Japanese and U.S. Cross-Border Common Stock Investments*

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At the end of 1989, Japanese investors held just over 1% of the U.S. stock market, while U.S. investors held less than 1% of the Tokyo market. This pattern of very limited cross-holding has persisted for nearly two decades, despite the diversification gains from cross-border investment. None of the standard explanations for limited international equity holding, such as capital controls on Japanese investors or limits on the international exposure of institutional portfolios, appears satisfactory. To justify these patterns, investors in *both* the United States and Japan must believe, inconsistently, that expected returns are substantially higher in their own market than in foreign markets. *J. Japan. Int. Econ.,* December 1990, **4**(4), pp. 476–493. University of Chicago, Chicago, Illinois 60637, and National Bureau of Economic Research, Cambridge, Massachusetts 02138; and Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, and National Bureau of Economic Research, Cambridge, Massachusetts 02138. © 1990 Academic Press, Inc.

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Despite the rapid increase in international investment during the last decade, most portfolio assets are held domestically. This is difficult to explain, because numerous studies have documented substantial reductions in portfolio risk through international diversification. This paper investigates the level of cross-border portfolio investments between Japan and the United States and asks how the observed levels compare with the predictions of standard portfolio theory. The principal focus is on equity investments, although we also present some evidence on cross-border bond investments.

The paper is divided into four sections. The first presents descriptive information on the level and trends in foreign holdings in both the Japanese and the U.S. stock markets. We show that Japanese investors hold just over 1% of the U.S. stock market, while U.S. investors hold an even smaller share of the equity traded in Tokyo. More than 90% of U.S. equity, and a larger fraction of Japanese stocks, are held domestically. Despite recent reductions in barriers to capital mobility, U.S. investors were net *sellers* of Japanese equities through much of the 1980s.

Section 2 addresses the diversification gains Japanese and U.S. investors could expect from holding each others' equities. Given the historical variances and covariances of stock returns in the United States, Japan, and other equity markets, we calculate the expected return differentials between U.S. and Japanese investors which would be needed to rationalize observed portfolio patterns. We find that U.S. investors would need to expect a 3% higher annual return in U.S. equities than in Japanese stocks and that Japanese investors would have to expect a 3% higher return in Japanese stocks to explain the long-standing pattern of very limited diversification.

Section 3 discusses potential explanations for limited international equity holding, such as capital controls on Japanese investors and limits on the international exposure of portfolios held by U.S. and Japanese institutional investors. None of these factors appears capable of explaining the low degree of international holding, especially during the late 1980s.

A brief conclusion suggests directions for extending this analysis to test competing explanations of incomplete international diversification.

1. CROSS-BORDER EQUITY HOLDING: THE U.S. AND JAPANESE CASES

New York and Tokyo are the world's largest equity markets, together accounting for more than two-thirds of the global equity portfolio. An investor holding a value-weighted world equity portfolio would hold substantial amounts of both markets. In practice, there is relatively little cross-border holding.

TABLE I
FOREIGN OWNERSHIP OF U.S. AND JAPANESE EQUITY

Year	Foreign equity holdings (%)		Share of trading by foreigners (%)	
	U.S. market	Japanese market	U.S. market	Japanese market
1970	3.9	4.9	8.1	—
1971	4.0	5.2	7.7	—
1972	4.1	4.5	8.3	4.5
1973	5.0	4.0	7.8	3.3
1974	5.4	3.2	7.6	4.0
1975	4.8	3.6	9.9	4.4
1976	4.9	3.7	10.2	4.7
1977	5.1	3.0	8.3	4.6
1978	5.0	2.7	9.2	3.8
1979	4.9	3.0	8.9	6.9
1980	4.5	5.8	9.8	10.9
1981	5.6	6.4	9.5	11.2
1982	4.9	7.6	8.1	14.4
1983	5.8	8.8	8.7	15.2
1984	5.9	7.4	8.0	13.5
1985	5.7	7.0	8.1	13.2
1986	7.1	5.3	10.0	11.6
1987	9.2	4.1	12.8	8.6
1988	7.8	4.3	13.9	8.2

Source. Column 2: Federal Reserve Board data on foreign equity holdings divided by market value of NYSE. Column 3: Tokyo Stock Exchange data. Column 4: average of gross foreign purchases and sales of corporate stock (from U.S. Treasury Bulletin) divided by total market value of trades on NYSE. Column 5: ratio of trades by foreigners through Sōgō Shōken brokers, grossed up to reflect omitted brokers (pre-1984), to total value of equity trades.

