90-F-11

Are Japanese Stock Prices Too High?*

by

Kazuo Ueda
University of Tokyo

August 1989
2nd Revision April 1990

* The author would like to thank T. Inoue, T. Ishikawa, T. Ito, F. Konya & J. Poterba for useful comments and suggestions.

1, Introduction

Japanese stock prices are at very high levels. Increasing number of investors have started to think that stock prices are too high, especially since the Black Monday crash. However, until the end of 1989 the Nikkei Dow had gone up about 70% since the Black Monday, 180% since the end of 1985, and 400% since the end of 1980. The compounded rate of return on a riskless asset, say one year bank debentures, is only about 70% since the end of 1980. The Nikkei Dow has come down sharply since the beginning of 1990, but it is still at an unprecedentedy high level.

Stock returns in other countries have also been high. The New York Dow Jones Average (30 Industrials) has increased by about 170% and the London FT index, by about 430%. Some of the other asset prices have also sharply increased during the same period in Japan. Most notable are land prices in the Tokyo Metropolitan area. Between 1980 and 1988 they have increased by about 260%, suggesting the possibility of a close relationship between stock and land prices.

In Figure 1 we look more closely at the behavior of Japanese stock prices by comparing the price dividend ratio (PDR) and price earnings ratio (PER) with those in the U.S. for the entire post war period. Interestingly, the U.S. ratios had been almost consistently higher than the Japanese ones until the early 1970s. Since then, the ratios have been higher in Japan. Since 1983, the Japanese ratios have skyrocketted to unprecedentedly high levels without corresponding increases in the U.S.

Such an observation immediately casts doubt on the view that the better performance of the Japanese economy--higher growth rates--has been the major reason for higher stock prices. The difference in the growth rates between the two countries were certainly much higher in the 1950s and 1960s than in the period since then.

The figure also reveals the possibility that increases in stock prices in the 1983-88 period and those in the earlier period may have been due to different economic factors.

In the following we analyze the behavior of Japanese stock prices, especially that of the PER and PDR, in an attempt to determine whether or not it can be explained by simple economic fundamentals such as the required return on stocks, growth rates. We also pay attention to the role of cross share holding among Japanese firms. Since this practise is similar to the buying back of shares, it may have been one of the reasons behind high stock prices in Japan.In addition, we analyze the role of land prices for the determination of stock prices.

In Section 2 we present a simple model of firm valuation, making clear the effect of cross share holding on the PER and PDR. In Section 3 & 4 this will be used to study the behavior of Japanese stock prices. We carry out two types of exercises:one, by estimating the value of fundamentals and using the model to calculate the theoretical values of the PER and PDR. These will then be compared with the actual values. In the other type of exercise we calculate the values of some of the fundamentals that are consistent with the model and the actual ratios. This will reveal the determinant of stock prices on the assumption that the stock market is efficient.

In Section 5 we study the effects of land prices on stock prices and to some extent land prices themselves.The final section offers some concluding remarks and directions for future research.

2, A Simple Model of Stock Prices

Let us consider a firm holding a real asset W. Ignoring taxes and assuming various linear homogeneities, the market value of the firm S is written as

$$S = P_W W \tag{1}$$

where P_W is the price of the real asset.[1] Rational behavior on the part of the firm requires that the demand for the asset is set at the level where its rate of return is equal to the required rate of return on the stocks, R, of the firm R. Letting r be the rent per unit of the real asset, we obtain

$$R = r/P_W + z_W \tag{2}$$

where z_W is the expected rate of inflation of P_W. We assume that capital gains are unrealized. Hence, earnings E of the firm are expressed as

$$E = r\ W. \tag{3}$$

The price earnings ratio (PER) can be written as

$$PER = 1/(\ R - z_W). \tag{4}$$

The usual formula for the PER is the inverse of the required rate of return. However, to the extent that expected capital gains are unrealized, reported earnings fall short of the requred return, resulting in a rise in the PER.

In the absence of bubbles in the price of the real asset

$$z_W = g_W \tag{5}$$

where the right hand side is the expected growth rate of the rent r.[2] The formula for the price earnings ratio is rewritten as

$$PER = 1/(R-g_W). \qquad (6)$$

We next assume, for simplicity, that all investments are financed by retained earnings and that there is no debt. Dividends are then equal to

$$D = rW - I \qquad (7)$$

with I being equal to investment. Letting $n=I/(P_W W)$, the formula for the price dividend ratio(PDR) is

$$PDR = 1/(R-z_W-n). \qquad (8)$$

Without bubbles this is rewritten as

$$PDR = 1/(R-g_W-n). \qquad (9)$$

The above is the basic framework of the paper. We now apply it to a simple, but important example which clarifies the role of cross share holdings among firms for the determination of PER and PDR. Let us assume that the firm holds a real asset K and a financial asset. There is another firm which is exactly the same as this firm. Between the two, each holds fraction x of the shares of the other firm.

We assume again that for the real asset

$$R = r_K/P_K + z_K. \qquad (10)$$

The market value of the firm is

$$S = P_K K + x S$$

$$= P_K K/(1-x) . \qquad (11)$$

Therefore, cross share holdings increase the market value of the firm.[3]

Earnings and dividends are written as

$$E = r_K K + xD \qquad (12)$$

and

$$D = E - I.$$

After some calculation, we obtain

$$PER = 1/(R - z_K - xn) \qquad (13)$$

$$PDR = 1/(R - z_K - n) \qquad (14)$$

where n is now equal to $I/(P_K K)$ and z can be replaced by g in the absence of bubbles. That is, cross share holdings raise the PER, but not the PDR.

The interpretation of this result is as follows. The return on the shares can be seen to be decomposed into the dividend yield r_K/P_K-n and the capital gain $n+z_K$ with the sum of the two equal to R. Consequently, capital gains per unit of funds is $x(n+z_K)$ for stocks and $(1-x)z_K$ for the real asset.Direct application of (4) yields (13).

