

## V. RECENT EQUITY MARKET DEVELOPMENTS AND IMPLICATIONS

*Starting in mid-July of this year, the equity markets of most OECD economies began to turn down and by early October had fallen by 20 to 35 per cent. The drops generally followed, or were close to, recent peaks; the major exception among the larger OECD economies was Japan where prices were already low following the prolonged adjustment in the aftermath of the bubble economy. The declines that happened stood out both by their size and by their simultaneous occurrence in all major economies. Since then, these markets have recovered a large part of those losses and once again appear over-valued on a number of measures. This chapter addresses, in turn, the nature of the third quarter drop compared with previous such episodes, outlines some benchmarks against which current levels of equity prices can be measured and assesses the implications of declines in equity prices in general for economic activity in the OECD area.*

### Some features of the third quarter market declines

The peaks that were reached in various equity markets by mid-July followed a sequence of gains dating back to the early 1980s, in most cases broken only by short-lived setbacks. While there were sound reasons to believe that these longer-term trends in various markets represented a response to improved fundamentals, for example, the drop in inflation (Blanchard, 1993), by the late 1990s many of these markets appeared to have reached levels that were difficult to rationalise. Part of this process seems to have been driven by extrapolation of then favourable trends in earnings as well as increased investor complacency regarding risk. The declines that occurred in the third quarter appeared to be the result of a downgrading of earnings projections and a reappraisal by investors of the risks inherent in these markets. Much of this seems to have been triggered by the spreading and deepening financial problems in emerging economies.

*Share prices fell...*

Equity market corrections are a periodic feature of all major economies but their simultaneous occurrence across a majority of G-7 economies is relatively uncommon. Using three *ad hoc* definitions,<sup>1</sup> based on quarterly changes in major stock indices, only four such episodes since the 1970s can be identified: *i*) the downturn following the first oil-price shock; *ii*) the “stagflation” period around 1981; *iii*) the crash in October 1987; and *iv*) in 1990, the German post-unification crisis and the collapse of the Japanese asset bubble which affected equity markets within the same quarter. In terms of the number of economies affected, the current period compares best with the first and third episodes.

*... in all major economies*

The drop in equity prices that happened also departed from past experience in two other important respects:

- There was a sharp downgrading of bank and financial shares almost everywhere. While it is common for bank share prices to be more cyclical than total equity prices on average – due to the sensitivity of their loan portfolios

*Shares of financial institutions were hard hit...*

1. These were: quarterly drops greater than 2 standard deviations; half-yearly ones, larger than 3 standard deviations; and declines in real prices by more than 2 standard deviations over 4 quarters.

*... and overall volatility rose and remains high*

to business activity as well as to their equity holdings in most countries – additional factors would seem to have been at play. These included: *i*) uncertainties regarding bank exposure to emerging markets; *ii*) the recently disclosed large positions of some banks with highly-leveraged borrowers, like Long-Term Capital Management and others; and *iii*) the unresolved financial crisis in Japan.

- Major equity markets have become unusually volatile. The magnitude of day-to-day percentage changes of equity prices since early July – a rough measure of overall stock market volatility – has been high by the standards of the past three decades and the intra-month variability is second only to that at the time of the crash in 1987. Furthermore, their implied volatility (based on option prices) shot up in the third quarter of 1998 to levels seen only in Japan in recent years (Figure V.1). In response, investors moved substantial funds into various government bond markets, which drove longer-term yields to record lows in some cases (the safe-haven effect).

Taken together, the rise in the pricing of risk (implied by the increase in interest rate spreads between corporate and government bonds), the increase in volatility and signs of weakness in national banking sectors represent additional negative facets surrounding the economic outlook. A renewal of the downward pressures on equity prices seen in the third quarter could exacerbate these factors.

