit ratio would then rise by an annual 4%, averaging 10.5%. The expected profit growth would then be: 1.04 *1.03 (GDP growth) - 1 ≅ 7%. As the profit ratio has averaged 9.4% over the past ten years, this estimated profit growth rate is rather high, owing to the assumptions on both GDP growth and the profit ratio.

10 2% has been the average inflation rate in the Netherlands in the past decade.

Table 2

Implicit expected profit growth figures, in percentages

Risk premium	1995	1996	1997	
			7th August (max.)	18th Dec. (last)
6.5%	11.6	15.4	22.0	16.2
6%	10.6	14.2	20.4	14.8
5%	8.7	11.8	17.2	12.2
4%	6.9	9.4	14.1	9.5
3%	5.0	7.0	10.9	6.8
2%	3.0	4.6	7.8	4.1
1%	1.2	2.3	4.6	1.4
0%	-0.7	-0.1	1.4	-1.3

is to explore whether the high P/E ratios could be caused by a lower risk premium. From Table 2 it appears that the P/E ratio in 1995 and 1996 can only be explained if the risk premium on equity had fallen to about 4% and 3%, respectively. At the peak of the stock market on 7th August 1997, the risk premium had to be below 2% to account for the P/E ratio at the time. As it seems unlikely that the risk premium on equity had fallen so much in such a short period of time, these figures give a clear indication that the Dutch stock market was characterised by asset inflation in the summer of 1997. Since then, the P/E ratio has moved closer to its intrinsic value. Nevertheless, the current P/E ratio is still high, requiring a risk premium of about 3%, which is half of its past value.

2.3 Real estate

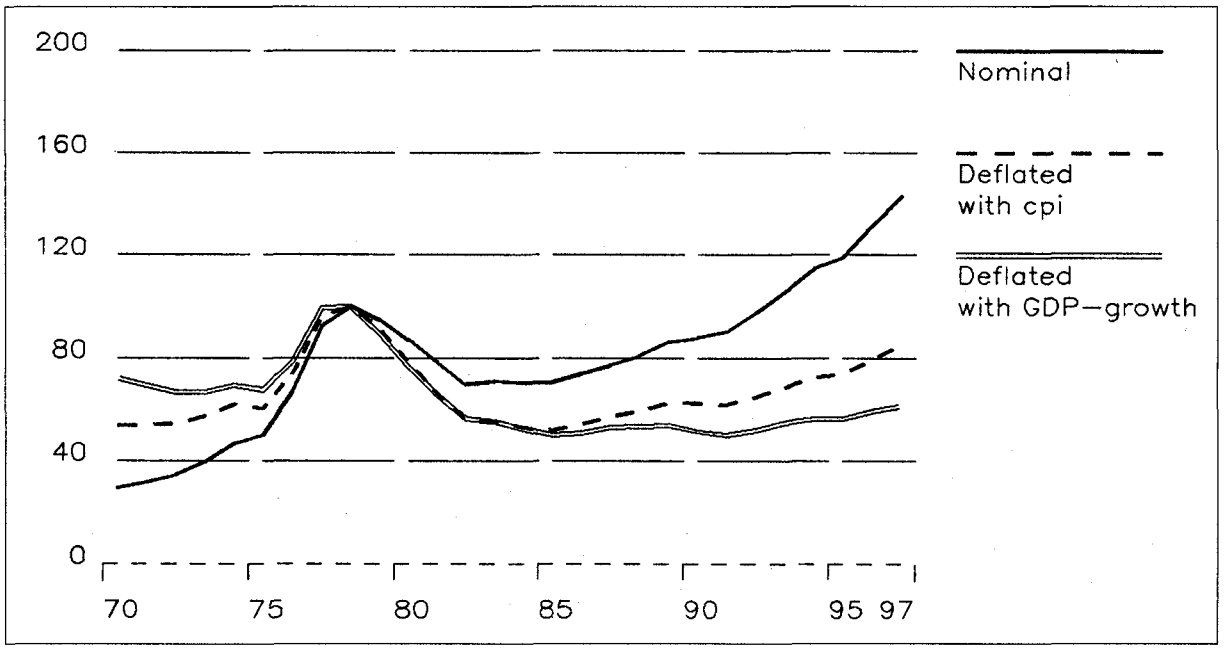
House prices in the Netherlands are currently far above the level of 1978, when the market peaked and subsequently a slump set in (Figure 4). However, Figure 4 also shows that *real* house prices, i.e. house prices deflated by the consumer price index, are still well below the 1978 peak. Considering developments in the relevant real economic factors (Section 1), it seems that the intrinsic value of houses has increased, leaving little – if any – indication for asset inflation in the housing market at present. First, there are demographic developments: the number of households has increased steadily, whereas political problems caused a slowdown in the supply of new houses. Second, new houses have become more luxurious and the quality of existing houses has been improved (e.g. dormer windows have been added or kitchens/bathrooms modernised) with the increase in prosperity. Figure 4 shows that if the nominal house price is deflated by the nominal GDP growth rate approximating the increase in prosperity and improved housing quality, house prices have barely gone up in recent years. Finally, the underlying value of houses for owner occupation should has risen because the costs of home ownership have fallen vis-à-vis the costs of renting a house. This is shown in Figure 5.[11] Given that the house price rise has been quite moderate in real terms and that there are, at least, three factors providing a justification for a higher real house price, there is little