Dividend payments between the firms offset each other. Hence, the dividends payed to households, $r_K K-I$, remains unaffected by cross share holdings. The market value of the stocks held by households is also unaffected and is equal to $P_K K$. Hence, the PDR, being the ratio of the two, is also unaffected by x.[4]

The relationship between cross share holdings and the PER has been discussed by a number of works including Ueda (1989) and French & Poterba (1989). The above analysis shows that this is just an example of a more general principle that the existence of unrealized capital gains which are expected decreases the PER.

3, Corporate Assets and the Market Value of Stocks

The foregoing results can be used in several ways to judge whether Japanese stock prices are too high or to analyze, by assuming that stock prices are at the right levels, the causes of stock price movements.

One way to accompolish this is to compare stock prices with the value of firms' assets. Equation (11) shows that the market value of a firm is equal to the sum of the market value of its assets. However, an obvious difficulty arises because of the implicit assumption made in the last section that Tobin's Q is equal to one. In the absence of this equality we must replace the price of capital goods in the right hand side of (11) by its shadow value, which is not directly observable. This implies that the comparison of a firm's market value with its assets with capital being valued at its replacement cost can be used as a test of equation (11) on the assumption of Q being one, or otherwise as a way to calculate Q. We will remain ambiguous on this point.

Ueda (1989b) has carried out such a calculation based on the data tabulated in the Report on National Accounts by the Japanese Economic Planning Agency. The latter lists data on the market value of shares issued by financial and nonfinancial corporations, and the market value of their assets. The assets are broken down into inventories, non-reproducable fixed assets (most of which is land), capital and net financial assets. But the data includes unlisted corporations. Hence, an attempt has been made to estimate the values of these variables for listed corporations using their balance sheets.

The results are shown on Table 1. On the assumption that Tobin's Q is equal to one, stock prices, on average, have underestimated the value of corporate assets for the last two decades.However, stock prices of those that are listed have overestimated the value of their assets since 1983. Hence, on this interpretation, these stock prices are too high.

To the extent that stock prices correctly reveal the value of assets held by firms, the results in Table 1 imply that the shadow value of capital fell short of its replacement cost for the most part of the 1970s and 80s. The exception is the capital held by the listed companies during the last several years.

There is a widespread suspiction that land prices in the Report on National Accounts are underestimated by a wide margin.In fact, estimates by Konya & Wakasugi (1987) show that stock prices of the companies listed in the first section of Tokyo Stock Exchange are on average still less than 50% of their assets in 1986. This is also shown in Table 1. Their estimates are based on survey results on land prices for a subset of companies, which are blown up to obtain aggregate figures.

In any case the valuation of land exerts a significant effect on the results of such analyses.

4, Corporate Earnings and Stock Prices

Alternatively, we may use equations (13) or (14) to check whether PERs or PDRs are at plausible levels, or to look into the causes of fluctuations in them.

(a) Simulating For the PER and PDR

Given estimates of R, n and x, we can use the two formulas to calculate the PER and PDR consistent with these estimates. The interest rate should be the sum of the rate on riskless asset and a risk premium. The riskfree rate is assumed to be the rate on call market rate minus the ex post inflation rate of the GNP deflator. The call rate is perhaps the only rate which moved freely (though not 100%) during the high growth period. On the other hand, call loans may not be a good alternative asset to stocks for many investors.

An estimate of the risk premium is obtained by taking the average of the difference between the ex post rate of return on stocks estimated by the Research Institute for Securities and the call rate. For the period of 1956 to 1987, the average of the return on stocks is 21.5% and that of the call rate is 7.5%, giving an estimate of 14% for the risk premium.

The rate of inflation of the real asset, z_K, will be assumed to be zero in real terms. This assumption will be relaxed in Section 5.

Estimating x is difficult because of data and conceptual problems. No reliable data on the market value of stocks held by corporations for the entire sample period exist. Many corporations hold stocks of other firms for speculation in its usual sense and for strenghthening ties with other corporations. In the following we do not distinguish between these two types of investment. The data on cross share holding comes from a survey by the union of Japanese stock exchanges , which lists the shares of stock holdings of major types of investors. But we have to be contented with shares calculated by the volume of stocks held and not by their market values. For corporations included in the calculation of cross share holding, we take all non financial companies and financial institutions other than life insurance companies. Mutual funds are also excluded. Major Japanese life insurance companies are mutual companies;therefore, we have decided to exclude them.

Using the growth rate of real GNP as a proxy for the growth rate of firms' assets, we can calculate, from (13) and (14), the PER and PDR consistent with the above assumptions. The results are shown in Table 2 along with the actual PER and PDR.

The table presents the results as averages of three subperiods:first, 1959-69, when the U.S. PER and PDR were higher than in Japan; second, 1970-82, when the Japanese ratios became higher than the U.S. ratios, but maintanining stable gaps between the two;third, 1982-88, when the Japanese ratios skyrocketted. Clearly, the simulated PER and PDR are much lower than the actuals. The table also shows simulated PERs based on an alternative formula for taking into account of the effects of cross share holdings (Ueda(1989a) & French & Poterba (1989))[5], but the results are essentially the same.

Most remarkable is the failure of the simulated series to track the sharp increases in the actual PER and PDR in the third period. Both the simulated PER and PDR are below ten, while the actual series are at unprecedentedly levels.

Some more insight into the gap between what the basic model predicts and the actual PER and PDR is gained by calculating a growth rate consistent with the actual PER or PDR and with the assumptions made above. This is done in Table 3. The growth rate calculated from the actual PDR is consistently higher than the actual growth rates with the difference betweeen the two increasing as the period progresses.The gap is wider for the series calculated from the PER. One might wonder that what matters is the expected growth rate which might have been much higher than the actual especially in the third period. Table 4 presents the results of a survey carried out by the Economic Planning Agency which asks a sample of corporate managers what they think the growth rate of the economy would be for the next three years. The table shows no sign for the expected to growth rate to increase in the late 1980s.

The above results suggest that the behavior of the interest rate and the growth rate fails to explain that of the PER and PDR. The reason is clear. The growth rates were higher in the 1950s and 60s than in the 70s and 80s. The real interest rate in the 1980s have remained high despite declines in the nominal interest rate.

