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ASSET PRICES AND MONETARY POLICY

by
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ABSTRACT/RÉSUMÉ

In this paper, the authors analyse the role of asset market prices in the formation of monetary policy with particular reference to equity markets, a concern for policy makers in the late 1990s. While asset prices have potentially valuable supplementary information for monetary policy makers, they are hard to interpret because of their inherent volatility. Dilemmas arise when asset price movements are large and there are no signs of inflation pressures. Waiting until speculative pressures run their course risks both contagion to other sectors and assets and potentially damaging fallout from a correction. Tightening monetary policy in these circumstances (perhaps to avoid potential fallout on other sectors) would be difficult to justify to the public. In the current situation of low inflation (late 1997), various valuation measures suggest that equity markets are over-valued in the United States, Canada and Italy. Other countries are either at more intermediate positions (Germany and the United Kingdom) or close to *calculated* equilibrium values. If there were to be a correction of the same order of magnitude as occurred in October 1987 (20 per cent) output growth could be lowered in the OECD area by 1/2 a per cent over this year and next, assuming no adverse effects on confidence.

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Dans cet article les auteurs analysent le rôle des prix du marché des actifs dans le développement d'une politique monétaire étroitement liée au marché des capitaux, préoccupation des décideurs de la fin des années 90. Bien que les prix des actifs représentent une information de valeur pour les responsables de la politique monétaire, ils sont difficilement interprétables du fait de leur volatilité inhérente. Les problèmes surgissent quand les mouvements des actifs sont importants alors qu'il n'y a pas de signe de poussée inflationniste. Attendre que les pressions spéculatives suivent leur cours comporte un risque de contagion pour les autres secteurs et actifs et peut nuire aux retombées d'une éventuelle correction. Resserrer la politique monétaire dans ces conditions (afin peut-être d'éviter de possibles retombées sur d'autres secteurs) serait difficile à justifier face au public. Dans la situation actuelle de faible inflation (fin 1997) plusieurs mesures d'évaluation laissent à penser que le marché des actions est surévalué aux Etats-Unis, au Canada et en Italie. Les autres pays sont plus ou moins dans une situation intermédiaire (l'Allemagne et le Royaume-Uni) ou proche des valeurs calculées d'équilibre. S'il devait y avoir une correction de même ampleur que celle d'octobre 1987 (20%), les perspectives de croissance dans la zone de l'OCDE pourraient diminuer d'un demi point de pourcentage cette année et l'année suivante, à condition que la confiance ne soit pas négativement affectée.

Table of Contents

ASSET PRICES AND MONETARY POLICY

Mike Kennedy, Angel Palerm, Charles Pigott and Flavia Terribile[1]

I.   Introduction

1.   The current high levels of equity prices in all major markets, with the important exception of Japan (Figure 1), have given rise to a view that stock prices are over-valued and vulnerable to a large correction[2]. At the same time, the volatility of equity markets has been increasing (Figure 2)[3] and prices seem to have become very sensitive to economic news. This paper basically focuses on some issues related to using asset prices in monetary policy formulation with a particular focus on equity markets in the current situation. The plan of the paper is first to examine the selected lessons from the historical experience with asset price movements (Section II) and then to attempt to identify some key forces acting on equity prices in the current situation (Section III) and the possible implications of a correction (Section IV).

2.   Below are the main findings:

On the role of assets prices in monetary policy formulation in general

−   Asset price movements are potentially helpful as supplementary indicators of inflation pressures. However, developments in these markets are hard to interpret and, at times, too ambiguous to serve as a formal guide to policy. Nonetheless, sharp rises in asset prices have at times served to confirm the message from other indicators.

−   Situations in which large asset price changes raise risks of systemic problems or other damage to the real economy, while relatively uncommon, are more problematic. Historically, large and sustained declines have proved the most damaging. Waiting until speculative forces have run their course risks contagion effects to other sectors or assets, potentially worsening the eventual fall-out from the correction. In the absence of well-perceived general inflation pressures, the authorities are likely to find it difficult to explain and justify a pre-emptive policy tightening, even one that could potentially limit the fallout from a correction.

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2.   See, for example, "Cliff-hanger on Wall Street", *The Economist*, 1-7 November 1997, pp. 85-86 for a summary of views.

3.   Implied volatility is calculated from options prices.

On the role of current equity prices in particular

- In the current situation, valuation measures of equity markets appear to be at extreme levels in the United States, Italy and Canada. Germany and the United Kingdom are more intermediate cases, while valuation measures appear to be close to calculated equilibrium values in France and Japan. The large increases in equity prices in these countries occurred against a background of low and stable inflation, as was the case in Japan during the latter half of the 1980s. But, unlike Japan in that period, they as yet do not seem to have spread to other asset markets or to be associated with excessive debt accumulation or over investment in real assets.

- Estimates based on rules of thumb from the Secretariat's INTERLINK model indicate that the direct effects of a 20 per cent stock market correction on GDP growth in OECD economies, if it were to occur now, would lower output in the area by about half of a per cent in the next two years (with most of its effect distributed over the second year). The largest effects are on the United States, Japan and Canada respectively. This ignores possibly large confidence effects, especially on capital accumulation. The fallout on the financial systems of countries is likely to be largest in Japan.

- The issue for monetary policy in those countries where output gaps have been closed is whether to tighten in the near term to contain incipient inflation pressures or to wait for better indications of their existence. The possible negative effect of a prospective stock market correction will have to be taken into account but itself does not shift the balance of risks. In those countries that still have significant output gaps and fragile recoveries, the need is to continue to support activity and to be prepared to offset any negative spillovers from an equity market correction in the United States.

II. The role of asset prices in monetary policy formulation[4]

3. By now it is widely accepted that the longer-run goal of monetary policy is price stability; policy responses to asset prices will depend on their effects on that goal. Large increases in asset prices that could potentially spill over into excessive demand growth with inflationary consequences, or that were an indication of an overly accommodative monetary policy, would be a concern since they would contain information relevant to the central bank's inflation objective. However, there are considerable difficulties in interpreting the information content of asset prices in this context. To begin with, asset prices are influenced a great deal by expectations about a range of factors concerning future developments, as well as risk premia which can vary considerably but whose determination is poorly understood. Depending on its cause, any given movement in asset prices can call for quite different monetary policy responses: for example an exchange rate appreciation implies monetary easing if it raises the prospects that domestic inflation pressures will ease; but calls for unchanged policy if the cause is a rise in inflation abroad. For these reasons central banks generally have been reluctant to make regular[5] or formal use of asset prices in policy formulation. At the same time, there are occasions when authorities do need to pay close attention to the potential consequences of asset price movements. These instances

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4.   Reviews of these issues are contained in Borio, Kennedy and Prowse (1994) and Smets (1997).

5.   An exception is the Bank of Canada which takes account of exchange rate movements in deciding the stance of monetary policy. But even in this case, judgement is employed in discerning what are the underlying factors behind any change.

fall into two classes: one is when such movements can be interpreted as fairly clear indications of a build-up of inflation pressures; the other is when there is a serious risk that a run up, even if not caused by monetary policy and even if not obviously the result of unsustainable speculative booms or "bubbles", will result in a severe contraction that could lead to systemic financial problems or other major disruptions to the real economy.

Experiences with asset prices as indicators of inflation

4.   The use of asset prices as indicators of future inflation is not straightforward. Exceptions may be the experience of several Nordic countries and the United Kingdom during the 1980s when some asset prices, such as real estate, rose by well over 100 per cent (Figure 3) indicating that monetary policy was excessively expansionary and that inflationary pressures were present. However, there were ample other signs of these conditions, including real growth in excess of potential, accelerating price and wage increases and an exceptionally rapid expansion of credit. Thus the asset price movements themselves largely confirmed other indicators. Moreover the asset price increases were greatly amplified by financial deregulation which expanded access to credit and heightened competitive pressures in the financial industry; the effects were further reinforced by tax incentives encouraging borrowing and the leveraged acquisition of real assets (whose effects were magnified by inflation); and by inadequacies in regulatory oversight.

5.   There also have been cases in which over-emphasis on asset price movements has led to problems in monetary policy formulation. An example here is the attempt by the Bank of England to limit the appreciation of Sterling during the latter 1980s. This policy was a factor leading to an overly easy monetary policy stance that resulted in a run up in inflation. Its subsequent containment produced a major recession. Attempts by the Bank of Japan to limit yen appreciation after 1985, by allowing nominal interest rates to continue to fall, at least helped delay monetary tightening that, in retrospect, probably should have begun earlier[6].

6.   However, Japan's experience during the latter 1980s is complex. It is often cited as a clear case where domestic asset price movements, in real estate and equity markets, seemed to signal that monetary policy was overly expansionary. It did turn out *ex post* that growth was overly rapid in relation to potential. Moreover, the strong growth in capital spending did create extensive excess capacity that became apparent with the onslaught of recession. However, the degree to which these developments reflected overly expansionary monetary policy, particularly given that they did not spill over into general inflation, remains unclear even *ex post*[7]. The signals provided by the asset market run ups at the time were even less clear given that there seemed to be a range of factors unrelated to monetary policy at work including: expanded access to credit arising from financial deregulation; increased incentives by banks to lend to real estate and to acquire stocks to boost profit margins that were being eroded by competition; and the increased access by banks' corporate customers to international financial markets. Moreover, large run ups in land prices had also occurred during the 1960s and 1970s and could be explained in part by the pressure of expanding demand on limited and highly inelastic land supplies; while the strength in capital spending could be partly explained by a need to rebuild capacity following the relative weakness of investment earlier in the decade and during the latter half of the 1970s[8]. For these reasons, asset price

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6.   See Shigehara (1997).

7.   See Hutchinson (1994).

8.   See Harris and Pigott (1997).

movements themselves do not seem to have provided a reliable *ex ante* signal about monetary policy even in this case, and may have been saying more about structural problems.

Systemic problems that have resulted

7.   Nonetheless, the monetary authorities cannot always ignore major asset price run ups. This is particularly the case when such events encourage excessive debt accumulation or other imbalances that in the event of a contraction would threaten to lead to severe balance sheet retrenchments and other adverse financial repercussions. The potential risks are especially evident when the banking system becomes over exposed to asset markets. In principle, authorities need to take account of these potential consequences in assessing economic prospects.   History has not, however, provided any clear guidelines as to the appropriate response in the face of such asset price run ups, or how they can deal with the consequences and constraints on policy that may arise if and when a contraction does occur. There is, as well, the inherent difficulty in establishing well-defined guidelines inasmuch as the pace of innovation in financial instruments continues to alter the exposure of inter-related parties and the nature of the systemic risks involved.

