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THE COST OF CAPITAL IN JAPAN: RECENT EVIDENCE AND FURTHER RESULTS

Albert Ando

Alan J. Auerbach

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ABSTRACT

We extend our recent work measuring the cost of capital in Japan and the United States by considering several questions that such results raised. Among our findings are:

(1) The small firm - large firm distinction appears to be more significant in Japan, not in the United States;

(2) Correcting Japanese accounting statements for cross-holding raises the estimated Japanese cost-of-capital by about 1 percentage point;

(3) Correcting Japanese accounting statements for unmeasured returns to land has a significantly more important effect: the most conservative correction we attempt raises the implied Japanese return to capital to parity with the United States during the mid-1980's.

Albert Ando
Department of Economics
University of Pennsylvania
3718 Locust Walk
Philadelphia, PA 19104-6297

Alan J. Auerbach
Department of Economics
University of Pennsylvania
3718 Locust Walk
Philadelphia, PA 19104-6297

1. Introduction

In two recent papers (Ando and Auerbach, hereafter AA, 1988a, 1988b), we investigated the question of whether the cost of capital is lower in Japan than in the United States. Examining accounting and market-based measures of the returns to holders of debt and equity in two countries from the early 1960s through the early 1980s, we reached a number of conclusions:

1. Measures of the cost of capital based on market returns were closer for the two countries than measures based even on corrected accounting data;

2. The differences between the measured costs of capital were more apparent for broad samples (AA 1988b) than for the selected samples of large companies (AA 1988a);

3. One could reject several potential explanations of the seemingly large differences in the cost of capital; among these were:

   a. differences in corporate tax burdens;

   b. the greater ability of Japanese corporations to avail themselves of tax deductible borrowed funds; and

   c. the potential understatement of Japanese returns to capital due to the presence of compensating liquid balances on the books of Japanese corporations.

We concluded that the most likely cause of the difference in rates of return was a combination of the higher saving rate in Japan and the imperfect flow of capital between the two countries. One interpretation of our differential results for large and small firms (Hodder 1988) was that this lack of access to international capital markets plagued only smaller firms. The intuition is that large U.S. and Japanese firms operate in a unified world capital market, while smaller firms do not. Hence, smaller Japanese companies could benefit from the targeting of the domestically generated Japanese surplus of funds, while smaller U.S. firms could not. Evidence to support this view comes from recent work suggesting that investment by smaller U.S. firms is more sensitive to internal funds than that of larger firms (Fazzari

et al 1988) and that the same is true for Japanese firms without a main bank connection (Hoshi et al 1989).

In this paper, we revisit the cost-of-capital issue once again. Our investigation is motivated by several factors. One is the desire to consider the small-firm-large-firm distinction in more detail. A second motivation is that data for the period 1985-88, after our previous sample ended, are now available. This was a period of liberalized capital export from Japan, during which Japanese investment in the United States grew sharply[1]. Hence, it might be possible to detect an erosion in a gap in the cost of capital due to capital market imperfections. Finally, the last few years have been a period of extreme behavior in capital markets, including the international stock market crash of October 1987 and, in Japan, a subsequent explosion in the prices of equity and land.[2] The opportunity to include such data in our analysis gives us the ability to evaluate additional hypotheses that might explain differences in rates of return between Japan and the United States. This ability is further aided by the availability for recent years of Japanese accounting data presented on a consolidated basis.

We begin our analysis in the next section with a review of our methodology and an update of our results for Japan and the United States to include the most recent period. In Section 3, we break the results down for companies of different sizes in the two countries. We find little evidence to support the contention that the most important differences in the cost of capital between the two countries are among smaller firms. Indeed, the distinctions between small firms and large firms seems greater in Japan than in the United States.

Section 4 presents our results regarding the importance of land and cross-holdings in explaining rates of return in Japan. We find that these two factors, particularly the significance of land as a corporate asset, help to explain why Japanese market returns have so greatly exceeded Japanese accounting returns, especially in recent years, and suggest that the cost-of-capital gap may be considerably smaller than estimates based on corrected accounting returns would suggest. This leaves as a major puzzle, however, the high and, in recent years, rapidly appreciating Japanese land prices. In Section 5, we discuss this puzzle and other questions that remain for future research.

2. Recent Evidence

As in our earlier work, our basic data source for the Unites States is the Compustat Tapes. For Japan, our primary source for data is the Needs-Nikkei Financial Data Tapes.

In the past, we have estimated the before-tax cost of capital faced by firms using two methods. Each method is based on the underlying assumption that, at least over long periods of time, the rate of return to a firm will equal the rate required by the holders of securities. Our approach is to take a weighted average of the returns to equity and the returns to debt in calculating the overall return to capital, using observed debt-equity ratios for weights.

For both of our measures of the cost of capital, we estimate the cost of debt using interest payments of the firm divided by the book value of firm's debt[3]. The resulting effective interest rate is adjusted for inflation to

produce an estimate of the firm's real cost of debt. The measures differ in the way we estimate the return to equity, before taxes.

Our first measure, to which we refer as a "corrected accounting" measure, begins with the firm's accounting earnings, before-tax, and adjusts for several differences between this measure and an economically appropriate one, including the inflation-induced understatement of depreciation and inventory costs and capital gains on net financial liabilities. Our second measure, based on returns to equity in the stock market, begins with the holding-period yield (dividend plus capital gain) to shareholders in a company as a measure of the return to equity after corporate taxes, and adds to this the taxes paid by the company. The measured holding period yield must be adjusted for new equity issues, a somewhat complicated procedure in Japan because of the common practice of issuing new shares at par value, normally 50 yen per share.

Each of these measures has its advantages and disadvantages, which we have discussed in detail in the past. While the market return may pick up components of earnings missed by the accounting measure, notably capital gains on land, it is very volatile and hence not very informative about the cost of capital over short periods of time.[4]

Table 1 presents annual averages for these two measures of the rate of return to capital in Japan and the United States for the period 1967 through 1988[5]. For the full period, the measure based on corrected earnings averaged 6.0 percent for Japan, slightly lower than our previous average for the period 1967-83 of 6.5 percent. The decline in Japanese earnings-price ratios since 1983, particularly after 1985, explains the drop from our previous average. For the United States, too, our average corrected accounting measure of the return to capital is close to our previous measure, with the extra years 1984-

88 reducing the average from 12.3 percent to 11.9 percent. In each country, the growth in equity values during the 1980s has reduced the average return to capital for the full sample period, but the gap between before-tax returns to capital based on corrected accounting measures remains at about 6 percentage points.