The rise in x is consistent with the increase in the PER. Differentiation of (13) with respect to x suggests that an increase in x by

growth rate of 4%. Roughly speaking , this suggests that during the last 20 years the PER has increased by about .5 due to the rise in x. This is a very small amount and has been dominated by the effects of the interest rate and the growth rate.[6]

We are led to conclude one of the following. (i) The basic model for the PER and PDR is too simple. (ii) The estimates of the required return, the growth rate and the extent of cross share holding are subject to large errors. (iii) The assumption of a constant risk premium is incorrect. (iv) There have been large bubbles in stock prices since, perhaps, mid 1970s. In the following we shall explore the second and third possibilities using two different methods.

(b) An International Comparison

As we saw in Figure 1, the Japanese PER and PDR are substantially higher than those in the U.S. for the last decade and a half. Certainly the U.S. figures are closer to the world average. But the difference between the Japanese and U.S. figures may be due to those in fundamentals such as the interest rate and the growth rate. A simple exercise that corrects for this would be to use the U.S. PER or PDR, the actual interest rate and the growth rate to calculate the risk premium, replace the interest rate and the growth rate by Japanese figures, obtaining estimates for Japanese PER or PDR consistent with the U.S. risk premium thus calculated.

The interest rate on three month Treasury Bills minus the inflation rate of the GNP deflator is assumed to be the riskfree rate in the U.S. The actual PDR and the real GNP growth rate can be used to obtain a risk premium series. Since the risk premium series exhibits wide fluctuations, we carry out the above calculation using averages of the variables for certain subsets of the sample.

The results are shown in Table 5 for the periods of 1970 to 1982, and 1983 to 1988, that is, the periods when the Japanese ratios were higher than the U.S. ratios.For the 1970-82 period, the simulated ratios compare reasonably with the actual ratios. In fact the actual PER is lower than the simulated PER. However, for the 1983-88 period,the actual PER and PDR are much higher than the simulated.

The only difference between the exercises of the last and this sections is the treatment of the risk premium term. The U.S. premium is much lower than the 14% assumption used in the last section. This explains why the simulated values come close to the actual for the 1970-82 period. The U.S. premium declined in the 83-88 period to 3.9% from 6.2% in the period before, but this is still not enough to explain the sharp rise in the Japanese actual PER and PDR.

In sum, the behavior of the Japanese PER and PDR in the 1983-88 period is hard to explain in terms of the movements in the interst rate or the growth rate. We may require some further analysis of the risk premium term.

(c) Estimating the Movements in Risk Premium

Another perspective on Japanese stock prices can be gained by using equations (13) and (14) simultaneously. Assuming that the stock prices are explained by the model of section 2 ,that we know the value of x and that $z_K=0$, we can solve (13) and (14) for R and n. Using a real interest rate series, we obtain an estimate of the risk premium.

Table 6 presents the results of such a calculation using the real rate on call market loans and the estimate of x as defined in section 4.(a) above. The table shows movements of the required return, the growth rate and the risk premium that are consistent with those of the PER and PDR.

The growth rate series is somewhat lower than, but tracks the movements of the actual growth rate of the economy fairly well (see Table 3). Most remarkable is a sharp decrease in the required rate of return in the 1980s. Between 1982 and 1988 the required rate of return declined by about 6%. And, almost two thirds of this comes from a decline in the risk premium. The risk premium is lowest in recent years in the post world war period with the exception of 1958.

Before we conclude that declines in risk premium have been the major cause of higher stock prices, we note that the declines in the required return shown in Table 6 may be due to increases in the rate of increase in the price of the real asset held by firms-- a factor that has been neglected in the above analysis. That is, the required return we have calculated is more correctly $R-z_K$. We now examine these two factors in turn, first the risk premium and second inflation in the price of real assets.

(d) What is Behind the Decline in Risk Premium?

A decline in risk premium may come from a decline in the degree of risk aversion or from a decline in the riskiness of asset returns. The latter possibility is easier to check.

In Figure 2 we plot the yearly standard deviation of the monthly return on stocks as a proxy for the riskiness of the return on stocks. Clearly, there is no sign that the riskiness decreased in the 1983-88 period. On the contrary, it was highest in 1987 as a result of the Black Monday and its aftermath.

An alternative measure of risk may be obtained by carrying out a rolling regression of the return on stocks on its lagged values and taking the estimate of the standard error of the regression. When annual data is used,such a procedure results in an estimate of the riskiness exhibiting a fairly sharp decrease in the 1983-88 period. However, this is due to the stability of stock returns at fairly high levels during this period. It is unclear whether this is a sign of the safeness in investment in stocks; it may well be that investors with a long time horizon regard this as a sign of an increase in riskiness. In sum, there is at best only weak evidence of a decline in the risk of stock returns during the 1983-88 period.

Assuming that there has been a decline in the risk premium, we are led to conclude that there has been a decline in the degree of risk aversion of the average investor. Finding evidence of this is left as a future task, but we may point out some candidates for the causes of a decline in the risk premium.

First, increases in wealth of the average investor may have led to declines in risk aversion depending on the form of the utility function. Yonezawa & Maru (1984), using cross section data on Japanese households, present results indicating that the degree of relative risk aversion is a declining function of wealth.

What seems more important is a change in the distribution of wealth among investors within the economy. There have recently been sharp increases in the share of wealth of institutional investors. Some of them hold a much larger portion of their wealth in the form of stocks than other investors. Examples of these investors are life insurance companies, pension funds (some of which overlap with life insurance companies) and special money trust and non monetary trust funds. In Table 7 we present evidence of the high share of stocks in the portfolio of these investors and the rapid growth of their assets.To the extent that these investors only represent the taste of final investors, we do not have to worry about their activities. Surely, however, there is economies of scale in investment in stocks. In fact, Ueda (1989a) has provided evidence that increases in the assets of these institutional investors have led to a rise in Japanese capital outflows--purchases of another risky asset.[7]

Finally,let us note that the decline in the risk premium as shown in Table 5 is much larger than that in the U.S. As we saw in Section 4.(b) , the decline in the risk premium in the U.S. between the 1970-82 period and the 83-88 period is 2.3%, while the corresponding number implied by Table 5 for Japan is 8.4%. A very different movement in the risk premium between the two countries in the face of high international capital mobility may require explanation. This may be due to the near absence of capital mobility in the 1970-82 period and /or the time Japanese investors take to learn the U.S. markets as they come into the market for the sirst time in history.