## Equity prices in perspective

*Valuation measures are out of line with past norms*

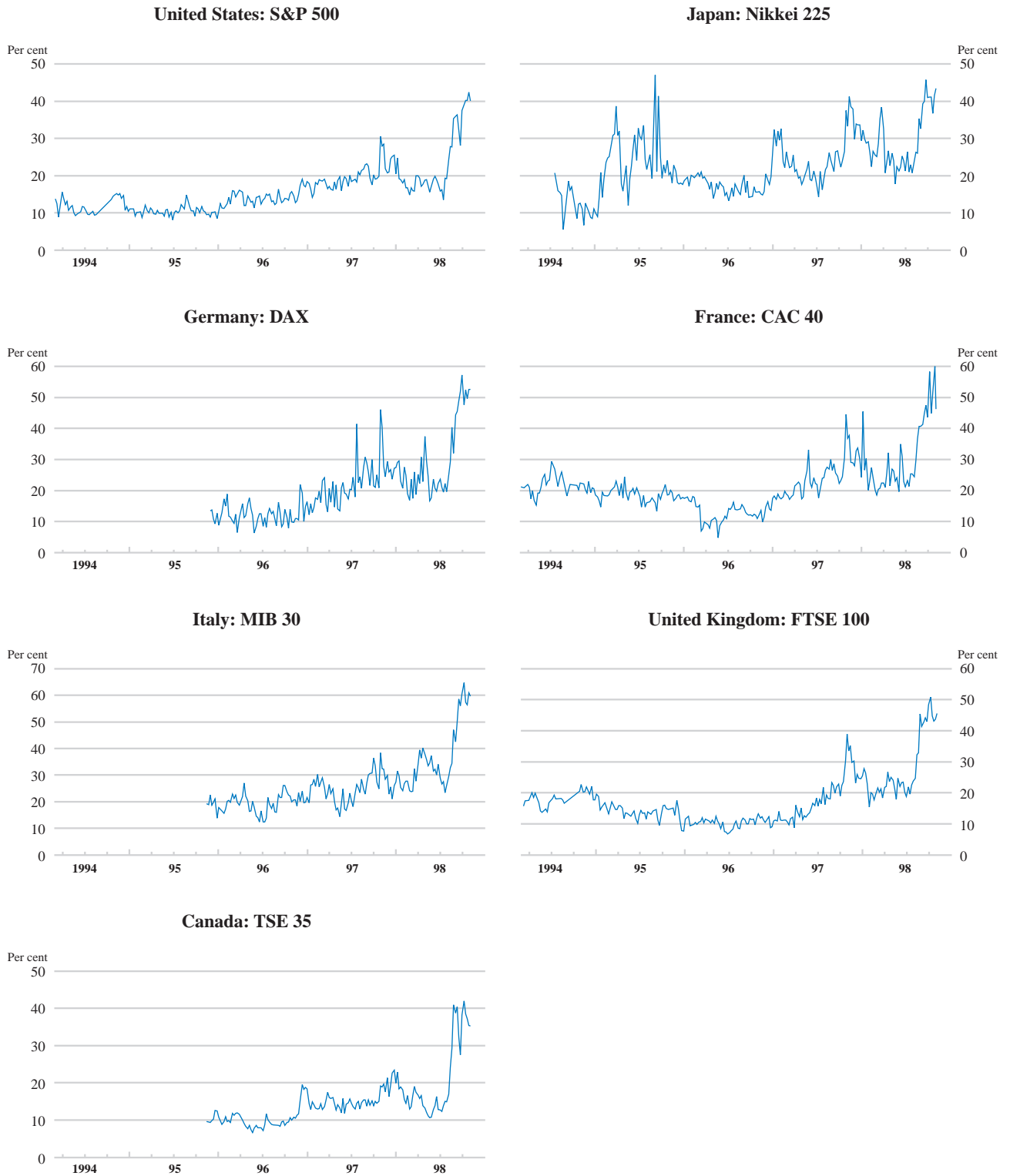
It is very difficult to determine what is the “appropriate” price level for equity. At best, only a range of such estimates can be provided. As a first approximation, the levels of the dividend-price and price-earnings ratios (commonly used market valuation measures) can be compared with their historical norms (Table V.1). On this basis, the dividend-price ratios as of early October were still below the norms of the past three-and-a-half decades for most economies, with the exception of the United Kingdom despite the declines in prices that had been registered. This was true even when the October dividend yields were compared with those in the 1960s, a time when inflation was similarly low. Price-earnings ratios, on the other hand, although high, were less out of line, in part because of the previous very strong earnings growth in a number of countries.