It is not surprising that one obtains a different trend for each country using the market-based measure of the return to equity, since both U.S. and Japanese stock markets rose during the mid-1980s. The difference is especially large for Japan, where the 1967-88 average of 8.2 percent exceeds our previous measure of 5.7 percent. This large jump is due to the growth in equity values during the period 1986-88, when the overall market return to capital (not just equity, but equity plus debt) averaged over 20 percent per year. By comparison, the U.S. market returns over the period 1967-88 averaged 9.8 percent, up by 1.5 percentage points.

It may be tempting to interpret this larger rise in Japanese market returns as evidence of an increasing cost of capital in Japan and a closing of the cost-of-capital gap. Had that occurred, however, we should first have observed a drop in the price of Japanese shares, to reflect the higher rate of capitalization of earnings, followed by a higher rate of return in the market and a lower price-earnings ratio thereafter. No such drop in equity prices is evident in the data, except for the crash of October 1987 that was not unique to Japan. Given the opening of foreign capital markets to Japanese investors during this same period and the considerable capital flows from Japan actually observed, this reduction in an already very low accounting-based rate of return is quite vexing. After breaking the results in Table 1 down by firm

size in the next section, we return to this puzzling result and pursue alternative explanations.

3. Rates of Return and Firm Size

In separating our samples by size, we must recognize the potentially serious biases in doing so. Firms that are small at the end of our sample but were large enough to be included in the data set two decades ago are more likely than a firm chosen at random to have experienced a rate of growth (and, presumably, an average rate of return) below average. Likewise, a firm that was small at the beginning of the sample period and did not disappear is likely to have grown at a greater than average rate. Since these biases work in opposite directions, we consider two samples for each of the two countries, broken down by size (market value of debt plus equity) in 1970 and size in 1985.

In each of the four samples so drawn, we divide the firms into quartiles by cumulative market value (i.e. each quartile contains one-fourth of total market value, not one-fourth of all firms). This method places many more firms in the bottom quartile than in the top, but we are primarily interested in the behavior of small firms in terms of how their behavior affects the aggregate measures previously reported.

The results of our calculations are reported in Table 2. For Japan, the results are relatively insensitive to the base year chosen; there is little evidence of any important selection bias. Perhaps surprising, in light of previous arguments, is the fact that the implied cost of capital increases with firm size, regardless of which of the four measures one uses. Taking simple averages of the measures in the table for each quartile yields (in

order of ascending size) rates of return of .090, .089, .081 and .072 for the market return measures and .065, .065, .057 and .055 for the corrected accounting measures. The main break appears to be between the top and bottom halves of the sample, by size.

The U.S. averages are more unstable across sample definition and method of measurement. This is particularly true for the two largest size categories, which have relatively few firms in them. Hence, we are less comfortable drawing results on the basis of the U.S. numbers. However, there is clearly no evidence in tables that the second or third quartile of firms in the United States had a lower required return to capital than the lowest quartile. Indeed, analysis based on grouping the results for the two larger quartiles, suggests that the cost of capital rises with firm size. While the results in this section must be interpreted with care because of the smaller number of firms in each size category, it is striking nonetheless that the only evidence of a required rate of return to capital that declines with firm size is for Japan, and that the opposite result seems to hold for the United States. One cannot make differences between the two countries disappear by focusing attention only on larger firms with presumably more comparable access to capital markets. Restricting attention to such firms simply magnifies the differences already observed in the full samples of firms from the two countries.

4. Explaining Returns in Japan

The increasing gap between accounting-based returns to capital in Japan and the United States has occurred in spite of the recent liberalization of capital markets in Japan. Since increased capital flows should have reduced

cost-of-capital differences, this trend strongly suggests that our accounting measures are incomplete, that some other factors underlie the increase in Japanese equity values.

We explore two such factors in this section. These are the remarkable behavior of land values in Japan and the strong pattern of equity cross-holdings among Japanese companies. Indeed, as we discuss below, these issues are related because significant cross-holdings make the values of a company's shares more sensitive to the changes in prices of underlying "fundamentals".

A. Cross-Holdings

To a much greater extent than in the United States, firms in Japan hold equity in other firms. Moreover, Japanese accounting practices regarding the equity of subsidiaries make the consolidations of financial statements of parent and subsidiary much less likely.[6]

Since only the flow income (i.e., dividends) from unconsolidated holdings will normally appear on income statements, rather than the total return (either total earnings or dividends plus accruing capital gains), the earnings of corporations with significant subsidiary holdings may be substantially understated. The extremely low dividend-price ratio in Japan (in recent years well below 1 percent) would exacerbate this understatement.

Moreover, the problem of understatement applies to cross-holdings in general. Many cross-holdings in Japan do not represent holdings by a parent of a subsidiary, but rather an interlocking ownership among free-standing independent companies. In this sense, a consolidation of returns to include subsidiaries would correct only part of the understatement of earnings. We estimate the importance of this phenomenon in two ways.

Our first approach considers only the effects of the lack of subsidiary consolidation. For recent years, there are now available financial statements for Japanese companies that are restated for the effects of consolidation.[7] However, the data are not available for a long enough period for us to perform all the relevant adjustments to accounting earnings used to produce the numbers in the third column of Table 1. While data on from 300 to nearly 800 corporations are available for years 1984-7, data for far fewer firms are available even for the period 1978-83. However, a rough estimate of the importance of this effect can be obtained if we assume that the unobservable difference between adjusted earnings on consolidated and unconsolidated returns equals the observable difference between the corresponding levels of unadjusted earnings.

The results of this calculation are given in Table 3. The inclusion of subsidiaries does make a significant difference in measured earnings, increasing them by a factor in the range of one-fourth to one-half. The implied increase in the rate of return to capital (calculated by multiplying the increase in the aggregate earnings-price ratio by the fraction of equity in the aggregate capital structure) averages 1.3 percent over the period 1978-87, or roughly one-fifth of the average for the same period of the corrected accounting numbers given in Table 1, 6.4 percent.

Given the importance of nonsubsidiary cross-holdings in Japan, we also consider a correction that takes account of all cross-holdings, for which aggregate data from other sources must be used and a variety of simplifying assumptions are necessary.