5, Land Prices

Another factor behind the decline in the simulated required return in Table 5 may have been the expectation of inflation on real assets. In fact, the true required return may not have declined. Obviously, land is the most plausible candidate for such an inquiry.

In Table 8 we show the results of such an analysis. In the table we add to the risk premium series in Table 5 various measures of the expected inflation of real assets, z_K, to arrive at alternative measures of the risk premium. For the index of land price we take that of the commercial area in the Tokyo Metropolitan area. In the first row of the table we just assume that the rate of increase of this index minus the inflation rate of the GNP deflator is equal to the expected real rate of inflation of land. Asako, Kuninori, Inoue and Murase (1989) provide a detailed estimation of the balance sheets of about 500 Japanese companies most of which are listed on the Tokyo Stock Exchange and obtaine a value of .464 for the average share of land in total real assets of these companies for the period of 1976-87.. We, therefore, multiply the above inflation rate by .464 to obtain the expected inflation rate of the total real assets. (Again, the assumption is that the prices of the other real assets increase at the same rate as the GNP deflator.)

The RP1 series exhibit almost no decrease in the 1980s. In fact, the average for the 1970-82 period is 10.1%, while for the 1983-88 period it is 11.8%. To the extent that this represents a good approximation to the expected inflation of land price, we do not require a decrease in the risk premium to explain high stock prices.

In the next column we estimate a simple ten period auto-regressive model for the above index using bi-annual data. A rolling regression of such a model and forecasts of one period ahead values of the index provide us with a crude measure of the expected rate of inflation of land price. The risk premium series constructed using this expected inflation rate is shown as the RP2 series in the table. The average of this series can be seen to have declined in the 83-88 period compared with the 70-82 period. However, this is entirely due to the slow catching up of the expected inflation series with the actual inflation series. Thus, in 1988, RP2 goes up to the level not different from the 1970-82 average.

Such an analysis suggests the possibility that at least some portion of the increases in the PER and PDR can be explained by the expectation of higher land prices. However, an obvious problem then is to see whether or not there have been bubbles in land prices.

The difficulty with the analysis of land prices is that the data on rents are hard to come by. Here we attempt to construct a rough measure of the time series movements in the rent yield (rents divided by land price) by the following procedure. We can obtain the data on rents earned and the area of buildings rented by major real estate companies from their company reports. (Companies included are Mitsubishi, Mitsui, Sumitomo, Toukyuu, Hannkyuu, Hannshinn, Heiwa, Tokyo and Osaka.)The area of buildings rented is multiplied by the index of the land price of commercial areas in 6 largest cities to obtain a measure of the monetary value of the land and buildings rented. Using this to divide the rents, we obtain a rent yield series.

Admittedly, this procedure suffers from the mixture of buildings and land rented. Thus, its absolute level may not contain much information. But we hope that its time series behavior may be a good approximation of the true rent yield series. In any case, the resulting series is plotted in Figure 3 along with the actual rate of inflation of land price.

Surprisingly, the rent yield series has not shown a sharp downward trend as is exhibited by the dividend yield for stocks. With the exception of the two periods of high land price inflation, the early 1970s and 1985 onward, the series has been almost constant. After the land price inflation in the early 1970s , the rent yield quickly recovered because of both the decline in the rate of land inflation and increases in rents as shown in Figure 4. The same thing may take place again in the early 1990s. In fact, the rents have begun to soar in the 1988-89 period.

The near constancy of the rent yield implies that the inflation rates of the rent per area and land price have been almost equal. For the 1963-84 period the former is 7.2% and the latter, 8.4% both in nominal terms. To the extent that the two are equal there have been no bubbles on land prices during this period.[8]

Back in Table 8, we use the rate of increase in the rent per area multiplied by .464, a proxy for the g_K term in (13) & (14), to calculate the risk premium. The result is shown as RP3 in the last column.Its behavior is almost the same as RP2. Again, we may not require as large a decline in risk premium as in Table 6 to explain stock prices.

5, Some Concluding Remarks

Movements in fundamentals such as the rate of interest and the growth rate together with the widespread practice of cross share holdings between corporations explain part of the behavior of Japanese PER and PDR as well as the different performance of stock prices in Japan and the U.S. However, the sharp rise in stock prices and the resultant increases in the PER and PDR in the 1983-88 period are difficult to explain by these factors only.

Recent sharp increases in stock prices seem to have been due to one or combination of the following possibilities. First, there may have been declines in the risk premium investors require on stocks. Second, the expected rate of increase in land price may have soared. Third, there could have been bubbles.

In the remainder let us discuss some of the factors that were not fully treated in the foregoing analysis. First, we have not discussed the role of taxes. This must be taken into account in a future work. But it seems unlikely that taxes have been a major factor in the 1983-88 episode;major changes in the Japanese tax system took place only in 1988 and 89.[9]

Second, there ought to be an analysis of the determinants of the degree of cross share holdings. Certainly , taxes play a role here. An increase in cross share holdings acts like buying back of shares and benefits shareholders when the rate of capital gains taxation is lower than that of dividends. Such a condition has been satisfied for households, indicating that this is a promising area of research.

Third, the absence of the effect of cross share holding on the PDR rests on the assumption that the degree of cross share holding does not change. When this is not true, the PDR may be affected by cross share holding. For example, frims must decrease dividends in order to increase holdings of stocks of other firms. Such a modification may result in a more reasonable explanation of stock prices than presented above.