8.   The rapid rise of equity prices during the 1920s, and their subsequent crash in 1929 (Figure 4), is frequently cited as an example of the dangers of speculative excesses. It is also an illustration of the difficulties involved in focusing on asset prices for monetary policy. At the time it was difficult to understand what was driving prices. There were arguments for a fundamental explanation of the stock market boom[9] which held that the rise in stock prices would have been justified by continued economic growth led by technological and structural changes in industry. On the other hand, most historians have argued that a bubble had developed in the stock market during the rapid growth of the 1920s. A change in fundamentals may have initiated the boom, but they were probably not the sustaining force[10].

9.   In the immediate aftermath of the 1929 crash, the New York Fed intervened in order to support the financial system and to try to confine the problem to the equities markets[11].   While this was appropriate, the Board's later concern about the possible revival of speculative excesses has been cited as the reason why policy failed to lend enough support to the economy. By not expanding the money supply sufficiently, the Federal Reserve Board effectively acquiesced in the long deflation from 1929 to 1933 which a less restrictive monetary policy might have curtailed. The failure of the Fed to support the banking system certainly exacerbated the banking crisis in 1931 and 1933[12]. In contrast, is the policy response to the 1987 stock market corrections. The immediate reaction of the monetary authorities has been widely perceived as having been appropriate; potential systemic risks were contained, helping to ensure that any problems were confined just to equity markets. However, in retrospect, the easing in response to the crash may have persisted for too long, contributing to the subsequent acceleration in inflation in many countries.

10.   The 1980s asset price booms presented authorities in many countries with no less a set of problematic choices. It is clear in retrospect that the real estate price booms in the United Kingdom and Nordic countries were leading to over accumulation of debt and real estate assets by households. As well,

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9.   See Fisher (1930) and Sirkin (1975).

10.   See Galbraith (1954); and White (1990).

11.   See Friedman and Schwartz (1963).

12.   See US Government (1988).

in the Nordic countries, bank exposures to real estate were becoming excessive. Likewise in Japan, the stock and real estate markets were becoming overvalued and were at risk of a substantial correction. In retrospect, the corrections of the asset price run ups in these cases led to prolonged recessions, aggravated, except in the United Kingdom, by very severe banking sector problems. The United States did not undergo nearly as large a nation-wide asset price boom, but it did experience rapid household debt accumulation and a rise in problem bank loans to commercial real estate. The excessive debt in this case, along with banking sector problems, did lead to retrenchments that slowed the recovery from the 1990 recession. In the United States, and considerably more so in Japan, the banking sector problems increased uncertainties about the impact of monetary policy and, especially in Japan, seem to have blunted its impact[13]. If these consequences could have been reliably foreseen, monetary policy should have been tighter than it was, or at least tightened earlier[14].

11.   Such *ex post* judgements, however, seriously understate the true policy uncertainties, dilemmas and constraints. As noted earlier, the factors behind the asset market run ups were far from clear *ex ante*, nor was it clear if, or to what extent, they would need to be reversed. For example, household financial assets and their capacity to service debt had also been increased by financial liberalisation; hence the degree to which debt accumulations had become a severe problem became clear only with the onset of recession. Much, if not all, of the stock market run ups during the latter 1980s, including in Japan for a large part of that period, seemed justifiable in view of the strong economic expansions underway and, in most countries, improved inflation performances. Nor was it clear that even a large reversal in asset markets would have significant effects on the real economy; this view was somewhat encouraged by the 1987 crash whose real effects were much milder than feared. Tightening monetary policy to counter asset price movements thus risked prematurely interrupting economic expansions that seemed sustainable and which had not, as yet, led to any overt inflation pressures. Authorities also faced the risk that such tightening would precipitate the very contraction and its repercussions that were feared; whereas waiting might allow a more gradual correction that would cause less of a problem. Moreover policy aimed at countering asset price movements, driven in large part by factors outside its traditional scope, or to prevent banking sector problems normally the responsibility of prudential authorities, would have been difficult to explain and could have undermined transparency and public confidence in monetary authorities.

III.   The situation in equities markets

12.   At present, it is developments in stock markets that are of most concern. The long run-up in the US stock market (Figure 5) and the spread of this strength to many other countries has invited comparisons with the 1920s. At that time, the surge in asset values was seen, in part, as a reflection of improved fundamentals in a "new age" in which technology and modern management techniques of large scale commercial and industrial enterprises would ensure rapid growth in earnings. The process was assisted by developments in the securities markets, such as the establishment of investment trusts and commercial banks' securities affiliates. The current US equity market has been characterised by optimism

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13.   Shigehara (1997).

14.   For a review of the experiences and problems with financial market reform, in particular the failure of the regulatory and prudential systems, see Edey and Hviding (1995); Harris and Pigott (1997) and OECD (1997).

about the future because of the promised rewards of technological change and the "new" economy[15]. Technology stocks have been among the best performers in the current US market. The drops in transactions costs for smaller investors plus the proliferation of new types of mutual funds following financial market deregulation have also been cited as factors contributing to the boom.

13.   Developing an appropriate monetary policy response depends in part on the implications for price stability, and in part on whether or not equity prices are over valued and at risk of a large enough correction to have disruptive effects. By the end of 1997, the rise in equity prices in various countries did not appear to have spilled over into other assets (land or housing). Indeed, the recent inflation performance of all countries has been very good, even in those where excess capacity has largely disappeared. The question of an appropriate response depends then on an evaluation of the sustainability of equity prices and the implications of a correction for the economy.

14.   Commonly used valuation measures to address these questions for equities markets are the dividend-price and the price-earnings ratios. Taking historical averages as a benchmark (Table 1), the dividend-price ratio for the United States and a number of other countries is very low (Figure 6) while price-earnings ratios are at the high end (Figure 7) of experience over the past two to four decades. Such low levels of the dividend yield could be signalling that the total returns to holding equity over long horizons will also be low[16]. The question is whether market participants are willing to accept low returns over a longer horizon[17]. If not, there is a risk of a correction.

15.   Another way of looking at this is to start from the premise that, in equilibrium, the dividend-price ratio (D/P) is determined by the riskless real rate of interest (r) and the equity premium (σ) less the expected growth rate of real dividends (g). Assuming that dividends are a constant fraction of earnings in equilibrium, then g could be thought of as real earnings growth as well. This is a variant of the "Gordon" formula[18]:

(1) $D/P = r + \sigma - g$.

The equity premium is a measure of the extra return required by investors to purchase stocks in recognition of their risk. The required return on equity is the sum of the real interest rate plus this premium. An equally simple formula for the equilibrium price-earnings ratio (P/E) can be developed from equation (1). Assume that in equilibrium the value of the pay-out ratio (the amount of earnings paid out as dividends) is a constant fraction of earnings and call it ν. Then the price-earnings ratio should be:

(2) $P/E = \nu/(r + \sigma - g)$.

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15.   In a Louis Harris and Associates poll of mutual fund investors published in April 1997, 75 per cent of the respondents thought that future returns would be equal to, or above, returns experienced in the past decade. See Easton (1997).

16.   See Fama and French (1988).

17.   In the United States, investors could be receiving dividends in the form of capital gains (through share buy backs), which would have a more favourable tax treatment. This could be one reason for the observed low dividend yield. Cole and Helwege (1996) have adjusted the US data for this effect and find that the dividend yield is still low. No such adjustments to the data are made here.

18.   See Gordon (1962).

16.   If the required return on equity has fallen for fundamental reasons, the current values of the dividend-price and the earnings-price ratio could be sustainable. On the other hand, strong earnings growth could equally be consistent with current low dividend-price ratios as long as this growth were sustainable. The price-earnings ratio (and by extension the price of equity) is sensitive to changes in any of these variables. For example, in the United States, as of late 1997 the difference between the price-earnings ratio of about 24 and its historical average of 15 could be explained by a difference in the risk premium of only one percentage point *ceteris paribus* (Figure 8). A change in real earnings growth or the real rate of interest of that magnitude would have the same effect.

17.   The Gordon formula (equation 1) can be used to make some illustrative calculations of potential overvaluation. One way to proceed is to use historical averages of the key variables and calculate the implied value of the equilibrium dividend-price ratio. It is equally possible to use the current level of the dividend yield and calculate implicit values of the real interest rate, the equity premium or the real growth in earnings, that would be consistent with current values of the dividend yield. Such calculations, as well as those for the dividend yield, are shown in Table 2.

18.   Care must be taken in interpreting these results since they depend critically on the assumptions made about underlying equilibrium levels of the determinants. A few words are in order here. The measure of the equity premium, which can only be inferred from the data, is the average of the past 15 years in most cases. This value is lower than the historical average and the one that existed in the 1970s. There seem to be good reasons for accepting this lower value. To begin with, inflation has come down from its high level in the 1970s and this could have contributed to the decrease of the equity premium below its trend[19]. Moreover, long-horizon investors[20] and households (Table 3) have increased their participation in the market and this has contributed to the post-war decline in the premium. Both of these groups are thought to be willing to accept a lower equity premium because of their longer-term horizons. Judgement was also used in choosing the current real interest rate levels. For the most part it was assumed that current inflation expectations had not adjusted fully to recent low levels of inflation. It was also assumed that real interest rates converge in Europe to 4 per cent and that the current very low real rates in Japan are not sustainable. Finally, long-run real dividend growth is assumed to be constrained to be equal to the growth of potential output[21].

19.   Because of the subjective nature of this exercise, the implications that follow are at best suggestive. Bearing this mind, the following can be said:

    – The implied dividend yield is above critical values in all countries, with the largest differences in the United States, Italy and Canada, in that order.

    – Similar patterns emerge when the other variables are examined. For example, in the United States and Canada the implied real interest rate necessary to sustain the current dividend yield is below levels on real indexed bonds in those countries. For Italy, where there are no index bonds, the implied real interest rate is below recent historical norms.

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19.   See Blanchard (1993) and Carlson and Sargent (1997).