Let d be the dividend yield of equity in the aggregate (total dividends divided by the total value of equity, summed over firms), and assume that all

companies whose shares are held by other firms have this same yield in any given year. Let f be the ratio of the market value of a company's cross-held equity (i.e. equity in other companies held as assets) to the market value of the company's own equity, and assume also that this ratio is constant in a particular year. Then, for a particular company i, the earnings-price ratio, purged of cross-holdings, is:

$$(1) \qquad (E/P)_i^c = [(E/P)_i - f\,d]/(1-f)$$

Expression (1) provides a measure that subtracts dividends from cross-held shares from earnings and the value of cross-held shares from equity value, yielding an earnings-price ratio for the firm's "own" operations.[8] Using the aggregate dividend yield for our sample and a measure for our sample's aggregate debt-value ratio (time series of which are provided in Table 4), we need only a measure of f, the cross-holding ratio, to translate the correction given in (1) into a numerical estimate of the correction applicable to the average accounting returns to capital presented in Table 1.

One cannot obtain a measure of f from our corporate financial statements, since cross-holdings are typically carried at book value, which we know to represent a woeful understatement of market value. Rather than attempt to correct these book values directly, we use aggregate statistics available in the Annual Report on National Accounts, published by the Japanese Economic Planning Agency (EPA).[9]

Table 5 presents series for the nonfinancial Japanese corporate sector for the period 1970-88. The first column of the table gives the gross aggregate value of nonfinancial corporate equity, while the second, third and fourth columns break these totals down by sector of ownership. Holdings by

the nonfinancial corporate sector itself, given in column 2 of the table, are cross-holdings. The cross-holding ratio, corresponding to the fraction f in equation (1), equals the ratio of column 2 to column 1 and is given in the last column of the table.

The table shows how important cross-holdings are now and have historically been in Japan, with the ratio remaining between .33 and .38 during the entire period. Indeed, since the late 1970s, nonfinancial corporations have themselves held more nonfinancial corporate stock than have households, as the share of nonfinancial corporate equity held by financial corporations has steadily grown. By the beginning of 1989, Japanese households held just 26 percent of that country's nonfinancial corporate equity.

Given these estimates of f and the insignificance of dividend yields in recent years, the correction based on expression (1) increases the corrected earnings-price ratio by roughly the same magnitude as correction based on subsidiaries alone. Its effect on the estimated returns to capital is given in the second column of Table 6, which repeats in its first column the corrected accounting measures given in Table 1. For the period 1970-88, the correction adds about .9 percentage points to the average corrected accounting return to capital. For the period 1978-87 used above to consider the consolidation of subsidiaries, the average impact of the cross-holding correction is 1.1 percent. Since, in principal, this number should exceed that based on subsidiary consolidation (for it includes all cross-holdings, not just holdings of subsidiaries), the two approaches provide a range of estimated effects of correcting for cross-holding.

Given the very rough nature of each calculation, this range is not wide. It gives us a fairly good picture of the significance of cross-holding and the lack of subsidiary consolidation in the understatement of the accounting returns to capital. This is an important correction, in that it may raise the estimated cost of capital by more than one percentage point, but it falls far short of explaining the several percentage point gap between accounting returns to capital in the two countries.

B. Land

Like cross-holding of equity, holding of land by a corporation can lead to an understatement of the firm's accounting earnings. In each case, a significant portion of the return on the asset may come in the form of unrealized capital gains that do not appear on financial statements unless the asset is sold. Hence, the large value of land holdings in Japan may help explain the low accounting-based return to capital there.

In addition, however, and unlike the case of cross-holdings, the significant increase over time in the value of land can also help explain why Japanese equities have grown in value at such a high rate even as the accounting rate of return has been quite low. The situation is different because cross-holdings do not represent a "primitive" component of the corporate sector's balance sheet. It would be circular reasoning to "explain" increases in the value of corporations as resulting from increases in the value of other corporations, without having some underlying explanation for any corporation's value increasing. On the other hand, land values could increase for a variety of reasons, leading the values of corporations holding the land to increase as well. Indeed, taking cross-holding into account could

then magnify the measured impact of increased land-holdings, via the indirect impact of increased land prices on the values of cross-held shares. This section considers the importance of land in explaining the recent high market returns in Japan, as well as the apparently low accounting returns there.

The value of land in Japan was extremely high by U.S. standards even several years ago. In recent years, this value has exploded in real terms. The rate of this recent increase and, indeed, the extent of appreciation over the past few decades, depends very much on which price index one uses.

The set of price indices we consider are given in Table 7. These series measure the price of land in Japan, expressed in terms of yen per square meter, for the period 1965-88. The first series applies to all privately-owned land, while the second excludes forest land. Each series shows a near doubling of land prices over the three-year period 1985-8, and a similar pattern of appreciation over earlier periods as well.

Since we do not know the quality and location of land held by individual firms in our sample, we must work with calculations based on the sample as a whole. Multiplying the aggregate price series in the first column of Table 7 by the land holdings of each firm in our sample produces the aggregate land-value ratio given in the first column of Table 8 for the period 1970-88.[10] The series suggests that by 1988, land accounted for nearly half of the value of a representative firm in our sample.

However, this understates the importance of land as a determinant of the value of the sample as a whole. Some of each firm's value is accounted for by the equity of other firms, which cancels in the aggregate. Given cross-holdings, we should expect an increase in land values to be exceeded by the corresponding increase in the value of gross nonfinancial corporate equity.

The reason is simple. If values reflect fundamentals, then the net value of equity held by those outside the nonfinancial corporate sector should reflect the increase in land values. Since shares held within the corporate sector must maintain their relative value to shares held externally, the gross value of shares must increase by the land value increase divided by (1-f), where f is the fraction of shares that are cross-held.

Netting out cross-held equity under the assumption that the aggregate ratio f given in the last column of Table 5 also applies to our sample as a whole, we obtain the ratio of land to net value given in the second column of Table 8. This ratio indicates how much of the value of the firms in our sample is accounted for by their land holdings. Using this ratio, we can calculate how much the real value of these firms should have increased simply to reflect increases in the real value of land, based on the price series given in the first column of Table 7. While substantial, averaging 3.1% for the period 1975-88, these numbers fall far short of explaining the very large returns to debt plus equity observed during the period 1985-88.

However, there is other evidence on land values suggesting that the series in Table 7 greatly understate the value of land held by corporations, and hence the role of land appreciation in the recent rise in Japanese equity prices. Our reasons for suspecting an underestimation by the procedure followed here are discussed in the appendix to this paper.

In light of our considerable uncertainty about the appropriate price series to use for the land held by firms in our sample, we consider an alternative approach based on aggregate National Income Account data on the value of land held by the nonfinancial corporate sector.