Are high land prices bubbles? We have seen that there is a possibility that for the period until the mid 1980s land prices reflected movements in fundamentals, i.e., rents. Land prices have skyrocketted since then. Rents have just started to catch up. In any case a more general equilibrium analysis in which determinants of land rents are made clear is desirable.

Finally, what can we say about the role of easy monetary policy in the recent rise of stock prices? To the extent that the effects of easy monetary policy are captured by lower interest rates, our analysis suggests that the direct effects are moderate. However, existence of money illusion or higher expected inflation rates (than ex post rates) would make the nominal interest rate more relevant for the calculation of the required return. Or, there could have been important liquidity effects. In such cases the effects of monetary policy would be much larger than suggested by movements in the real interest rate.The foregoing analysis has not payed enough attention to such a possibility. In addition, Figure 3 indicates that the periods of sharp decreases in the rent yield on land corresponds with the periods of easy monetary policy, suggesting that the total effects of easy monetary policy on stock prices may be fairly large. We are now witnessing a reversal of such effects as monetary policy has become increasingly tight since the mid 1989.

References:

Asako, Kazumi, Kuninori Morio, Inoue Toru & Hideaki Murase (1989) "Land Evaluation and Tobin's Q: A Measurement of Multiple Q," (in Japanese)Economics Today Vol.10-3, Japan Devepment Bank.

French, B. Kenneth & James M. Poterba (1989) "Are Japanese Stock Prices Too High?" mimeo.

Konya, Fumiko & Keimei Yakasugi (1987) "Tobin'Q and Stock Prices," (in Japanese) Research on Securities, Vol. 80.

Research Institute of Securities (1988) A Report of a Research Group on Japanese Stock Prices.(in Japanese)

Ueda, Kazuo (1989a) "Japanese Capital Outflows:1970-86," forthcoming in the Journal of Banking and Finance.

------ (1989b) "On the Recent Movement of Japanese Stock Prices," (in Japanese) JCER Economic Journal, No.18, Japan Center for Economic Research.

Wojnilower, Albert M. (1980) "The Central Role of Credit Cruches in Recent Financial History," Brooking Papers on Economic Activity. No.2.

Yonezawa, Yoshiyasu & Junko Maru (1984) The Japanese Stock Market, (in Japanese), Toyo-Keizai.

Footnotes:

1, If Tobin's Q is not equal to one, we need to use the shadow price of capital rather than its replacement cost in the evaluation of real capital. We also need to adjust the formulas below for the presence of adjustment costs of capital.

2, It is, of course, easy to write down the formula for the case where the expected growth rates are not constant. But the empirical implementation of such a case would be very difficult.

3, This statement must be taken with caution. An issue of new shares in the process of an increase in the degree of cross share holdings would still raise the market value of the firms, but not the price per share. A debt financed purchase of shares, of course, will not increase the market value. The firms may alternatively decrease dividend payments, using the money saved to purchase shares of the other firm. In this case both the market value and the price per share increase.

4, When x is not constant, say increasing, the PDR is also affected by x, or more precisely by changes in x. Taking this into account is straightforward but did not change the empirical results substantially.

5, The formula used by Ueda (1989a) is PER=(1-x*d)/(R*(1-x)) where d is the ratio of dividends to earnings. This formula and (13) are exactly the same so long as all retained earnings are invested. Calculations in the table produce different results because the growth rate of the economy is not the best proxy for the growth rate of firms' assets.

6, The effect of a change in x on the PER depends much on the initial PER. If the latter is 30, an increase of x by .01 raises PER by .36. Thus, there is a possibility that we may underestimate the impact of x on PER because of our failure to explain the PER itself.

7, Many people have pointed out the existence of a "Kane Amari (excess liquidity)" effect in the recnt rise in stock prices. Behind this is a notion that monetary policy works not only by affecting interest rates but also through liquidity effects. (For example, Wojnilower(1980).) In our framework such an effect can be potentially captured by the risk premium term.

8, The abosolute levels of the rent yield in Tokyo are known to be much lower than in other cities. But this per se does not imply the existence of bubbles if rents are increasing at higher rates.

9, Since April 1988, the Maru-Yu system has been abolished. Most individuals have since payed a 20% flat tax on interest earnings on bonds and deposits. This may have been a factor in the increases in stock prices since 1988. However, the effect may not have been very large because the large holder of stocks, the corporate sector, had not been enjoying the merit of the Maru-Yu system to begin with.

Table 1 Market Value/ Corporate Assets

	all private[a]	listed[a]	listed[b]
1970	.397		
1971	.390		
1972	.704		
1973	.514		
1974	.386		.270
1975	.343		.261
1976	.412		.293
1977	.386		.333
1978	.488		.364
1979	.456		.377
1980	.402	.747	.351
1981	.411	.901	.351
1982	.374	.859	.343
1983	.468	1.04	.363
1984	.565	1.27	.425
1985	.605	1.28	.425
1986	.870	1.73	.453

a, Ueda (1989b)
b, Konya & Yakasugi (1987)

Table 2

	PER	PERJ	PERJ1	PDR	PDRJ
1956-69	13.8	7.9	7.3	21.6	19.3
1970-82	16.6	9.6	12.9	50.1	29.4
1983-88	41.2	6.3	10.0	127.7	7.2

PER, PDR actual
PERJ, PDRJ simulated
PERJ1 simulated using the formula in f.n. 5.

Table 3 Simulated Growth Rates

	N	NE	ND
1956-69	9.9	24.7	12.2
1970-82	5.0	16.3	12.6
1983-88	4.2	28.4	17.3

N actual
NE hypothetical, calculated from PER
ND hypothetical, calculated from PDR

Table 4, International Comparison

		1970-82	1983-88
	PER	11.3	13.8
U.S.	PDR	24.2	26.1
	i	.28	3.0
actual	n	2.1	4.0
	PER	16.6	41.2
	PDR	50.1	127.7
Japan	i	.7	4.2
	n	5.0	4.2
	PER	26.9	17.3
hypoth.	PDR	50.5	26.0

Table 5 Expectations of Real GNP Growth

Time of Survey	Average of Answer	Actual
1980.1	5.1	3.7
1981.1	5.2	3.3
1982.1	4.5	3.8
1983.1	3.7	4.3
1984.1	4.3	4.1
1985.1	4.5	3.8
1986.2	3.8	4.5
1987.1	2.7	...
1988.1	3.2	...