Table I reports the total foreign ownership of stock on both the U.S. and Japanese exchanges. Foreign holdings of U.S. equities have increased almost continuously during the last two decades, from 3.9% in 1970 to 7.8% in 1988. Foreign holdings in Japan follow a more jagged pattern. Overseas investors were net purchasers of Japanese equities in the early 1970s, but they became net sellers in 1973 and continued to reduce their share until the late 1970s. The foreign share of Japanese equities, near 5% at the beginning of the 1970s, declined to 2.7% in 1978, then rebounded so that by 1983, 8.8% of the Tokyo market was held by foreign investors. The late 1980s were once again a period of net foreign selling, however, with foreign ownership halving—from 8.8 to 4.1%— between 1983 and 1987. This pattern of both rising *and declining* cross-

border equity investment casts doubt on theories of imperfect diversification that focus on inertia or structural impediments.

Table I also reports an alternative measure of international equity holding, the fraction of transactions on the Tokyo and New York Stock Exchanges which involve foreign investors. As with share ownership, foreigners account for a relatively small proportion of trading volume. During the last decade, the fraction of transactions involving foreign investors in New York grew from 9.8 to 13.9% in 1988. In Tokyo, the fraction grew from 6.9% in 1980 to a peak of 15.2% in 1984 and then declined to 8.2% in 1988.

On average, foreigners in both markets trade more frequently than domestic investors. In 1987, for example, foreign investors in the United States held 5.9% of the shares and accounted for 12.8% of the trading volume. In the same year, foreign investors in Japan held 4.1% of the market and accounted for 11.6% of the volume. Foreign trading is less important in the United States and Japan than in a number of smaller equity markets. For example, Howell and Cozzini (1989) report that more than 20% of the turnover in Canada and the United Kingdom, and more than 40% of that in France, is due to foreign investors.

The lower turnover rate among Japanese domestic investors than among foreign holders may partly reflect the importance of long-term intercorporate share-holdings, which are unlikely to be sold. The aggregate turnover rate on the Tokyo Stock Exchange was 59% in 1988, when Japanese nonfinancial corporations held 29% of the outstanding equity.[1] On the extreme assumption that corporate shareholders *never* trade, the implied turnover rate for domestic noncorporate Japanese investors is 74.2%, compared with 124% for foreign investors. There is no apparent explanation for the relatively high turnover among foreign investors in the United States.

Table I focuses on all foreign participants in the U.S. and Japanese equity markets, but does not address the cross-border activities of U.S. and Japanese investors in particular. Table II presents data on net purchases of equity and debt by U.S investors in Tokyo and by Japanese investors in New York.[2] United States investors have displayed the same jagged pattern as other foreign investors in the Tokyo stock market, making substantial net purchases of equity during the early 1980s but becom-

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[1] Tokyo Stock Exchange (1990).

[2] The data underlying these tabulations use the nationality of the transactor as the nationality of the investor. In some cases, beneficial ownership may be different, such as when investors from less developed nations transact through New York or London investment firms. There is, unfortunately, little data on the importance of this phenomenon.

TABLE II
NET U.S. AND JAPANESE PURCHASES OF DEBT AND EQUITY

	Purchases of Japanese securities by U.S. investors			Purchases of U.S. securities by Japanese investors		
	Stock ($1989M)	Stock (% of TSE)	Bonds ($1989M)	Stock ($1989M)	Stock (% of NYSE)	Bonds ($1989M)
1970	—	—	—	31.9	0.001	6.4
1971	—	—	—	147.0	0.007	5,108.0
1972	0.511	0.143	—	471.5	0.019	8,824.8
1973	−0.700	−0.152	—	1,382.4	0.064	2,097.4
1974	−1.589	−0.476	—	−113.2	−0.008	−3,314.5
1975	−0.093	−0.029	—	50.7	0.004	−631.3
1976	−0.335	−0.091	—	146.0	0.009	−1,568.8
1977	−1.233	−0.298	—	67.5	0.004	8,875.2
1978	−0.966	−0.174	—	138.8	0.010	9,103.3
1979	−0.045	−0.008	—	217.0	0.015	−466.4
1980	1.447	0.287	—	−233.2	−0.015	−2,437.6
1981	0.752	0.139	—	160.9	0.010	1,781.1
1982	0.937	0.185	—	0.0	0.000	1,034,4
1983	1.587	0.260	—	339.9	0.020	3,153.5
1984	−0.367	−0.049	0.898	−156.4	−0.009	8,958.3
1985	−0.454	−0.052	0.278	343.5	0.018	27,989.3
1986	−9.300	−0.566	−0.818	3,727.6	0.163	15,754.5
1987	−11.811	−0.490	−1.851	12,402.7	0.521	2,691.2
1988	1.562	0.046	−1.622	2,014.6	0.084	30,856.4
1989	5.105	0.126	−2.605	3,348.0	0.122	8,724.0