20.   See Blanchard (1993) and Golob and Bishop (1997).

21.   In a number of countries, there do not exist long-run time series on dividend growth from which to make estimates of equilibrium growth rates. Potential output growth has therefore been used as a reasonable proxy which also facilitates cross-country comparisons.

- The implicit growth of dividends (proxied by potential output growth) is significantly above potential growth in the four countries mentioned.

- Finally, equity valuation measures in Japan and France appear to be closest to their fundamentals, while those in Germany and the United Kingdom are more intermediate cases.

20.   In the United States, Italy and Canada, current high prices could be being supported by investors extrapolating recent developments. This could well be the case in the United States for earnings. For instance, an aggregation of analysts' forecasts of earnings growth for the S&P 500 companies shows a 14 per cent rise in nominal earnings for the coming year. These rates are considerably in excess of nominal GDP and they follow two years of exceptionally strong earnings growth. In addition, markets also appear to be optimistic that the threat of inflation has been lessened considerably and, with it, the possibility that interest rates will have to rise any time soon. Here, Italy could be an exception because of further convergence of nominal interest rates with EMU. However, the measures in Table 2 implicitly assume such convergence has occurred. The yield curves in a number of countries appear flat by historical standards. The difficulty in justifying current valuation levels has prompted suggestions of the possible existence of an unsustainable element in prices[22]. Whether equity markets (particularly the US market) have developed a bubble[23] is very difficult to determine *a priori*[24]. One piece of evidence supporting this view has been the recent increase in the expected volatility of returns (see Figure 2).

IV.   Possible consequences of a large correction

21.   Gauging the effect of a substantial correction of equity prices on the real economy is difficult, partly because history is not much of a guide. For example, the effects of the 1987 correction on the US as well as on other economies appear to have been modest. In the United States, this was due to the offsetting effects of the exchange rate. In the case of other countries, it reflected smaller wealth effects. The role of the 1929 stock market crash in explaining the Great Depression, while originally thought important, appears to have been limited. Wealth effects on consumer spending were probably marginal (only 6 per cent of all households were directly affected). The drop in equity values at that time did increase the debt-equity ratios of firms that were already highly leveraged but the largest declines in business investment spending occurred later when business confidence was plummeting[25]. In the current situation any slowdown in spending in the United States and the United Kingdom (and Canada to a lesser extent) would come about in the context of aggregate demand that is close to or above potential levels estimated for the economy. For those countries where output gaps are still present, any reductions in long-term interest rates, as occurred in the aftermath of the 1987 correction, would provide some buffering effect on demand.

22.   The direct effects on GDP will come through wealth changes on consumption and costs of capital increases, as well as its availability, for investment.

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22.   See Federal Reserve Chairman's recent testimony before Congress, 29 October 1997.

23.   Blanchard and Watson (1982) argue that bubbles are more likely to appear when fundamentals are difficult to assess, as they are currently.

24.   See Shleifer and Summers (1990) for a description of how the process might work. On the econometric difficulties testing for a bubble, see Flood and Hodrick (1990).

25.   See US Government (1988).

 − Using rules of thumb from the Secretariat's INTERLINK model, measures of the effect on consumption spending of a large US stock market correction (for example, a 20 per cent drop as occurred in October 1987), both on growth in that country and on other major countries where the role of equity in household portfolios is not large, are estimated to be relatively small, even assuming that similar declines take place in the stock markets of other major countries (Table 4). The level of output for the area as a whole is estimated to fall about ½ a per cent in the next two years with most of the effect occurring in the second year. In order, the largest effects are on the United States, Japan and Canada. These estimates, however, are likely to be an upper bound. For example, in the United States, the United Kingdom and Canada, equity markets have been rising for some time and consumption has probably not fully adjusted to the higher level of wealth.

 − The other expenditure channel is investment (Figure 9). Any effects are only likely to be significant to the extent that the stock market correction coincided with changes in business conditions; a phenomenon that in the past has been associated with changes in the broader outlook in financial markets that would imply higher spreads on longer-term and riskier debt[26]. Furthermore, such changes would have to be permanent and involve a general movement in asset markets to be of significance for investment decisions; fluctuations in equity values away from what might be considered its longer-term trend -- as defined by movements in fundamentals -- do not typically have a significant impact[27]. Such a movement would be typically linked with changes in perception regarding the business cycle climate. On the other hand, a sharp financial correction may engender rapid shifts in the value of outstanding positions of market participants and bring into doubt previous perceptions of their creditworthiness thus lowering access of borrowers to credit.

23.   Historically, the fall out from an asset price boom seems to have had its greatest effect through problems it created in the financial system. The risks to a banking system that is not already in a fragile position would seem to be limited. Important here, is whether or not there has been a spill over to other asset markets like housing and commercial real estate from rising stock markets. This does not appear to be an issue where markets may be over valued (the United States, Italy or Canada) in the current situation. In a number of OECD countries in the past, adjustment has been made more difficult and prolonged because of the fall out from collapsing asset prices. The aftermath of the excesses of the "bubble" economy still clouds prospects for a solid recovery in Japan. If the current low level of the Nikkei were to persist, a number of major Japanese banks would come under pressure to improve their capitalisation levels either by raising new capital or by reducing the size of their balance sheet (Table 5).

24.   Further complications can develop to the extent that there is contagion to other countries, which could arise through several vehicles. First, new issuance in the United States has been dominated by foreign issuers, many of which come from emerging markets (Table 6). A decline in the US market would reduce the scope and increase the cost of raising further capital by foreign firms. Second, markets are directly linked -- the same stocks are quoted in different stock markets and held by investors in different parts of the world -- and the changes in the value of these stocks prompt a similar response from investors holding these assets independent of their location. Finally, a weaker US economy would feed into weaker equity prices elsewhere. Short-term correlations between changes across major stock markets do suggest that large shifts in one market are quickly spread to other markets, particularly between the United States, on the one hand, and the United Kingdom and Canada, on the other (Figure 10). The low

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26.   See Fama and French (1989).

27.   See Tease (1993).

correlation between the United States and Japan is due to the special factors that have been affecting the Japanese equities markets since the fallout from the bubble economy. Nevertheless, it seems unlikely that the Japanese market would escape a major downward adjustment on equity prices from current levels, even if the adjustment might perhaps be less than elsewhere, given that current values are basically around their equilibrium counterparts, according to estimates presented here.

BIBLIOGRAPHY

Blanchard, Olivier J.(1993), "Movements in the Equity Premium", *Brookings Papers on Economic Activity* 2, pp. 75-138.

Blanchard, Olivier J. and Mark Watson (1982), "Bubbles, Rational Expectations and Financial Markets", in *Crises in the Economic and Financial Structure*, Paul Wachtel (ed.), Lexington.

Borio, C.V., N. Kennedy and S. D. Prowess (1994), "Exploring Aggregate Asset Price Fluctuations Across Countries", *BIS Economic Papers*, No. 40, April.

Carlson, John B. and Kevin H. Sargent (1997), "The Recent Ascent of Stock Prices: Can it be Explained by Earnings Growth or other Fundamentals", *Economic Review*, Federal Reserve Bank of Cleveland, pp. 2-12.

Cole, Kevin, Jean Helwege, and David Laster (1996), "Stock Market Valuation Indicators: Is This Time Different?" *Financial Analysts Journal*, May/June, pp. 56-64.

Easton, Thomas (1997), "Buy High, Sell Low", *Forbes*, April 7, p. 119.

Edey, Malcolm and Ketil Hviding (1995), "An Assessment of Financial Reform in OECD Countries", *OECD Economic Studies* No. 25, pp. 7-38.

Ely, David P. and Kenneth J. Robinson (1989), "The Stock Market and Inflation: A Synthesis of the Theory and Evidence", *Economic Review*, Federal Reserve Bank of Dallas, March, pp. 17-29.

Fama, Eugene F. and Kenneth R. French (1988), "Dividend Yields and Expected Stock Returns", *Journal of Financial Economics*, October, pp. 3 - 25.

Fama, Eugene F. and Kenneth R. French (1989), "Business Conditions and Expected Returns on Stocks and Bonds", *Journal of Financial Economics* 25, pp. 23-49.

Flood, Robert P. and Robert J. Hodrick (1990), "On Testing for Speculative Bubbles", *Journal of Economic Perspectives* 4(2), Spring, pp. 85-101.

Fisher, Irving (1930), *The Stock Market Crash and After*, Macmillan.

Friedman, Milton and Anna J. Schwartz (1963), *A Monetary History of the United States, 1867-1960*, Princeton University Press.

Galbraith, J.K. (1954), *The Great Crash of 1929*, Houghton Mifflin Company.

Golob, John E and David G. Bishop (1997), "What Long-Run Returns Can Investors Expect from the Stock Market?", Federal Reserve Bank of Kansas City *Economic Review*, Third Quarter, pp. 5-20.

Gordon, Myron J. (1962), *The Investment, Financing and Valuation of the Corporation*, Homewood, Ill.

Hardouvelis, Gikas A. (1990), "Stock Market Bubbles before the Crash of 1987?", Federal Reserve Bank of New York *Research Paper* No. 9004, March.

Harris, Stephen and Charles Pigott (1997), "Regulatory Reform in the Financial Services Sector: Where are we Going; Where have we Been", OECD *Financial Market Trends*, June, pp. 71-74.

Hutchison, Michael M. (1994), Asset Price Fluctuations in Japan: What Role for Monetary Policy?", Bank of Japan *Monetary and Economic Studies*, Vol. 12, No. 2, December, pp. 61-83.

Jacobs, Jill (1996), "Profits and Labour", *Economic Research*, Goldman Sachs.

Mehra, Rajnish and Edward C. Prescott (1985), "The Equity Premium: A Puzzle", *Journal of Monetary Economics* 15(2), March, pp. 145-161.

OECD (1997), *The OECD Report on Regulatory Reform: Volumes 1 and 2*, Paris.

Poterba, J.M. and L.H. Summers (1988), "Mean Reversion in Stock Prices: Evidence and Implications," *Journal of Financial Economics* 22, pp. 27-59.

Seyhun, H. Nejat (1990), "Overreaction or Fundamentals: Some Lessons from Insiders' Response to the Market Crash of 1987", *The Journal of Finance*, Vol. 45, No. 5, December, pp. 1363-1388.

