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JAPANESE FINANCE: A SURVEY

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ABSTRACT

Five sets of questions puzzle observers of Japanese financial markets, particularly from the U.S. viewpoint. They concern: the apparently low corporate cost of capital, low real interest rates, high equity prices, high land prices, and the rising real yen. The paper surveys writings on these issues, in brief enough form that one can see how the questions fit together. Topics covered include: the leverage of Japanese firms, dividend payout, equity price/earnings ratios, corporate taxation, cross-ownership, land price/rental ratios, speculative bubbles, the household saving rate, international capital mobility, expected real appreciation of the yen, the lower cost of financing investment internally and through "main bank" relationships, and the move to a more market-oriented system as these relationships break down.

Conclusions include: (1) the real interest rate in Japan may remain below that in the United States, despite international arbitrage, (2) the main relevant effect of the internationalization in Japan may have been to accelerate the process whereby corporate finance becomes market-oriented, so that (3) affiliated firms are losing the special privilege of borrowing at a cheaper rate, while (4) unaffiliated firms are able to borrow more cheaply than before, and (5) the increased availability of funds for asset-market arbitrage allowed the great run-up in equity and land prices in the 1980s.

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## INTRODUCTION

The structure of Japanese financial markets and the behavior of observed financial prices have raised a number of important interrelated questions, in the minds of American observers among others. The first set, of particular concern to American businessmen, pertain to:

(1) the cost of capital to Japanese firms. Is it lower than the cost of capital to U.S. and other firms? And if so, why? What are the implications for the level of investment in Japan (and what are the implications, if any, for the trade balance)? The cost of capital is usually represented as a weighted average of the cost of borrowing (measured, for example, by the real interest rate) and the cost of equity financing (inferred, for example, from the ratio of required corporate earnings to the price of equity). A major theme of Meerschman (1989), and for the conclusion of this paper as well, is that this standard way of viewing the cost-of-capital question can be misleading, or at least incomplete. But, for the moment, it does serve to introduce the next two Japanese financial prices whose behavior has raised puzzles.

(2) The Japanese interest rate. Is it lower than in the U.S. and other industrialized countries, in real terms in particular? If so, why?

(3) Japanese equity prices. Why are they so high relative, for example, to earnings? Alternatively, why have they risen so much, especially in recent years? One of a number of possible contributing

explanations for high price/earnings ratios is number 2 above, a low interest rate [used to discount expected future earnings or dividends into current equity prices]. Another is a high expected real growth rate in the economy [raising expected future earnings relative to observed current earnings]. Because corporations hold land, yet another of the contributing factors to high equity prices is high Japanese land prices.

(4) Japanese land prices. Why are they so high relative, for example, to rents? Alternatively, why have they risen so much in recent years? The two contributing explanations given for high equity prices apply equally here: a low interest rate [used to discount expected future rents into current land prices] and a high expected economic growth rate [raising expected future rents relative to observed current rents]. A final question, which the paper shall argue is intrinsically tied to the question of low Japanese interest rates, relates to the exchange rate.

(5) The foreign exchange value of the yen. Why is it so high, in real terms? Alternatively, why has it increased so much over time? What are the implications?

No single paper can hope to answer all these questions. Much is written on the subject of Japanese financial markets every year. The institutional details, as well as the market prices themselves, change rapidly, by virtue of domestic financial deregulation and innovation, international financial liberalization, and tax reform. A goal of this paper is to survey the issues, including a variety of recent contributions [many of them unpublished] to the study of one

or another of the financial market prices enumerated above, in brief enough form that one can see how the different questions fit together. The survey does not purport to be exhaustive of the literature, however.

There is a fundamental thread that winds through the issues, and it is worth spelling it out here. The paper subscribes to the common view that a low real interest rate and a high expected growth rate are two major factors explaining high price/earnings ratios in the stock market and high price/rental ratios in the land market in Japan. One respect in which the paper deviates from conventional views is in arguing that the Japanese real interest rate can remain low despite high integration into international financial markets. Even so, a major apparent puzzle that remains is to explain why price/earnings and price/rental ratios were not just as high (or even higher) in the past, when Japanese real interest rates were just as low (or even lower) and Japanese growth rates were just as high (or - until 1973 -- even higher). The difficulty, in other words, is to explain why price/earnings and price/rental ratios increased so much in the 1980s.

The proposed answer is that in previous decades, and especially prior to 1973, institutional aspects of the Japanese financial system such as those discussed in Meerscham (1989) rendered the observed interest rate in large part irrelevant for the pricing of assets such as equities and land. This answer implies that anyone able to borrow from a bank or government agency, at artificially low interest rates, for the purpose of acquiring land or corporate equity, could have

made "excess" profits; but not just anyone was able to do so. Such sources of funds were not available to the man-in-the-street, or even to the corporation-in-the-street. To those favored corporations who did have access to such funds, such as members of the industrial groupings known as keiretsu, the number of profitable investment projects typically exceeded the supply of funds available.

The international financial liberalization that has taken place in Japan over the last ten years has been important for many reasons, not least because it forced the pace of domestic financial liberalization. But it is possible that the primary effect of the structural changes since the 1970s has not been to bring the level of "the" cost of funds in Japan up to the level of the world real interest rate as is conventionally suggested.<sup>1</sup> Rather the primary effect has been to bring the cost of capital facing a typical un-affiliated Japanese firm or institutional investor down toward the cost of capital facing a favored keiretsu firm.<sup>2</sup> This process has included both the accumulation of a vast pool of savings -- particularly in the hands of institutional investors -- and the development of active bond and equity markets in which these funds could be invested. The increase in the pool of funds available for arbitrage purposes helps to explain the price increases in equity and land markets in the 1980s.

The paper begins with the issue of access to cheap borrowing, shifts to a consideration of the equity markets (including such issues as dividend-payout rates, P/E ratios, and corporate taxation),

considers domestic and international determinants of the real interest rate, and concludes with a discussion of internal financing. Measurement and accounting problems occur from the beginning, and will be discussed as we proceed. But throughout, the paper attempts to concentrate on those trends in financial prices that are so strong that one cannot easily attribute them entirely to measurement problems.

#### THE STANDARD WEIGHTED-AVERAGE MEASURE OF THE COST OF CAPITAL

The claim that the cost of capital is lower in Japan, perhaps giving Japanese firms an "unfair" advantage, arose with some American businessmen in the early 1980s . The original statements<sup>3</sup> are widely considered to have been somewhat simplistic. But later versions are more persuasive.<sup>4</sup> A traditional measure of the cost of capital is a weighted average of the cost of borrowing and the cost of equity:

$$r_c = w r_d + (1-w) r_e, \quad (1)$$

where  $r_d$  is the cost of debt,  $r_e$  is the cost of equity, and  $w$  is the relative weight of debt in total financing. Under this definition, the claim can be broken down into some combination of the following three possibilities: (a) the cost of borrowing is lower in Japan, (b) the cost of equity is lower in Japan, or (c) the weight on debt-financing (versus equity-financing) is higher in Japan. All three statements contain some truth.<sup>5</sup>



### Real interest rates

Nominal interest rates in Japan have been below those in the United States continuously since 1977. Japanese inflation has also been relatively low over this period, and it is of course the real interest rate, not the nominal rate, that matters for investment. But calculations using 10-year government bond yields suggest that Japanese real interest rates have been below U.S. real rates virtually continuously from 1967 to 1988. (See Chart 1.<sup>6</sup>)

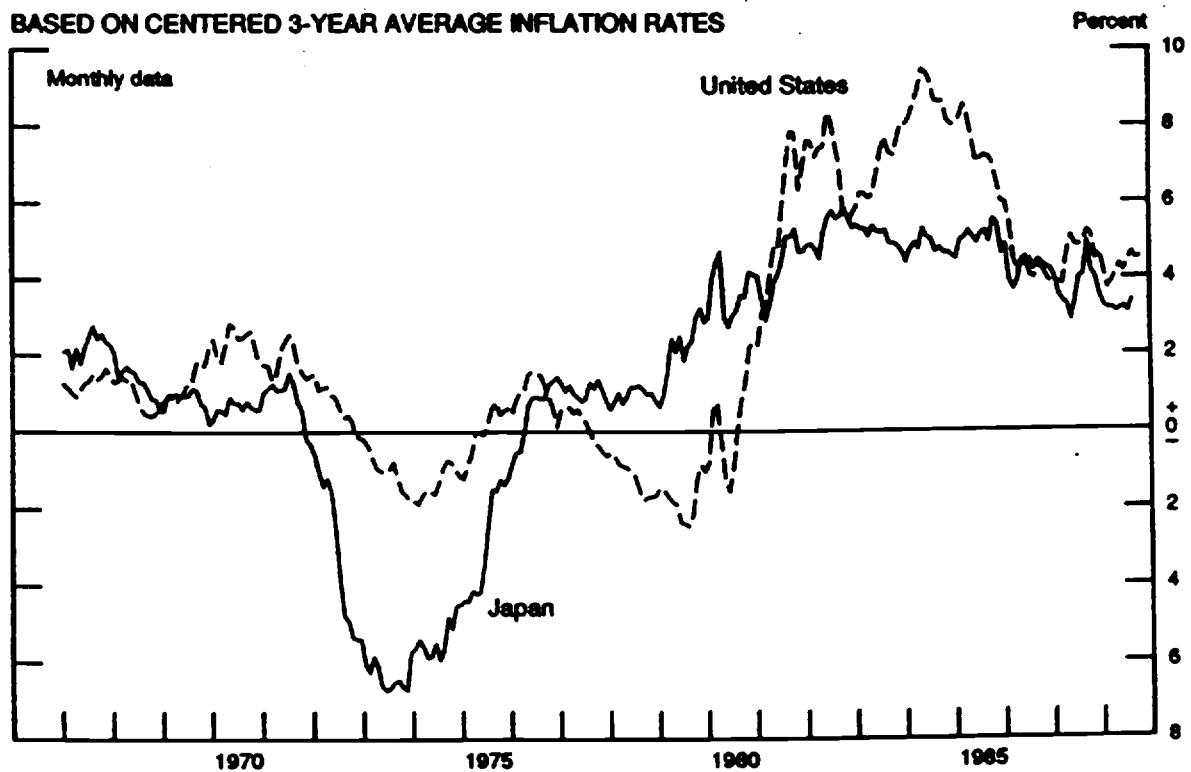
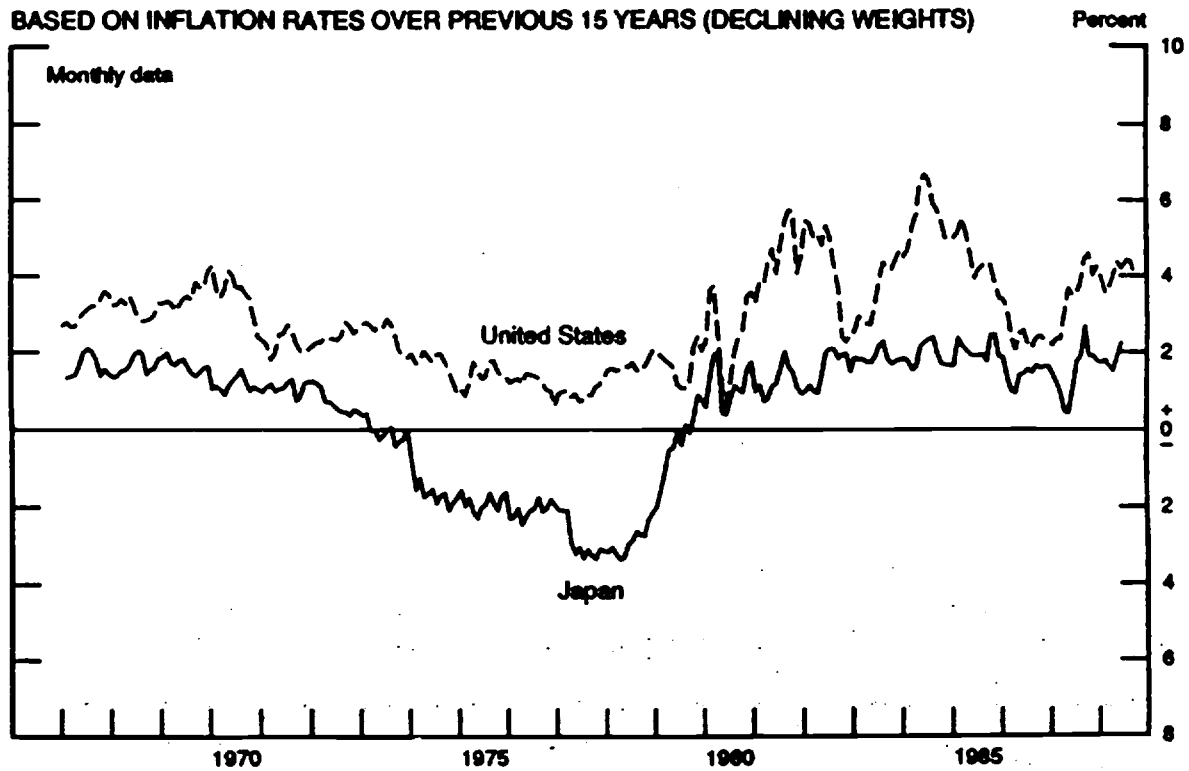
Bernheim and Shoven (1986) estimate that the Japanese real interest rate on average lay below the U.S. real rate during the period 1971-82, although the difference was quite small for the long-term rates [which presumably are the ones that matter for investment]: 0.23, 0.30, or 0.93, depending whether expected inflation is estimated, respectively, by the inflation rate over the preceding year, the average ex post rate, or a simple ARIMA model.<sup>7</sup>

In the period 1982-84, the U.S. long-term real interest rate rose substantially above that in Japan and other G-7 countries.<sup>8</sup> This differential is widely considered to have been the result of a U.S. fiscal expansion (which was accommodated neither by monetary policy nor by private saving in the United States), counterpoised to fiscal contraction in Japan and some major European countries.<sup>9</sup> Bernheim and Shoven put the U.S.-Japan long-term real interest differential, on average for the period 1983-85, at 2.02.