Source. Net purchases of Japanese equity and bonds (both corporate and government) by U.S. investors are from the Japanese Securities Dealers Association. Net purchases of U.S. equity and bonds by Japanese investors are from various issues of the *U.S. Treasury Monthly Bulletin* and are deflated using annual averages of the Consumer Price Index; the percentage of U.S. and Japanese equity market held by investors from the other country use the total market value of the Tokyo and New York Stock Exchanges.

ing net sellers in 1984. This is not simply because the United States is an important component of the total. In 1987, for example, U.S. investors accounted for less than one-third of net foreign selling of Japanese equities. Earlier in the decade they comprised less than one-fifth of the activity.

Monthly data (not reported) show that net U.S. selling of Japanese stocks was heaviest in October 1987, the month of the stock market crash. However, October accounts for less than one-quarter of U.S. net sales in 1987. Net sales of Japanese shares by U.S. investors in 1986 and 1987 totaled more than 1% of the value of the Tokyo Stock Exchange. Simi-

larly, U.S. investors were net sellers of Japanese bonds during 1986–1988.

Japanese investments in U.S. stocks and bonds financed a substantial portion of the U.S. current account deficit during the 1980s. As the third column of Table II shows, Japanese net purchases peaked at one-half of 1% of the value of NYSE equities in 1987, more than three times as much as net purchases in any other year. Japanese net purchases of U.S. corporate and government bonds were relatively small in 1987, but much larger—$28.0 billion in 1985, $15.8 billion in 1986, and $30.8 billion in 1988—in other recent years. These large net purchases of U.S. bonds support the view that structural impediments are not important barriers to Japanese investment in international securities. It appears that the limited share of foreign equity in Japanese portfolios reflects an active portfolio decision to buy U.S. bonds, rather than stocks. The pattern of stock selling by U.S. investors in the period 1984–1985, when purchases of Japanese bonds were on balance positive, similarly suggests that U.S. investors were not systematically selling Japanese securities, as they might if exchange rate fluctuations or other factors explained the flight from equities.

Table III reports estimates of the *stock* of equity cross-holdings for the United States and Japan at the end of 1985 and the end of 1989. For Japanese investment the United States, the estimate relies on a "perpetual inventory" calculation using the data from Table II as input. The very limited Japanese activity in U.S. equity markets prior to 1970 suggests that excluding data from before 1970 will not lead to serious errors in the estimated stock. The results show that Japanese holdings were only slightly greater than one-tenth of 1% of the U.S. market in 1985, but increased substantially during the subsequent four years to exceed 1% of the market at the end of 1989.

The perpetual inventory estimate of Japanese equity holdings in the United States is similar to that implied by IRS data on the international pattern of dividend witholding, as reported in Lewis (1987). Japanese investors received 6% of the dividends paid to foreigners by U.S. firms, which would imply equity holdings of 0.3% of the U.S. market. While larger than our perpetual inventory estimate, the order of magnitude of these values is similar.

United States holdings of Japanese shares display a different trend. The stock estimate for 1985 assumes that the U.S share of total foreign holdings in the Tokyo market was proportional to the average U.S. share of foreign *trading* during the 1972–1985 period. This average of 15.8% (standard deviation 5.8%) could misrepresent actual holdings if U.S. investors traded on their holdings to a different degree than other foregin investors. The results suggest U.S. holdings of more than 1% of the Japanese market

TABLE III
Cross-Border Ownership of Japanese and U.S.
Equities, 1985 and 1988

	Percentage of	
	U.S. market owned by Japanese investors	Japanese market owned by U.S. investors
1985	0.15	1.11
1989	1.04	0.22

Source. Authors' calculations. Data in column 2 refer to December of each calendar year, while data in column 3 refer to March of the following year.

