International Portfolio Investment

Chapter 15

Focus on the Issues

- In this chapter, we focus on the following issues:
    - (i) why investors diversify their portfolios internationally,
    - (ii) how much investors can gain from international diversification,
    - (iii) the effects of fluctuating exchange rates on international portfolio investments,
    - (iv) whether and how much investors can benefit from investing in U.S.-based international mutual funds and country funds, and
    - (v) the possible reasons for "home bias" in actual portfolio holdings.

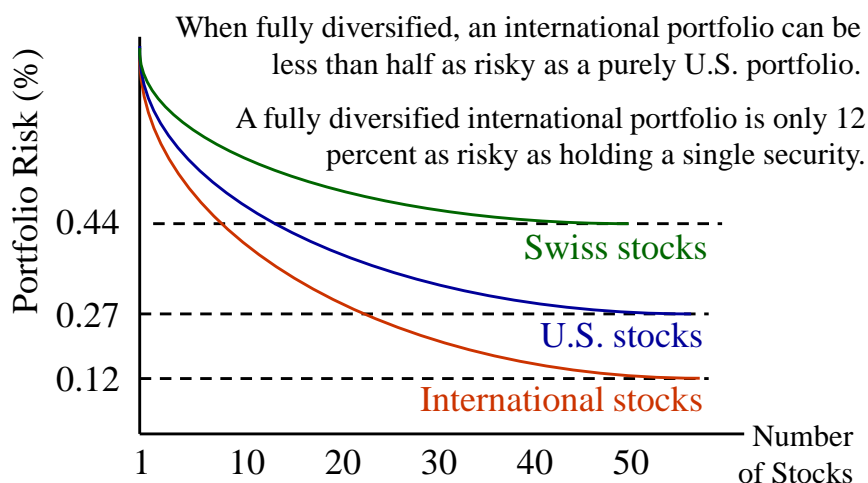## EXHIBIT 15.1 U.S. Investment in Foreign Equities
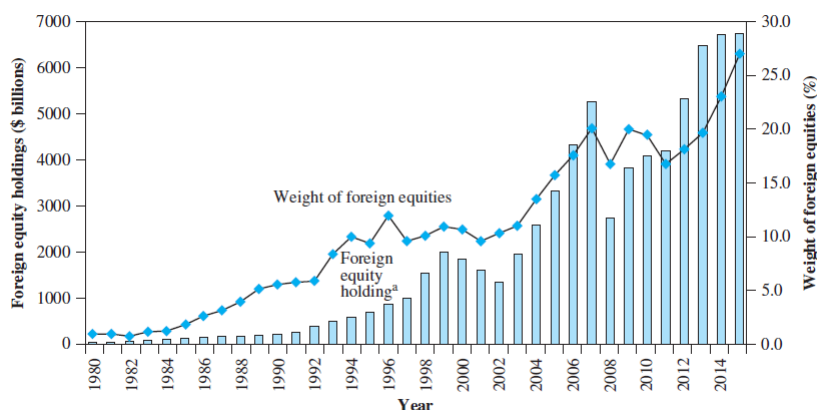
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International Correlation Structure and Risk Diversification

- Security returns are much less correlated across countries than within a country.
  - This is true because economic, political, institutional, and even psychological factors affecting security returns tend to vary across countries, resulting in low correlations among international securities.
  - Business cycles are often high asynchronous across countries.

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Domestic vs. International Diversification

When fully diversified, an international portfolio can be less than half as risky as a purely U.S. portfolio.

A fully diversified international portfolio is only 12 percent as risky as holding a single security.

Portfolio Risk (%)

0.44 — — — — — — Swiss stocks

0.27 — — — — — — U.S. stocks

0.12 — — — — — — International stocks

Number of Stocks: 1 10 20 30 40 50

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EXHIBIT 15.4 Summary Statistics of the Monthly Returns for 12 Major Stock Markets: 1980.1–2015.12 (all statistics in U.S.D.)

Stock Market	Correlation Coefficients											Mean (%)	SD (%)	β[a]	SHP[b]	(Rank)
	AU	CN	FR	GM	HK	IT	JP	NL	SD	SW	UK					
Australia												1.067	6.89	1.07	0.1	8
Canada	0.68											0.895	5.48	0.99	0.094	9
France	0.55	0.58										1.046	6.25	1.11	0.107	7
Germany	0.51	0.57	0.79									0.922	6.57	1.14	0.083	11
Hong Kong	0.55	0.54	0.44	0.47								1.28	8.21	1.07	0.11	5
Italy	0.42	0.5	0.65	0.6	0.38							1.022	7.39	1.06	0.087	10
Japan	0.39	0.38	0.45	0.38	0.31	0.4						0.728	6.1	0.96	0.057	12
Netherlands	0.6	0.7	0.79	0.81	0.54	0.63	0.47					1.076	5.53	1.08	0.126	3
Sweden	0.58	0.59	0.65	0.69	0.51	0.59	0.44	0.71				1.097	6.67	1.13	0.107	6
Switzerland	0.53	0.55	0.72	0.74	0.44	0.51	0.48	0.77	0.63			1.047	4.97	0.85	0.134	2
United Kingdom	0.66	0.69	0.7	0.66	0.57	0.57	0.48	0.8	0.66	0.69		1.029	5.32	1.02	0.122	4
United States	0.58	0.77	0.63	0.63	0.5	0.46	0.38	0.73	0.61	0.59	0.69	1.043	4.36	0.88	0.152	1