Table 6

	XNO	XRO	PREMIUM
1956	0.07787	0.14467	0.12653
1957	0.07422	0.14562	0.10144
1958	0.03506	0.10166	-0.00034
1959	0.01886	0.06426	0.02558
1960	0.03019	0.06949	0.05370
1961	0.02966	0.06206	0.05731
1962	0.04160	0.08020	0.03423
1963	0.02684	0.06924	0.04890
1964	0.02964	0.08654	0.03962
1965	0.03421	0.09341	0.07509
1966	0.03295	0.07735	0.06868
1967	0.05521	0.10261	0.09367
1968	0.07514	0.11874	0.08909
1969	0.07928	0.11298	0.08036
1970	0.12185	0.15705	0.13875
1971	0.12295	0.15705	0.14782
1972	0.08493	0.10733	0.11647
1973	0.08712	0.10802	0.16504
1974	0.11186	0.13716	0.21978
1975	0.05770	0.08080	0.05104
1976	0.05662	0.07572	0.07769
1977	0.07377	0.09197	0.09355
1978	0.07234	0.08834	0.09249
1979	0.08950	0.10520	0.07701
1980	0.09327	0.10957	0.03825
1981	0.07078	0.08628	0.04368
1982	0.07356	0.09036	0.03975
1983	0.05691	0.07081	0.01454
1984	0.06057	0.07147	0.02283
1985	0.05363	0.06353	0.01270
1986	0.03510	0.04255	0.01294
1987	0.02201	0.02789	-0.00939
1988	0.02483	0.02990	0.00322

XRO: required return
XNO: growth rate
PREMIUM: risk premium

Table 7 Stock Holdings of Institutional Investors

	1981	1982	1983	1984	1985	1986	1987	1988
Special Money T.	.06	.45	.89	1.52	5.37	11.26	16.66	13.00
	(NA)	(NA)	(9.8)	(10.0)	(26.6)	(34.7)	(43.3)	(43.0)
NonMonetary T.	.12	.30	.54	.67	3.44	9.17	13.32	22.21
	(	NA		)	(20.8)	(24.5)	(32.7)	(40.0)
Life Insurance Companies	28.6	32.9	37.6	43.2	50.5	62.6	75.4	92.5
	(17.4)	(16.6)	(16.1)	(15.6)	(14.9)	(15.5)	(18.5)	(20.0)
Pension Funds at Trust Banks	7.9	9.7	11.8	14.0	16.7	19.5	22.7	26.3
	(9.2)	(8.8)	(8.3)	(10.0)	(12.6)	(15.8)	(23.9)	(25.5)
Households	346	388	429	479	528	574	643	703
	(7.3)	(7.1)	(6.8)	(7.9)	(8.5)	(8.5)	(10.9)	(9.9)
share of Institutional investors	11.7	12.4	13.3	14.0	16.4	21.2	24.5	27.5

Notes: 1, Figures are for March of each year, except for households for which they are at end of year before.
2, Figures are assets in billion yen. Those in brackets are shares of stocks held.
3, The last line is the four investors in the table plus mutual funds with high stock ratios divided by household assets.

Table 8 Alternative Estimates of Risk Premium

	RP1	RP2	RP3
1970	0.14578	0.15338	0.20482
1971	0.15658	0.13247	0.19004
1972	0.22033	0.13811	0.15017
1973	0.21543	0.12702	0.19398
1974	0.07657	0.19571	0.18962
1975	0.01588	0.08546	-0.00322
1976	0.04713	0.11180	0.12978
1977	0.07135	0.10494	0.08503
1978	0.09022	0.07244	0.08056
1979	0.11338	0.10140	0.10977
1980	0.05872	0.07251	0.05404
1981	0.05556	0.06697	0.06189
1982	0.05054	0.04383	0.05936
1983	0.03670	0.03275	0.03418
1984	0.05032	0.04605	0.03334
1985	0.06451	0.02237	0.02346
1986	0.22787	0.02268	0.02439
1987	0.27505	0.03060	0.02501
1988	0.05420	0.09231	0.07025