in 1985. The substantial sales of Japanese shares, evident in Table II, reduce this share during the subsequent four years. By December 1989, the estimate of U.S. holdings in the Japanese market is only two-tenths of 1%. The estimate for December 1987 implies virtually no Japanese holdings by U.S. investors, a problem which Scholl (1989) also finds in the U.S. national accounts for international transactions. These results suggest that the estimates understate the extent of U.S. holdings and justify future research on U.S. investment in Japan before the availability of reliable securities transaction data in 1972.[3]

International equity investments are not the only way to achieve the benefits of diversification. Foreign direct investment is an obvious alternative to portfolio investment and accounts for a larger flow of assets between nations. In 1988, for example, when net Japanese purchases of U.S. equities totaled just over $2 billion, Japanese FDI in the United States was more than 10 times this amount. Although some studies, for example Jacquillat and Solnik (1978), suggest that investments in multinational corporations provide little international diversification, the rapid growth of FDI during the 1980s may alter this conclusion. Alternatively, returns similar to those from holding foreign equities can be achieved by holding foreign securities traded on domestic stock exchanges. United States investors, for example, may hold American Depository Receipts

[3] Cooper and Kaplanis (1986) estimate the U.S. investors held 98.8% of their equity portfolio in U.S. equities in 1980, with 0.08% of their equity portfolio in the Japanese market. This estimate is of the same order of magnitude as our estimates for that period. Although these authors present estimates of cross-border equity holdings for many different countries, their findings are not based on actual data on the pattern of international holdings in any nation other than the United States. Rather, they assume ad hoc division rules across world markets for other countries, including Japan.

(ADRs) on Japanese firms traded in the United States and Japanese inves-
tors can purchase the shares of U.S firms traded in Tokyo. At the end of
1988, 67 U.S. firms were traded on the Tokyo Stock Exchange, and 9
Japanese firms were traded as ADRs on the New York Stock Exchange.
Barclay *et al.* (1990), however, report that for U.S. shares listed in Tokyo
and Japanese shares traded in New York, offshore-market volume is only
a trivial fraction of the volume in their home market.[4]

These alternative ways to achieve international diversification notwith-
standing, a basic feature of both real and financial asset holdings is that
domestic investors are largely specialized in domestic assets. Although a
complete tabulation of real and financial cross-holdings between the U.S.
and Japanese economies is beyond the scope of this paper, the next
section presents a simple framework for evaluating the ability of standard
portfolio models to explain these findings.

2. What Return Expectations Could Explain Lack of Diversification?

Diversification is the standard argument for holding foreign equities.[5]
Although the logic of the view that cross-national investment spreads risk
which may be difficult to diversify in a single equity market is unassail-
able, the practical importance of such diversification is difficult to mea-
sure. This section provides a simple metric for evaluating the observed
lack of diversification. Using a standard portfolio framework, we ask
what pattern of return expectations by U.S. and Japanese investors would
be needed to explain the observed lack of diversification.

2.1. A Representative Investor Framework

We assume that there are representative U.S. and Japanese investors
who have one-period exponential utility functions of the form

$$U(W) = -e^{-\lambda'W/W_0}, \tag{1}$$

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[4] Another recently popular vehicle for cross-border equity investment is the country-
specific or international equity mutual fund. Many country-specific closed-end funds were
started in the United States during the late 1980s. Share purchases by these funds are
included in the equity purchases data we report above. The most important open-end fund
for U.S.–Japanese equity investments is the Japan Fund, with assets of $404 million (or
approximately 0.1%) of the Tokyo Stock Exchange at the end of 1988.

[5] Standard references on the gains from international diversification include Levy and
Sarnat (1970), Lessard (1975), Solnik (1975), Solnik and Noetzlin (1982), and Jorion (1985,
1989).

where W_0 is initial wealth, W is terminal wealth, and $\lambda = \lambda'/W_0$ is the coefficient of relative risk aversion. Each investor seeks to maximize $E[U(W)]$, where $E[\ ]$ is the expectation operator over random returns. We also assume that the real returns in world equity markets are normally distributed with time-invariant mean vector μ and variance–covariance matrix Σ. These parameters may differ for U.S. and Japanese investors, because their numeraire consumption baskets are different. We define w as the portfolio weight invested in each market, which generates a mean return of $w'\mu$ and a portfolio variance of $w'\Sigma w$.