[11] The costs-of-home-ownership index is calculated as follows: the average mortgage burden is put at 50% of the mortgage rate (after taxation) * the average house price. To this, the fiscal costs of notional rent income are added: 60% of the average house price * the rate of notional rent income (which varied between 1.5% and 2% in recent years) * 50% tax (i.e. the marginal tax rate to which most home owners are subject). Figure 5 compares this to the rental cost index, published by Statistics Netherlands.

evidence of asset inflation in the Dutch real estate market. This is in contrast with our conclusion above that the Dutch stock market was – and probably still is – subject to asset inflation.

Figure 4

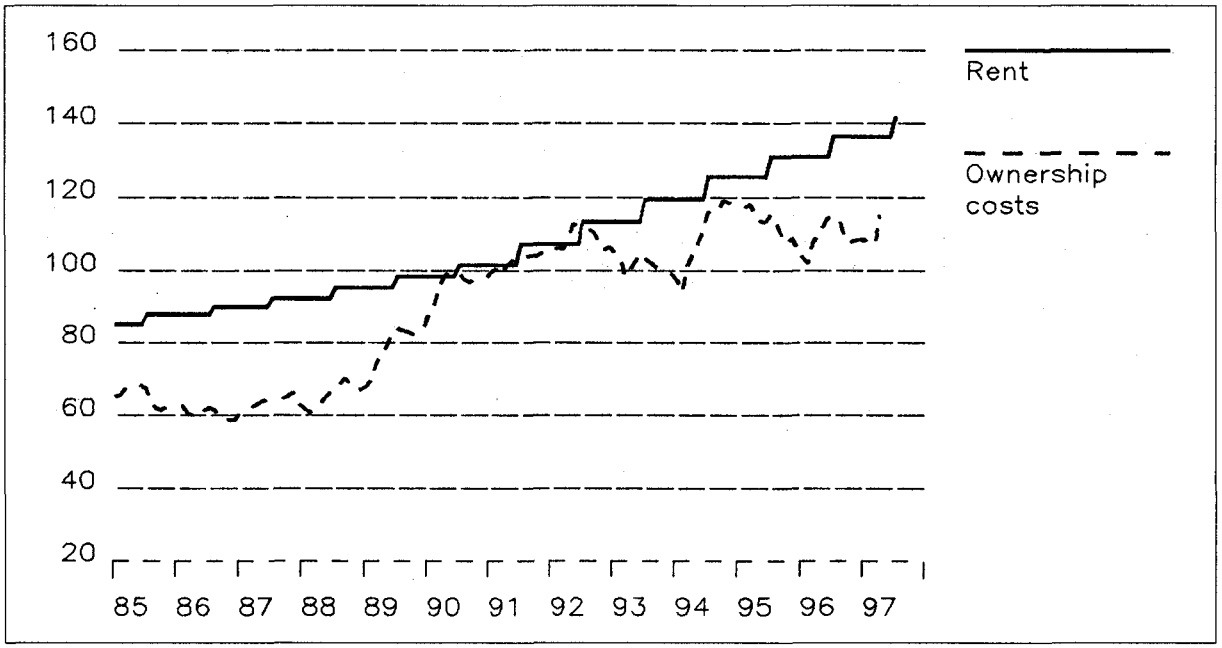
House prices relative to economic growth and consumer prices
1978 = 100



Sources: For 1970-75, CPB estimates, NVM thereafter.