The U.S.-Japan real interest differential has been smaller in the years since 1985,<sup>10</sup> than it was in the first half of the decade.

Chart 1

# LONG-TERM REAL INTEREST RATES 10-YEAR GOVERNMENT BOND YIELDS



Sources: Lawler, Loopesko and Dudey (1988)

This differential, even if small, is still present however (anywhere from 1/2 per cent to 3 per cent in mid-1989, depending on the measure), and may still be a consequential factor. I would estimate the 10-year real interest differential to be at least 0.8 per cent, as of the end of August, 1989.<sup>11</sup> (We postpone until Section 4 the question of how such a differential can persist despite the apparent international integration of financial markets.)

The standard formula for the equity price/earnings ratio and the price/rental ratio is

$$\frac{1}{r - g}, \quad (2)$$

where  $r$  is the real interest rate used to discount expected future earnings or rents to the present, and  $g$  is the expected growth rate of earnings or rents, as the case may be. Often the best we can do to get an idea of the expected growth rate of earnings or rents is assume that they are equal to the expected growth rate of the economy.<sup>12</sup> If  $r - g$  were a number like .02 in the world economy at large (which admittedly may be too low), then the Japanese interest rate would only have to be lower by .01 -- or the growth rate higher by .01, for that matter -- to explain a doubling of the price/earnings ratio.<sup>13</sup>

Nevertheless, because the real interest differential is thought to be rather small, with the exception of the early 1980s, those who argue that the cost of capital is low in Japan and that this has presented a problem for the "competitiveness" of U.S. industry ever since 1973 (e.g., Krugman, Hatsopoulos, and Summers, 1988), tend not

to emphasize the real interest rate. They choose, rather, to emphasize the cost of equity financing and the relative weight of debt versus equity in corporate financing. (We return to the role of the real interest rate later, however.)

#### Leverage (debt/equity ratios)

In the past, Japanese corporations have had a much higher ratio of debt to equity than U.S. corporations, that is, they have been much more highly leveraged. (In terms of equation (1) earlier, the debt/equity ratio is  $w/(1-w)$ .) In the period 1970-72, for example, debt/equity ratios in Japan were four times as high as in the United States. This commonly-observed characteristic of the Japanese system is one major reason why calculations often show that a lower overall cost of capital in Japan than in the United States; equity-financing is known to be more expensive than debt-financing in any market, presumably because portfolio investors demand a higher expected return on equity to compensate them for higher risk.<sup>14</sup>

How have Japanese firms been able to rely so heavily on debt? As a number of authors have pointed out, a particular debt/equity ratio that would be very risky for a U.S. firm may have been less risky for a Japanese firm. There are several reasons for this. (1) Much of the borrowing, particularly for members of a keiretsu, was from the firm's main bank. As has been pointed out elsewhere, a main bank would not cut off lending in time of financial difficulty; to the contrary it would do all it could to see the company through.<sup>15</sup> (2)

Until recently, all loans had to be collateralized. This certainly reduced the risk from the viewpoint of the bank, which in turn helps explain the reduced danger that bank lending (as well as the ability to sell bonds) would dry up in time of difficulty. (3) It has been suggested that such government policies as allowing the formation of cartels in event of recession reduced the risk of financial difficulty or bankruptcy.<sup>16</sup> (4) It has also been suggested that the practice of paying workers a substantial fraction of their compensation in the form of twice-yearly bonuses that vary with the success of the company acts as a sort of profit-sharing mechanism, and again reduces the risk of bankruptcy.<sup>17</sup>

In any case, it is important to note that the seemingly robust regularity that "Japanese firms are highly leveraged" now appears to be a thing of the past. The debt/equity ratio fell throughout most of the 1970s and 1980s, and has by now fallen below the level in the United States, as shown in the last two columns of Table 1 [from French and Poterba].<sup>18</sup> This reversal is due only in small part to the increase in corporate leverage in the 1980s that has generated so much alarm in the United States, partly because of its association with "junk bonds" and mergers and acquisitions. The reversal is due primarily to the decline in Japan, which is in turn due, at least in an arithmetic sense, to the soaring value of Japanese equities and to decreased reliance on the main bank system [and also to the reduced need for external financing of any sort after 1973]. Each of these factors will be discussed below.

## EQUITY CAPITAL

The rate of return on equity: stock prices and dividends

The third of the standard components of the overall cost of capital is the cost of equity financing,  $r_e$ , in the standard equation. It is the most ambiguous of the components to measure. One approach has been to use the realized market rate of return on equity, i.e., the dividend/price ratio plus the rate of increase of equity prices. Baldwin (1986) and Ando and Auerbach (1985) computed the overall return to debt plus equity [in what are intended to be improvements on the Hatsopoulos (1983) approach of omitting equity altogether on the Japanese side of the calculation]. They both found little evidence of a difference between Japan and the United States.<sup>19</sup> Ando and Auerbach (1985) found that the market rate of return to equity is in fact much higher in Japan (13.6% for the median of their sample of firms, versus 2.2% for the U.S. firms). Subsequently, on a much larger sample of firms but with a similar methodology and time period, Ando and Auerbach (1988) found that the overall rate of return on capital was substantially lower in Japan than in the United States after all.<sup>20</sup>

Stockholders' realized rate of return on equity is in any case a very noisy indicator of their ex ante expectations, however.<sup>21</sup> Friend and Tokutsu (1987, p.317) pointed out that while realized market rates of return on equity have been higher in Japan [over the period 1962-1984] than in the United States, a reverse answer results

if the dividend/price ratio is added to the rate of growth of dividends [per share], rather than to the rate of growth of prices.

In the absence of a speculative bubble, stock prices can be thought of either as the present discounted value of expected future dividends or the present discounted value of expected future earnings (as a proxy for the more correct Free Cash Flow<sup>22</sup>). In both the United States and Japan the dividend payout rate (Div/E) is substantially less than 1, which suggests that the expected rate of growth of dividends is greater than the expected rate of growth of earnings [properly averaged over the perhaps-distant future]. Many rapidly-growing companies pay no dividends at all, for example, and rather re-invest all earnings into highly-profitable projects. We consider the subject of dividends first, and turn to earnings in the next sub-section.

There has been no upward trend in Japanese dividends [per share] over the last 20 years.<sup>23</sup> This makes it especially difficult to explain the high level of Japanese stock prices, if one follows the common approach of choosing the present-discounted-value-of-future-dividends formula and estimating expected dividends from actual realized dividends. On the other hand, the observed high level of prices relative to dividends would be perfectly understandable if the increase in dividends were thought still to lie in the future. If dividends are expected to grow at a constant rate from now on, then the current dividend/price ratio should equal  $r_e - gd$ , where  $r_e$  is the required rate of return on equity capital [presumably higher than the real interest rate because of a risk premium] and  $gd$  is the

expected growth rate of dividends. As of 1988, the dividend price ratio was only .006 in Japan, as compared to .030 in the United States [third and fourth columns of Table 1, from French and Poterba]. If  $r_e$  is assumed to be the same in the two countries, then the current levels of stock prices make sense if and only if the dividends are expected to grow at a rate 2.4 per cent faster in Japan than in the United States.

Why should Japanese dividends grow rapidly in the future, given that they have not done so in the past? We have no good theory of how shareholders wish to receive the return on their equity investment, i.e., in the form of dividends or capital gains [or of how managers choose to pay dividends]. In a sufficiently abstract (Modigliani-Miller) world the payout rate is indeterminate. On the one hand, tax considerations point to postponing the payment of dividends. On the other hand, the hypothesis that managers sometimes use funds for purposes other than maximizing shareholder welfare points to shareholders insisting on early payment of dividends. But dividends do get paid, and one hypothesis is that some shareholders like to receive quarterly checks for liquidity reasons. They could instead sell some stock to generate cash, but there are transactions costs to doing so. The ratio of retirees to working-age people is close to a minimum in Japan now, and will soon begin to rise until, by 2020, it will be the highest of the major industrialized countries. It is entirely plausible that wealthy Japanese retirees in the future will wish to receive high dividend payments on their holdings. Thus it is not entirely implausible that the expected



future growth rate of dividends in Japan should be almost as high as the rate of return on capital, or that it should be 2.4 per cent higher than the growth rate in the United States, notwithstanding the dividend record of the past 20 years.

An alternative approach is to look at the amount of earnings the firm is required to generate per unit of equity, that is, the inverse of the price/earnings ratio. If one is trying to determine whether the Japanese stock market may be overvalued, looking at earnings has the advantage that they are tied directly to the productive capacity of the economy, as opposed to dividends.<sup>24</sup>

#### Price-earnings ratios

The price/earnings ratio [like the price/dividend ratio] has been observed to be higher in Japan than in the United States ever since the early 1970s. Because this difference could be explained by a lower discount rate in Japan, it is often the basis of arguments that the cost of equity capital is lower in Japan. But the difference could also have other explanations, such as a higher expected growth rate in Japan. If a high growth rate were the complete explanation, one would not want to attribute the high P/E ratios to a low discount rate. [More broadly, one would not want to attribute the superior performance of Japanese industry necessarily to a low cost of capital.] The paper now turns to the subject of the high and increasing P/E ratios in Japan, an important question in its own right.

Table 1  
From French and Poterba (1989)

Price-Earnings Ratios, Dividend-Price Ratios (in Percent),  
Foreign Equity Holdings (in Percent), and Debt-Equity Ratios,  
Japan and the United States, 1970-1988

Year	P/E		D/P		Foreign		D/E	
	Japan	U.S.	Japan	U.S.	Japan	U.S.	Japan	U.S.
1970	9.0	18.6	3.9	3.3	4.9	3.7	1.63	.54
1971	13.5	18.7	3.9	2.9	5.2	3.6	2.13	.50
1972	23.3	19.3	2.4	2.5	4.5	4.0	2.23	.48
1973	13.9	12.3	2.1	3.4	4.0	4.3	1.38	.69
1974	16.5	7.9	2.7	5.0	3.2	4.5	1.44	1.04
1975	25.2	11.8	2.5	3.8	3.6	4.8	2.13	.78
1976	22.0	11.2	2.1	3.7	3.7	4.7	1.88	.72
1977	19.3	9.1	2.0	5.0	3.0	4.6	1.82	.85
1978	21.5	8.2	1.7	5.2	2.7	4.7	1.62	.91
1979	16.6	7.5	1.8	5.3	3.0	4.6	1.78	.83
1980	17.9	9.6	1.6	4.4	5.8	4.8	1.59	.64
1981	24.9	8.2	1.5	5.3	6.4	5.1	1.64	.76
1982	23.7	11.9	1.4	4.6	7.6	5.3	1.44	.70
1983	29.4	12.6	1.2	3.7	8.3	5.6	1.03	.62
1984	26.3	10.4	1.2	4.1	8.8	5.6	.93	.74
1985	29.4	15.4	1.2	3.4	7.4	5.9	.71	.66
1986	58.6	18.7	0.8	3.0	7.0	6.7	.45	.65
1987	50.4	14.1	0.8	3.2	5.3	7.0	.43	.71
1988	54.3	12.9	0.6	3.0	4.8	7.2	.36*	.71*

Source: Entries reflect values on last trading day of each year. Foreign holdings of U.S. equity are from the Federal Reserve Board Flow of Funds tables. Foreign holdings of Japanese equity are from the Tokyo Stock Exchange, with 1988 value estimated from monthly net sales data in Monthly Statistics Report. The debt-equity ratio is defined as the book value of debt divided by the market value of equity. The debt-equity ratios for the U.S. are from the Federal Reserve Board (1988). The debt-equity ratios for Japan for 1970-75 are from Ando and Auerbach (1988). Ratios for 1976-87 are based on the data for "All Industries" in Daiwa (1980, 1984, 1987, and 1988). Starred values for 1988 are the authors' estimates.