Our assumptions imply that the expected utility for a given portfolio allocation w is

$$E[U(W_0, w)] = \exp[\lambda w'\mu + (\lambda^2/2)w'\Sigma w]. \tag{2}$$

The first-order condition for this investor's choice of w is

$$\mu - \lambda \Sigma w = 0. \tag{3}$$

In principle, this first-order condition could be solved for optimal portfolio weights w^* given estimates of λ, Σ, and μ. However, in practice it is difficult to estimate mean returns with any precision. Merton (1980) shows that while estimates of variances and covariances based on historical data may have relatively small errors, estimates of expected returns are notoriously imprecise. Since the Japanese stock market experienced very high returns during our sample period, any calculation using these data will suggest that U.S. investors should have held Japanese stocks because they offered higher average returns than U.S. equities.

We avoid this problem by taking a different approach and using estimates of Σ and w to ask what pattern of expected returns, μ, is implicit in the observed portfolio patterns. Thus, we compute

$$\mu^* = \lambda \Sigma w. \tag{4}$$

This yields a simple rule for finding the implicit expected return: weight the covariances of market j with all other markets by the investor's portfolio shares in each market, and then scale the result by the risk aversion coefficient. The resulting estimates, μ_j^*, are increasing in all covariances and in the risk aversion parameter. This calculation can be applied to both U.S. and Japanese investors to compare the vectors of mean returns implicit in their portfolio holdings.

2.2. *International Return Covariances*

Our analysis employs equity returns in seven major markets: the United States, Japan, Canada, France, West Germany, Switzerland, and

TABLE IV
CORRELATIONS OF QUARTERLY EQUITY RETURNS, 1975–1988

	United States	Japan	Canada	France	West Germany	Switzerland	United Kingdom
Unhedged returns							
United States	—	0.43	0.83	0.45	0.52	0.60	0.62
Japan	0.42	—	0.36	0.31	0.35	0.43	0.39
Canada	0.76	0.41	—	0.36	0.42	0.52	0.50
France	0.45	0.39	0.30	—	0.62	0.64	0.45
West Germany	0.47	0.45	0.33	0.63	—	0.84	0.42
Switzerland	0.57	0.52	0.46	0.64	0.88	—	0.53
United Kingdom	0.56	0.39	0.45	0.45	0.44	0.50	—
Currency hedged returns							
United States	—	0.51	0.77	0.48	0.52	0.68	0.60
Japan	0.53	—	0.44	0.32	0.37	0.45	0.44
Canada	0.78	0.46	—	0.30	0.35	0.49	0.48
France	0.52	0.41	0.37	—	0.55	0.50	0.42
West Germany	0.54	0.41	0.38	0.60	—	0.84	0.52
Switzerland	0.68	0.48	0.51	0.55	0.87	—	0.60
United Kingdom	0.62	0.48	0.50	0.47	0.55	0.62	—
Standard deviations of annual returns							
Unhedged dollars	16.52	21.44	19.96	28.48	20.90	22.32	25.08
Hedged dollars	16.52	17.20	18.08	25.62	20.70	20.74	23.54
Unhedged yen	20.26	16.52	22.32	28.02	21.16	21.12	25.80
Hedged yen	16.08	16.52	18.16	24.38	18.90	18.96	22.72

Source. All calculations use quarterly stock returns derived from MSCI Perspectives. The upper triangles are from the perspective of a Japanese investor, while the lower triangles are from that of a U.S. investor. Hedged returns assume that investors hedge currency risk on their initial investment each quarter using three-month forward contracts.

the United Kingdom. Together these markets account for more than 80% of global equity value.[6] Table IV presents the annualized standard deviations of quarterly returns in these markets during the 1975–1988 period, along with the cross-market return correlations.[7] The upper triangles show the correlations for yen returns facing Japanese investors, and the lower triangles report the analogous correlations for dollar returns facing

[6] If Japanese equities are included without any correction for cross-holding of shares, an issue discussed in French and Poterba (1989), these nations account for more than 90% of global market value.

[7] The variance and covariance structure of international equity returns is sensitive to horizon choice. Poterba and Summers (1988) show that returns for each of the markets in this table evidence mean reversion, so they are less variable per unit time over long than short horizons.

U.S. investors. To simplify our analysis, we combine the five European equity markets into a single "Europe" aggregate.

Investors purchasing equity in foreign markets are exposed to exchange rate risk. We consider both unhedged returns and returns assuming investors use three-month forward contracts to lock-in an exchange rate for the amount of their initial investment. Although one could develop a more complicated strategy that also hedged some component of the random return, our simple strategy eliminates most of the exchange rate risk. Currency traders advise us that the cost of our hedging strategy for a U.S. investor is about 0.15% per year for Japanese yen, British pounds, and Deutsche marks; 0.20% per year for Swiss francs; and 0.25% per year for Canadian dollars and French francs. These costs are included in our hedged returns.