Shigehara, Kumiharu (1997), "Monetary Policy and Economic Performance: the Recent Experience of the United States and Japan", paper presented at the International Economic Association Conference "Monetary Theory as a Basis for Monetary Policy", 4-7 September, Trento, Italy.

Shiller, Robert (1981), "Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?" *American Economic Review* 71(3), June, pp. 421-436).

Shleifer, Andrei and Lawrence H. Summers (1990), "The Noise Trader Approach to Finance", *Journal of Economic Perspectives* 4(2), Spring, pp. 19-33.

Sirkin, Gerald (1975), "The Stock Market of 1929 Revisited: A Note", *Business History Review* 49(2), Summer, pp. 223-231.

Smets, Frank (1997), "Financial Asset prices and Monetary Policy: Theory and Evidence", Bank for International Settlements, *Working Paper No. 47*, September

Tease, Warren (1993), "The Stock Market and Investment", *OECD Economic Studies* No. 20, Spring, pp. 41-63.

US Government (1988), "Study VIII: A Comparison of 1929 and 1987" in *Report of the Presidential Task Force on Market Mechanisms,* January.

White, Eugene N. (1990), "The Stock Market and the Crash of 1929 Revisited", *Journal of Economic Perspectives* 4(2), Spring, pp. 67-83.

Zhou, Chunsheng (1996), "Stock Market Fluctuations and the Term Structure", Federal Reserve Board of Governors, *mimeo*.

Table 1. Some stylised facts on G-7 equity markets

	Whole period	1960-69	1970-79	1980-89	1990-97	1996	1997Q1	November
United States (S&P)								
Real long-term interest rate[1]	2.80	2.34	0.11	5.23	3.34	3.82	4.04	3.8
Price earnings ratio	15.21	17.77	12.28	12.16	19.61	19.10	18.80	24.23
Dividend yield	3.60	3.18	4.02	4.18	2.79	2.11	1.88	1.59
GDP potential growth rate[2]	2.86	3.82	2.96	2.74	2.28			
Japan (Topix)								
Real long-term interest rate[1,3]	2.58	3.01	-0.71	4.58	3.74	3.18	2.75	1.1
Price earnings ratio (adjusted)[4,5]	27.58	n.a.	13.86	22.71	41.38	59.04	47.00	30.00
Dividend yield	2.23	4.42	2.30	1.07	0.78	0.79	0.93	0.91
GDP potential growth rate[6]	3.61	n.a.	4.34	3.85	2.48			
Germany (Dax)								
Real long-term interest rate[1]	4.09	4.18	3.25	4.78	4.18	4.69	4.12	4.1
Price earnings ratio[7]	14.00	n.a.	12.75	13.20	16.10	15.60	18.20	18.60
Dividend yield	3.00	n.a.	3.96	3.00	2.14	1.88	1.58	1.49
GDP potential growth rate[9]	3.00	3.90	2.91	2.08	2.49			
France (Composite)								
Real long-term interest rate[1]	3.36	2.35	0.91	4.99	5.73	4.69	4.12	4.1
Price earnings ratio[7]	11.82	n.a.	12.50	10.40	13.10	14.80	17.70	16.70
Dividend yield	4.21	n.a.	4.86	4.53	3.27	3.27	2.78	2.61
GDP potential growth rate[6]	2.53	n.a.	3.32	2.30	1.93			
Italy (Composite)								
Real long-term interest rate[1]	2.31	2.29	-2.24	3.59	6.62	5.27	4.79	3.6
Price earnings ratio[8]	16.90	n.a.	n.a.	15.60	17.40	15.90	18.30	19.30
Dividend yield	2.98	n.a.	4.01	2.35	2.87	2.43	2.13	1.66
GDP potential growth rate[6]	2.60	n.a.	3.63	2.43	1.82			2.22
United Kingdom (FT-SE)								
Real long-term interest rate[1]	2.50	3.00	-1.39	4.11	4.80	5.06	4.65	4.1
Price earnings ratio[9]	11.42	14.64	9.79	9.40	13.24	13.87	14.79	16.81
Dividend yield[9]	4.78	4.71	5.35	4.72	4.20	3.81	3.64	3.60
GDP potential growth rate[2]	2.23	2.85	1.87	2.34	2.16			
Canada (TSE-300)								
Real long-term interest rate[1]	3.77	3.17	1.09	5.20	6.17	5.75	5.07	3.8
Price earnings ratio	20.27	17.36	11.63	14.31	42.86	19.48	22.83	23.82
Dividend yield	3.41	3.22	3.95	3.55	2.66	2.05	1.77	1.59
GDP potential growth rate[6]	3.09	n.a.	4.19	2.94	2.18			

1. Real long-term interest rates are defined as the nominal 10 year rate less a smooth series of GDP deflator inflation. The series was smoothed using a Hodrick-Prescott filter. The November value is calculated as the nominal 10 year rate less the Secretariat's projection for inflation on average over 1998 and 1999.
2. Data start from 1961.   3. Data start from 1964.   4. Price-earnings have been adjusted to take into account cross-share holdings between firms.   5. Data start from 1976.
6. Data start from 1970.   7. Data start from 1974.   8. Data start from 1986.   9. Data start from 1963.

16

Table 2. **Evaluations of current dividend yields**

| | Recent and historical data | | | |
| | Dividend yield | Real interest rates | Average value of premium | Average potential growth |
	November 1997		1980-97[1]	1980-97[2]
United States	1.59	3.90	1.70	2.50
Japan	0.91	2.75	0.34	2.00
Germany	1.49	4.00	0.36	2.25
France	2.61	4.00	0.86	2.15
Italy	1.66	4.00	1.19	2.20
United Kingdom	3.60	4.00	2.35	2.25
Canada	1.59	4.00	1.29	2.60

| | Measures of potential overvaluation | | | |
	Implied dividend yield[3]	Implied real interest rates[4]	Implied premium[4]	Implied growth of dividends[4]
United States	3.10	2.38	0.19	4.00
Japan	1.09	2.57	0.16	2.18
Germany	2.11	3.38	-0.26	2.87
France	2.71	3.92	0.76	2.25
Italy	2.99	2.67	-0.14	3.53
United Kingdom	4.10	3.50	1.85	2.75
Canada	2.69	2.90	0.19	3.70

1. For Japan, Italy and Canada the 1980-89 average was used because of extreme values in the data in the 1990s.
2. For Japan, the historical average was not used. The potential growth rate for Japan was lowered in view of the mounting evidence that the slowdown in productivity seen in the first half of the 1990s reflected a permanent rather than a cyclical phenomenon.
3. Implied dividend yield is the sum of columns two and three, less column four in the top panel. Similar calculations could be made for the price-earnings ratio using equation (2) in the text and historical values for the price-earnings ratio.
4. Implicit values of the real interest rate, the premium and the growth rate are derived from equation (1) in the text using the current dividend yield and various combinations of two of the other measures from columns two to four in the top panel.

Table 3. **Household equity holdings, net wealth and disposable income**

A. Households' equity holdings as a per cent of net wealth

	1980/84	1985/89	1990/94	1995	1996	1997[1]	*Memo*: Capital gains on equity in 1997 (as a share of net wealth)[1]
United States	10.6	11.0	15.1	19.5	20.9	24.4	5.2
Japan	4.5	7.6	5.8	5.4	4.9[1]	3.7	-1.0
France[2]	1.3	3.1	2.9	2.6	2.9	3.2	0.4
Italy[2]	0.8	2.1	3.6	3.8	3.6	4.7	1.4
United Kingdom	5.5	6.3	9.4	11.3	11.3	12.4	1.6
Canada	13.7	13.9	14.2	15.6	16.5	18.3	2.4

B. Households' equity holdings as a per cent of net financial wealth

	1980/84	1985/89	1990/94	1995	1996	1997[1]	*Memo*: Capital gains on equity in 1997 (as a share of net financial wealth)[1]
United States	20.7	20.4	26.3	32.3	33.8	38.9	8.1
Japan	17.2	26.8	19.7	15.3	12.4[1]	9.5	-2.6
Germany	4.8	7.5	5.8	5.7	6.5[1]	7.6	1.7
France[2]	7.8	20.1	18.6	11.4	12.0	13.2	1.7
Italy[2]	2.2	4.7	7.7	7.9	7.4	9.0	2.6
United Kingdom	16.2	18.0	22.8.	22.4	21.8	23.7	3.0
Canada	35.1	34.6	34.6	36.1	38.0	40.7	5.4

C. Households' equity holdings as a per cent of disposable income

	1980/84	1985/89	1990/94	1995	1996	1997[1]	*Memo*: Capital gains on equity in 1997 (as a share of disposable income)[1]
United States	52.1	56.0	76.8	102.1	114.4	135.8	28.3
Japan	23.8	56.8	43.2	35.6	34.7[1]	26.0	-7.0
Germany	7.2	13.4	10.3	11.0	14.0[1]	17.1	3.8
France[2]	5.2	12.7	12.1	10.9	12.9	14.4	1.9
Italy[2]	2.5	8.0	16.6	18.2	17.2	23.4	6.8
United Kingdom	24.2	36.0	53.1	63.0	62.6	67.6	8.6
Canada	53.8	58.3	64.0	75.4	83.0	91.1	12.0

1. Secretariat estimates based on previous year's data, average savings rate over last five years, and observed movements in stock market indices. Value of stock markets as of 13 November 1997.
2. For France and Italy, national sources' estimates for household equity holdings have been corrected to exclude non-quoted shares. Data presented are based on national authorities' estimates of the ratio of quoted to non-quoted shares in household portfolios.