Table 2  
From French and Poterba (1989)  
Adjusted Price-Earnings Ratios, Japan 1975-1988

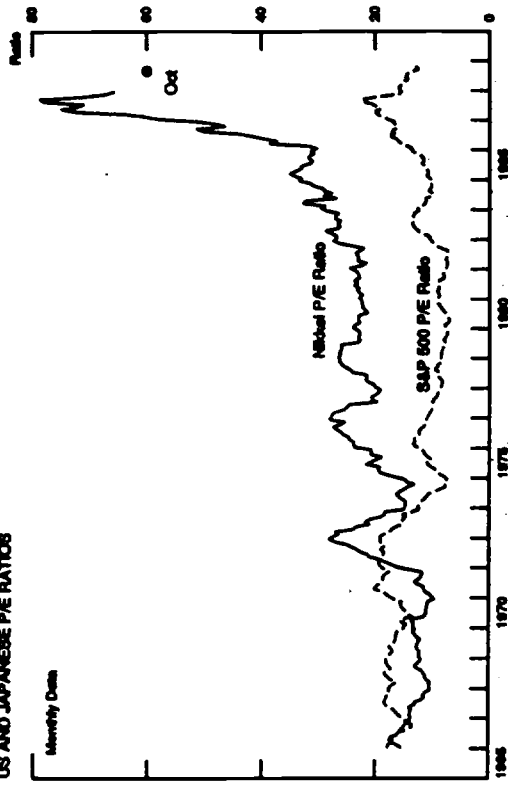
Year	Unadjusted P/E	Cross-Holding		Reserves Factor	Depreciation Adjustment			
		Factor	Interim P/E		Method 1		Method 2	
					Factor	P/E	Factor	P/E
1975	25.2	0.784	19.8	0.98	.599	11.5	.905	17.2
1976	22.0	0.824	18.1	0.97	.655	11.6	.920	16.1
1977	19.3	0.797	15.4	0.97	.684	10.2	.926	13.7
1978	21.5	0.792	17.0	0.97	.704	11.7	.931	15.3
1979	16.6	0.778	12.9	0.97	.717	9.0	.935	11.7
1980	17.9	0.770	13.8	0.97	.755	10.1	.947	12.6
1981	24.9	0.764	19.0	0.97	.702	13.0	.932	17.1
1982	23.7	0.769	18.2	0.97	.700	12.4	.931	16.3
1983	29.4	0.795	23.4	0.97	.692	15.8	.936	21.1
1984	26.3	0.734	19.3	0.97	.711	13.3	.943	17.5
1985	29.4	0.694	20.4	0.97	.668	13.3	.924	18.2
1986	58.6	0.695	40.7	0.98	.624	24.8	.908	35.7
1987	50.4	0.665	33.5	0.97	.660	21.5	.920	29.8
1988	54.3	0.669	36.3	0.97*	.660*	23.2	.920*	32.1

Source: Authors calculations described in the text. The unadjusted P/E ratio corresponds to the NRI 350 index. Starred values for 1988 are estimated using 1987 data.

Chart 2

PRICE/EARNINGS RATIOS

US AND JAPANESE P/E RATIOS



RATIO OF JAPANESE TO US P/E RATIO

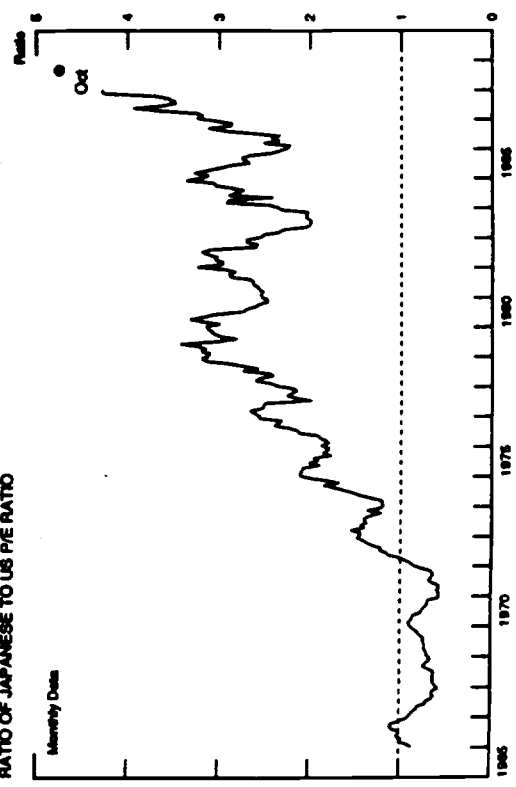
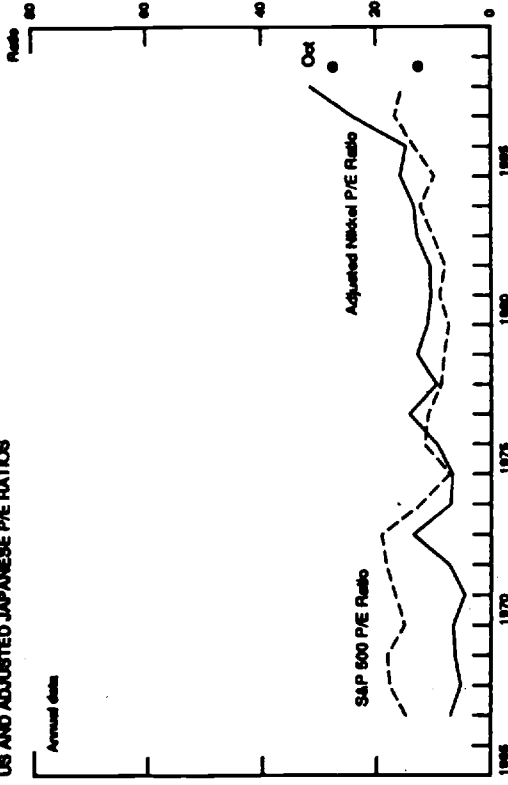


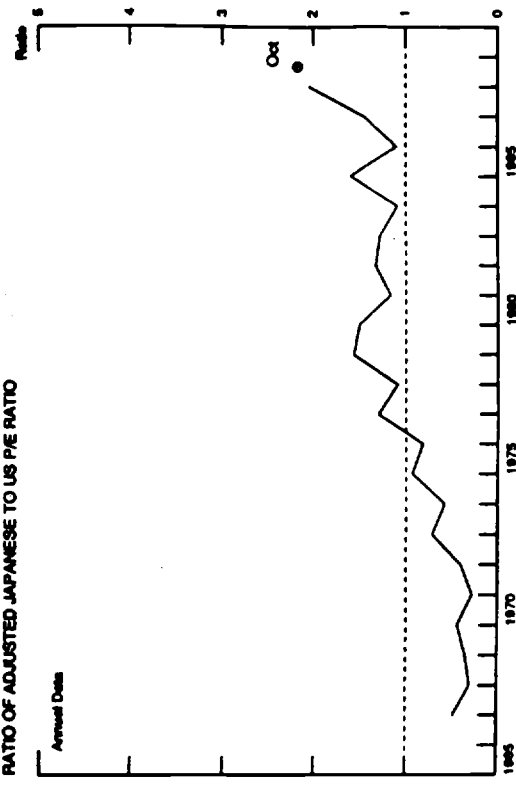
Chart 4

PRICE/EARNINGS RATIOS

US AND ADJUSTED JAPANESE P/E RATIOS



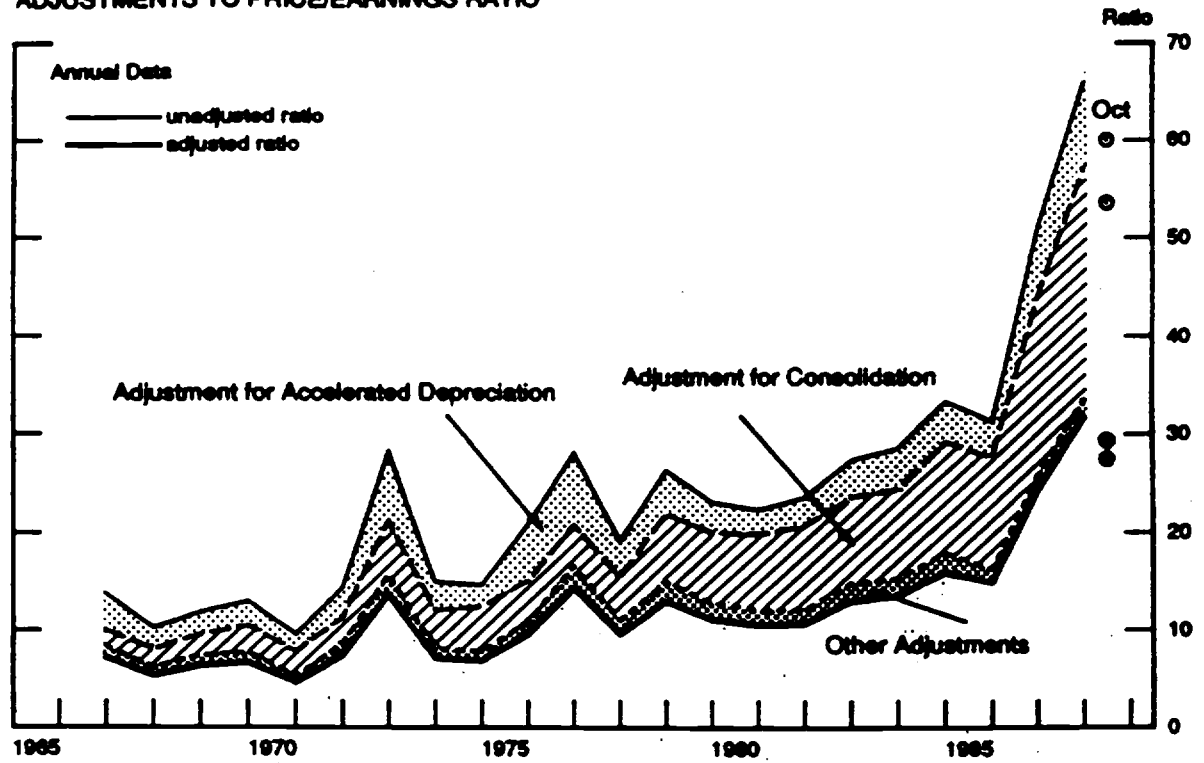
RATIO OF ADJUSTED JAPANESE TO US P/E RATIO



Source: Lawler, Loopesko and Dudey (1988)

Chart 3

### ADJUSTMENTS TO PRICE/EARNINGS RATIO



Source: Lawler, Loopenko and Dudgey (1988)

Some, such as Ando and Auerbach, have looked at the price-earnings ratio because they are interested in the cost-of-capital question, and they consider P/E to be inversely related to the required rate of return  $r_e$ . Others, such as French and Poterba (1989) and Lawler, Loopesko and Dudey (1988) are interested in the price-earnings ratio for its own sake. As shown in the first two columns of Table 1, the reported price/earnings ratio for Japanese firms has been higher than the P/E ratio in the United States ever since 1972, and reached 58.6, three times as high as the U.S. level, in 1986. In the stock market crash of October 1987, the decline in Japan was smaller and shorter-lived, with the result that by the end of 1988 Japan's reported P/E was more than four times that in the United States or the rest of the world. (See Chart 2.)

Such an apparent discrepancy would be difficult to explain. If earnings are expected to grow at rate  $g_e$ , then the earnings/price ratio should equal  $r - g_e$ . The end-1988 differential between reported earnings/price ratios in the United States and Japan was .06 [ $= .078 - .018$ ]. The real growth rate of the Japanese economy averaged 1.56 per cent faster than the U.S. economy over 1980-88; there is no particular reason to expect the real growth rate of the economy to increase in the future, or to expect the growth rate of earnings to be higher than the growth rate of GNP. Thus the rate of return on capital  $r$  would have to be more than 4 percentage points lower than in the United States to explain the difference in reported P/E ratios. Such a finding would support the cost-of-capital-advantage school, but seems too large to be plausible [although the paper will

argue below that some difference in real rates of return may remain even in international financial markets that are perfectly integrated].

French and Poterba (1989), Ando and Auerbach (1985, 1988), and Lawler, Loopesko and Dudey (1988), all emphasize the importance of correcting earnings for a number of measurement problems. Ando and Auerbach (1985) focus on three distortions related to inflation: depreciation accounting, inventory accounting, and accounting for nominal liabilities (and assets). They find that correcting for these distortions increases estimated earnings, and therefore reduces the P/E ratio, for virtually all the Japanese firms in their sample, while it has no systematic effect for the U.S. firms.<sup>25</sup> The principle apparent source of the effect is that the Japanese firms rely more on debt than equity (see above), so the fact that inflation reduces the real value of their outstanding liabilities is more important for them.<sup>26</sup> If this is indeed the source of the effect, then the fact that the debt/equity ratio in Japan appears to have fallen below that in the United States in 1986 (and that inflation fell in both countries in the 1980s), suggests that the inflation accounting may no longer be as important for the P/E comparison.

French and Poterba have some other corrections to make to reported earnings and therefore P/E ratios. First is the point that earnings reported by U.S. corporations include the profits of subsidiaries, while those reported by Japanese firms do not (only actual dividends received from subsidiaries), so their earnings look smaller. A calculation to convert P/E ratios to what they would be if there were

no cross-holding of corporate equity (which requires adjusting both earnings, by removing intercorporate dividends, and share prices) reduces the Japanese P/E ratio. In 1988 the adjustment is big enough to reduce it from 54.3 to 36.3.

Second, reported Japanese earnings also look smaller because they deduct [both on the firms' tax returns and on their financial statements] generous allowances for special reserves for such possible future contingencies as product returns, repairs, and retirement benefits. But this effect is relatively small.

Third, Japanese firms often take greater depreciation allowances which, like the previous two factors, works to reduce reported earnings. (Unlike U.S. firms, when a Japanese firm claims a high depreciation allowance for tax purposes, it must do the same on its income statement.) French and Poterba consider two alternate ways of correcting for the difference in depreciation accounting. The effect of all three corrections together is to reduce the 1988 P/E ratio from 54.3 to either 23.2 or 32.1, depending on which depreciation correction is used. Lawler, Loopesko and Dudey (1988, 24) make their own adjustments for depreciation and consolidation of earnings, which produce a very similar result. (See Charts 2 and 3.) The analogous downward adjustment in U.S. P/E ratios is much smaller. Overall, these accounting differences in earnings explain about half of the difference between Japanese and U.S. ratios. This still leaves Japanese equities about twice as high as U.S. equities. Or, if our interest is in the cost-of-capital question rather than in the is-Japan's-market-too-high question, the correction still leaves



Japanese earnings/price ratios at about half U.S. levels.