The correlations for unhedged dollar returns in the second column of Table IV are generally smaller than those for currency hedged dollar returns in the second panel. This suggests that the dollar returns on foreign currency contracts are less highly correlated than the equity returns denominated in local currency. The correlations for a U.S. investor are surprisingly similar to those for a Japanese investor. Only two market pairs in each set of hedged and unhedged correlations, Switzerland–West Germany and the United States–Canada, display monthly return correlations above 0.70. For all other market pairs, the return in one explains less than half of the quarterly return variation in the other.

These relatively low correlations suggest that substantial diversification is possible. For example, an investor might compare a world buy-and-hold strategy with holding a portfolio of only domestic securities. For the 1979–1988 period, the standard deviation of the world portfolio was 15.9% for a Japanese investor who did not hedge currency risk, compared with 17.9% for a portfolio of only Japanese stocks. For a U.S. investor, the world portfolio standard deviation was 15.2%, compared with a domestic return risk of 16.3%.

2.3. *Implicit Return Expectations*

Table V presents the expected returns implied by various estimates of w. In each case, we use the covariance matrix for three markets: Japan, the United States, and our European aggregate. There is little concensus regarding the relative risk aversion parameter, λ. Typical estimates of λ based on returns in U.S. bond and equity markets, reported, for example, by Friend and Blume (1975), Hansen and Singleton (1983), and Ferson and Constantinides (1990), range from 1 to 20. A coefficient of relative risk aversion of 3 leads to implied expected returns in the U.S. equity market that are roughly consistent with historical standard deviations in

TABLE V
EXPECTED ANNUAL REAL RETURNS IMPLIED BY OBSERVED VARIANCE–COVARIANCE
MATRICES AND PORTFOLIO WEIGHTS

	Unhedged returns (%)			Hedged returns (%)		
	United States	Japan	Europe	United States	Japan	Europe
	Observed portfolio weights					
U.S. Investors	8.48	5.13	7.43	8.48	4.88	7.09
Japanese Investors	3.91	8.21	4.25	4.18	8.22	4.18
	Dometic holdings = 0.90 * market value					
U.S. Investors	8.28	5.66	7.49	8.25	5.10	7.03
Japanese Investors	4.34	7.93	4.72	4.36	7.95	4.43

Source. The expected real annual returns are estimated using the first-order condition $\mu = \lambda \Sigma w$. We assume that the coefficient of relative risk aversion λ is 3. The variance–covariance matrices Σ are estimated using real (CPI-adjusted) quarterly returns for 1975–1988. The weights w on the countries within the European portfolio are given by the estimated portfolio weights for U.S. and Japanese investors in Cooper and Kaplanis (1986). The other observed portfolio weights for U.S. investors are 98.8% in the United States, 0.1% in Japan, and 1.1% in Europe. The observed portfolio weights of Japanese investors are 2.3% in the United States, 96.5% in Japan, and 2.2% in Europe. The increased international weights assume that 90% is invested in the domestic market and 5% is invested in each of the two foreign markets.

this market.[8] We report estimates for $\lambda = 3$, but as Eq. (4) shows, μ^* is a linear function of λ. Readers with other preferred values can adjust our estimates to reflect this by multiplying the reported expected return by the preferred value of $\lambda/3$.

The results in Table V suggest that U.S. and Japanese investors have significantly higher expectations about returns in their own market than they do about returns in the other's market. With a coefficient of relative risk aversion of 3, the estimates of cross-border equity holdings from Table III imply that the representative unhedged U.S. investor expected annual real returns of 8.48% in the United States, 5.13% in Japan, and 7.43% in Europe. The comparable estimates for the representative unhedged Japanese investor are 3.91% in the United States, 8.21% in Japan, and 4.25% in Europe. The results for hedged investors are similar. Given our assumptions and the observed variance–covariance structure of returns, hedged U.S. investors would have to expect U.S. returns to be

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[8] This value of λ is coincident with the average values of the return and standard deviation on the U.S. equity market. This does not imply that $\lambda = 3$ reconciles the relative returns on risky equities and riskless debt, the "equity premium puzzle" of Mehra and Prescott (1985).