Table 4. **Macro effects of an equity market correction[1,2]**

(Consumption effect only, changes compared to baseline in level terms)

Scenario 1: Correction of 20 per cent in US equity values[1]

Impact on	Real GDP (percentage points)		Inflation (percentage points)		Current account (US$ billion)		Current account (as per cent of GDP)		Trade balance (as per cent of GDP)	
	1st year	2nd year	1st year	2nd year	1st year	2nd year	1st year	2nd year	1st year	2nd year
United States	-0.2	-0.5	0.0	-0.2	5.6	16.4	0.1	0.2	0.1	0.1
Japan	-0.1	-0.3	0.0	-0.1	-1.2	-4.4	0.0	-0.1	0.0	-0.1
Germany	-0.1	-0.2	0.0	0.0	-0.6	-1.8	0.0	-0.1	0.0	-0.1
France	0.0	-0.1	0.0	0.0	-0.2	-0.9	0.0	-0.1	0.0	-0.1
Italy	0.0	-0.2	0.0	-0.1	-0.3	-1.2	0.0	-0.1	0.0	-0.1
United Kingdom	0.0	-0.1	0.0	-0.1	-0.2	-0.8	0.0	-0.1	0.0	0.0
Canada	-0.1	-0.4	0.0	-0.1	-0.3	-1.1	-0.1	-0.2	0.0	-0.1
OECD[3]	-0.1	-0.3	0.0	-0.1	1.6	2.9	0.0	0.0	0.0	0.0
OECD Europe[3]	0.0	-0.2	0.0	-0.1	-2.1	-7.5	0.0	-0.1	0.0	-0.1

Scenario 2: Correction of 20 per cent in equity markets of all G-7 Countries[2]

Impact on	Real GDP (percentage points)		Inflation (percentage points)		Current account (US$ billion)		Current account (as per cent of GDP)		Trade balance (as per cent of GDP)	
	1st year	2nd year	1st year	2nd year	1st year	2nd year	1st year	2nd year	1st year	2nd year
United States	-0.2	-0.6	0.0	-0.2	5.3	15.7	0.1	0.2	0.1	0.1
Japan	-0.2	-0.5	0.0	-0.3	-0.7	-3.3	0.0	-0.1	0.0	-0.1
Germany	-0.1	-0.4	0.0	0.0	-0.6	-1.7	0.0	-0.1	0.0	-0.1
France	-0.1	-0.2	0.0	-0.1	-0.2	-0.8	0.0	0.0	0.0	0.0
Italy	-0.1	-0.3	0.0	-0.1	-0.3	-1.2	0.0	-0.1	0.0	-0.1
United Kingdom	-0.1	-0.2	0.0	-0.2	0.3	0.7	0.0	0.0	0.0	0.0
Canada	-0.2	-0.5	0.0	-0.1	0.0	-0.3	0.0	0.0	0.0	0.0
OECD[3]	-0.1	-0.4	0.0	-0.2	2.3	4.6	0.0	0.0	0.0	0.0
OECD Europe[3]	-0.1	-0.2	0.0	-0.1	-1.9	-6.8	0.0	-0.1	0.0	-0.1

1. The equity market correction is assumed to produce an *ex ante* drop in US real private consumption of 0.6 percentage points relative to baseline; this drop is not immediate but gradual with a mean lag of 0.75 years and a maximum lag of 4 half-years. Simulations based on fixed exchange rates and unchanged policies.
2. The equity market correction is assumed to have an *ex ante* drop in real private consumption of 0.6 percentage points relative to baseline in the United States; 0.2 in Japan; 0.1 in Germany, France and Italy; 0.3 in the U'nited Kingdom; and 0.4 in Canada. These drops are not immediate but gradual with a mean lag of 0.75 years. Simulations based on fixed exchange rates and unchanged policies.
3. Weighted averages.

Table 5. **The effects of a stock market's decline
on the balance sheets of major Japanese banks**

	March 1996	March 1997	November 1997	Critical level[1]
Nikkei		18244	15500	14800
Value of banks' stock holdings				
- market (Yen trillion)	55.3	47.3		
- book (Yen trillion)	39.3	39.3		
- unrealised profits (Yen trillion)	16.0	8.0		
Stock market change since March 1997 average (per cent)			-15.0	-18.9
Value change of banks' holdings (Yen trillion)			-7.1	-8.9
New unrealised profits (Yen trillion)			0.9	-0.9
Change in Tier 2 capital (Yen trillion)[2]			-3.2	-4.5
Regulatory capital	41.2	40.9	37.7	36.4
Risk-weighted assets	452.3	456.9		
BIS capital ratio	9.1	9.0		
Estimated BIS capital ratio			8.3	8.0

1. This column shows the level of the stock market at which the average capitalisation ratio of major Japanese Banks would fall below the critical 8 per cent level.

2. Under BIS capitalisation rules, only 45 per cent of unrealised profits on stock holdings are counted in Tier 2 capital.

Source: OECD Secretariat estimates using data from Bank of Japan and Bloomberg.

Table 6. Foreign and domestic issuers in the United States equity market

($US billion)

	1970/79[1]	1980/89[1]	1990	1991	1992	1993	1994	1995	1996	1997Q1[2]	1997Q2[2]
Net issues	7.91	-42.29	-37.7	76.9	103.4	130.1	24.1	-2.3	3.8	-59.0	-36.1
Non-financial corporate business	5.52	-55.89	-63.0	18.3	27.0	21.3	-44.9	-58.3	-64.2	-86.2	-83.6
Financial sector	2.04	10.63	17.9	28.0	44.0	45.4	20.9	5.6	9.2	-19.8	-8.1
Rest of the world	0.35	2.97	7.4	30.7	32.4	63.4	48.1	50.4	58.8	47.0	55.6

1. Averages of annual data.
2. Quarterly figures are seasonally adjusted at annual rates.
Source: Secretariat calculations on the basis of *Flow of Funds Accounts of the United States*, Board of Governors of the Federal Reserve System, Washington, 1997.

Figure 1. **Equity nominal market prices**
(Daily from January 1996 up to November 1997)
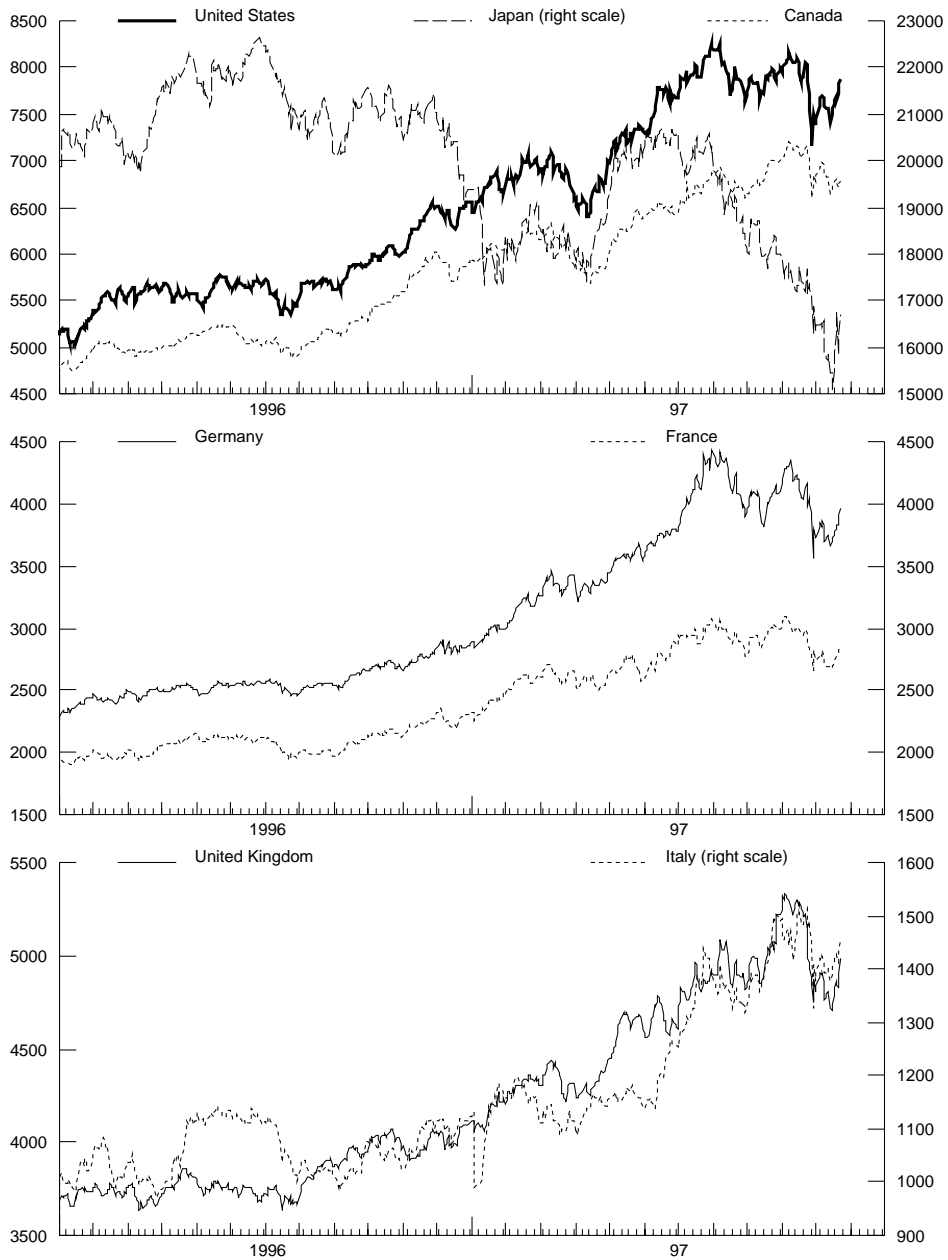
Source: Financial Times.
USA: Dow Jones Industrial, Japan: Nikkei 225, Canada: composite, Germany: Dax, France: CAC40,
Italy: MIB, United Kingdom: FTSE 100.