Over the past half decade there has been a fall in the dividend-pay-out ratio in a number of countries. One reason could be that corporations have changed how they distribute earnings – preferring to generate lower-taxed capital gains by re-investing earnings as opposed to paying dividends.<sup>2</sup> This could help justify some part of the unusually high prices as long as earnings growth is sustained. Another interpretation is that firms may not be raising dividend payments because current earnings are believed to be cyclically high and not sustainable.

*Measures that emphasise the role of risk and earnings growth...*

An alternative approach to assessing share prices that puts more focus on earnings sustainability, as well as investor perceptions of risk, starts from the premise that, in long-run equilibrium, the dividend-price ratio is directly related to equilibrium levels of the risk-free real interest rate and the equity risk premium less the growth in real

2. However, Cole *et al.* (1996) have adjusted the US data for this effect and they still find that the dividend yield is low.

Figure V.1. Implied volatility of stock prices<sup>1</sup>

1. Implied volatility could be interpreted as the market's prediction of future volatility and is calculated from call option prices using the Black-Sholes formula.  
The scale differs from country to country.

Source: Bloomberg.

Table V.1. Some stylised facts in G-7 equity markets<sup>a</sup>

	Whole period	1960-69	1970-79	1980-89	1990-97	1998 Q2	Oct. 1998	Nov. 1998
United States								
D/P	3.6	3.2	4.0	4.2	2.8	1.4	1.6	1.4
P/E	15.2	17.8	12.3	12.2	19.6	26.6	24.0	28.6
Japan								
D/P	2.2	4.4	2.3	1.1	0.8	1.2	1.2	1.0
P/E <sup>b</sup>	27.6	n.a.	13.9	22.7	41.4	115.5	n.a.	220.6
Germany								
D/P	3.0	n.a.	4.0	3.0	2.1	1.3	1.7	1.9
P/E <sup>c</sup>	14.0	n.a.	12.7	13.2	16.1	22.9	17.7	26.8
France								
D/P	4.2	n.a.	4.9	4.5	3.3	2.2	3.0	2.3
P/E <sup>c</sup>	11.8	n.a.	12.5	10.4	13.1	19.8	14.7	21.0
Italy								
D/P	3.0	n.a.	4.0	2.3	2.9	1.3	2.3	1.3
P/E <sup>c</sup>	16.9	n.a.	n.a.	15.6	17.4	30.6	19.6	43.6
United Kingdom								
D/P <sup>c</sup>	4.8	4.7	5.3	4.7	4.2	2.8	3.8	3.4
P/E <sup>c</sup>	11.4	14.6	9.8	9.4	13.2	18.4	21.9	23.9
Canada								
D/P	3.4	3.2	3.9	3.6	2.7	1.4	1.9	1.7
P/E	20.3	17.4	11.6	14.3	42.9	33.6	22.3	23.5

a) D/P denotes the dividend-price ratio and P/E the price-earnings ratio.

b) Price-earnings ratios have been adjusted for cross holdings between firms. Data start from 1976.

c) For Germany and France, data start from 1974; for Italy, data start from 1986; and for the United Kingdom, data start from 1963.

Source: OECD, Bloomberg and Salomon Smith Barney.

dividends.<sup>3</sup> Assuming that dividends are a constant fraction of earnings in equilibrium, the long-run growth rate of real earnings and dividends would be the same. The equity premium is the extra return (above the riskless real interest rate) required by investors to purchase stocks in recognition of their riskiness.