3.6% per year higher than those in Japan, while Japanese investors would have to expect returns to be 4.0% per year higher *in Japan,* to justify the existing pattern of asset holdings.[9]

These large differences between the implied expected returns are relatively insensitive to errors in the estimated portfolio weights. Even if we assume that investors place only 90% of their wealth in the domestic market and 5% in each of the other two markets, the implied expectations for both U.S. and Japanese investors are between 2.6 and 3.6% per year higher for returns in their own market than for returns in the other's market.

Since these results are based on strong assumptions, the reader should not put too much emphasis on our precise estimates. It is clear, however, that the limited cross-border equity holdings of U.S. and Japanese investors imply a substantial difference of opinion about the returns in the U.S. and Japanese markets. In the next section we consider economic and institutional explanations for these different perceptions.

3. ARE INVESTORS JUST XENOPHOBIC?

A number of factors might explain why investors hold little foreign equity. These largely take the form of reasons why the perceived riskiness of foreign investments might be greater than that of domestic investments. Black (1974, p. 338), who modeled these factors as a tax on foreign investments, listed a number of relevant considerations:

> [there are] various kinds of barriers to international investment, such as the possibility of expropriation of foreign holdings, direct controls on the import or export of capital, reserve requirements on bank deposits and other assets held by foreigners, . . . restrictions on the fraction of a business that can be foreign owned . . . even . . . the unfamiliarity that residents of one country have with other countries.

Most of these factors are difficult to quantify, however. Some are difficult to reconcile with the large gross equity flows which underlie the small net equity purchases. In 1989, for example, when net foreign equity purchases in the United States were $10.4 billion, gross purchases were $213.8 billion. High transaction costs and "market aversion" thus seem weak explanations of observed portfolio patterns.

Other more concrete explanations, such as limits on foreign equity holdings by some classes of investors and taxes which induce differences in expected returns, are also sometimes offered as explanations for lim-

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[9] These estimates are similar to the findings of Cooper and Kaplanis (1986), who estimate that a tax equal to 170 basis points would be needed on U.S. investments into Japan and one equal to 340 basis points on Japanese investments into the United States to explain portfolio patterns in 1980.

ited international investment.[10] This section addresses these two possibilities and argues that neither provides a complete explanation of observed investment patterns.

Institutional Restrictions. The simplest explanation for why investors do not hold foreign shares is that institutional restrictions prevent them from doing so. This explanation may be particularly applicable for Japanese investors during some of the early years of our sample period. Ueda (1989) reports that capital outflows from Japan were discouraged or prohibited from late 1973 to 1976 and from 1979 to 1980. The Foreign Exchange and Foreign Trade Control Law, enacted in December 1980, "established the presumption that there were no restrictions on international flows in principle" (Ueda, 1989, p. 11). Restrictions on foreign investment by institutions were gradually relaxed during the first half of the 1980s.[11] For example, the proportion of pension funds that could be invested in foreign securities increased from 0 to 10% in 1981 and to 30% in 1986. Similarly, insurance companies could invest 10% of their funds in foreign assets until 1986 and 30% thereafter.

Strict limits on international investment before 1980 may explain why Japanese investors did not hold U.S. equities in the 1970s. However, this is not an adequate explanation of the ownership pattern observed today. Table VI shows the current limits on foreign investment for major classes of Japanese institutions, as well as information on their recent holdings of foreign securities (where available). The limits do not appear to be binding for any of the investor categories, casting doubt on the view that institutional restrictions play a critical role in limiting diversification. These Japanese institutions make substantial investments in U.S. government and corporate bonds, so the puzzle of why they own little *equity* applies even to the allocation of foreign assets, not just to the choice between domestic and foreign assets.

United States investors are less constrained than their Japanese counterparts. For individuals there are effectively no limits on cross-border equity investments, while institutions such as pension funds are constrained by only the "prudent man" rule, which prohibits excessively risky investments. Moreover, the pattern of U.S. equity investment in Japan, the sharp rise during the early 1980s and net selling during more recent years, suggests that if there are limits they are not binding.[12]

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[10] Stulz (1985) discusses various barriers to international investment and their effect on expected returns.

[11] Gultekin *et al.* (1989) test whether the price of risk was equal in Japan and the United States before, and after, the 1980 regime switch. They reject the hypothesis of equality in the early sample, suggesting imperfect capital market integration, but do not reject it for the later data period.