Figure 5

Home ownership costs versus rental costs
1990 = 100



3. When the bubble bursts: the risks of asset inflation in the Netherlands

3.1 Theory: the monetarist and the financial stability approaches

The main danger of asset inflation is that it may generate a future equity price decline or a fall in house prices, thereby dampening real economic activity. The economic literature provides two main theories on this: the monetarist theory (based on Friedman and Schwartz (1963)) and the financial fragility theory (put forward by Minsky (1977)). According to the monetarists, an asset bubble may arise even though the risk of a crash has been correctly priced ex ante by rational economic agents. While the bubble lasts, the average return is higher than the risk-free interest rate because the chances of a crash have been correctly discounted in a risk premium. When the bubble bursts, a financial crisis may – but does not necessarily – occur. If economic agents continue to have confidence in the liquidity of their bank deposits, there is only a "pseudo" financial crisis (Schwartz (1987)). Private expenditure will be lower because the net capital of households and firms has decreased, but there is no danger of a money supply contraction and therefore no need for the monetary authorities to intervene. A "real" financial crisis occurs if a stock exchange crash causes the public to lose faith in the banking sector prompting a massive withdrawal of deposits. If this leads to bank failures and a contraction of the money supply, the central bank should act as lender of last resort to avoid deflation.[12] In the monetarist view, it is unlikely that a financial crisis will cause an economic downturn as long as monetary policy is adequate, although such a crisis may reinforce and prolong a downturn.[13] Indeed, monetarists argue that the causality is often the other way around: cyclical weakening sets in motion a confidence crisis which may cause problems for banks. For these reasons, monetarists do not see a necessary link between asset bubbles and business cycles.

Most proponents of the financial fragility approach see asset bubbles as the product of an irrational mania on the part of investors, so that risk is being under-priced ex ante. Financial fragility is easily built up during boom periods when rising equity and house prices, as well as inflation, stimulate excessive lending by banks, i.e. lending which exceeds the expected income flows of households and businesses (this is known in the literature as speculative or Ponzi financing). Under these conditions, it is plausible that a stock or real estate market crash leads to a banking crisis. Consequently, consumer spending and investment, as well as output and employment, are depressed because of the decline in private agents' net capital and the reduction in lending stemming from the banking crisis.[14] In short, contrary to the monetarist approach, the financial fragility approach perceives a clearly discernible connection between asset bubbles and business cycles.

Banking crises play a major role in both the monetarist and the financial fragility approach. The next section addresses the sensitivity of Dutch banks to a stock exchange crash or a real estate crisis. In addition, both approaches emphasise that a fall in house or equity prices impairs the net capital position of private agents, which in turn adversely affects private consumption and business investment. Section 3.3 presents empirical evidence on the size of these effects in the Netherlands.

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[12] According to monetarists, financial instability can be largely prevented by pursuing price stability. If inflation is volatile, so are real interest rates, making it difficult for banks and other financial institutions to properly assess the creditworthiness of their debtors, and increasing the risk of bad debts.

[13] Bernanke (1983) shows that the length of the depression in the 1930s was due to the higher costs of financial intermediation, which prevented households, farmers and small businesses from obtaining credit and forced them to cut down on their spending.