This approach can be used to make illustrative calculations of consistent sets of observations for the dividend yield, the real interest rate, the risk premium and growth. The first column in the lower panel of Table V.2, for example, shows the dividend yield consistent with October levels of the real rate of interest and average values of the risk premium and real growth over the past 18 years.<sup>4</sup> In a similar manner, the other columns show the implied level of the real interest rate, the risk premium or the real growth rate which could validate the October dividend yield with the other assumed determinants of share prices taking on the current (the real interest rate) or more recent historical average (the risk premium and real growth) levels. Comparing these implied values with their actual counterparts in the top panel of Table V.2, and bearing in mind the judgmental nature of this type of exercise, the following may be said:

... give mixed results across economies

– In October, the dividend yield consistent with average values of its determinants was still above current values for the United States and Canada despite

3. Formally, the expression is  $D/P = r + \sigma - g$ , where D/P is the dividend-price ratio;  $r$  the real interest rate;  $\sigma$  the risk premium; and  $g$  the growth rate of real dividends. This is a variant of the Gordon formula (see Myron Gordon (1962), *Investment, Financing and Valuation of the Corporation*, Homewood, Ill.). This expression can be re-written to show the determinants of the price-earnings ratio (P/E) by assuming a constant dividend-pay-out ratio ( $v$ ). Then the price-earnings ratio is:  $P/E = v/(r + \sigma - g)$ .

4. It is worth pointing out that judgement is required in deriving the historical risk premium which can only be inferred from the data. Concretely, the Gordon formula was used to derive a measure of the risk premium using average values of dividend yields, real interest rates and real growth over the past 18 years in most cases. A description of the method used is contained in Kennedy *et al.* (1998).

Table V.2. Evaluations of current dividend yields

	Recent and historical data			
	Dividend yield	Real interest rates	Average value of premium	Average potential growth
	October 1998		1980-97 <sup>a</sup>	1980-97 <sup>b</sup>
United States	1.60	3.90	1.70	2.50
Japan	1.18	2.75	0.34	2.00
Germany	1.71	4.00	0.36	2.25
France	3.01	4.00	0.86	2.15
Italy	2.28	4.00	1.19	2.20
United Kingdom	3.81	4.00	2.35	2.25
Canada	1.92	4.00	1.29	2.60
	Measures of potential overvaluation			
	Implied dividend yield <sup>c</sup>	Implied real interest rates <sup>d</sup>	Implied premium <sup>d</sup>	Implied growth of dividends <sup>d</sup>
United States	3.10	2.40	0.20	4.00
Japan	1.09	2.84	0.43	1.91
Germany	2.11	3.60	-0.04	2.65
France	2.71	4.30	1.16	1.85
Italy	2.99	3.29	0.48	2.91
United Kingdom	4.10	3.71	2.06	2.54
Canada	2.69	3.23	0.52	3.37

*Note:* The columns in the bottom panel are each calculated on the basis of the data in the top panel (see footnotes for details) and have no relationship to each other. Indications of overvaluation can be obtained by comparing similar columns in each panel, for example the current dividend yield (top panel) with that implied if the dividend yield were in line with fundamentals (bottom panel).

- a) For Japan, Italy and Canada the 1980-89 average was used because of extreme values in the data in the 1990s.
- b) Potential growth of the economy is used as a proxy for real dividends or earnings growth to put the calculations on a comparable basis across countries. 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.
- c) Implied dividend yield is the sum of columns two and three, less column four in the top panel. It is meant to represent a proxy for the equilibrium level of the dividend yield.
- d) Implicit values of the real interest rate, the premium and the growth rate are derived from the formula in footnote 3 of 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.

the declines in prices that have occurred. The same was true for Germany and Italy although to a lesser extent.

- Similar patterns for these economies emerge when the other variables are examined. For example, the implied real earnings growth seems high while implied risk premia look low.
- On the other hand, based on the various calculations used, valuation measures in Japan, the United Kingdom and France all appear close to levels consistent with fundamentals as defined here.
- The bounce back in equity prices that has generally occurred in major markets has not appreciably changed these conclusions.