[12] Howell and Cozzini (1989) document the rapid growth of U.S. pension fund investment in international equities during the 1980s. The value of foreign assets held by U.S. pension

TABLE VI
LIMITS ON CROSS-BORDER EQUITY HOLDINGS OF
JAPANESE INSTITUTIONS

Institution	Maximum holding of foreign securities (%)	Actual holdings (%)	
		1985	1988
Life insurance companies	30	9.4	14.2
Non-life insurance companies	30	8.7	10.4
Postal life insurance	20	3.4	5.6
Pension trusts/bank trust accounts	30	5.4	7.1
Naigai funds/foreign securities	100	—	—
Loan trust and non-Tokkin trusts[a]	5	—	—
Tokkin funds	100	—	—
Securities investments trusts	50	—	—

Source. Column 2, Morgan Guaranty Trust, *World Financial Markets*
Nov. 10, 1989; column 3, Bank of Japan, *Economic Statistics Monthly*, as
reported in Ueda (1989).

[a] Loan trusts and non-Tokkin trusts are not permitted to invest in equities.

Taxation. A second factor which could explain limited cross-border diversification is differential taxation of foreign and domestic investment. Japan imposes a 15% withholding tax on dividends paid to foreign investors, the same as the United States. Residents of both Japan and the United States receive a tax credit for taxes withheld by foreign governments.[13] For untaxed institutional investors, the crediting provisions are of little value. However, even assuming that these investors face heavier tax burdens on their foreign than domestic investments, for plausible dividend yields this would reduce expected returns by 50–75 basis points. Thus it seems unlikely that tax clientele considerations discourage cross-border investment between the two countries.[14]

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funds was $62.8 billion in December 1988, with an estimated $2.3 billion in Japan. Foreign assets represent approximately 4% of pension assets in the United States.

[13] Morgan Stanley Capital International (1990).

[14] One potential concern which is difficult to gauge empirically is fear of *future* tax changes, which could reduce the value of foregin-held equity. The host country might raise its withholding tax, for example, and if the investor's home country did not extend its credit, this could reduce the after-tax return on holding foreign shares. The appropriate response to such a change, however, would be asset sales. Such a change might impose substantial transactions costs on investors holding foreign assets.

5. CONCLUSIONS

Modern portfolio theory suggests that investors should hold diversified portfolios. International equity investment patterns, however, stand in contrast in this prediction. Our analysis of the two largest equity markets, the United States and Japan, suggests very limited cross-holding during the last two decades. For the period until the early 1980s, Japanese capital controls may explain this portfolio pattern. For more recent years, however, alternative explanations are required.

Limited diversification can, tautologically, be due to investor beliefs that expected returns in their own market are higher than expected returns elsewhere. For plausible degrees of risk aversion, however, our findings suggest that Japanese investors must expected domestic returns more than five percentage points *per year* higher than those of their counterparts in the U.S. investment community. Institutional constraints on cross-border portfolio holdings, of the kind which have been modeled in many previous studies of international capital market equilibrium, do not appear binding for most investors.

Some recent evidence suggests that investor interest in foreign equity issues is growing. Japanese investors substantially expanded their holdings of U.S. stocks during the late 1980s. In the United States, international equity mutual funds, and closed-end mutual funds specializing in the stocks of particular countries, grew very rapidly in 1989 and early 1990. In 1989, when net purchases of all common stock mutual funds in the United States totaled $1.217 billion, net purchases of international and global equity funds totaled $1.175 billion (Investment Company Institute, 1990). In contrast, in 1988, there were net sales of $605 million in these funds, and in 1987, net sales were $1.65 billion. Given the historical swings in cross-border equity purchases, it is premature to draw strong conclusions on the basis of this evidence, however.

The cross-border equity puzzle is a serious challenge to existing theories of portfolio behavior, and it deserves further investigation. The current paper has not attempted to develop formal tests of alternative explanations for imperfect diversification, many of which may be partially correct. Empirical studies could address the links between foreign direct investment and portfolio investment; the role of common languages, market structures, or trade ties; the level of transactions costs; and many other factors in determining the level of portfolio linkage. For many purposes it may be better to study cross-border investments between pairs of countries that do not include Japan. The presence of capital controls during much of the postwar period restricts the potential shifts in cross-border portfolio patterns that can be observed between Japan and any other nation. Foreign investors account for a significantly larger share of

volume in most European equity markets than in either Japan or the United States, and these data could be used to construct more powerful tests of what determines cross-border investment. Research on these issues is currently underway.

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