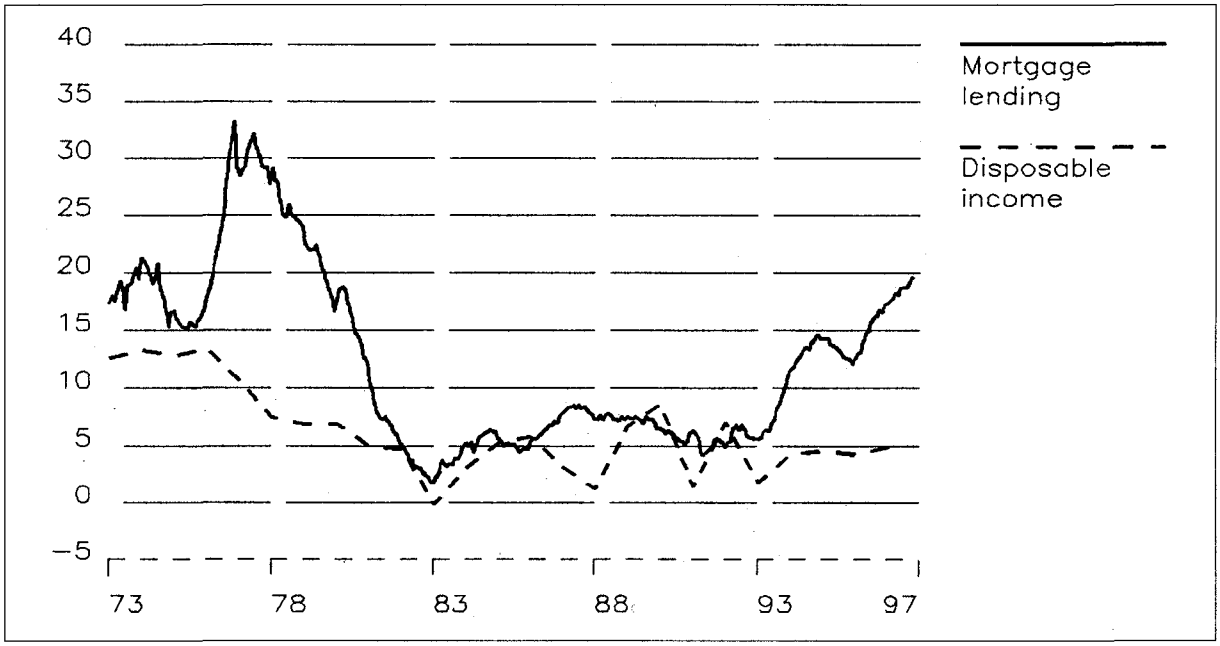
[14] This process may be reinforced by debt deflation (see Fisher (1933)): when debtors repay their debts, the money supply and the price level go down, generating an increase in the *real* value of private agents' debts.

3.2 Banking crises

A bursting asset bubble is likely to depress the banking sector balance sheet for two reasons. First, an asset crash has a *direct* impact on the balance sheet if banks invest in equity or real estate. In addition, there may be an *indirect* effect if during the preceding boom period banks have engaged in speculative or Ponzi financing; i.e. have granted loans which form an excessive burden on the expected future income and cash flows of households and businesses, on the assumption that the collateral underlying the individual loans (equities in the case of securities-based lending, real estate in the case of mortgages) will retain its value or even increase in value as time goes by. If a crash takes place, such loans lose their value: the contraction of economic activity saddles households and businesses with payment problems, while at the same time the collateral – the loan's liquidation value – has decreased in value. If the banking sector balance sheet deteriorates, a confidence crisis could emerge, resulting in depositor withdrawals and the possible failure of banks. Banks with a low solvency ratio will be the first to go. All this warrants the conclusion that the risk of a crash-induced financial crisis depends on (1) the extent to which banks own equities or real estate; (2) whether banks have undertaken excessive lending as defined above; and (3) their solvency ratio.

Figure 6

Mortgage lending and disposable income
Annual percentage changes



It seems unlikely that a bursting asset bubble can set off a banking crisis in the Netherlands. Dutch banks have small equity holdings (less than 1% of the total value of outstanding equities), especially compared to banks in other countries. At the same time, the solvency ratio of Dutch banks is fairly high: around 12%, well in excess of the 8% BIS standard (BIS (1997)). No empirical data are readily available on the criteria which banks apply to their lending operations, so we cannot judge to what extent this lending can be called "excessive". It appears, however, that the banks' vulnerability to crises in the real estate market may have risen. Figure 6 shows that the recent growth in mortgage lending has far exceeded the development in disposable income. This is due to the fact that for some years now, both double (partner) and temporary incomes are taken fully into account in determining the maximum mortgage. In addition, more can be borrowed in relation to the value of collateral: in the past 70% of the forced-sale value of a house was the criterion, whereas nowadays it is generally 125% with outliers to 150%. Finally, the forced-sale value, expressed as a

percentage of the purchase price, has gone up over recent years. On the other hand, the increase in vulnerability should not be exaggerated since the average house-buyer brings in more own funds today (25-30%) than in the 1970s. Moreover, some banks have recently tightened their acceptance policy by including an assessment as to whether a potential debtor can still meet his debt service obligations if interest rates go up.