Once we get the corrected Japanese earnings/price ratio up to the neighborhood of .04, it becomes slightly easier to explain the differential vis-a-vis the United States (which is at .09 when similarly adjusted by French and Poterba). If, for example, the expected rate of growth of earnings ~~ge~~ in Japan were 2 1/2 per cent faster than in the U.S. and the required rate of return were 2 1/2 per cent lower, that would explain the differential. But if it is true that the required rate of return is lower by, say 2 1/2 per cent, what might be the source of this difference?

We consider in turn three possibilities: more favorable tax treatment, a lower real interest rate, and internal financing that is cheaper than the market interest rate. In the end, the paper will favor the third explanation, especially for the period before liberalization, together with the second explanation, especially for the period since liberalization.<sup>27</sup>

### Corporate taxation

Corporate taxation is one of the respects in which the effective cost of capital facing the firm can differ from the observed rate of return on investment [whether as viewed by the equity investor or by the firm itself]: it is of course the after-tax cost of capital that should matter for investment decisions. It would presumably be more convenient for any American businessman who wished to claim that Japanese industry had an "unfair advantage" in the form of a low cost

of capital, if the source of the advantage were more favorable tax treatment by the Japanese government. In the past, the corporate income tax rate in Japan has been much higher than in the United States, especially after the more favorable U.S. tax treatment of business adopted in 1981 [or even than in other countries such as the United Kingdom, which cut its corporate tax rate in 1984].<sup>28</sup> In 1985, the Japanese government raised 5.9 per cent of its tax revenue from corporations, as compared to only 2.1 per cent in the United States.<sup>29</sup> This has made it difficult to claim a tax advantage for Japanese industry.<sup>30</sup>

Indeed, when Ando and Auerbach (1985) computed after-tax earnings/price ratios and after-tax return-to-capital rates, they found that "it is Japanese, not American, firms that are taxed more heavily on their real incomes," (p.25). They registered two possible qualifications. First, one would prefer to look at the marginal effective tax rates that are relevant to the firm's decision whether to invest, rather than the average tax rate; but they noted that such measures were unavailable for Japan. Second, their calculations apply to the unlevered firm, but a corporation derives tax advantages from borrowing since interest payments are tax-deductible and one might expect these advantages to be larger for Japanese firms [both because they have had higher debt/equity ratios until recently and because the corporate tax rate that they are deducting against is higher]. But Ando and Auerbach compute an upper bound on this tax advantage, and claim that it is very small. Thus they feel able to "rule out" the claim that the corporate tax system gives Japanese

firms a cost-of-capital advantage (p.37). Noguchi (1985), taking into account the advantages of borrowing, also concludes that the tax burden is higher on Japanese, not U.S., corporations.

Other authors have ascribed more importance to the tax advantages of borrowing in Japan. Bernheim and Shoven (1986) disputed the prevailing approach in public finance of presupposing that the (pre-tax) real interest rate must be constant across countries, in light of the observed failure of this condition. They first computed the after-tax cost of capital under the 1980 tax codes, using the actual interest rates and inflation rates that held on average for the 1970s (which entails assuming a U.S.-Japan real interest differential of 1.5 per cent).

Bernheim and Shoven found a smaller tax wedge on capital in Japan than the United States, with the result that the after-tax cost of capital in Japan was negative.<sup>31</sup> They attributed this result to the greater importance of interest payments (tax-deductible, on a nominal basis) in Japan. They then repeated the computations for 1985 tax codes, using the actual interest and inflation rates for the early 1980s. Despite the adoption of accelerated depreciation allowances in the U.S. tax code in 1981, the estimated U.S. cost of capital rises substantially in the 1980s, as a result particularly of the much higher real interest rate (5.0 per cent, as compared to 2.0 per cent in the 1970s<sup>32</sup>). The real interest rate was higher in Japan as well, but there remains a substantial difference in the after-tax costs of capital in 1985 [5.48 for the U.S. versus 2.76 for Japan]. The central message of Bernheim and Shoven was that variation in real

interest rates tend to dwarf variation in corporate tax laws as determinants of the cost of capital. They included in this message the changes in the 1986 tax reform (including the removal of the investment tax credit that had been increased in 1981), which was under debate at the time that they were writing. Fukao (1988, 339-341) found a larger tax wedge [less negative] for Japan than the United States during the period 1981-84, but found that the combination of the 1986 U.S. tax reform and lower inflation rates brought the post-1986 tax wedge in the United States very close to that in Japan.

In December 1988, the Japanese Diet approved a tax reform which had been long sought by the ruling Liberal Democratic Party. The reform, among other things, cut the Japanese corporate tax rate from 42 per cent<sup>33</sup> to 37 1/2 per cent (with the full cut not effective until 1990). This leaves the tax rate only slightly higher than the current rates in the United States (34 per cent) or the United Kingdom (35 per cent).<sup>34</sup> Shoven (1989) updates his calculations of the effective tax rates on corporate investment. He finds that the effective tax rate on investments in Japan is up sharply to 32 per cent in 1988 (as compared to 5 per cent in 1980). Part of the reason is the tax reform: in Shoven's calculations [unlike Ando and Auerbach's (1985)], the high average corporate tax rate in Japan worked to reduce the effective marginal tax rate on new investment, because it increased the value to the corporation of borrowing to finance the investment and deducting the interest payments from its taxable income. He thus estimates that the reduction in the average

corporate tax rate in itself raised the effective tax rate 9 percentage points.

The major reason for the increase in the marginal effective tax rate on investment is not the tax reform, however, but rather the sharp decline in expected inflation relative to the 1970s. [This decline is estimated to have raised the effective tax rate by 23 percentage points]. The fall in the inflation rate in Japan [from 9% in the 1970s to 1%] means that the favorable distortion caused by the tax-deductibility of nominal interest payments is reduced. This leaves the effective Japanese tax rate still somewhat below the U.S. rate, which was at 41 per cent in 1988 (up from 29 per cent before the Tax Reform Act of 1986).

It is possible that the moderate tax advantage that remains in Shoven's numbers does not adequately take into account the downward trend in the Japanese reliance on debt,<sup>35</sup> and that by now little is left of the Japanese tax advantage. Ando and Auerbach (1985, 1988) dismissed the importance in this context of taxes altogether.<sup>36</sup> Bernheim and Shoven (1986, p.3) concluded that "under prevailing tax systems, differences in the cost of capital between countries are largely attributable to differences in domestic credit market conditions, rather than to taxes." Since the time that these two papers were written, the difference in tax treatment between the two countries has, if anything, narrowed.<sup>37</sup> If the public finance economists think that taxes are of at best second-order importance in comparing the cost of capital between the U.S. and Japan [or that the difference has, if anything, gone against Japanese corporations], why

should international economists disagree?

Total stock market capitalization and the late-80s run-up

The empirical fact that dominates the study of Japan's stock market is the tremendous run-up in prices since 1970, especially in the 1980s. We have already discussed the level of stock prices when they are compared to dividends, and when they are compared to earnings. The same trend is evident when comparing total capitalization (price times number of shares) in Japan to capitalization in the United States.

The Japanese stock market capitalization is supposedly much larger than the U.S. (44 per cent of the world vs. 29 per cent).<sup>38</sup> But market values need to be adjusted for double-counting that results from intercorporate share ownership. (Nearly 2/3 of corporate equity in Japan is held by other corporations.) When French and Poterba adjust the Japanese market for cross-holdings, they find that it is still smaller than the U.S.: 33 per cent of the world capitalization versus 36 per cent for the U.S.. But the growth of the Japanese market is still remarkable (a 68-fold increase since 1970).

French and Poterba observe that the 1986-88 run-up in the stock market is similar when measured relative to GNP. Their computed ratio of adjusted equity to GNP fluctuated between .14 and .33 during the period 1970-85, and then rose sharply to .68 by 1988. (Meanwhile, the U.S. ratio, though more than twice as high as the Japanese ratio in the early 1970s, was only .49 in 1988.)

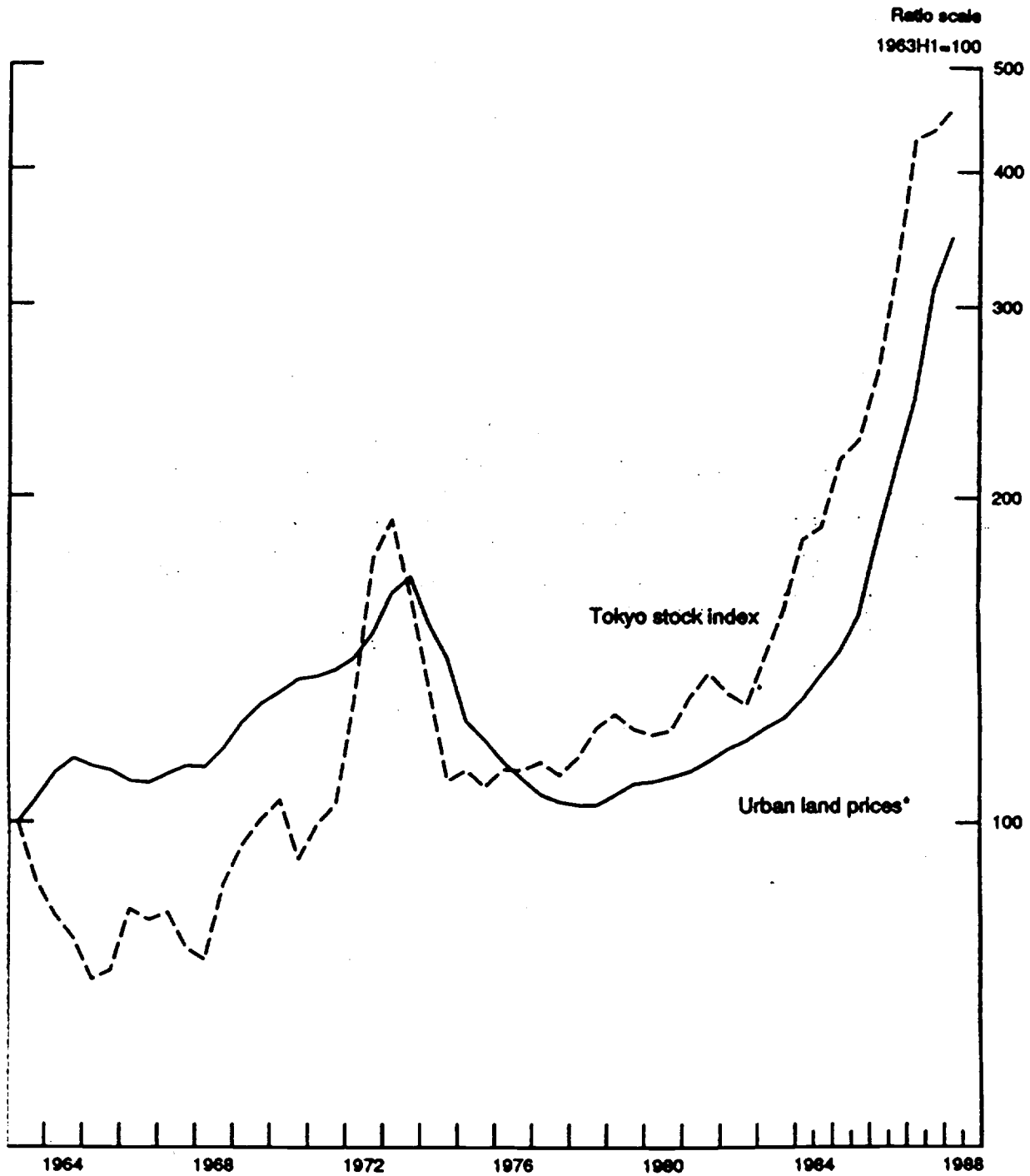
The only ratio where French and Poterba do not find potentially explosive behavior is the ratio of equity prices to the replacement cost of capital, that is, Tobin's Q. They do find that the Q ratio in Japan increased about 35 per cent from 1973 to 1987, to .67 or .77 [depending on the method of calculating net equity outstanding]. But the United States ratio, at .71, is in about the same range. The fact that the replacement cost of capital in Japan has increased almost as much as stock market prices French and Poterba tentatively attribute to the fact that land prices have almost doubled since 1983 (and the fact that companies hold a lot of land<sup>39</sup>). They thus tentatively conclude that the puzzle as to why equity prices rose so much in the 1980s may be the same as the puzzle why land prices rose so much in the 1980s. (See comparison of stock prices and land prices in major cities in Chart 5.)<sup>40</sup>

### Land prices

The soaring price of land in Japan is a major phenomenon in its own right. In 1986 the price of land in Tokyo (for residential use) was 150 times the price in New York [16 times the price in London, 35 times in Paris, and 11 times in Munich].<sup>41</sup> The unit cost of land for the country overall was about 40 times as high.<sup>42</sup> Thus the value of all the land in Japan is several times as great as the value of all the land in the (much larger) United States.<sup>43</sup> A favorite "factoid," which is apparently true, is that the grounds of the Imperial Palace in Tokyo, when evaluated at the land prices of the adjoining Otemachi

Chart 5

# REAL JAPANESE URBAN LAND PRICES AND REAL TOKYO STOCK INDEX



Note: Both series deflated by an index of consumer prices.