Figure 1A, U.S. and Japanese PERs

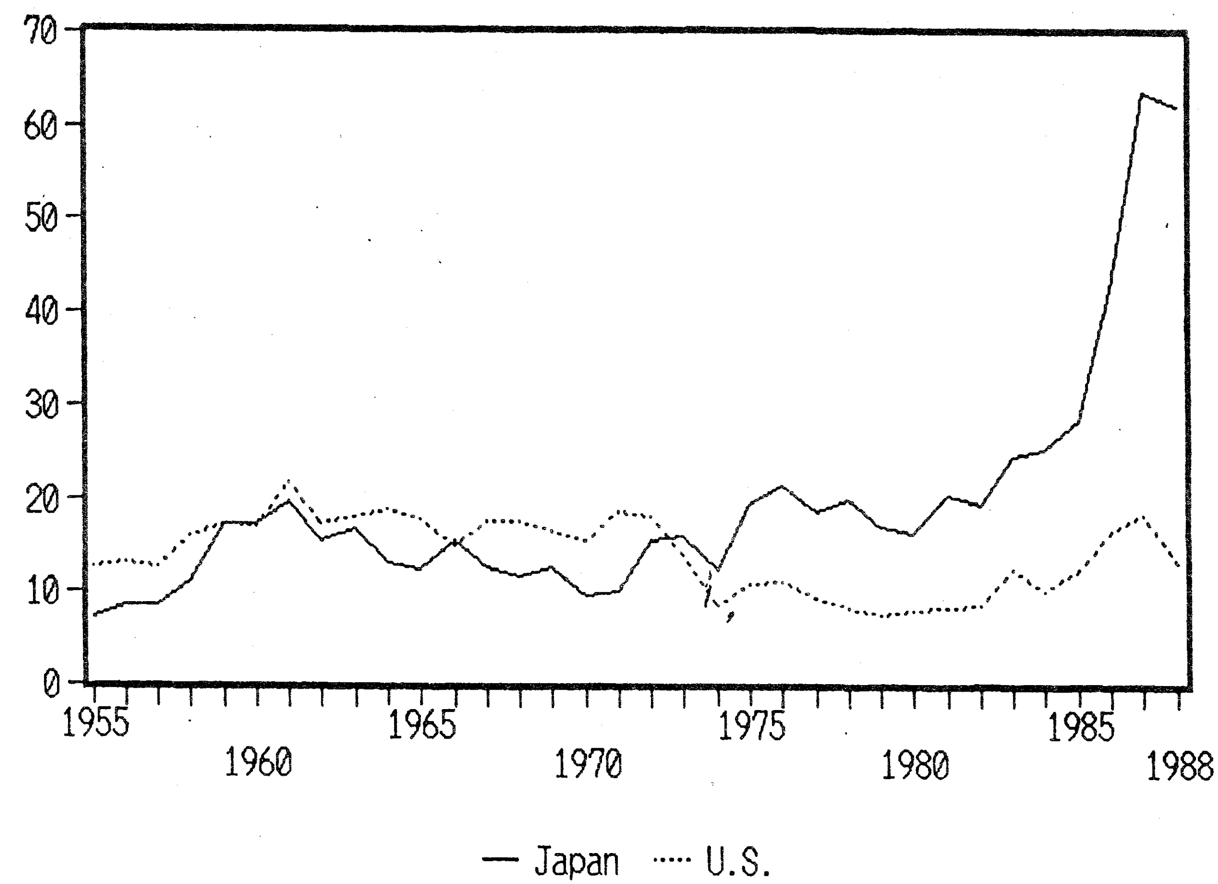

FIGURE 2
STANDARD DEVIATION OF MONTHLY RETURNS

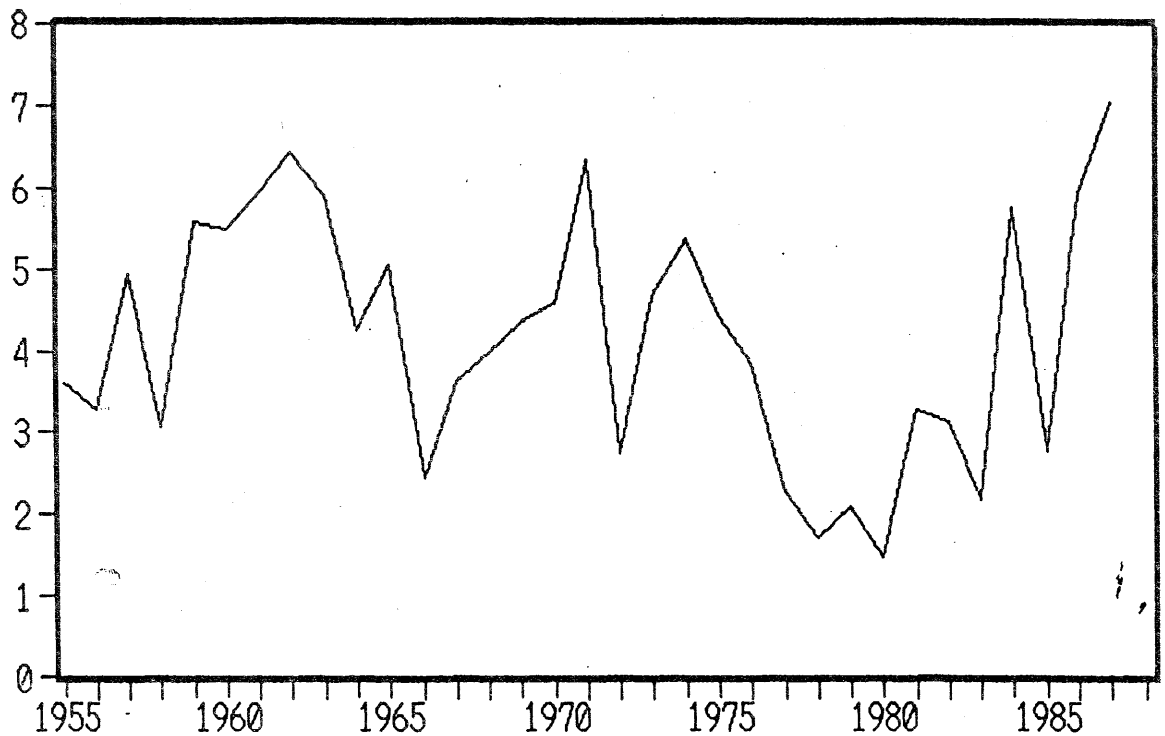

Figure 3