3.3 Consumption

Generally speaking, rising asset prices will stimulate consumer spending because (1) households' net capital expands; (2) a buoyant stock exchange climate and rising house prices usually boost consumer confidence; and (3) credit becomes more readily available (Section 3.2). For those very same reasons, private consumption will suffer when a crisis arises in the equity or real estate market. The two crises are likely to have different quantitative effects. Equity ownership is concentrated in the better-off part of the population (whose propensity to consume out of capital is low), while home ownership is spread much more equally. This implies that a loss of capital ensuing from a real estate crisis would have a stronger impact on consumption than an equally large loss resulting from a stock exchange crash.

The effect of a crash in the equity or real estate market on consumer spending can be quantified by examining the statistical link between capital and consumption, but there are two caveats. First, where equities are concerned, a positive statistical link need not be an indication of a wealth effect. The causality may be the other way around due to the leading indicator properties of consumption. In Poterba and Samwick (1995), it was shown empirically that in the United States higher consumption was the cause, rather than the result, of higher equity prices. Second, it could well be that consumer spending reacts disproportionately strongly to asset market crashes as compared to modest price falls (i.e., wealth effects are non-linear). The reason is that the increased uncertainty makes for a greater propensity to save (Dormbusch and Fischer (1987), p. 276).

Equities

With these two considerations in mind, an empirical estimation of the effect on consumption of a 20% fall in equity prices can be derived from the MORKMON model of the Nederlandsche Bank.[15] The first year the estimated effect on the volume of Dutch private consumption is negligible, while after four years consumption will be a total of 0.3% lower. It is worth noting that the strongest influence of the crash is exercised through the slump in economic activity abroad. The direct wealth effect is very small (not more than a cumulative decline of 0.1% after four years) since equities comprise a relatively small share of Dutch households' financial assets.[16]

Houses

According to the MORKMON model, a 10% fall in house prices has a much stronger negative effect on private consumption (of -0.1% after one year to a cumulative -0.8% after four years). This total effect is made up of a direct wealth effect on consumption (-0.1% after one year; a cumulative -0.4% over the next three years) and indirect effects through higher unemployment, stronger wage moderation and hence decreased purchasing power. The direct wealth effect of a 10%

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[15] The 20% fall in equity prices worldwide was first translated into the relevant exogenous variables for the Dutch economy using the NIGEM model.

[16] Wealth effects in the Netherlands are small in general. The Nederlandsche Bank's macro-economic model for the European Union (EUROMON), shows that consumption in the Netherlands, as compared to the comsumption of several other European countries, has the lowest wealth elasticity.

fall in house prices is much stronger than that of a 20% drop in equity prices because home ownership is more equally spread over the Dutch population.

3.4 Investment

The economic literature is ambiguous as the relation between the level of equity prices and investment is unclear. According to Tobin's q theory, it is lucrative to invest if the ratio q between a business's market value and its replacement value exceeds 1. So equity price declines, which cause $q < 1$ for certain businesses, should have a negative impact on investment. However, as pointed out by Blanchard, Rhee & Summers (1993) and others, the evaluation by the manager of the marginal investment project (q^*) may deviate from the market's valuation (q). This may be due to the fact that managers are better informed than investors or that the market value is unduly high relative to the fundamentals because of rational or irrational bubbles (see Section 3.1). The cause of the discrepancy between q and q^* determines which of the two should underlie the investment decision (see Blanchard, Rhee and Summers (1993)). There is, therefore, no obvious theoretical relation between equity prices and investment.

Empirical research shows that market value and hence equity prices play no more than a limited role in investment decisions (see, for example, Blanchard, Rhee and Summers (1993) for research on the United States). Regarding Dutch businesses, Tobin's q has not been found to have any significant influence on investment behaviour (De Haan (1997), Van Ees and Garretsen (1994) and Van Els and Vlaar (1996)), since most investment is financed with internal funds (i.e., retained profits). In the period 1985-90, over 50% of the investment by Dutch businesses was financed in this way (Van Ees and Garretsen (1994)).[17] External financing is often considered too expensive because of agency problems, information asymmetry and taxation. These objections are stronger for equity financing than for bank loans.[18]

Still, in spite of the limited role played by equity in the financing of investment,[19] it is possible that a stock market crash could have an indirect negative effect on investment, in that it could impair producer confidence and further restrict access to bank loans, thereby limiting businesses in their investment opportunities. The fall in consumer spending may also be expected to cause a contraction of investment.