\* Index of urban land prices, six largest cities, commercial area.

Source: Lawler, Loopesko and Dudgey (1988)



area, is worth more than all the land in the State of California!<sup>44</sup>

The price of land, analogously to the price of equity, should equal the present discounted value of future rents (in the absence of a speculative bubble). If rents are expected to grow at rate  $gr$ , then the price/rental ratio should be given by

$$P_{\text{land}}/\text{rent} = \frac{1}{r - gr}$$

Thus the same possible explanations arise for high land prices as arise for high equity prices: a low discount rate  $r$  or a high growth rate  $gr$ . Noguchi (1987, as described by Ito, 1989a) observes that the price/rental ratio is much higher in Tokyo than in other major world cities,<sup>45</sup> and concludes that about half of the Japanese land price is a speculative bubble, that the demand for land is based on a self-confirming expectation of future capital gains. But Ito (1989a) disagrees, arguing that Noguchi omits the possibility that expectations of rising land prices could be correctly based on fundamentals, because the relative price of land will increase in a growing economy where the supply of land is fixed.<sup>46</sup>

In terms of the above equation,  $gr$  could be high. Ito shows in an Overlapping Generations model where land is a substitutable factor of production that if land is in fixed supply, its relative price will increase, at a rate essentially given by the real growth rate of the economy.<sup>47</sup> Boone (1989) and Boone and Sachs (1989) argue similarly. When we were considering equity prices, we used the real growth rate of the economy as a guide to thinking about the likely growth rate of earnings; so Ito's and Boone's argument does not give us a reason why

land price/rental ratios in Japan should have increased so much over the last 18 years. In the theory, with growth in the economy, the price and rent should each rise proportionately. Instead, while land and housing prices have sky-rocketed, the rental rate has remained approximately constant in real terms. (See the last lines of Table 3). [The price/rental ratio for housing increased by 67 per cent between 1970 and 1987.<sup>48</sup>].<sup>49</sup>

### Speculative bubbles

There is always the possibility of a speculative bubble, to explain the price of land, the price of equity, or both. It is sometimes argued that special institutional features of the Japanese stock market,<sup>50</sup> such as the dominance of trading by the big four security firms and administrative guidance by the Ministry of Finance, keep prices artificially high. It is argued, for example, that such features might explain why the Japanese market "was not allowed" to fall as far in the crash of October 1987 as other countries' markets.<sup>51</sup> But financial economists have not yet been able to construct good models of what gets speculative bubbles started, or what causes them to collapse. We do not even have much idea whether bubbles are more or less likely in perfectly competitive "efficient" markets than in markets where trading is characterized by turnover taxes, larger transactions costs, oligopolistic market-makers, or government intervention.

It is possible that some short-term movements in financial markets

represent speculative bubbles. But before we do anything so radical as attributing the longer-term movement in Japan's equity and land prices to a speculative bubble, we return to the possibility of a low discount rate in Japan.

#### DETERMINANTS OF THE REAL INTEREST RATE

If one thinks of the real interest rate as equilibrating the various sources and uses of funds, then a low real interest rate would be explained by some combination of four factors: a high corporate saving rate net of investment, a high public saving rate, a high household saving rate, or a high availability of savings from abroad. Each factor probably has played a role at one time or another.

We know that the government was a source of cheap capital for many firms in the 1950s and 1960s, but that it went sharply into deficit and became a big user of funds after 1973. The Ministry of Finance took pains to cut the government budget deficit in the early 1980s, but the deficit has nevertheless been relatively high throughout the post-1973 period, and thus cannot explain a low real interest rate during this period.<sup>52</sup> The corporate sector was in deficit in the postwar period until the first oil shock. We know that the corporate deficit has been sharply lower since then,<sup>53</sup> as the result of a fall-off in the previously-high level of investment [which helps explain the extension of the period of cheap capital well past 1973]. But

the high Japanese private saving rate is the factor most often cited as applying throughout the period.

### Household saving rate

The Japanese household saving rate, at 23.0 per cent of disposable income averaged over 1970-86, is among the highest of industrialized countries. Other figures for comparison are the U.S. 11.5, U.K. 10.4, and France 17.7.<sup>54</sup> The question of why the saving rate is so high in Japan is another major topic in itself. We briefly run through some of the arguments that have been suggested.

Hayashi (1986) claims that much of the apparent differential in personal saving rates between Japan and the United States can be explained by four accounting differences. But even after adjustment, a substantial differential remains.<sup>55</sup>

At least six reasons for the high Japanese saving rate have been given, by Hayashi and others.

(1) a high growth rate: the older dissaving generation are always outweighed by the younger saving generation.<sup>56</sup>

(2) demographics: currently Japan has one of the longest life expectancies and smallest ratio of aged to working-age population [15 per cent, vs. 20 per cent in the U.S. and 23 per cent over all the OECD countries].<sup>57</sup> Horioka (1986) has estimated that the age ratio can explain a difference in saving rates of 11.5 per cent.<sup>58</sup>

(3) an underdeveloped social security system. There are conflicting effects on the saving rate,<sup>59</sup> and Horioka argues that

they approximately cancel out.

(4) the bonus system of employee compensation: the lump-sum payments at the end of each half-year might act as a sort of forced saving. This would require a sort of "calendar illusion". But Ishikawa and Ueda (1984) find that the bonus system does indeed have an effect on saving (though they estimate it to be at most three percentage points).

(5) the high price of land and housing. Even before recent price increases (1985-87), housing prices in Japan were almost twice as high as those in the United States. They are 2.5 - 2.7 times higher if differences in floorspace are taken into account.<sup>60</sup> As a result, housing constitutes 65 per cent of saving in Japan as compared to 31 per cent in the United States.<sup>61</sup> By itself, the saving implications of expensive housing are not as clear as often asserted.<sup>62</sup> But a positive effect on saving does follow from the unavailability of consumer credit; Hayashi, Ito and Slemrod (1988) report that Japanese have to accumulate up to 40 per cent of the purchase price as a downpayment.<sup>63</sup> Also, mortgage interest is not tax-deductible as it is in the United States. Japanese appear to have a greater cultural bias against personal indebtedness than do Americans; rather than using credit cards to postpone payment for purchases, for example, Japanese are fond of magnetic cards that allow them to pre-pay, and then deduct purchases as they are made.<sup>64</sup>

Balassa and Noland (1988, p. 92) argue that a special combination of high housing prices and the strategic bequest motive on the part of the elderly are the best explanation of high saving. Horioka

(1985, 1988) reports that, while opinion surveys in the United States report old age as the most important motive for saving, surveys in Japan place saving to buy a house as more important (together with education and marriage). Horioka (1986) estimates that high land prices explain a difference in saving rates of 5.0 per cent.<sup>65</sup>

(6) tax incentives: in the past, the tax system has deliberately increased the after-tax return to households in a number of ways. Japanese could escape paying taxes on much of their savings by taking advantage of such exemptions as deposits in the maruyu system and the postal savings system. A family of four could legally hold \$455,000 in tax-free assets.<sup>66</sup> The 1987 tax reform, effective April 1988, abolished the tax-exempt savings accounts. But it did retain two pro-saving features of the tax system. First, when a saver does pay tax on interest earnings or dividends, they are taxed separately from his income tax and at a rate lower than the top marginal rate. Second, although the December 1988 tax reform, effective April 1989, instated the taxation of capital gains on sales of securities [which were previously not taxed], the tax rate is still below that of the United States [especially since the 1986 U.S. tax reform] and other major countries. (The saver gets his option of 5 per cent of the value of the transaction or 20 per cent of the capital gain.<sup>67</sup>)

Although one of the reasons behind the Japanese tax reform was foreign pressure ("gaiatsu") to make the Japanese system less pro-saving, and therefore more like the U.S. system, the effect of this decrease in the after-tax return on the supply of saving and therefore on the real interest rate is not clear. In theory, the

substitution effect and income effect go in opposite directions. Saxonhouse (1982) believes that the Japanese are, in fact, target-savers: because their goal is to save enough to buy a home, a decrease in the after-tax rate of return means that they now need to save more, not less, to achieve the same goal. In empirical studies, a positive effect of the after-tax return on the saving rate has been difficult to find. (For Japan, see Makin, 1985, and Hayashi, 1986. Iwata, Suzuki and Yoshida, 1988, p.129-131, however, do find evidence of an effect [by breaking down the tax rate and other variables by income class].) A simulation analysis in Hayashi, Ito and Slemrod (1988) concluded that the Japanese saving rate would go down by a few percentage points if Japan were to abolish the maruyu, but this was not a statistical test.<sup>68</sup>

#### International capital mobility

Even if a tax reform or a land-use reform were to reduce the Japanese level of household saving toward that in Western countries, there is a serious further question as to whether such a change would lower the Japanese real interest rate or the cost of capital to firms. If capital is perfectly mobile internationally, it is argued, then a decline in national saving should not put any upward pressure on the rate of return within Japan, but rather should be entirely offset by increased borrowing from abroad (and decreased lending) at an unchanged rate of return.<sup>69</sup>

Feldstein and Horioka (1980) initiated what has proven to be a long-lasting debate by observing that changes in countries' rates of national saving in fact had large effects on their rates of investment, and interpreting the finding as evidence of low capital mobility. The paper was subjected to many econometric attacks, but the basic results seemed to hold up.<sup>70</sup>

It is possible to test the international equalization of rates of return more directly. Many studies have documented the failure of real interest rates to be equalized across countries,<sup>71</sup> seeming to confirm the Feldstein-Horioka results. We saw in Section 1 that the Japanese real interest rate has been below the U.S. rate for quite some time, and appears to be so still. But the Japanese government announced the removal of controls on international capital movements in 1979-80, and further liberalization measures in 1983-84, partly in response to pressure from the U.S. Treasury.<sup>72</sup> Is it possible that this announced liberalization has failed to be genuine or complete?

A number of studies have shown, using data on covered interest differentials, that the 1979-80 and 1983-84 liberalizations did indeed have the effects advertized.<sup>73</sup> By now covered interest parity holds as well for Japan (vis-a-vis the Eurodollar market) as it does for such major countries as Canada, Germany and the United Kingdom: the differential between the dollar interest rate and the interest rate on domestic currency is equal to the discount on the dollar in the forward exchange market. This finding suggests that Japan is highly integrated into world financial markets with respect to the movement of capital across national boundaries.



The finding still leaves open the possibility of differences associated with the currency in which an asset is denominated, as opposed to the political jurisdiction in which it is issued. For example, investors' expectations that the dollar may in the future depreciate against the yen in nominal terms almost certainly explain why the yen interest rate is less than the dollar interest rate.<sup>74</sup> Similarly, expectations that the dollar may depreciate against the yen in real terms may explain why the yen real interest rate is less than the dollar real interest rate. In that case, the Feldstein-Horioka view is correct -- real interest rates are not necessarily equalized internationally and changes in saving (even if truly exogenous) need not be offset by borrowing from abroad and thus may be heavily reflected as changes in investment -- and yet the explanation may be the imperfect international integration of goods markets that allows failures of purchasing power parity, rather than imperfect international integration of financial markets. If there is no way of arbitraging directly among countries' goods or among their plant and equipment, and if plant and equipment are imperfect substitutes for bonds within each country, then perfect international arbitrage among countries' bonds is not sufficient to equalize real rates of return among countries' plant and equipment.

#### Long-term real appreciation of the yen

It is often argued that real interest differentials and expectations of real depreciation exist only because of short-run

factors such as sticky goods prices, and that they must vanish in the long run.<sup>75</sup> How then could the Japanese real interest rate remain below the U.S. real interest rate for 30 years? One possible answer is that capital controls prevented equalization in the 1960s and 1970s,<sup>76</sup> that the differential after liberalization in the early 1980s was a transitory phenomenon, and that henceforth the differential will be zero.

But an alternative possibility is that investors have expected the yen to appreciate in real terms throughout the last 30 years, and that they still do. Let us decompose the real interest differential,  $r-r^*$ , by adding and subtracting the expected rate of appreciation of the yen,  $\text{appr}^\bullet$ :

$$\begin{aligned} r-r^* &= (i-\text{infl}) - (i^*-\text{infl}^*), \\ &= (i-i^*-\text{appr}^\bullet) + (\text{appr}^\bullet-\text{infl}+\text{infl}^*), \end{aligned}$$

where  $i$  and  $i^*$  are the Japanese and U.S. nominal interest rates, respectively, and  $\text{infl}$  and  $\text{infl}^*$  are the Japanese and U.S. expected inflation rates, respectively. We see that even if the expected rate of returns on domestic and foreign bonds are equalized when expressed in a common currency, i.e.,  $i-i^*-\text{appr}^\bullet = 0$ , there will still be a non-zero real interest differential if there is a nonzero expected future real appreciation of the yen ( $\text{appr}^\bullet-\text{infl}+\text{infl}^*$ ). Expected real changes in the exchange rate would be ruled out if purchasing power parity held, but it is well-known by now that purchasing power parity in fact fails to hold.