Figure 2. Implied volatility of stock prices (1)
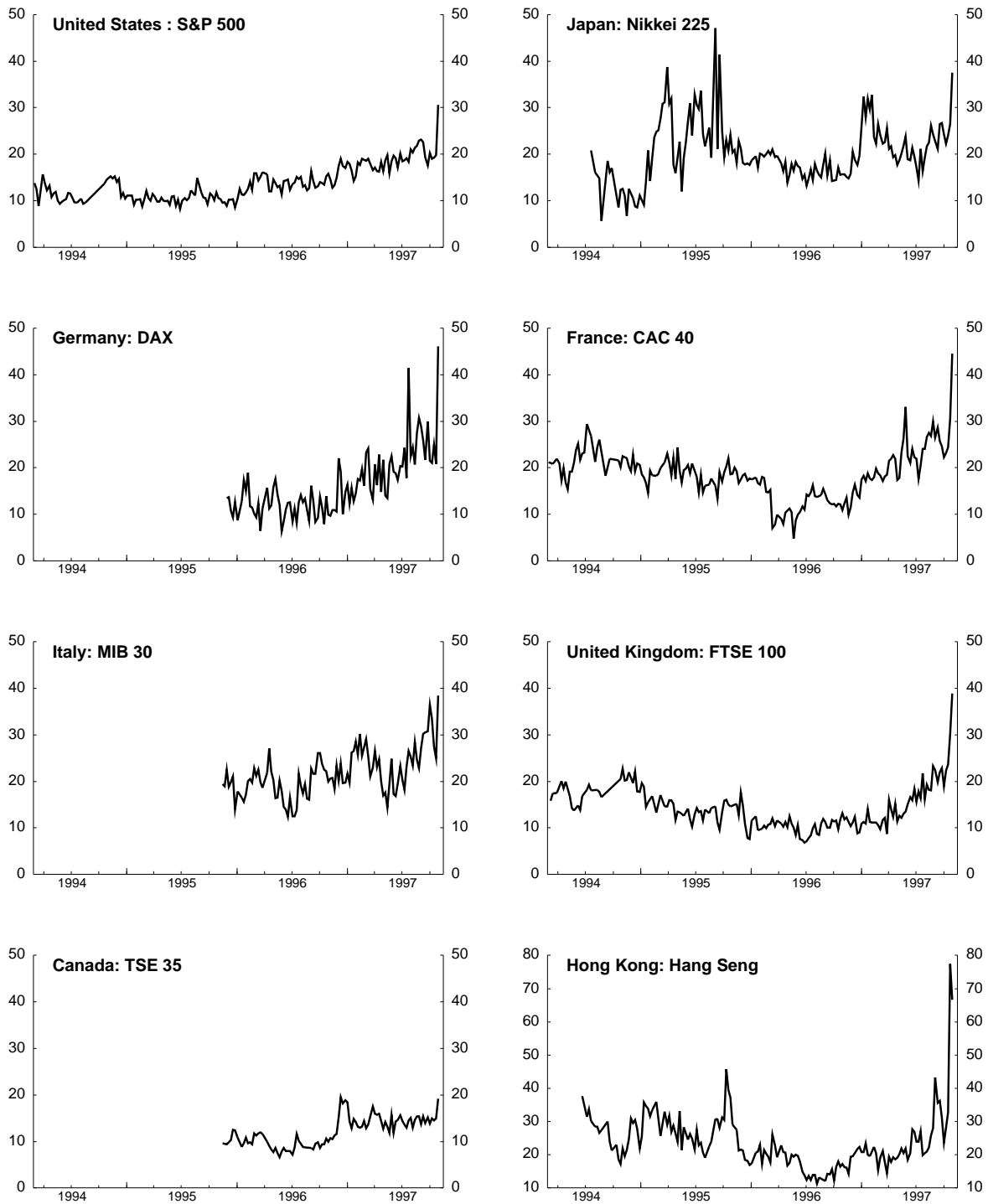
1. Implied volatility is the market's prediction of expected volatility and is indirectly calculated from current call option prices using the Black-Sholes model.In essence, this is the market's volatility 'forecast' for the underlying security during the remaining life of the option.

Source: Bloomberg.

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Figure 3. Real housing prices
(Index 1984=100, except for Sweden: 1988=100)
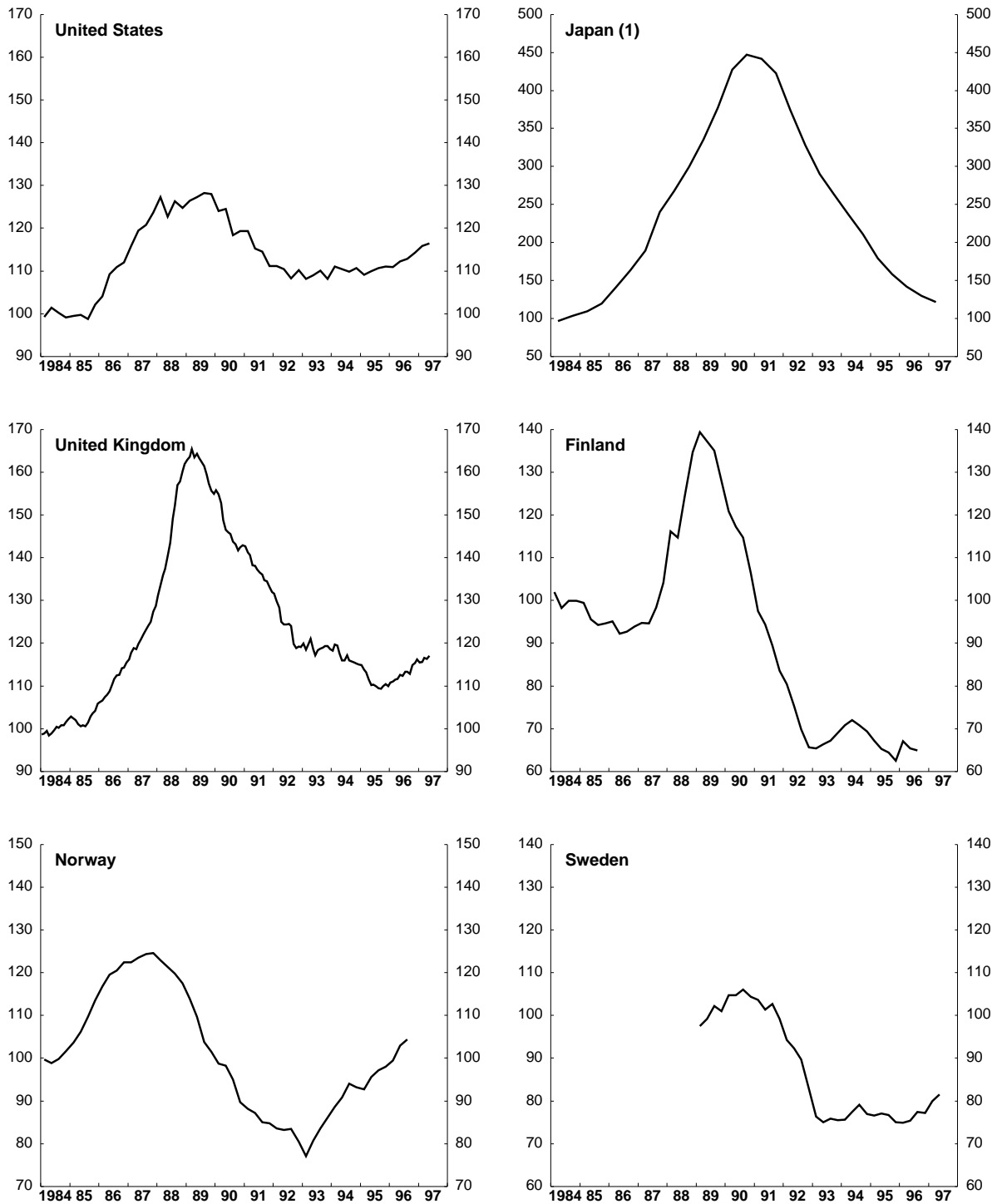
1. Japan: commercial land prices.
Sources: United States: DRI; Japan: Nikko Research Center; United Kingdom: Halifax; Finland: Bank of Finland; Norway: Bank of Norway; Sweden: SCB.

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Figure 4. Historical stock prices in the United States and in the United Kingdom
(in logs)
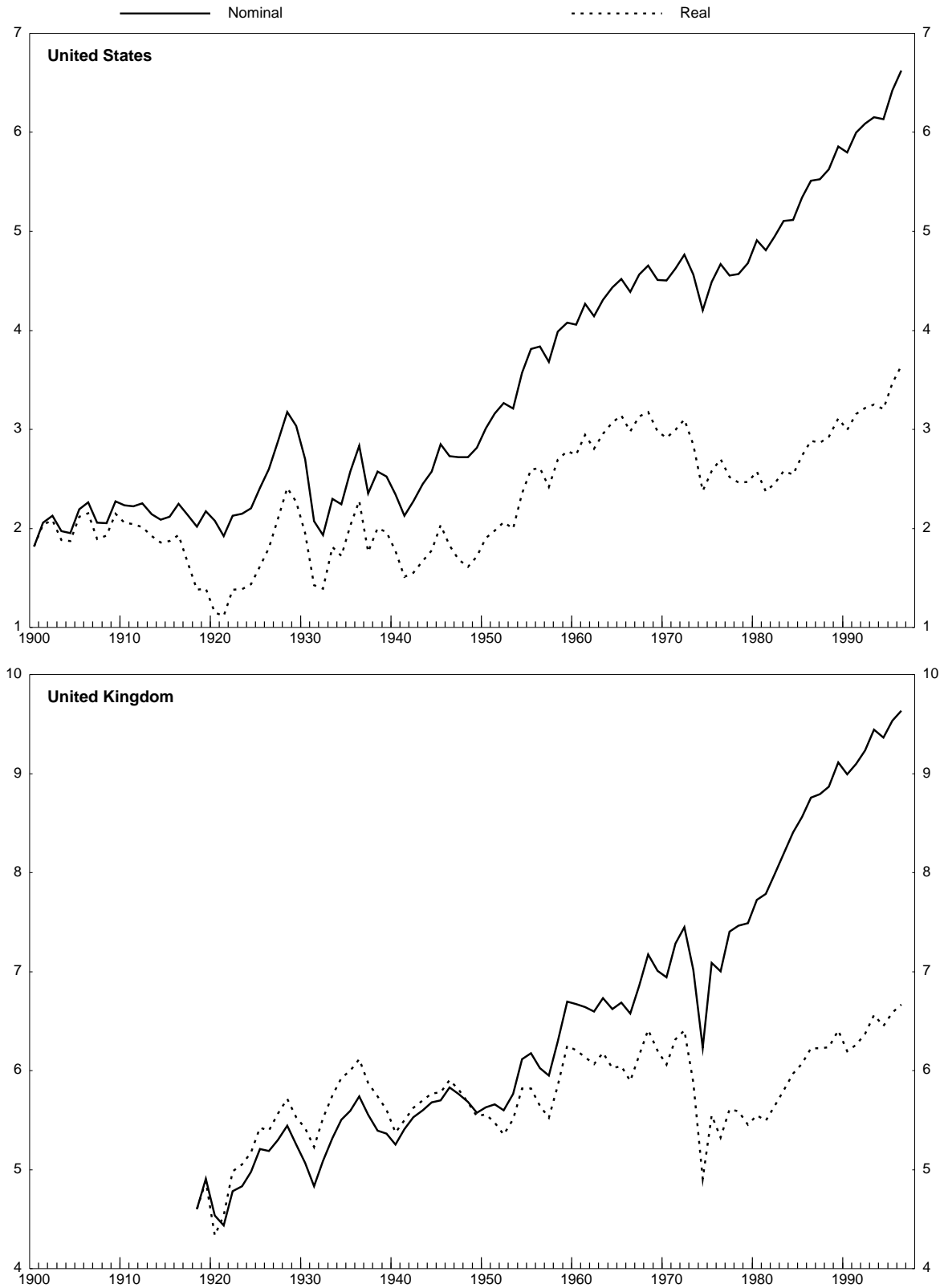
Source: United States : Standard and Poors Index from Historical Statistics of the United States, US Federal Reserve Bank, and DRI.
            United Kingdom : BZW equity index from Bank of England