RENT/LAND VALUE

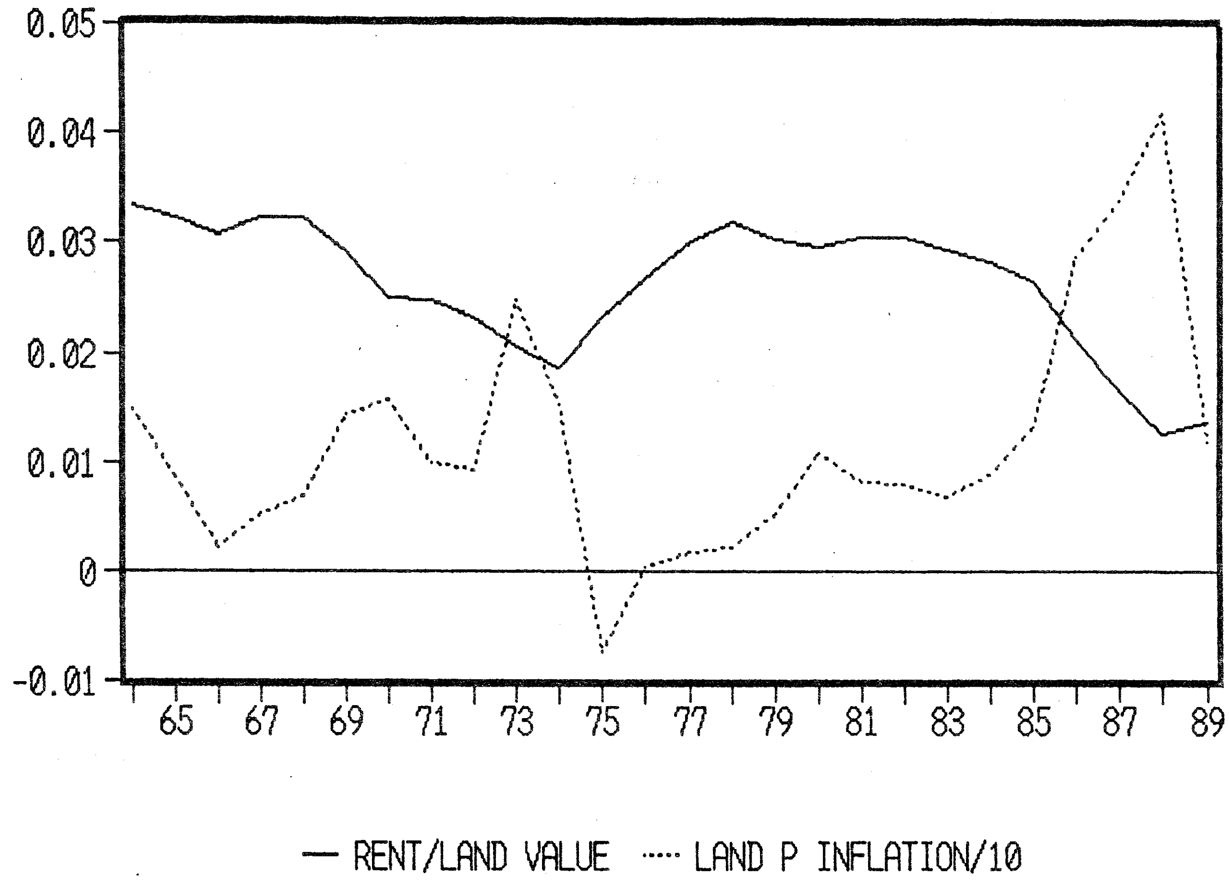

FIGURE 4 INFALTION OF LAND PRICE
AND RENT PER AREA

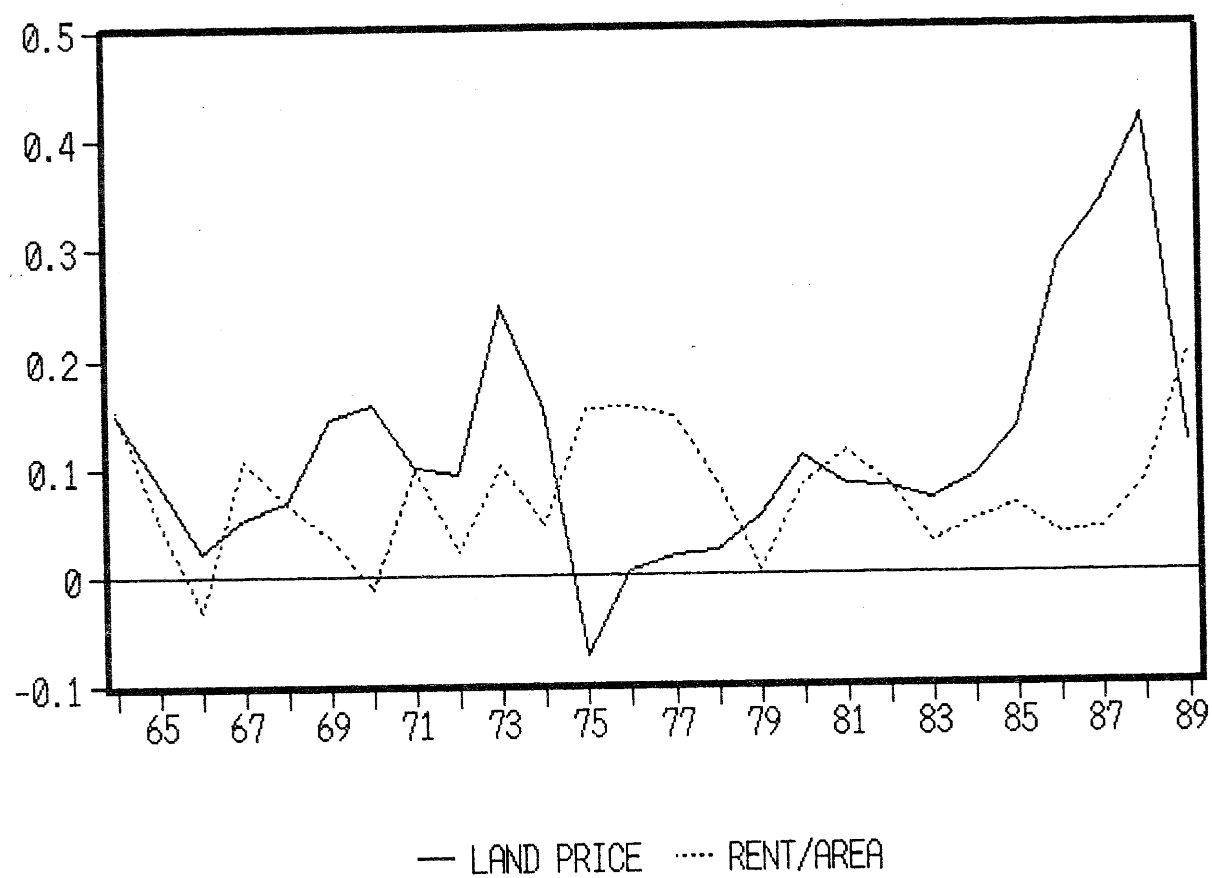

Figure 1B, U.S. and Japanese PDRs