One reason to believe that there is indeed such an expectation is that survey data show that market participants in the 1980s have

indeed expected a rapid appreciation of the yen against the dollar.<sup>77</sup> A second reason to believe this is that the yen has in fact appreciated steadily against the dollar in real terms over the postwar period. During the fixed exchange rate era, 1950 to 1973, the yen appreciated against the dollar at an average logarithmic rate of 3.66 per cent per year in real terms (using the two countries CPIs to deflate). During the floating rate era, 1973 to 1989 [April], the real appreciation of the yen has continued, at an average rate of 3.46 per cent per year. Even if one believes that the yen has overshoot its equilibrium somewhat as of [April] 1989 -- and many economists are saying that to the contrary the yen has not appreciated enough, to be consistent with long-term fundamentals -- the basic point about the trend in the real exchange rate would be little affected. With such a strong trend in the real exchange rate over the last 40 years, it is easy to believe that investors have long since come to incorporate into their long-term expectations a real appreciation of the yen of 3 per cent per year. Thus it is easy to believe that, even if international arbitrage drives the U.S.-Japan interest differential to equality with expected appreciation of the yen, that this could leave a real interest differential as large as 3 per cent.

How could the yen appreciate steadily against the dollar in real terms over such a long period? Many consider the tendency for purchasing power parity to hold at least in the long run to be virtually the most fundamental and traditional principle of

international monetary economics. [The observed trend also violates, to the extent that it is statistically significant, the currently-popular hypothesis that the real exchange rate follows a random walk.]

A number of explanations have been attempted for the long-term trend in the real yen, including a relatively low elasticity of imports with respect to income in Japan (Krugman, 1989), and a relatively rapid rate of productivity growth in Japanese manufacturing (Marston, 1987). A natural explanation is the classical observed pattern, most often attributed to Balassa (1964), that a rapidly growing country tends (1) to experience an increase in the price of its nontraded goods relative to its internationally traded goods (because of higher productivity growth in the traded-goods sector, or else because non-traded goods are superior goods in consumption), and therefore (2) to exhibit an apparent real appreciation of its currency when the deflation is done using CPIs which include a large share of nontradable goods within them.

Let us look at the real exchange rate defined in terms of consumer price indices:

$$E_{\text{real}} = E [\text{CPI}^* / \text{CPI}]. \quad (3)$$

We will represent the CPI in each country as a weighted average of non-traded goods and traded goods (in "Cobb-Douglas" form). We use  $a$  and  $a^*$  to represent the weights of nontraded goods in the domestic and foreign country's price indices, respectively:

$$\begin{aligned} E_{\text{real}} &= E [P_n^{a*} P_t^{(1-a*)} / P_n^a P_t^{(1-a)}] \\ &= [(P_n^*/P_t^*)^{a*} / (P_n/P_t)^a] [EP_t^*/P_t]. \end{aligned} \quad (4)$$

If the "law of one price" does hold for traded goods, then  $P_t = EP_t^*$ , and the last bracketed term in (4) drops out:

$$E_{\text{real}} = [(P_N^*/P_t^*)^{a^*} / (P_N/P_t)^a]. \quad (5)$$

Equation (5) tells us that the real exchange rate will change if the relative price of non-traded goods changes in either the foreign country or the domestic country, even though Purchasing Power Parity may hold perfectly well for the tradable share.

This description sounds like it was specially designed for Japan, where tradable goods consist primarily of manufactured, agricultural and mineral products, and nontradables include housing, golf-club memberships, and other services. The model in Ito (1989a) shows that if the supply of land is inelastic in Japan and elastic in the United States, the yen will appear to appreciate in real terms as the economies grow (where the price of housing services is included in the relevant CPI).

Testing the hypothesis of a change in the relative price of nontraded goods, however, is more difficult than it might seem. Most sectors are at least partly traded in character. Table 3 singles out 17 specific services that are fairly clearly not traded and shows the relative change in their prices in Tokyo over the period 1972 to 1987. Ten of the services, including particularly the forms of urban transportation, went up in price more than the general CPI, and seven less.<sup>78</sup> This provides some support for the hypothesis, though less than one might have expected.

There is an alternative way to view the decomposition of the economy into traded and nontraded. Virtually all sectors use at

least some amount of internationally traded goods as intermediate inputs in production (energy, for example). At the same time, virtually all sectors involve at least some domestic value-added before the product in question is sold to the consumer, even if it is only shipping, marketing and retailing. [Indeed, the amount of resources devoted to the distribution system is thought to be notoriously high in Japan.] It is possible that each sector has experienced an increase in the price of nontraded value-added and inputs relative to its traded value-added and inputs. Such a trend would explain a real appreciation of the yen calculated with CPIs, or even more disaggregated industry prices, even if the law of one price held perfectly for the traded component. This hypothesis may show up in the increasing ratio of the CPI to producer price indices or unit labor costs in Japan. It is also relevant to the recent literature on pricing markups for Japanese imports and exports.<sup>79</sup> In any case, the hypothesis bears further investigation.

Regardless whether the relative price of nontraded goods does in fact prove the correct explanation of the real appreciation of the yen, it is undeniable that a strong sustained trend of real appreciation has taken place, with the implication that a real interest differential of 2 or even 3 per cent is perfectly consistent with highly integrated financial markets.<sup>80</sup>

We have argued that, even if Japanese corporations are now no more highly levered than American corporations, and even if international arbitrage now equates the Japanese and foreign nominal interest rates

(when expressed in a common currency), that the Japanese real interest rate may still lie below the foreign rate. A real interest differential [whatever its source] could in turn help explain high price/earnings ratios in the Japanese stock market, high price/rental ratios in the Japanese land market, and a lower cost of capital to Japanese firms.<sup>81</sup> But the argument about the low real interest rate might seem to apply to the past in Japan as much as, or more than, to the present. Similarly, the argument that the expected rate of real economic growth in Japan is high applies to the past as much as, or more than, to the present. How can one explain that price/earnings ratios and price/rental ratios were not also high in the past, i.e., that they have risen sharply in the 1980s?

#### INTERNAL CORPORATE FINANCING AND RELATIONSHIP BANKING, VERSUS THE MARKET SYSTEM

The standard formula for the price/earnings ratio and the price/rental ratio,  $1/(r-g)$ , assumes that the real interest rate  $r$  [or a required rate of return equal to the real interest rate marked up by a risk premium] is relevant for discounting expected future returns. This assumption is appropriate for economies where corporate finance is oriented around a unified central market, i.e., a common pool of funds into which most savers deposit and from which most investors draw off.<sup>82</sup> This description applies to the United

States, and it applies increasingly to Japan today. But it did not apply very well to Japan in the 1970s, and still less so in the 1960s, as Meerschwan (1989) explains at greater length.

The existence of lending by government agencies to favored firms in favored industries at subsidized rates, and the artificial "repression" of other interest rates through regulation and administrative guidance, have always been major ways that Japanese corporations have been thought to have an "unfair" cost-of-capital advantage in the past.<sup>83</sup> Equally familiar is the claim that large corporations or keiretsu take profits from one activity and cross-subsidize investment in another; but it has seldom been clear why Japanese industry should want to do this.<sup>84</sup>

Recent theoretical developments have helped us understand better how the cost of internal finance can be less than the cost of external finance.<sup>85</sup> One route is asymmetric information between the firm's managers and the typical stockholder or bondholder in the market regarding the rate of return on an investment; another route is incentive or "agency" problems. "Internal finance" in the United States would be the corporation's financing of an investment out of retained earnings (or out of depreciation charges), as opposed to financing at market rates by borrowing from a bank or issuing securities.

Retained earnings are also important in Japan, important in particular to understanding why the cost of capital remained low in the 1970s. Ever since the Japanese economic growth rate fell off with the oil shock of 1973, the number of profitable investment



projects has fallen short of the supply of funds available. (In the national savings identity, the offset to the increase in the saving-investment balance of the corporate sector was primarily a large increase in the government budget deficit in the 1970s, followed by a large increase in the current account surplus in the 1980s.) In other words, since 1973 firms have been able to finance investments out of retained earnings to a much greater extent than previously. Retained earnings appear to be a cheaper source of financing than issuing corporate debt or equity, because they get around problems of incomplete information or incentive incompatibility.

It can be argued that in Japan "internal finance" de facto includes as well borrowing by a firm from its main bank under a long-term relationship. The reasoning is that the main bank, like a large shareholder (which, in fact, it often is) can keep close tabs on what goes on inside the firm, thus largely obviating the information and incentive problems.<sup>86</sup> Hodder (1988b) concludes that the advantages of "lender monitoring" are key, and that they may explain why studies like Ando and Auerbach (1988) find that the cost of capital is lower in Japan than the United States.<sup>87</sup>

Empirical evidence in support of the proposition that internal and main-bank finance are cheaper than external or market finance is offered by some recent microeconomic studies of the determinants of firm investment. It has long been true that variables such as cash flow did a better job econometrically of explaining business fixed investment than theoretically-preferable variables such as the real interest rate and Tobin's Q [at least when each factor was considered

on its own].<sup>88</sup> The new theories of information and incentive problems, however, now provide the desired rigorous theoretical basis for including cash flow. Fazzari, Hubbard and Petersen (1988) have recently estimated regression equations for investment on a cross-section of U.S. firms. They distinguish firms that pay low dividends, which they assume are liquidity-constrained, from others. They show that cash flow is a more important determinant of investment in the former group, which they interpret as evidence in favor of the internal-finance hypothesis. (Tobin's Q, the ratio of the market price of equity to replacement cost, is also included as an explanatory variable, to capture expectations of the return to investment.) One can interpret such findings as analogous to the Feldstein-Horioka result: just as a high correlation of national saving and investment across countries suggests that there may exist some barriers that separate individual countries from the worldwide capital market, so does high correlation of corporate saving and investment across firms suggest that there may exist barriers that separate individual firms from the nationwide capital market.

Hoshi, Kashyap and Sharfstein (1988) apply a similar methodology to Japan, where the segregation of firms can be more persuasively accomplished. They break down a sample into two groups. One consists of 121 "affiliated" firms, those with ties to large banks (typically a main bank) that are part of its keiretsu. The other consists of 25 "independent" firms, without close links to any particular bank. They find that among the independent firms, cash flow positively affects investment [and Tobin's Q does not], while

among the affiliated firms cash flow has no significant effect.<sup>89</sup> The conclusion is that the first group faces a barrier between the cost of financing investment out of retained earnings and the cost of borrowing, like American firms do, while the latter can borrow from their affiliated banks as easily as financing out of retained earnings. The authors conclude that one possible implication is that "the institutional arrangements in Japan may offer Japanese firms an important competitive advantage (p.24)."

The hypothesis that internal and indirect finance (especially from the main bank) is cheaper than direct or market finance can thus support the claim that the true cost of capital to Japanese corporations (at least those that are members of keiretsu) has been low in the past. But established banking relationships have begun to break down in Japan and the market has begun to take their place, as corporations begin to use banks less and bond markets more, a process that accelerated in the 1980s as the result of international liberalization as well as domestic deregulation.<sup>90</sup> The share of bank lending in total external financing fell from 84 per cent in 1971-1975, to 57 per cent in 1981-1985, as many firms found they could borrow more easily or more cheaply on the open market. But if the relevant interest rate was higher in the 1980s than it was in the past, this raises some difficult questions.<sup>91</sup> The first is how one explains the fact that price/earnings and price/rental ratios were lower in previous decades than today. [The second, why firms would voluntarily abandon advantageous banking arrangements, is addressed subsequently.]

We must ask who would have had the opportunity to arbitrage between the low "cost of capital" and the high expected future return to holding land or equities. For those who had the opportunity to buy land, plant and equipment, or equity, the opportunity cost of funds was high, a number more like the observed rate of return on equity or the growth rate of the economy than like the observed interest rate or the still lower cost of internal finance.<sup>92</sup> The individual small investor did not have such opportunities; he was given little alternative to depositing his savings in a low-interest-rate account.<sup>93</sup> The same was to a certain extent true of institutional investors such as pension funds and insurance companies, and in any case the pool of available savings in such institutions was far smaller than in the 1980s. A corporation that was favored with access to cheap loans from the government or from its main bank was not generally free to use those funds to "speculate" in land or in the shares of other corporations. [Nor was there much point in buying back its own shares, when it had plenty of profitable new projects to invest in.] Thus the arbitrage between the interest rate and real assets that we take for granted in a market-oriented system was not entirely relevant in the earlier period.

As noted, firms have begun to rely less on banks for their financing, and more on marketplace borrowing, due in large part to deregulation and internationalization. The most important liberalizations include: the removal of ceilings on interest rates after 1978 [in response to growing reluctance on the part of banks to

absorb growing quantities of government debt at artificially low interest rates], the switch to a presumption that firms were allowed to sell bonds to foreign residents [as part of the Foreign Exchange Law Reform] in 1980, the legalization of warrant bonds in 1981, the legalization of non-collateralized bonds for sufficiently safe corporations beginning in 1983, and the liberalization of issues of Euro-yen bonds as part of the Yen/Dollar negotiations between the Ministry of Finance and the U.S. Treasury in 1984.<sup>94</sup>

Note that even for those steps that represent domestic innovation or deregulation as opposed to international liberalization, foreigners have been an important driving force. There has been both direct political pressure on the Japanese government from foreign governments and competitive pressures on Japanese financial institutions from the activities of foreign rivals.