The aggregate market values of land held by the nonfinancial corporate sector, again obtained from EPA data, are presented in Table 9. Also presented, for comparison are gross and net (of cross-holdings) aggregate equity values for the sector, taken from Table 5. The ratio of land value to gross equity value is given in the last column of the table.

According to the table, the value of land held by nonfinancial corporations exceeded gross equity value during all but the last two years of the sample. By 1989, this fraction had fallen to 73 percent. Even in that year, however, land value far exceeded the value of equity net of cross-holdings by one-third.

Given our debt-value ratios in Table 4, this translates into the series of land value ratios given in the first two columns of Table 10 based on equity gross and net of cross-holdings, respectively, comparable to those in the first two columns of Table 8. The figures in Table 10 indicate land-value ratios that are nearly twice as large as those based on the price series in Table 7, although, the trends over time are similar. Given that these new estimates show land as representing the majority of all corporate value, it is not surprising that the increases in market value attributable to land are quite significant. Based on the same inflation rate of land prices as before, (calculated using the aggregate price series in Table 7), the real returns to debt plus equity attributable to real appreciation of land are given in the last column of Table 10.

These returns are considerably larger than those in Table 8, and "explain" a much greater fraction of the overall market returns during the mid-1980s. For example, during the period 1986-8, the average increase in

value due to land appreciation alone is estimated to have been 17.0%, compared to the overall average market return of 20.9%.

Thus, at least one measure of the value of land suggests that the changes in equity values in Japan in recent years may be consistent with the appreciation of the land held by Japanese firms, although this leaves unexplained the reason for such land appreciation. Given th estimated importance of land on corporate balance sheets, and the apparent importance (at least in recent years) of capital gains in motivating the holding of land, it is likely that accounting returns that include only direct returns to the holding of land will greatly understate the required returns to debt plus equity of Japanese firms during our sample period.

To correct the measured accounting returns for the incorrect measurement of the total returns to land, we take an approach that is similar to the one used to correct for cross-holdings. Let r equal the direct rent on land received by firms, expressed as a fraction of land value. Then, taking account of cross-holdings as well, and letting d be the dividend yield and l the land-gross equity ratio, the corrected return to equity should be:

$$(2) \qquad (E/P)_i^{lc} = (E/P) + f\,[(E/P)_i^{lc} - d] + l\,[g - r]$$

where g is the true return to the holding of land, presumably much larger than r because of the importance of anticipated capital gains. Expression (2) says that we should replace the returns to cross-holdings and land actually appearing on corporate income statements, d and r, with the true returns that firms actually earn on these holdings, equal to the full return on equity, $(E/P)_i^{lc}$, and the full return on land, g.

Assuming that g equals $(E/P)_i^{lc}$, i.e., that the required returns to land and other assets are the same, we may solve (2) to obtain (compare to (1)):

$$(3) \qquad (E/P)_i^{lc} = [(E/P)_i - fd - lr]/(1 - f - l)$$

To make this correction, we require an estimate of r, the rent-value ratio for land held by the corporate sector. We face serious obstacles in estimating this ratio. In the first place, as far as we know, Japanese national accounts do not report the rent on land earned by corporations. In the second place, one of the features of the extraordinarily high price and the rate of increase of the price of land in Japan is that the rent-value ratio for land is extremely small when it is measured. For example, the rent earned by the household sector for 1985 is reported to be 1,790.1 billion yen, whereas the land owned by the same sector at the beginning of 1985 valued at the current market price is reported to be 657.8 trillion yen, implying the rent-value ratio of .27%. In order to remain as conservative as possible in our estimate of the contribution of the real capital gains on land to the rate of return on capital, we have arbitrarily decided to use the rent-value ratio of 1.5% in this context.[11] [12]

Using this, along with estimates of the fractions d, f, and l, we can use expression (3) to obtain accounting return measures corrected for cross-holdings and land. For d, we use the series based on our sample, given in Table 4. For f, we use the cross-holding fraction from Table 5. For l, we have two choices. One is based on the aggregate statistics given in Table 9. The second can be obtained from the land-value figures based on our sample, given in Table 8. The latter measure is lower, and hence will result in a smaller correction to the accounting rate of return. These alternative

estimates are provided in the second and third columns of Table 11. The first column of the table repeats for convenience the basic corrected accounting measures from Table 1.

If anything, the first set of corrections explains "too much", in that the total corrected returns to capital now far exceed those of the United States; in some years exceeding 50 percent. However, the second set of corrections, based on the use of the price series for land reported in Table 7 combined with reported land holdings for our sample firms, yields results that are much more plausible. Indeed, comparing this series with the corrected accounting series for the United States in Table 1, we find very little difference between the two countries in recent years, with the U.S. return not noticeably higher after 1980. While this hardly constitutes proof that the cost of capital is now similar in the two countries, it does suggest that the gap that appears to exist in Table 1 can be eliminated using quite feasible corrections to the way one measures the accounting rate of return in Japan.

Our results suggest that land appreciation may help explain a significant portion of the recently high market rates of return in Japan. However, this is true only when we use land value estimates based on aggregate statistics, which suggest that land represents almost all the value of the nonfinancial corporate sector. In such a case, the implied correction to accounting rates of return is so large as to imply a very high rate of return on non-land assets, since such assets would represent such a small part of corporate value.

If we use a very conservative price series to estimate the value of corporate land, we find that capital gains on land, while still important, can explain only a small part of the recent appreciation of share values.

However, the correction to accounting returns based on these land value estimates produce quite reasonable estimates of corrected accounting returns, estimates that are extremely close to those for the United States over the period 1984-8 when liberalized capital markets in Japan would have led us to expect a convergence of the costs of capital in the two countries.

Even by our very conservative estimates of land values, which we believe may greatly understate true values, the value of land held by the firms in our sample represented over half of their net (of cross-holdings) value in 1988. This emphasizes how important it is to understand and allow for the behavior of land prices and the accounting for the return to land in estimating the cost of capital.

4. Conclusions

In this paper, we have attempted to clarify the implications of our earlier work in two ways: by exploring reasons for an aggregate cost of capital differential between the United States and Japan, and alternative explanations for observed differences between the countries in measured rates of return. We judge our findings to raise as many questions as they answer, although the significance of land and cross-holdings is certainly important enough to "explain" differences in rates of return. The explanation remains incomplete, however because it is difficult to understand the relationship of land values to the market value of firms. In some sense, our results argue for a change of focus in future research, away from explaining the perceived cost of capital gap and toward achieving a better understanding of Japanese capital markets, or more broadly, Japanese asset markets in general including the market for land.