## Possible effects on economic activity of a stock market decline

Changes in equity prices can have large and direct effects on economic activity through changes in household wealth. The impact will depend on how households view the decline (permanent versus temporary) as well as on their exposure to asset prices in combination with their marginal propensity to consume out of financial wealth. For the United States, an extensive empirical literature points to a relatively narrow

*Share price declines directly affect consumption...*

Table V.3. Macroeconomic effects of an equity market correction<sup>a</sup>

Consumption effect only, changes compared with baseline

	Effects of a 20 per cent fall in real equity prices in each individual country			
	Real private consumption (percentage points)		Real GDP (percentage points)	
	1st year	2nd year	1st year	2nd year
United States	-1.2	-1.1	-0.8	-0.8
Japan	-0.6	-0.7	-0.5	-0.4
Germany	-0.2	-0.4	-0.1	-0.2
France	-0.3	-0.2	-0.1	-0.1
Italy	-0.1	-0.2	0.0	-0.1
United Kingdom	-0.2	-1.0	0.0	-0.4
Canada	-0.3	-0.4	-0.1	-0.1
	Effects of a 20 per cent simultaneous fall in real equity prices in G-7 countries			
	Real private consumption (percentage points)		Real GDP (percentage points)	
	1st year	2nd year	1st year	2nd year
	United States	-1.2	-1.2	-1.0
Japan	-0.7	-0.8	-0.7	-0.8
Germany	-0.3	-0.5	-0.4	-0.5
France	-0.3	-0.3	-0.3	-0.4
Italy	-0.1	-0.2	-0.2	-0.4
United Kingdom	0.0	-1.0	-0.1	-0.7
Canada	-0.3	-0.4	-0.5	-0.5
OECD total <sup>b</sup>			-0.6	-0.7

a) Simulations based on fixed exchange rates and unchanged policies.

b) Weighted averages.

range for the estimated marginal propensity to consume out of equity market wealth of 4 to 7 per cent. Accordingly, the potential impact of a 10 per cent stock market correction on the level of private consumption, after one year, is calculated to be about 0.5 per cent for this economy. Because of a lack of similar studies and data for other economies, direct effects of real equity prices on household consumption in the G-7 economies were estimated by the Secretariat (Boone *et al.*, 1998). This work suggests similar orders of magnitude for the United States, but smaller impacts for the other economies.<sup>5</sup> These differences likely reflect, among other things, variations in the size of household equity holdings across countries. Based on the estimated effects on consumption, simulations carried out with the INTERLINK model, which allow for economy-wide ramifications of lower consumption, suggest that a 20 per cent simultaneous fall in equity prices in all the major countries could lead to a reduction in the level of output for the OECD area of around 0.7 per cent over the coming two years (Table V.3).

### ... and investment

Lower equity prices are also likely to have a direct negative impact on investment. Estimating this influence is, however, difficult as the effects come through channels – the real user cost of capital, the level of indebtedness of the corporate sector, the availability of internal finance, the uncertainty about demand and capacity utilisation – difficult to identify empirically (Whitaker, 1998). The effects on capital investment, moreover, would only materialise to the extent that stock market corrections were associated with a fundamental change in business conditions (Fama and French, 1989).

5. According to these results, a 10 per cent fall in real equity prices reduces US consumption by 0.5 per cent after one year. The effects are 0.4 per cent for the United Kingdom, 0.3 per cent for Japan and 0.2 per cent for Canada within 2 years. For continental European countries the estimated effect is less than 0.2 per cent within 2 years.

A recent study estimated that the potential impact of real equity prices on business investment could be four times as large as that on private consumption (Meredith, 1997). Since the level of investment in the major OECD countries is about one-fourth as large as that of consumption, based on this estimate the adjustment of investment and consumption following a fall in equity prices could contribute roughly equally to the decline in output.

The estimated ex ante declines in total demand provided above could well prove to be on the low side. During a major correction, increasing crisis awareness is likely to lead to a rise in the pricing of risk-taking (or an outright refusal to accept additional risks). In the event, financial institutions will have to adjust their balance sheets, inter alia by reducing the amount of credit they extend. In the worst case, this can lead to a “credit crunch” – such as happened in the wake of the US Savings & Loans and more recently the Japanese banking crisis – with strong additional impacts on consumption and investment. The effects here could be uneven across economies since the size of equity holdings in banks’ portfolios and the sensitivity to a fall in equity prices varies. Even where bank equity holdings are low, however, there are additional sources of financial fragility. For example, as noted above, some banks are exposed to highly-leveraged investors. Finally, in most economies, institutional investors are important holders of equities; given a large correction, they too could come under pressure to reduce their exposure.

*Additional negative effects could be felt if the financial sector retrenches*

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