In a follow-up paper, Hoshi, Kashyap and Sharfstein (1989) address the gradual weakening of the links between banks and affiliated firms that has been taking place in Japan. Choosing 1983 as the first year in which the effects of deregulation were fully felt, they begin with their sample of firms that had close banking ties during the period 1977-1982, and divide it into a sub-sample who shifted emphasis thereafter from bank-borrowing to direct market finance, and a sub-sample who continued to rely primarily on their banks; they find that the former group developed a strong sensitivity of investment to cash flow after 1983, while the latter group did not. This constitutes further evidence that bank-borrowing in Japan obviates some of the usual costs of external financing.

Some have surmised that if public policy and the main-bank system have kept the cost of capital artificially low in Japan in the past, the deregulation and internationalization of Japanese financial markets must now have eliminated that advantage. Even if we could be confident that the Japanese cost of capital has been raised in this manner, that would still leave open the question of whether or not the traditional system produced a greater level of economic efficiency for the economy overall. On the one hand, any way of obviating information or incentive problems must represent a gain. On the other hand, the exclusion of certain firms and certain industries from the privileges of cheaper financing is only beneficial if there exists some decision-making mechanism superior to the market to decide who is worthy of inclusion and who is not, a questionable proposition.

It is also possible that the previous system of denying Japanese savers, banks, and taxpayers, an opportunity to earn an equilibrium rate of return on their savings, even if inefficient in the economists' sense that it failed to maximize intertemporal welfare, nevertheless produced an (artificially) high level of investment. Such a proposition would be consistent with the legendary Japanese corporate emphasis on maximizing market share at the short-run expense of current profits.<sup>95</sup> An alternative line of argument, adopted by Krugman, Hatsopoulos and Summers (1988), is that the U.S. market system produces an inefficiently low level of investment because of excessive concern with short-term profits and capital gains, at the expense of longer-term investment opportunities.<sup>96</sup>

Perhaps the United States has recently succeeded in "dragging the Japanese down to our level."

In any case, a puzzle remains. If the effective cost of capital under the traditional system is less than the market interest rate under the new system, why are Japanese firms voluntarily giving up their advantageous main-banking relationships for the difficulties of the marketplace? Hodder (1988b) concludes that if firms are leaving their main bank relationships, it must be because it is advantageous to do so, though he also concludes that it must have been advantageous for them to enter into these relationships in the first place.

Hoshi, Kashyap and Sharfstein (1989) suggest a possible explanation to the paradox: there are hidden costs to the system of bank monitoring, and a cheaper way of overcoming the information and incentive obstacles to borrowing -- which is available only to older, well-established, successful firms -- is to take advantage of the firm's reputation by issuing highly-rated bonds.<sup>97</sup> The alternative possibility is that the change is not desirable from the viewpoint of the well-established firms. There is little evidence that banks and other financial institutions are supplying less credit to their domestic clients (or offering less favorable terms), and instead taking advantage of the higher interest rates in the United States by lending abroad. Still, it may not be possible for trust and long-term relationships to survive in an environment where new-comers deal only in explicit contracts.

Even under this theory, which agrees that the typical keiretsu firm

may face a higher cost of capital now than in the past, the deregulation and internationalization of Japanese financial markets over the last ten years is advantageous to one group of firms: those that never had access to preferential financing from main banks or government agencies in the past. While small firms lack the reputation necessary to borrow abroad, there are many large and medium-sized firms that were never members of keiretsu or favored by the government, and had little means of financing expansion before the advent of free financial markets. For this group, internationalization has probably lowered the cost of capital, whether they now finance themselves by issuing bonds in the Euromarket or in newly-liberalized domestic markets.

Of the conclusions of this paper, those that are perhaps novel are that (1) it is possible that the real interest rate in Japan remains below that in the United States, despite international arbitrage, and that (2) the main relevant effect of the internationalization in Japan may have been to accelerate the process whereby corporate finance becomes market-oriented, so that (3) affiliated firms are losing the special privilege of borrowing at a cheaper rate, while (4) unaffiliated firms are now able to borrow more cheaply than before, at the going interest rate, and (5) the increased availability of funds that can be used for asset-market arbitrage allowed the great run-up in equity prices and land prices in the 1980s.



Table 3

Increases in prices of non-traded services in Tokyo  
1987/1972

electric light	1.72
gas	2.39
water	5.83
mail	4.10
phone	1.00
telegram	2.22
freight	3.46
rail	3.89
tramcar	7.00
bus	5.33
newspaper	3.15
receiving fee	2.24
cinema	2.14
bathing	5.93
hairstressing	4.04
cleaning	2.49
lodging	2.40
house price*	3.40
house rental*	2.29
Tokyo CPI (pre-war base)	2.47
national CPI	2.45

\*source: Iwata and Yoshida (1988, p.510).

All other numbers are from Economic Statistics Annual,  
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1. For example, by Balassa and Noland (1988, p.113).
2. [If Japanese financial markets have indeed been evolving toward a single economy-wide cost of capital, this number is not necessarily higher than the cost of capital that faced even favored keiretsu firms in the past. Possible reasons are given later in the paper.]
3. Semiconductors Industry Association (1980) and Hatsopoulos (1983).
4. For example, Hatsopoulos and Brooks (1986) and, especially, Hatsopoulos, Krugman, and Summers (1988).
5. The three-way breakdown has been calculated by Friend and Tokutsu (1987), among others.
6. The charts are borrowed from an uncirculated paper by Lawler, Loopesko and Dudey (1988). [Chart 1 may understate the Japanese real interest rate in the 1970s, both because the actual inflation rates that are used overstate expected inflation rates and because the government bond rates that are used were too low to be willingly absorbed by private investors.]
7. Lawler, Loopesko and Dudey (1988, 26) show real interest rates on Japanese 1-year government bonds that have been below U.S. yields during virtually the entire 1965-1988 period. [This paper not ready for circulation.] Friend and Tokutsu find that the real cost of debt, weighted between short-term and long-term, was .80 per cent lower in Japan than the U.S. on average over the period 1962-1984 [1.70 lower over the period 1970-1984].
8. The increase in the U.S. real interest differential from 1981 to mid-1984 is often credited with much of the explanation for the contemporaneous appreciation of the dollar. The differential vis-a-vis the real interest rate in Japan was no larger than vis-a-vis Germany and some other countries. But then the movement of the dollar against the yen was actually less than against the mark and other major European currencies (contrary to widespread impression), and actually peaked in 1982 rather than February 1985.
9. One of many possible references on the capital inflow that resulted from the shift in the U.S. monetary/fiscal mix in the 1980s is Frankel (1988a). References on the forces behind the inflow from Japan in particular are given in Frankel (1988b).
10. .58 according to French and Poterba, 1989, p.40 (average of first quarters of 1986, 1987 and 1988); they use long-term government bond yields, minus previous year's inflation rate.

11. On August 23, 1989, the nominal interest differential between the United States and Japan was 3.3 % for 10-year government bond yields, 3.5 % for one-year Eurocurrency rates, and 5.6 % for bank prime lending rates. A survey of forecasters conducted by Alan Teck on that day put the difference in expected inflation rates at 2.5 per cent for the 10-year horizon [4.75 % in the U.S., versus 2.25 % in Japan] and 2.6 % for the one-year horizon. (Currency Forecasters' Digest, White Plains, N.Y., Sept. 1989.) The CPI inflation differential was 3.3 % in 1988 and 2.0 % in the first 5 months of 1989. [IMF data.]

12. The formula also works for firms' dividend/price ratio, again with the growth rate properly defined.

13. A similar point is made by French and Poterba (1989, p.19). However, they conclude that, while a lower real rate of interest in Japan might be able to explain the high level of Japanese stock prices on average during their sample period (the 1970s and 1980s), it cannot explain the increase during the last three years, 1986-88.

14. The apparent conclusion that a firm can lower its cost of capital by increasing the weight on debt would only hold if the cost of equity could be assumed to be independent [whereas it might in fact be expected to rise as the firms levered beta rises].

15. E.g., Abegglen (1985), Crum and Meerschwam (1987) or Meerschwam (1989).

16. On the so-called recession cartels, see Yamamura (1982) and Meerschwam (1989, p.17).

17. Other reasons have been given as well why a given corporate balance sheet that might spell excessive risk in the United States would not be as worrisome in Japan. For example, Abegglen (1985, 165) argues in this connection that a typical Japanese firm does not consolidate the financial assets held by its subsidiaries into its own balance sheet -- where a corresponding U.S. firm might do so -- and carries land and securities on its books at original cost. [But the fact that much of Japanese equity is held by other firms, so that the total amount of equity in Japan is not as large as appears on the books, seems like a reason why Japanese debt/equity ratios might be understated.] Some of these accounting questions are discussed under the heading of price/earnings ratios below.

18. Since 1986, actually falling to half the U.S. level in an estimate for 1988 [according to French and Poterba (1989, p.8 and Table 4)].

19. C.Baldwin computes a risk-return frontier for each country and finds little difference between the two; i.e., the level of expected return for any given level of risk is similar. Ando and Auerbach (1985) is based on a fairly small sample of firms (for the period 1966-1981). [In addition to their calculation of the average rates of return, they also look at earnings/price ratios, discussed below.]

20. They found that the before-tax returns were 6.5 per cent in Japan, versus 12.3 per cent in the United States. [After-tax returns were 2.5 per cent versus 5.6 per cent.] The time period was 1967-83.

21. Also this approach amounts to looking at the problem from the viewpoint of the market investor, rather than the firm. The two do not necessarily face the same cost of funds. Hodder (1988b) dissents from the Ando and Auerbach approach on these grounds. We save until later the argument that firms may have access to some funds that are cheaper than the expected rate of return on capital [that internal financing is cheaper than both the cost of debt and the cost of equity].

22. Free Cash Flow is defined as profit after tax, minus changes in working capital, minus other capital spending, plus depreciation. [More of earnings go to net investment in Japan than in the United States.]

23. Minimum dividend-payout rates were established in the early 1970s (Meerschwan, 1989).

24. Lawler, Loopesko and Dudey (1988, 25) point out that the Japanese rate of growth of earnings per share need not be correlated with the rate of growth of the Japanese economy. On the other hand, dividends would appear to be one step further removed than are earnings, via the (difficult to determine) procedure whereby firms set their payout rates.

25. When Ando and Auerbach apply a corresponding correction for their measure of total return to capital, on the other hand, they find that the median rate for Japan falls more than that for the U.S..

26. Apparently the fact that the inflation rate is lower in Japan has less of an effect than the higher debt/equity ratio.

27. There is a fourth possibility, that the "equity premium" (defined as the expected rate of return on equity minus the interest rate) is smaller for Japan, which would in theory require that the Japanese stock market be less risky than the American stock market. Ueda (1989, 12-13) argues that the risk premium in the Japanese stock market declined sharply between 1982 and 1988, but can find little evidence of a corresponding

decline in riskiness. Lawler, Loopesko and Dudey (1988, 26-27) conclude that uncertainty in the two stock markets was roughly similar in the late 1980s (despite some possible differences in the past), whether estimated from the standard deviations of monthly changes or expected volatilities implicit in stock index options. [As already noted, studies such as Baldwin (1986) claim to find no sign that the expected rate of return on Japanese securities is lower, even for a given amount of risk.]

28. Hale (1987, p.1).

29. Shoven (1989). See also Noguchi (1985).

30. The paper treats separately the possibility that favorable treatment of saving in the Japanese tax system has been one of the causes of high household saving in Japan. This effect, if it existed, would operate via a low real interest rate.

31. Consistent with the findings of Shoven and Tachibanaki (1988).

32. They artificially boost the U.S. real interest rate for the 1970s up a bit, because it was in fact observed to be negative, which would "wreak havoc" with the methodology that they adopt to evaluate tax systems [from King and Fullerton.]

33. The tax rate on undistributed profits during the period 1984 to 1987 was 43.3 per cent. (Homma, Maeda and Hashimoto, 1986, p.14., and Homma, 1987, p.21.) However, it had been lower in the 1950s and 1960s, ranging from 35 per cent to 40 per cent. (Homma *et al*, 1984, p.124, Table 2.39, and Shoven and Tachibanaki, 1988, Table 3.6.)

34. When state and local taxes on corporations are added in, the Japanese rate is about 50 per cent and the U.S. rate about 40 per cent. These numbers are taken from Shoven (1988). [One of several motives for the Japanese tax reform is that the Ministry of Finance fears that, in the absence of international harmonization of corporate tax rates, business would increasingly be able to find ways to arbitrage across tax jurisdictions.]

35. Recall the figures from French and Poterba that by 1988 the debt/equity ratio in Japan had fallen below that in the United States. Noguchi (1985, p. 9, 18) lists the fall in the debt/equity ratio is one of several reasons why the tax burden on Japanese investment increased in the late 1970s and early 1980s [though, like Ando and Auerbach, Noguchi thinks that the Japanese burden has been higher than the U.S. burden all along]. The most important of the reasons [as with Shoven] is the fall in the inflation rate.

36. Takenaka (1986) concludes that the impact of the investment tax credit on Japanese investment is negligible.

37. In addition to the U.S. tax reform of 1986 [which rolled back investment incentives for U.S. firms], the Japanese tax reforms that took effect in April of 1988 and April of 1989 raised the tax rate on Japanese saving in a number of ways [besides changing the corporate tax system in a way that would evidently would leave Ando and Auerbach (1985) and Shoven in disagreement as to the sign of the effect on investment incentives]. The previously existing pro-saving bias in the Japanese tax system, compared to the American system, constituted part of the difference in "tax wedges" computed by Bernheim and Shoven (1986). It is discussed below, under the topic of determinants of the real interest rate in Japan.