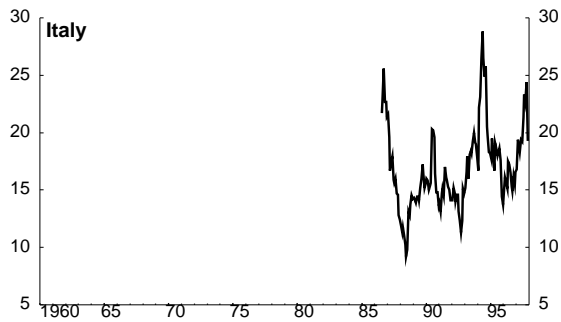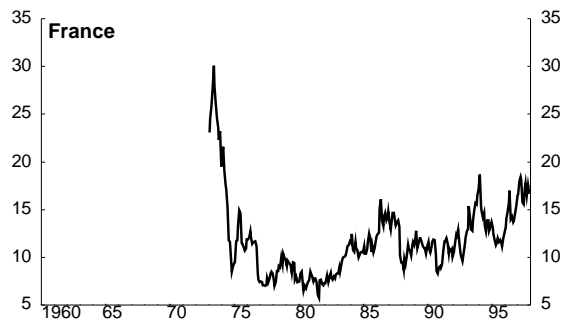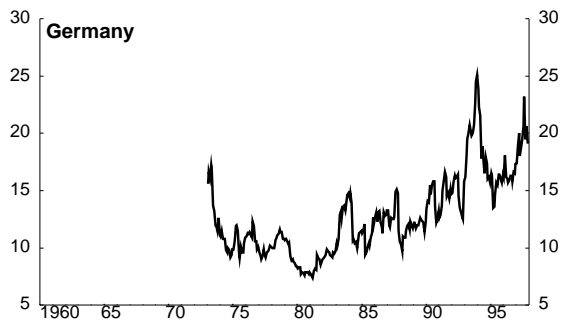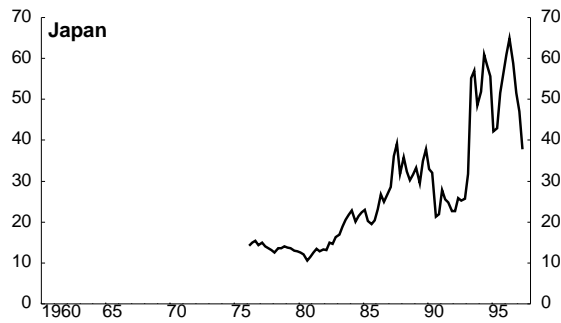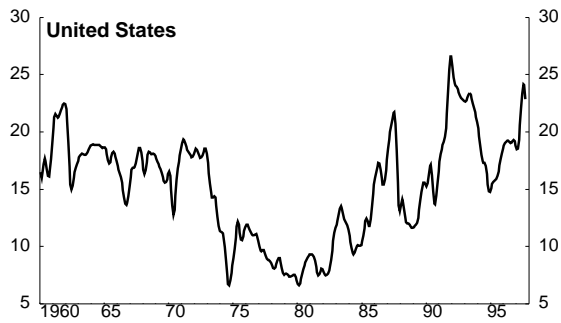**Figure 5. The US stock market in the 1920s, and in the 1990s**

——— S&P Index 1921=100   ········ S&P Index 1988=100

Figure 6. Dividend yields
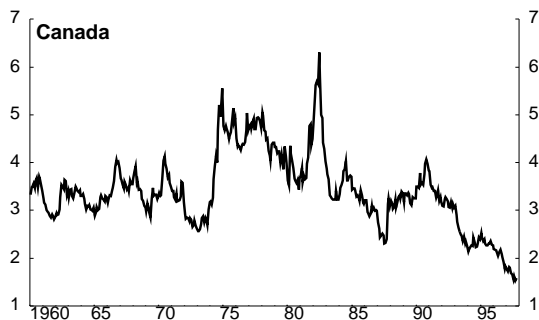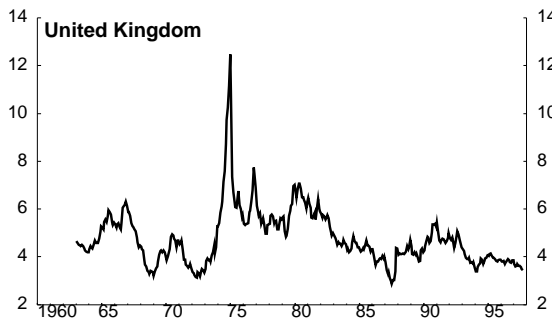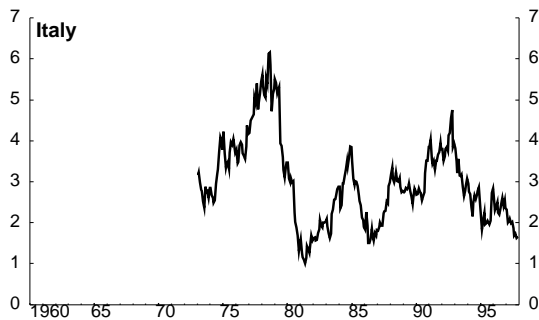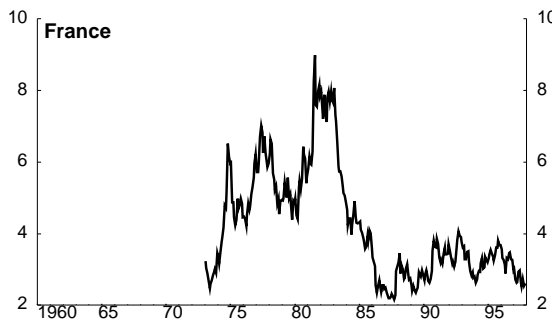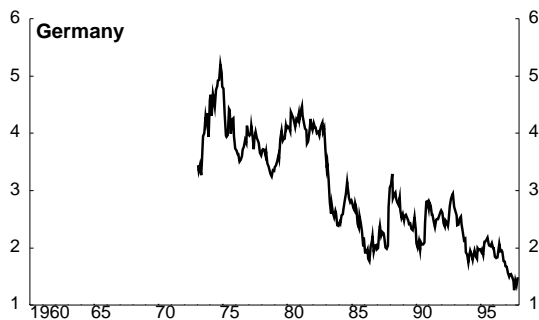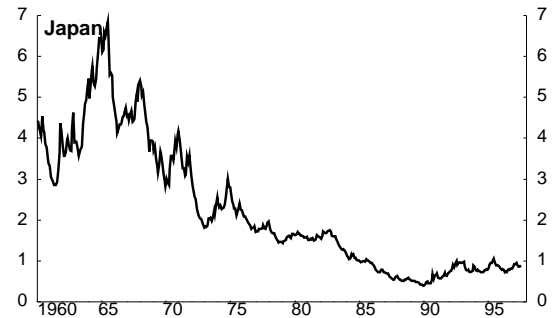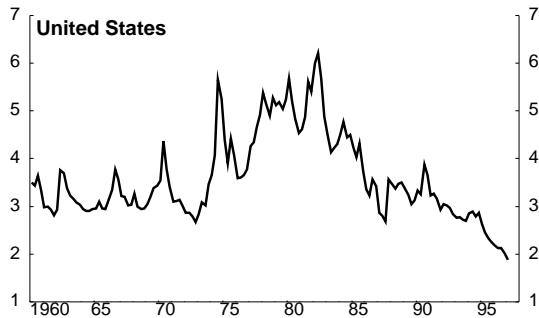
Sources:
United States (S&P): DRI.
Japan (Topix): Bank of Japan.
Germany (Dax): Salomon Brothers.
France (composite): Salomon Brothers.
Italy (composite): Salomon Brothers.
United Kingdom (FT-SE): ONS
Canada (TSE300): Cansim.

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Figure 7. Price-earnings ratios
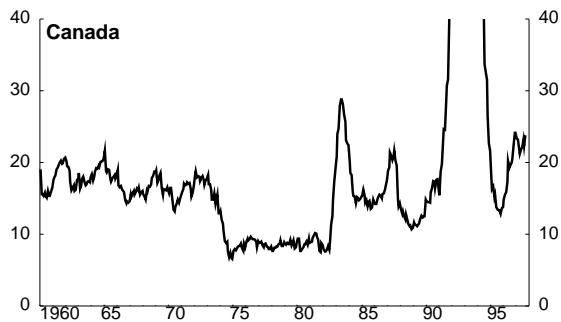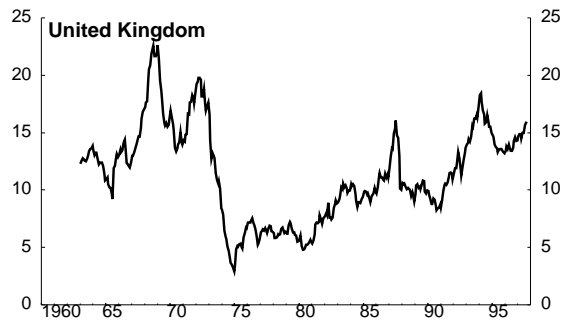
For Japan, the price-earnings ratio has been adjusted
to take account of cross-shareholdings between firms.