Table 1

Returns to Capital in the United States and Japan

(1967-88)

Year	United States		Japan	
	(1)	(2)	(3)	(4)
	Corrected	Market	Corrected	Market
1967	0.090	0.222	0.070	0.000
1968	0.075	0.104	0.088	0.139
1969	0.069	-0.071	0.083	0.094
1970	0.077	0.012	0.081	-0.027
1971	0.085	0.121	0.082	0.054
1972	0.087	0.160	0.065	0.253
1973	0.097	-0.124	0.030	-0.042
1974	0.140	-0.192	0.010	-0.195
1975	0.140	0.234	0.045	0.054
1976	0.135	0.186	0.042	0.048
1977	0.140	-0.005	0.048	0.043
1978	0.170	0.086	0.047	0.067
1979	0.193	0.141	0.058	0.068
1980	0.173	0.210	0.067	0.054
1981	0.138	-0.028	0.082	0.114
1982	0.117	0.165	0.076	0.054
1983	0.122	0.218	0.076	0.199
1984	0.124	0.034	0.068	0.102
1985	0.121	0.253	0.069	0.101
1986	0.093	0.192	0.054	0.268
1987	0.103	0.094	0.045	0.051
1988	0.127	0.140	0.046	0.309
Average	0.119	0.098	0.060	0.082

Note: "Market" measures the cost of capital on the basis of market equity yields. "Corrected" measures the cost of capital on the basis of accounting earnings, with adjustments for depreciation, net financial liabilities, inventories and, for Japan, reserves.

Table 2

Average Rates of Return, By Size Category

Japan

Quartile	Market Returns		Accounting Returns	
	Sample 1970	Sample 1985	Sample 1970	Sample 1985
First (Largest)	.067	.077	.052	.057
Second	.080	.081	.058	.055
Third	.095	.083	.069	.061
Fourth (Smallest)	.090	.089	.064	.065

United States

Quartile	Market Returns		Accounting Returns	
	Sample 1970	Sample 1985	Sample 1970	Sample 1985
First (Largest)	.092	.135	.136	.128
Second	.113	.085	.176	.148
Third	.089	.090	.128	.125
Fourth (Smallest)	.095	.090	.103	.101

Notes: Each sample divides firms into quartiles of total market value; sample 1970 divides sample using firm size in 1970; sample 1985 divides sample using firm size in 1985; averages for Japan are for the period 1967-88; for the U.S., averages are computed for the period 1970-88.

Table 3

The Effects of Japanese Subsidiary Consolidation

Year	No. of Firms	Earnings-Price Ratios		Implied Increase in Return to Capital
		Unconsolidated	Consolidated	
1978	61	.098	.134	.014
1979	76	.098	.134	.014
1980	82	.111	.163	.021
1981	90	.097	.143	.018
1982	94	.089	.128	.016
1983	111	.068	.097	.012
1984	670	.070	.092	.011
1985	754	.075	.099	.012
1986	768	.041	.052	.005
1987	328	.030	.039	.006

Note: Sample in each year consists of all firms for whom information both on consolidated and unconsolidated basis is available. Implied increase in returns to capital equals difference between two columns multiplied by ratio of equity to debt plus equity, taken from Table 4 below.

Table 4

Debt-Value Ratios and Dividend Yields in Japan

Year	(1) Debt-Value Ratio	(2) Dividend Yield	(3) No. of Firms
1966	0.663	0.029	959
1967	0.637	0.027	991
1968	0.663	0.031	995
1969	0.630	0.025	1005
1970	0.620	0.024	1014
1971	0.680	0.027	1049
1972	0.689	0.023	1089
1973	0.581	0.015	1107
1974	0.600	0.014	1138
1975	0.682	0.017	1157
1976	0.668	0.016	1168
1977	0.655	0.015	1180
1978	0.646	0.014	1201
1979	0.613	0.013	1198
1980	0.596	0.012	1208
1981	0.602	0.014	1213
1982	0.572	0.011	1170
1983	0.579	0.011	1182
1984	0.508	0.008	1247
1985	0.489	0.008	1263
1986	0.477	0.007	1245
1987	0.380	0.005	916
1988	0.394	0.005	742

Note: Based on the same sample as the one used to prepare the Japanese side of Table 1.

Table 5
Cross-Holdings of Equity in Japan

Year	Equity Held by:				
	(1) Total	(2) Nonfinancial Corporations	(3) Financial Corporations	(4) Households	(5) Ratio (f) (2)/(1)
1970	31.5	10.6	8.2	12.7	0.34
1971	27.4	9.2	7.2	11.0	0.33
1972	33.8	11.2	9.9	12.7	0.33
1973	69.2	23.8	21.4	24.0	0.34
1974	73.2	28.7	17.6	26.9	0.39
1975	62.7	23.4	16.5	22.8	0.37
1976	60.9	20.4	18.7	21.9	0.33
1977	78.9	28.9	22.7	27.3	0.37
1978	78.3	28.1	23.4	26.8	0.36
1979	108.0	40.3	31.0	36.7	0.37
1980	119.8	46.0	33.6	40.2	0.38
1981	121.9	46.0	36.0	40.0	0.37
1982	133.4	49.2	41.8	42.4	0.38
1983	128.8	44.8	44.0	40.0	0.35
1984	160.7	58.6	54.7	47.4	0.36
1985	203.1	75.5	71.0	56.6	0.37
1986	241.1	88.3	87.0	65.8	0.37
1987	374.0	141.1	136.8	96.1	0.38
1988	472.2	181.3	167.1	123.7	0.38
1989	668.3	250.7	244.2	173.4	0.38

Notes: The total is the sum of holdings by nonfinancial and financial corporations and by households, reported at the market value. Conceptually, it differs from the equity reported in Nikkei-Needs tapes because (1) these figures apparently include equities of financial corporations; and (2) equities held by foreigners are excluded. It is our impression that the discrepancy due to these conceptual differences is quite small. Economic Planning Agency, Annual Report on National Accounts, 1990.

Table 6

Accounting Returns to Capital, Japan
Corrected for Cross-Holdings

Year	(1) Basic Corrected Return	(2) Return with additional correction for cross-holdings
1970	0.081	0.089
1971	0.082	0.088
1972	0.065	0.070
1973	0.030	0.032
1974	0.010	0.009
1975	0.045	0.049
1976	0.042	0.045
1977	0.048	0.053
1978	0.047	0.051
1979	0.058	0.065
1980	0.067	0.077
1981	0.082	0.094
1982	0.076	0.088
1983	0.076	0.087
1984	0.068	0.081
1985	0.069	0.083
1986	0.054	0.066
1987	0.045	0.058
1988	0.046	0.054

Notes: Basic Corrected Return is reproduced from Table 1, column (3).