4. Implications of asset price inflation for monetary policy

4.1 Introduction

In the event of indications of asset price inflation, the question arises whether, and how, the central bank should react. This fundamental question can also be addressed by turning the argument around. Indeed, it is commonly accepted that, once a speculative asset price bubble bursts, central banks have a role in mitigating any adverse impact on the real economy. This is not only a key lesson drawn by monetarists, among others, from the stock market crash in 1929 (in particular with

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[17] Note that this study dealt with quoted companies. Small firms rely even more heavily on internal financing.

[18] As a consequence, internal financing is particularly important for the investment by businesses that are subject to credit constraints (Van Ees and Garretsen (1994) and De Haan (1997), the latter observing that one-third of Dutch businesses are facing credit restrictions).

[19] New equity issues play a fairly volatile role over time in the financing of investment, averaging around 10% (De Haan (1997), p. 105).

respect to the importance of avoiding a money supply collapse induced by the weakening of financial institutions), but it is also a major theme in the theories on financial instability (Minsky (1986)) and asymmetric information (Mishkin (1991)). Does this not imply that these same monetary authorities have a task in preventing the emergence of such bubbles in the first place? The following subsection addresses this question. First, the principal monetary policy objective of ensuring price stability is translated into operational terms and subjected to a broad review. Subsequently, on the basis of the analysis in previous sections, the different channels through which asset prices influence consumer prices are mapped out. As monetary policy primarily focuses on consumer prices, this provides a conceptual framework for identifying the central bank's possible role when asset price inflation occurs.

4.2 Asset price inflation and the role of monetary policy

The prime objective of monetary policy is to promote sustainable economic expansion, for which price stability over the medium run can be considered a precondition. There are, however, differing views on the definition of price stability. In the United States, Federal Reserve Board Chairman Alan Greenspan uses a well-balanced but somewhat vague definition: price stability is achieved when general price developments do not influence the decisions of economic agents.[20] In Europe price stability has been defined more precisely as an inflation rate between 0 and 2%, measured against the relevant consumer price index.[21] In line with this definition, the Nederlandsche Bank has specified price stability as "an inflation not in excess of 2%".[22] In other continents, too, the focus is on consumer prices. New Zealand has announced that "12-monthly increases in the CPI of between 0 and 3% will be considered consistent with price stability".[23] Similarly, Canada has targeted its monetary policies at a rise in the consumer price index of between 1 and 3% and Australia aims for an average underlying inflation rate of between 2 and 3% over the business cycle.[24]

From a purely theoretical perspective, this monetary policy focus on consumer prices has the drawback that asset prices seem to be made irrelevant. A quarter of a century ago, Alchian and Klein (1973) pointed at this shortcoming by arguing that a correct measure of inflation should also take asset price developments into account, to the extent that these determine future consumer prices.[25] More recently, Goodhart (1995) has echoed this argument and has called upon monetary authorities to give asset prices an explicit role in the policy making process in order to prevent the impact of monetary policy on asset markets from accentuating the business cycle.

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20 Greenspan was not the first to use such a definition: his predecessor, Paul Volcker, described "reasonable price stability" in the early 1980s as "a situation in which ordinary people do not feel they have to take expectations of price increases into account in making their investment plans or running their lives" (Volcker and Gyothen (1992), p. 178).

21 In a report to the EU central bank governors, the Group of Experts chaired by R. Raymond (1990) defined price stability as "a level of inflation close to zero [...] i.e. a maximum of 2% in the medium run".

22 De Nederlandsche Bank, Annual Report 1994, p. 21.

23 As specified in the January 1997 Policy Targets Agreement between the minister of finance and the central bank governor.

24 The inflation objective in Australia relates to the headline consumer price index, excluding special factors that are considered either very volatile (such as fresh fruit and vegetables) or not directly related to domestic demand pressures (such as changes in the mortgage rates or in the prices of certain public services).