38. Hale (1989) opines that the dramatic reversal of the rankings of U.S. and Japanese capitalization over the course of the 1980s represents the financial market's negative judgment on Reaganomics, as compared to policy-making by bureaucrats in the Japanese Ministry of Finance. But when Murphy (1989) observes the same reversal, he worries that Japan's policy-makers are not ready to accept the responsibility of greater weight in the world.

39. Which they usually carry on their books, not at current market price, but at the price of acquisition [which, in the case of land held since the 19th century, is essentially zero].

40. Ueda (1989, p.7), however, computes the ratio of the market value of corporate shares to the value of corporate assets and concludes that, "according to this result land prices are not a major factor in the recent rise in stock prices."

41. Iwata and Yoshida (1988, p.509).

42. Ito (1989a).

43. In 1984, the value of land in Japan was 3.17 times GNP, while in the U.S. it was only .80 times GNP. (Sachs and Boone, 1988.)

44. For example, Boone and Sachs (1989).

45. About five times higher than London. Boone (1989, 47) estimates that the price of land in Tokyo is 150 times that in New York, despite little difference in rental rates on apartments and buildings.

46. There are a number of special institutional features that affect the Japanese land market, such as building height restrictions, special protection for rice paddies, and a level of taxation of capital gains at the time of sale that is much

greater than annual property taxes. Some of these can be viewed as contributing to the inelasticity of the supply of land.

47. Limiting the supply of space, in addition to geography, are land-use restrictions such as building-height limitations and "sunshine laws."

48. The price of land alone went up even more than the price of housing over this same period. [The price/rental ratio for land increased by 14 per cent between 1975 and 1986 (27 per cent in the three big cities).] The source is Iwata and Yoshida (1988, p. 510).

49. Ito's theory may, however, give us a reason why land price/rental ratios in Japan should be higher than in the United States. Ito shows that if the supply of available land increases at the growth rate of the economy, then the relative price of land will be constant. In terms of the equation, if the supply of land is more elastic in the United States than in Japan, then  $gr$  will be lower and therefore  $P_{land}/rent$  will be lower in the U.S.

50. The Ministry of Finance began to look after the stability of the Japanese stock market after a crash in 1965. Takagi (1989) discusses the history and institutional features of the market.

51. Lawler, Loopesko and Dudey (1988, 31-33) and Murphy (1989).

52. And that the apparent implications for the real interest differential and international capital flows vis-a-vis the United States were greatly exacerbated by the U.S. fiscal expansion of the early 1980s.

53. Indeed, Balassa and Noland (1988, p. 84) report that the Japanese corporate sector was in surplus in the years 1974-77, although others show only a declining deficit [where both financial and nonfinancial corporations are included; Lincoln, 1988, Table 3-2, pp.76-77].

54. Blade (1988, p.18).

55. According to Blades (1988, p.18-19), adjusting for consumer durables in 1986 raises the U.S. household gross saving ratio from 11.5 % to 22.1 %, while only raising the Japanese ratio from 21.2% to 25.8 %. [When the saving ratios are averaged over 1970-1986, adjusting raises the U.S. ratio to 23.6 % and the Japanese ratio to 26.1%.] See also Balassa and Noland (1988, p.80-96). Takayama et al (1988) go so far as to say, on the basis of several accounting corrections, that the Japanese saving rate is not high at all.

56. As in the life-cycle hypothesis of Franco Modigliani.

57. Over the next 30 years, Japan will go from having the highest ratio of working age population to elderly out of the G5 countries (5.9 in 1985) to the lowest (2.3 in 2020); Shoven (1989). A simulation by Auerbach, Kotlikoff, Hagemann and Nicolletti (1989, 117), based on the rapid ageing of the Japanese population, predicts that the national saving rate in Japan will decline from 22 per cent [close to Germany's], to a minimum of 1 per cent, over the period 1990 to 2028 [falling below the U.S. national saving rate in the year 2020].

58. An additional possible explanation -- not on standard lists - - for the high saving rate in Japan is that it is the only non-nuclear country of the G-5. Slemrod (1986) points out that a higher perceived threat of nuclear annihilation should reduce people's saving rate by reducing their expected horizons, and offers supporting evidence from U.S. time series.

59. On the one hand low Social Security benefits encourage workers to save more, but on the other it encourages them to retire early.

60. Horioka (1988, p.218).

61. Frankel (1988b, fn 33).

62. Sachs and Boone (1988) construct a model to answer the question what would happen to saving if land prices fell, in response, for example, to the sorts of measures often urged on Japan by Americans: the ending of prohibitions on rice imports and the liberalization of land-use restrictions. Their model predicts that saving would rise rather than fall, due to the fall in wealth. Similarly, Shibuya (1988) estimates that the wealth effect would nearly eliminate any positive effects of land prices on saving; and Yoshikawa and Ohtake (1989) show that the estimated positive effect of higher land prices on saving by future home-buyers may be more-than-offset by estimated reductions in saving on the part of those who abandon plans ever to buy a home.

63. Horioka (1988, p.219) reports that Japanese families plan downpayment ratios of 45 to 55 per cent, but that actual downpayments are as low as 20 per cent. He argues that an increase in the availability of mortgage credit would not increase total saving, but would only result in a combination of lower pre-purchase saving [to make the downpayment] and higher post-purchase saving [to pay off the loan] (p.229).

64. Arguing against the idea that Japanese are culturally pre-disposed to save more is the fact that the high saving rates are only a phenomenon of the post-war era [as pointed out by Hale (1987, p.26) and Balassa and Noland (1988, p.81)]. Also sometimes listed as reasons for high saving rates in Japan are



obstacles to consumption such as the inefficient retailing system, the lack of space in living quarters for consumer durables, and the lack of leisure time in the work-schedule. (See, for example, Balassa and Noland, p.94.) But economic theory is dubious as to the implications for the saving rate of institutional impediments that apply to future consumption as much as to current consumption. [Wealth is only of use to the household to the extent that it is consumed sooner or later.]

65. Hale (1987, p. 27) believes that "Any set of structural reforms which reduce the price of housing while increasing the tax incentive to own it could have a more dramatic effect on savings and consumption than many policies seemingly targeted on savings behavior itself."

66. The figure is from Shoven (1989). Furthermore, many households held more tax-free accounts than the number to which they were legally entitled; the total number of accounts in the postal savings system was said to be twice the population.

67. Ministry of Finance (1988); Shoven (1989).

68. So far, there has apparently been no sign of a significant decrease in the household saving rate in Japan since the April 1988 abolishment of the maruyu. (It should be noted that the latest tax reform also instituted a sales tax -- indeed this was its politically most controversial feature -- which could in theory have either a positive or negative effect on the saving/consumption decision, depending particularly on whether households believe that the government will raise the sales tax rate in the future.)

69. However it is fairly clear that such a decrease in saving would reduce the Japanese current account surplus -- and all the more so if capital is highly mobile -- which is what many Americans want.

70. The "saving-retention" coefficient finally began to decline in the 1980s however, according to the latest studies: Feldstein and Bacchetta (1989) and Frankel (1989). The latter paper contains 65 references on the subject (many of them demonstrations that one can have a high correlation between saving and investment despite perfect capital mobility).

71. For example, Mishkin (1984). Glick (1987) applies to Japan and other Pacific countries in particular.

72. The story of the U.S. Treasury campaign for the liberalization of Japanese financial markets, which began in 1983, is told in Frankel (1984).

73. Otani and Tiwari (1981), Frankel (1984, 1988, 1989), Eken (1984) and Ito (1986).

74. The interest differential could in theory be explained by either of two terms [after the possibility of a covered interest differential, or political premium, has been eliminated], both of them associated with the currency: expected depreciation or an exchange risk premium. The possible exchange risk premium between the dollar and yen is examined by Fukao and Okuba (1984), Fukao (1987), Frankel and Froot (1987), Ito (1988), and Frankel (1988).

75. The real appreciation of the dollar against the yen and European currencies beginning in 1981 was widely considered an example of Dornbusch "overshooting" caused by shifts in monetary or fiscal policy: the real exchange rate change would disappear over time as U.S. traded-goods prices adjusted downward in response to excess supply and Japanese traded-goods prices adjusted upward in response to excess demand.

76. One problem with identifying capital controls as the source of the U.S. Japan real interest differential throughout the 1970s is that during the period 1976-1978, when the covered interest differential was the largest in absolute magnitude, the nominal interest in Tokyo was above the yen interest rate in the London Euromarket, demonstrating that controls were acting to discourage capital inflow, not outflow, at least at the short-term end of the spectrum.

77. Frankel and Froot (1987), Ito (1989b), and Froot and Ito (1988).

78. The source is the Bank of Japan. If the price of housing and the rental rate are added to the list, then the number increasing faster than the CPI is 12 out of 21. [The answers are the same regardless whether the Tokyo CPI is used [Management and Coordination Agency (pre-war base)] or a national CPI [IFS].]

79. On pricing-to-market by Japanese firms, see Branson and Marston (1989), Froot (1988), Marston (1989) and Ohno (1989).

80. One must note, however, that if "the" real interest rate is lower in Japan than the United States only because of an expected rate of real appreciation of the yen in terms of a basket of goods that includes non-traded goods, this does not in a meaningful way reduce the cost of capital for a firm producing traded goods.

81. Note, however, that if the explanation for the real interest differential lies in an expected rate of increase in the relative price of nontraded goods, then it can only explain high equity prices or a low cost of capital within the nontraded goods

sectors.

82. [Note that this does not preclude some firms having projects with rates of return greater than the market rate or internal funding sources at costs less than the market rate; it requires only that the market rate be the marginal cost of funds for most firms.]

83. Of twelve government financial institutions -- which as recently as 1980 supplied 17 per cent of funds for investment in plant and equipment -- the Japan Development Bank and the Small Business Finance Corporation were particularly notable in channeling subsidized investment funds to selected industries (Lee, 1988, p.25-36). The more general low-interest rate policy of the government before 1973 was explicit (for example, Tamura, 1987).

84. Abegglen and Stalk (1985), Gerlach (1987) and Hodder and Tschoegl (1985). If the investment is expected to be profitable in the long run, then it should be made in a market-oriented financial system such as the U.S., with the investment funded by borrowing in the market if necessary, as readily as under the Japanese system.

85. For example, Bernanke and Gertler (1987) in the macroeconomic literature, and Myers and Majluf (1984) and Jensen and Meckling (1976) in the finance literature. The first two focus on information costs, the last on incentive problems.

86. For example, Crum and Meerschman (1986), Hamada and Horiuchi (1987), Hodder (1988a,b), and Hoshi, Kashyap and Sharfstein (1989a,b). Japanese financial institutions (including not just banks, but also life insurance companies and other institutional investors), unlike their U.S. counterparts, are allowed to take large debt and equity positions in the same firm; Prowse (1989) argues that this difference constitutes in itself a way that the Japanese system is better able to circumvent agency problems.

87. His argument is that the advantages of lender monitoring may show up in part as low reported earnings/price ratios because banks receive payments for their services in the form of "compensating balances" and transactions fees, which come out of reported corporate earnings [rather than in the form of interest payments]. On the general point that the apparent cost of borrowing is understated in Japan by the requirement of compensating balances, see, e.g., Bronte (1982, p. 17).

88. For example, Jorgenson (1971) and Meyer and Kuh (1957).

89. Hayashi and Inoue (1989) find that  $q$  is significantly related to firm growth, and that much, though not all, of the power of cash flow to explain investment in a cross-section of Japanese

firms disappears when correcting for the endogeneity of cash flow. They do not segregate affiliated and non-affiliated firms.

90. Crum and Meerscham (1986) and Meerscham (1989), for example, discuss the decline of "relationship banking," and its replacement by the market.

91. Despite the diminished importance of subsidized government lending and the main bank system, the era of cheaper capital through internal finance was prolonged past 1973 in Japan by the greater availability of retained earnings when the number of profitable investment projects that needed to be financed diminished. The share of funds coming from internal finance narrowly-defined (retained earnings and depreciation charges), as opposed to external finance (securities-issues and borrowings), rose from 32.9 per cent in the period 1970-74 to 46.3 per cent in the period 1975-78, and stayed in that neighborhood subsequently [1979-85]. (The source is Tamura, 1987, p.3.) It is the changes of the 1980s that need explaining.

92. When markets in government bonds and other instruments did begin to develop, especially in the 1970s, the observed interest rate was presumably somewhere between the low cost of internal and subsidized finance and the high rate of return to physical investment.

93. As noted in Meerscham (1989), only pre-existing shareholders received advantageous new-share subscription rights.

94. Shinkai (1988), Hoshi, Kashyap and Sharfstein (1989), Crum and Meerscham (1986), Feldman (1986), Frankel (1984), Sakakibara and Kondoh (1984), and Suzuki (1987), among many other sources.

95. For example, Abegglen and Stalk (1985), Crum and Meerscham (1986) and Meerscham (1989).

96. McKinnon (1989) argues that excessively short investment horizons in the United States (in contrast to Japan) are attributable to high interest rates, which are in turn attributable to the risk of dollar depreciation against the yen under the floating exchange rate system. Stein (1989) offers a theory with more rigorous foundations.

97. It is noteworthy that agencies to rate the creditworthiness of corporations [the analogues of Moody's or Standard and Poor's] did not develop in Japan until recently.