Table 7

Land Values: Two Price Series (thousand of yen per m^2)

Year	(1) Average Price of Corporate Land Including Forests	(2) Average Price of Corporate Land Excluding Forests
1965	1.29	1.74
1966	1.36	1.83
1967	1.42	1.93
1968	1.52	2.06
1969	1.74	2.36
1970	2.07	2.91
1971	2.62	3.65
1972	3.41	4.90
1973	4.46	6.50
1974	4.57	6.52
1975	4.97	7.10
1976	5.38	7.62
1977	5.88	8.24
1978	6.71	9.38
1979	8.02	11.29
1980	9.59	13.56
1981	10.99	15.82
1982	11.75	16.98
1983	12.39	17.80
1984	12.92	18.89
1985	14.20	20.66
1986	17.99	26.08
1987	24.73	36.10
1988	26.91	39.60

Notes: For sources and the method of computations, see Appendix, Tables A.1 and A.2.

Table 8

Land Values and Capital Gains

Year	Ratio of Land Value to Debt Plus Gross Equity	Ratio of Land Value to Debt Plus Net Equity	Implied Return to Capital (Debt Plus Net Equity) Due to Land Appreciation
1975	.268	.304	.003
1976	.288	.290	.003
1977	.252	.288	.010
1978	.255	.292	.027
1979	.270	.315	.053
1980	.305	.361	.057
1981	.333	.392	.045
1982	.347	.413	.020
1983	.346	.406	.019
1984	.305	.370	.012
1985	.287	.354	.030
1986	.293	.363	.090
1987	.300	.393	.014
1988	.440	.573	.048
Average	.304	.365	.031

Note: Land value based on reported holdings of land in m^2 for the sample panel, valued at the price given by Table 7, column (1). To convert the debt plus gross equity to the debt plus net equity, the ratio from aggregate data reported on Table 5 and the debt value ratio reported on Table 4 were used.

Table 9

Land Values and Equity Values in Japan

Year	(1)[1] Equity (Gross)	(2)[2] Equity (Net)	(3)[3] Land	(4) Ratio of Column (3) to Column (1)
1970	31.5	20.9	36.7	1.17
1971	27.4	18.2	44.6	1.63
1972	33.8	22.6	53.9	1.59
1973	69.2	45.4	74.6	1.08
1974	73.2	44.5	97.5	1.33
1975	62.7	39.3	97.7	1.56
1976	60.9	40.5	106.0	1.74
1977	78.9	50.0	113.6	1.44
1978	78.3	50.2	120.1	1.53
1979	108.0	67.7	134.8	1.25
1980	119.8	73.8	160.8	1.34
1981	121.9	75.9	189.4	1.55
1982	133.4	84.2	211.3	1.58
1983	128.8	84.0	225.7	1.75
1984	160.7	102.1	234.2	1.46
1985	203.1	127.6	243.2	1.20
1986	241.1	152.8	264.6	1.10
1987	374.0	232.9	329.3	0.88
1988	492.2	290.9	443.5	0.94
1989	668.3	417.6	487.7	0.73

[1] The sum of the market value for corporate shares owned by nonfinancial corporations, financial institutions, and by households. Note that (a) it includes shares of financial corporations, and (b) it does not include shares owned by foreigners. Figures for balance sheets of financial institutions from the same source appear to suggest that the total value of equity for financial corporations is relatively small.

[2] The sum of the market value for corporate shares owned by financial institutions and by households.

[3] The value of land and forrest owned by nonfinancial corporations.

Source: Economic Planning Agency, Annual Report on National Acounts, 1990, pp. 332-351.

Table 10

Land Values and Capital Gains
(Based on Aggregate Land Value)

Year	Ratio of Land Value to Debt Plus Gross Equity	Ratio of Land Value to Debt Plus Net Equity	Implied Return to Capital due to Real Land Appreciation
1970	.445	.509	.063
1971	.522	.584	.123
1972	.493	.550	.135
1973	.454	.523	.094
1974	.532	.630	-.113
1975	.499	.566	.006
1976	.574	.644	.006
1977	.504	.577	.020
1978	.536	.613	.057
1979	.488	.570	.094
1980	.549	.650	.102
1981	.620	.731	.086
1982	.679	.807	.040
1983	.735	.862	.040
1984	.715	.868	.027
1985	.612	.755	.064
1986	.572	.708	.176
1987	.546	.715	.270
1988	.573	.746	.063

Note: Value of land and gross and net equity values from Table 9. The ratio of equity to debt plus equity was computed as (1 - column (1), Table 4), and hence based on the average value for our sample panel of firms. See Part II of Appendix.

Table 11

Accounting Returns to Capital, Japan
Corrected for Cross-Holdings and Land

Year	Basic Corrected Return		Japanese Return with Additional Correction for Cross-Holdings and Land	
	U.S.[1]	Japan[1]	Based on[2] National Accounts	Based on Price Series Given in Table 7, Column (1) and Sample Land Intensity as Given in Table 8, Column (1)[3]
1970	.077	.081	0.166	
1971	.085	.082	0.188	
1972	.087	.065	0.140	
1973	.097	.030	0.053	
1974	.140	.010	0.000	
1975	.140	.045	0.093	0.064
1976	.135	.042	0.098	0.057
1977	.140	.048	0.099	0.068
1978	.170	.047	0.108	0.066
1979	.193	.058	0.131	0.089
1980	.178	.067	0.196	0.111
1981	.138	.082	0.308	0.146
1982	.117	.076	0.398	0.140
1983	.122	.076	0.519	0.136
1984	.124	.068	0.511	0.119
1985	.121	.069	0.289	0.120
1986	.093	.054	0.186	0.095
1987	.103	.045	0.177	0.084
1988	.127	.046	0.186	0.116

Notes: [1] From Table 1, Columns (1) and (3).

[2] Using the formula (3) in the text and aggregate data; however, see Appendix, Part II.

[3] Also based on the formula (3) in the text.

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1. According to the August 1988 (p. 69) and 1989 (p. 47) issues of the Survey of Current Business, the stock of Japanese direct investment capital in the United States grew by 38.9 percent in 1986, 31.0 percent in 1987 and 51.8 percent in 1988.