25 More specifically, Alchian and Klein (1973) argue for the construction of a "constant utility" price index using *inter alia* futures prices for all relevant goods and services. When such prices are not available, asset prices can act as substitutes as these reflect the current price of future consumption flows.

However, this viewpoint creates more difficulties than it resolves. If the end objective for monetary policy were to be broadened beyond consumer prices by focusing on some amalgamated index that also included asset prices, this would, in practice, create new problems of its own. Given a much higher volatility of asset prices than consumer prices, targeting the stability of this index could be expected to lead to greater and more frequent adjustments in monetary policy, which would have adverse consequences for the stability of consumer prices and output.[26] Viewed from this perspective, it is questionable whether asset prices should play a substantive role in the determination of monetary policy.

The crux of the problem lies in the fact that developments in asset prices may be driven by changes in many more or less "fundamental" factors – such as expected rates of return, time preferences, fiscal treatment, or risk premia – that in principle need not prompt an adjustment to the monetary policy stance. This makes clear that the main difficulty for policy makers is the identification of asset price inflation. The foremost difficulty lies in establishing whether an asset price development should be attributed to real or inflationary pressures. But, as illustrated by equation (1), there is a further complication to the extent that policy may need to react differently to a price change towards, rather than away from, equilibrium. If an asset price increases, but the price level is brought closer to equilibrium, a policy reaction would be destabilising. The identification problem is thus twofold: first, in finding out to what degree an asset price change reflects real factors and, second, in identifying how the new price relates to the equilibrium price on the relevant asset market.

Moreover, at a technical level, the construction of a relevant asset price index is problematic. As the asset market consists of numerous sub-markets with generally heterogeneous products, changes in expenditure patterns are relatively pronounced and differences in product quality have a relatively strong impact on price developments. As a consequence, it is hardly possible to construct a representative asset price index. Although these measurement problems also apply to the consumer price index, they are significantly smaller: consumer products are more homogeneous, the pertinent expenditure patterns are less variable, and the time horizon determining the value of these products is much shorter.

4.3 The impact of asset price inflation on consumer prices and output

A more pragmatic approach to the question whether asset price developments should influence monetary policy is by determining how these may affect the (current and future) stability of consumer price inflation or output growth. In this context, along the lines of the analysis set out in the previous sections, four main channels can be identified through which asset price developments influence inflation or output.

First, asset price developments may have a direct impact on consumer prices to the extent that they prompt adjustments in the prices of services of capital goods (for instance, rents will rise when the underlying value of real estate increases). In view of the lags and rigidities constraining such price adjustments, this effect is weak in the Netherlands. Second, changes in the value of assets may lead to adjustments in domestic expenditure, which in turn may indirectly affect output growth and inflation. As set out in Section 3.3, these wealth effects do not seem very large in the Netherlands; this is confirmed by a relatively low estimated elasticity in the MORKMON-model of the Nederlandsche Bank.[27] Third, asset price changes may spawn confidence effects, which will also indirectly impact on the level of domestic expenditure (on both consumption and investment products). Fourth, asset

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[26] The extent to which this would occur depends on the weight assigned to asset prices in the combined index.

[27] The elasticity of private consumption to household wealth is estimated at 0.05 in this model, described in Fase, Kramer and Boeschoten (1992); see also footnote 16. Strictly speaking, the third and fourth channel set out hereafter also influence domestic expenditures; however, it is unclear to what extent this elasticity fully reflects these channels, particularly in exceptional circumstances (such as those prevailing in Japan in recent years).

price developments may generate a self-reinforcing effect through the credit channel, thereby creating a procyclical influence on the business cycle. More specifically, a rising asset market will boost the value of available collateral, which in turn may fuel the growth of credit and spending (including that in the asset market). Conversely, when an asset market loses value and individuals experience difficulty in servicing their debts, banks will suffer losses and may react by reducing credit, thereby magnifying the cyclical downturn (through a "credit crunch").

This analysis of the relationship between asset prices on the one hand and consumer prices on the other, is instrumental in determining whether monetary policy should react to asset price developments. To the extent that consumer prices are directly influenced by asset price increases or are indirectly subjected to upward pressure as a result of adjustments in domestic expenditures (reflecting wealth and confidence effects), some monetary policy tightening will – other conditions being equal – be appropriate to maintain price stability. Conversely, asset price declines will reduce upward pressure on consumer prices, thereby creating scope for a monetary easing to support output growth. This indicates that pronounced asset price developments may, in principle, influence the monetary policy stance, even when this policy is primarily focused on (developments of) consumer prices.