Sources: see Figure 6.

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28

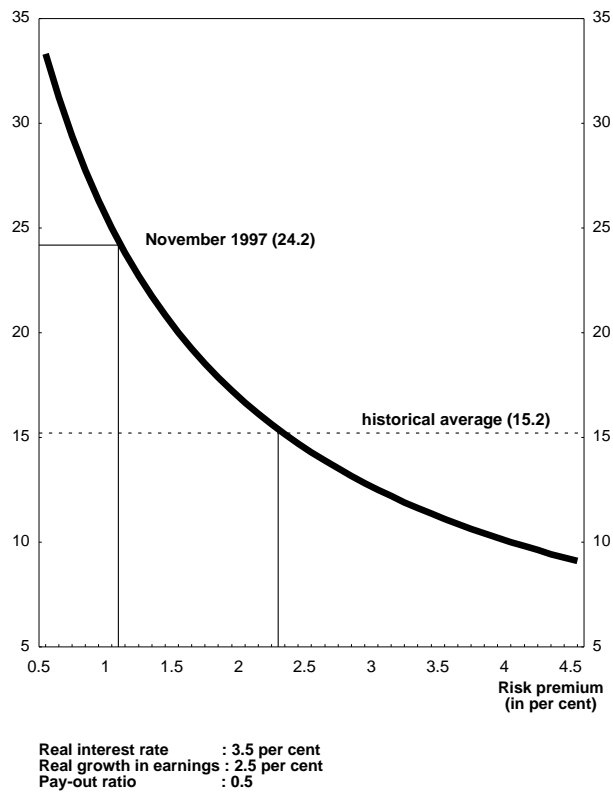**Figure 8. Sensitivity of price-earnings ratio to changes in fundamentals**

Real interest rate   : 3.5 per cent
Real growth in earnings : 2.5 per cent
Pay-out ratio   : 0.5

Figure 9. Stock prices and investment

—— Business fixed investment (left scale) ········ Real stock prices (right scale)

United States	: Standard and Poors 500
Japan	: TOPIX
Germany	: CDAX
France	: SBF 250
Italy	: MIB
United Kingdom	: FT-SE-A Non Financials
Canada	: TS300
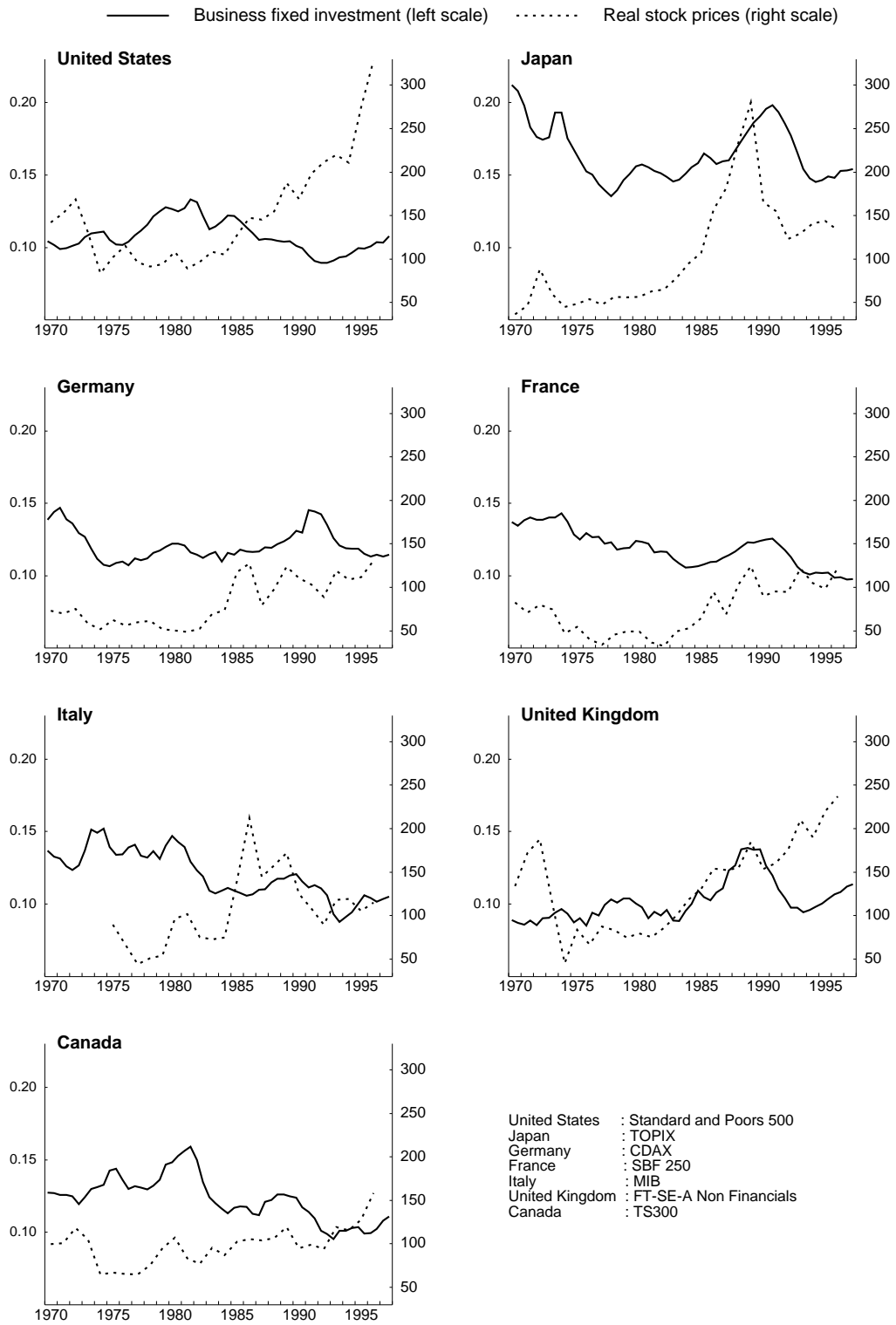
Figure 10. Correlations across stock markets (1)

Japan vis-à-vis the United States

United Kingdom vis-à-vis the United States

Germany vis-à-vis the United States

France vis-à-vis the United States

Canada vis-à-vis the United States

France vis-à-vis Germany
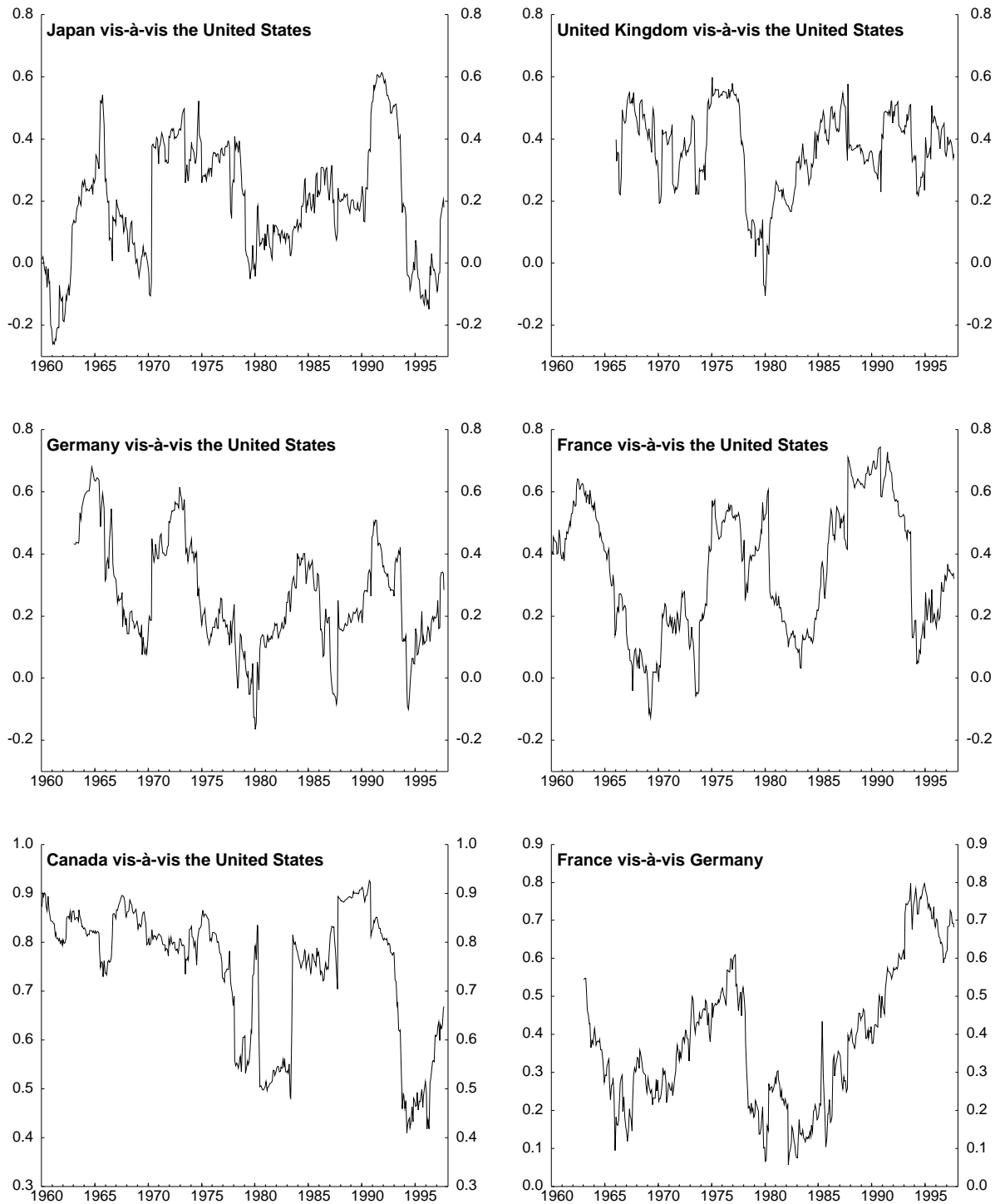
1. As measured by the correlation of monthly price changes calculated over a 36 month period.
Sources: Bloomberg, OECD Secretariat.

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