2. The sharp drop in Japanese equity markets during the winter of 1989-90 occurred too recently to be accounted for in the data studied in this paper.

3. Although a market value of debt would be preferable, we have concluded in the past that this correction would introduce new errors and is not likely to be as significant as the others we undertake.

4. There are further problems plaguing each measure that relate to the effects of taxes on market value. If there is accelerated depreciation, then the value of the firm's equity may be less than its replacement cost because old capital bears less valuable depreciation allowances than new capital. Hence, the true cost of capital, equal to the expected rate of return to new investment before tax, will be lower than that implied by the corrected accounting measure.

Equity value may also be lower than replacement cost if the marginal source of equity funds is retained earnings. In this case, again, the earnings-price ratio will overstate the return to new equity investment. The understatement will be less severe for the market-based measure, since only the dividend yield (relative to the replacement cost of capital) will be overstated by the equity undervaluation.

For further discussion of such valuation issues, see Auerbach (1983). We have not pursued this question here, due not only to the uncertainty about which assumption about equity valuation is correct, but also because of our view that such corrections are quite unlikely to be as significant as the others we undertake in this paper.

5. Our figures for the United States for the years 1967-69 are taken from our earlier paper (AA 1988b), since our current version of the Compustat tape does not provide data for this period. This use of earlier calculations does not appear to pose a problem of comparability, as our methodolgy is the same and the two samples nearly so. The aggregate results for the two data sets for overlapping years (1970-84) are virtually identical.

6. For further discussion, see McCauley and Zimmer (1989) and Aron (1989).

7. We are very grateful to Kevin Hassett of Columbia University for supplying us with the results of the calculations based on the consolidated financial retur

8. One can also interpret this measure as carrying out the consolidation of firms, as was done above in the case of subsidiaries, by rewriting equation (1) in the following way:

$$(1') \qquad (E/P)_i^c = (E/P)_i + f\,[(E/P)_i^c - d]$$

This expression indicates that the corrected earnings-price measure is obtained by replacing the dividend-price ratio of cross-held shares with the corrected earnings-price ratio of these shares.

9. Economic Planning Agency, Annual Report on National Accounts, 1989.

10.Our data set provides information on land holdings beginning only in 1970.

11.These figures are taken from Economic Planning Agency, Annual Report on National Accounts, 1990, p. 91 and p. 351, respectively.

12. Note that, whether land is actually rented out would be irrelevant, since firms would presumably earn imputed rent on the land they use themselves in the form of reduced rental expense.

APPENDIX

I. On the Size and the Price of Land Held by Non-Financial Corporations and Real Capital Gains Due to Their Ownership[1]

The analysis presented in the text of our paper has made clear the importance of the real capital gains on land in the true earnings of Japanese corporations. The estimate of these capital gains, in turn, depends critically on our estimate of the size of corporate holdings of land and its price. Unfortunately, information on these quantities from alternative sources can vary widely, making it very difficult to form a coherent picture of asset markets. In this appendix, we present the background information on these quantities in order to enable the reader to interpret our result in a proper perspective, and to stimulate further discussion on the assessment of data on these quantities.

The Nikkei-Needs tape contains two pieces of information on land held by each corporation: physical size of the land in square meters (variable No. 230) and its book value (No. 231). It is clear that the book value is of no use to us, since in many cases the ratio of the book value to the square meters implies that the recorded book value is no more than a few yen per square meter, perhaps because the land was owned since before the second world war.

In an earlier version of this paper, we reported the result using the information on square meters of land owned by corporations in the Nikkei-Needs sample, using a price based on the average price of land for all purposes for Niigata prefecture reported in Chika-Koji. The choice of the prefecture was

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[1] This further investigation of the price of land and corporate holdings of land and forests was partly motivated by comments offered by Professor Yasushi Iwamoto on the earlier version of this paper. We are grateful to him for calling our attention to the question of the presence of forest land in corporate holdings in our calculation.

meant to utilize the price of land near the bottom, but not quite at the bottom, of all prefectures, in order to generate a reasonably conservative result. However, we now recognize the possibility that we could still have overestimated the price of land because a part of corporate holdings of land is forest, whose price is much lower, while prices reported in Chika-Koji refer largely to urban land. An alternative source of information on the land price is the Annual Report on National Accounts.

The Annual Report on National Accounts, however, reports only the aggregate value of land owned by corporations and by households, and not the price or the physical size, although these values are indeed broken down into several categories including forest land. We must, then, find some other source of information on either the price or the physical size of land corresponding to the value reported in National Accounts. One possible source of information on the physical size of land is the Summary Report on Prices, Etc., of Fixed Assets (Kotei Shisan no Kakaku to no Gaiyo Chosho), prepared by the Ministry of Home Affiars. The Summary Report provides the physical size of the land in square meters divided into the same categories as in National Accounts, but only for total; that is, it does not divide land into those owned by corporations and by households. Thus, for example, in 1985, from these two sources, we have the following set of information:

Table A.1
Value of Land Owned by[1]
(in ¥ billion)

Households				Corporations			
Residential	Farm	Other	Forest	Residential	Farm	Other	Forest
523,140.1	120,522.4	29,219.3	29,936.8	230,550.9	1,203.1	28,035.8	2,484.5

Physical Size of Land[2] (total)
(in million m^2)

Residential	Farm	Other	Forest
12,953.1	55,751.4	16,503.3	76,547.4

[1] Annual Report on National Accounts, 1990, pp. 418-419

[2] Summary Report on Prices, Etc., of Fixed Assets, List of Privately Owned Land by Purpose (Physical Measure)

In order to proceed, therefore, we must assume that the price of land owned by households and that of land owned by corporations for the same purpose are the same. Under this assumption, we can compute the size of land owned by corporations and its price classified by use as follows:

Table A.2
Land Owned by Corporations by Use

	Residential	Farm	Other	Forest
Physical Size (in million m^2)	3,962.3	551.0	8,081.0	5,867.0
Price (¥ 1,000 per m^2)	58.18	2.18	3.47	.42
Average Price of Corporate Land Excluding Forest (¥ 1,000 per m^2)		20.66[1]		
Average Price of Corporate Land Including Forest (¥ 1,000 per m^2)		14.20[2]		

[1] The weighted average of first three prices using physical size as weights.

[2] The weighted average of all four prices.