However, monetary policy may not be the preferred instrument in reaction to the impact of asset price inflation through the fourth channel – the provision of credit. In particular, if the previous three channels are weak and asset price inflation takes place in a context of relatively stable (current and expected) consumer prices, the risks will mainly relate to the prospective stability of the financial institutions. In this situation, asset price developments are likely to represent a greater risk for the future stability of output growth than that of (future) inflation. The recent Japanese experience is a case in point.

In effect, when a self-reinforcing interaction takes place between the development of bank credit and asset prices, but consumer prices remain stable, monetary policy is a rather blunt instrument as it influences many other variables besides this interaction. (Assuming, of course, that this instrument is implemented in a market-friendly manner within a liberalised financial context). A more targeted instrument to address a credit spiral is supervision policy, which can contribute to a sufficiently prudent implementation of credit standards by banks, for instance through collateral requirements that offer adequate protection against asset price collapses. To the extent that banks use the asset price and business cycle-upswings to make provisions for less favourable times – as responsible banks should – the credit channel will not have a procyclical influence. Using this instrument kills two birds with one stone: more emphasis on prudential policies will enhance prospects not only for continued financial stability, but also (by dampening banks' credit activities) for sustained price stability. More generally, as set out in the so-called Tinbergen rule, aiming for two objectives (price stability and financial stability) requires at least two instruments (interest rate policy and prudential policy).

In practice, recent developments in Dutch mortgage lending also call for prudential vigilance, since banks have eased the conditions under which they provide mortgage credits (in particular as noted in Section 3.2, both partner and temporary incomes can now be fully counted in determining the credit ceiling; many banks have also increased the level of this ceiling relative to the value of the underlying real estate). A further warning is provided by banks' greater marketing efforts for these credits, for instance by means of fiscally attractive packages.

4.4 Asset prices as leading indicators

When monetary policy is primarily aimed at consumer prices, the role of asset prices will, in practice, be subsidiary and may thus be small. However, asset price developments could also play a part in the monetary policy process to the extent that they provide leading information on future consumer price and output developments. Indeed, studies confirm that asset prices do have some leading indicator properties. However, for the Netherlands the results of these studies, particularly

regarding prospective inflation, are not unambiguous and are subject to major uncertainty ranges that vary over the course of time. Specifically, using bivariate regressions, Borio et al. (1994) establish a positive relationship between asset and consumer price developments, but do not find this relationship to be statistically significant. Bikker and Kennedy (1997), by contrast, establish a negative relationship between the deviations from trend of asset and consumer price developments; however, this relationship is relatively weak and is the result of two simultaneous influences between these two variables (the dominant influence is that rising asset prices generally reflect a lowering of inflation expectations which – when the expectations turn out correct – later translate into a moderation of consumer prices). In all, asset prices do not seem to possess particularly reliable information, thereby limiting their usefulness for monetary policy purposes.

Conclusions

In summary, there are valid reasons to focus monetary policy primarily on consumer price developments; this enhances monetary instrument stability and precludes the considerable identification problems of asset price inflation. In this situation, asset price developments play a role to the extent that they directly influence consumer prices or indirectly lead to changes in domestic spending through wealth and confidence effects. In addition, asset prices may influence monetary policy on account of their leading information for future consumer price and output developments; however, in practice this information does not appear to be very reliable and may thus best be used as a complement to other leading indicators. When asset price inflation interacts with credit growth, supervision policy can help contain risks of future financial instability while also assisting monetary policy efforts aimed at maintaining consumer price stability.

More specifically for the case of the Netherlands, where the monetary strategy has been consistently anchored in an exchange rate commitment over a period of many years, the scope for making active use of monetary instruments for domestic (asset price or other) objectives is extremely limited. This constraint at the macro-level adds to the arguments to address exuberant asset price developments with policy instruments at the micro-level. This does not, however, resolve the problem that it is well-nigh impossible to conclusively identify excessive asset price changes in practice. Supervision policies will thus need to be especially on the alert in a buoyant market in order to prevent asset prices from having a destabilising influence, through the credit channel, on medium-term prospects for sustained non-inflationary growth.

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