From these figures, it is clear that corporations do own a significant amount of forest land whose price is much lower than that for other types of land. In the text, we will primarily rely on the average price including forest land shown above. We wish, however, to gain some sense of whether or not these prices are reasonable by comparing them with prices reported in Chika-Koji. While any average price including forest land cannot be compared with prices reported in Chika-Koji, at least residential land price should be roughly comparable to the price of the corresponding type of land in Chika-Koji. It is generally believed that price reported in Chika-Koji is considerably below the actual transaction price in the market, perhaps by a half. We record below the average price for residential, commercial, and industrial land reported in Chika-Koji, for the highest priced prefecture (Tokyo) and the lowest priced prefecture (Shamine-Ken):

Table A.3
Price of Residential, Commercial and Industrial Land
According to Chika-Koji
(In ¥ 1,000 per m^2 for 1985)

		According to National Survey	According to Surveys by Provincial Government
Residential	Tokyo	353.9	297.3
	Shimane-Ken	55.0	29.5
Commercial	Tokyo	3691.0	1893.8
	Shimane-Ken	219.0	82.3
Industrial	Tokyo	195.0	N.A.
	Shimane-Ken	35.5	N.A.

Comparing Table A.3 with Table A.2, we see that the discrepancies are enormous. The residential land price for Shimane-Ken, the prefecture with the lowest land price in the country, given in Table A.3, is of the same order of magnitude as the "national average" shown in Table A.2, namely, ¥58.18 thousand per square meter. The Tokyo price is at least 5 times higher in Table A.3 compared to Table A.2. The category called "other" in Table A.2 must include commercial and industrial land, whose prices in Table A.3 are of entirely different order of magnitude. As we have mentioned earlier, there are indications that even Chika-Koji prices are underestimates, and we must also remember that land owned by large corporations included in the Nikkei-Needs tape are much more likely to be located in major commercial and industrial centers such as Tokyo, Osaka and Nagoya rather than in remote areas such as Shimane-Ken. We must conclude, therefore, that relying largely on figures shown in Table A.2 for calculations in the text, we are likely to be underestimating the effect of real capital gains on land for values of corporations by a large margin.

We can attempt to assess the reasonableness of our estimates from yet another angle. We record below the total value of debt plus equity for non-financial corporations as reported in Annual Report of National Accounts and the corresponding sum for all corporations included in the Nikkei-Needs tape and included in our sample (only a few firms with significant missing data were excluded from our sample), and similarly the total square meters of land from these two sources:

Table A.4
Corporate Land Value and Debt + Equity (1985)

	Land Value (¥ billion)	Debt + Equity (¥ billions)
(1) National Accounts	264,618.3[1]	947,894.8[2]
(2) Nikkei-Needs	68,094.3[3]	215,074.8[4]
(2)/(1)	.257	.227

[1] Annual Report on National Accounts, 1990, p. 325

[2] As above, the sum of total debts, given on p. 325, plus the sum of equities owned by non-financial corporations, financial institutions, and by households. The latter is subject to error since it does not include holdings by foreigners and includes some equities of financial corporations.

[3] Square meters reported in the Nikkei-needs Tape multiplied by the average price reported above, namely, ¥14,210 per square meter.

[4] Nikkei-Needs Tape records adjusted as described in the text.

According to the above table, both in the case of total debt plus equity and the value of land, corporations included in Nikkei-Needs tape appear to account for between 20% and 25% of national totals.

It has been suggested by a number of authors that ownership of forest land is concentrated in a few industries, namely, paper and pulp, stone, clay and glass, mining, non-ferrous metals, and electric generating. This suggestion seems to us to be reasonable, and we thought that we might apply the price of land excluding forest for those corporations in industries other than the ones listed above. We found that the distribution of land between these two types of industries reported in the Nikkei-Needs tape does not seem to make sense:

Table A.5
Distribution of Debt + Equity and Land (1985)

	Land (million m^2)	Debt + Equity (¥ billion)
Forest Owning Industries	3914.4	69,087.7
Non Forest Owning Industries	877.7	145,987.8
Total	4792.2	215,074.8

If we suppose that the ownership of non-forest land by forest owning industries is in the same proportion to the ratio of debts plus equity of these industries to the non-forest owning industries, then our estimate of non-forest land owned by forest owning industries must be approximately 415 million square meters. This implies that forest land owned by corporations is approximately 3,499 million square meters, while non-forest land owned by these corporations is approximately 1,293 million square meters. In other words, the fraction of forest land in total land owned by corporations included in Nikkei-needs tape is 73%. Figures reported in the National Accounts and the Summary Report referred to above implies that this ratio should be 32% (= 5,867/(5,867 + 8,081 + 551 + 3,962)). Thus, we have another serious contradiction in data from alternative sources.

The review of data in this appendix makes clear that, at least for those of us not close to the sources of data, the information about Japanese land prices and size and distribution of ownership of land contain many puzzles, and it is difficult for us to arrive at an understanding of the land market in Japan and its role in asset pricing that makes a reasonable economic sense. We hope to be able to clarify at least some part of these puzzles by learning more about the nature of available data in the future. Meanwhile, the general pattern of data

appears to imply that estimates of real capital gains on land accruing to corporations during the past 20 years are most likely to be seriously underestimated by the method displayed in Table 8. Similarly, the method may seriously underestimate the effect of capital gains on land in the correction of accounting measures of the cost of capital, given in the last column of Table 11.

II. Debt-Value Ratio in our Sample and in Aggregate Data

The debt-value ratio reported in Table 4 is based on figures reported in Nikkei-Needs tape for our sample of firms, after some adjustments for reserves, accounts payables, and so on. The Annual Report on National Accounts, in its balance sheet section, reports debts of non-financial corporations. For the beginning of 1985, we have

Table A.6
For Nonfinancial Corporations

Gross Debt	¥ 650.4 trillion
Gross Equity*	203.1
Debt Value Ratio	.76

* It should be recalled that this figure may include some equities of financial corporations and excludes holdings by foreigners.

This ratio of .76 appears to be radically different from the one reported in Table 4, namely, .489. Some adjustments will reduce the difference: for instance, eliminating accounts payable from the debt to reduce the debt-value ratio to .70, but the difference is still quite large.

Since our sample accounts for only about 23% of the total reported in national accounts in terms of debts plus equity (see Table A.4 above), we must conclude that other, presumably smaller corporations and some large semi-public

corporations included in national accounts must have much higher debt-value ratios than firms in our sample. We nevertheless use the figure for our sample average in all our calculations in the text since we have serious difficulties interpreting some aggregate debt items in the balance sheet reported in the National Accounts.