β measures the sensitivity of the market to the world market.

Clearly the Japanese market is more sensitive to the world market than is the U.S.

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Optimal International Portfolio Selection

- The correlation of the U.S. stock market with the returns on the stock markets in other nations varies.
- The correlation of the U.S. stock market with the Canadian stock market is 77%.
- The correlation of the U.S. stock market with the Japanese stock market is 38%.
- A U.S. investor would get more diversification from investments in Japan than Canada.

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EXHIBIT 15.5 Selection of the Optimal International Portfolio

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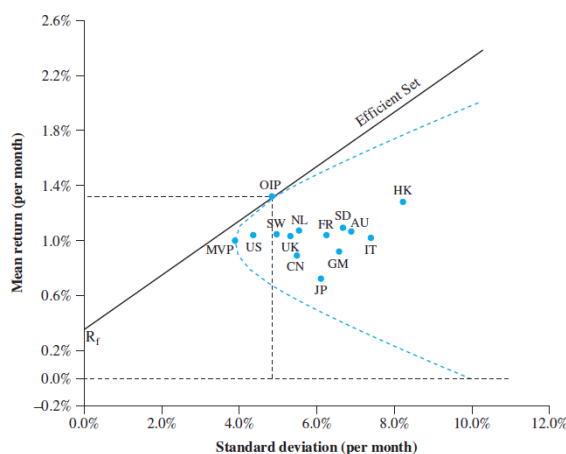
EXHIBIT 15.6 Composition of the Optimal International Portfolio by Investor's Domicile (Holding Period: 1980–2015)

Stock Market	From the Perspective of Investors Domiciled in												
	AU	CN	FR	GM	HK	IT	JP	NL	SD	SW	UK	US	LC[a]
Australia (AU)	0.2006	0.0270											0.1320
Canada (CN)													
France (FR)													
Germany (GM)													
Hong Kong (HK)	0.0841	0.0790	0.0557	0.0538	0.1103	0.1297	0.1176	0.0584	0.0797	0.0725	0.0723	0.1045	0.0796
Italy (IT)		0.0118	0.0748	0.0713		0.0584		0.0746	0.0236			0.0001	0.0593
Japan (JP)													
Netherlands (NL)													
Sweden (SD)	0.1622	0.0790	0.0208	0.0252	0.0425	0.1350	0.2257	0.0293	0.1055	0.1191	0.1327		0.2714
Switzerland (SW)	0.2355	0.2477	0.5366	0.5155	0.3268	0.4008	0.3515	0.5324	0.4756	0.5992	0.3304	0.3115	
United Kingdom (UK)			0.0322	0.0649				0.0233	0.0648		0.1946		0.1958
United States (US)	0.3176	0.5555	0.2798	0.2693	0.5204	0.2761	0.3052	0.2822	0.2508	0.2092	0.2700	0.5839	0.2619
Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Risk-free rate (%)[b]	0.5125	0.2374	0.3351	0.3576	0.3023	0.6730	0.1666	0.3718	0.3782	0.2368	0.4794	0.3802	0.3802

EXHIBIT 15.7 Gains from International Diversification by Investor's Domicile (monthly returns: 1980–2015)

Investor's Domicile	Domestic Portfolio			Optimal International Portfolio			Gains from International Investment			
	Mean (%)	SD (%)	SHP	Mean (%)	SD (%)	SHP	ΔSHP	(Δ%)[a]	ΔR(%)[b]	(%p.a.)[c]
Australia (AU)	1.06	5.13	0.106	1.18	3.95	0.169	0.063	(59.4)	0.32	(3.84)
Canada (CN)	0.88	4.34	0.148	1.10	3.77	0.230	0.082	(55.4)	0.36	(4.32)
France (FR)	1.10	5.58	0.137	1.16	4.15	0.200	0.063	(46.0)	0.35	(4.20)
Germany (GM)	0.89	5.96	0.090	1.17	4.16	0.196	0.106	(117.8)	0.63	(7.56)
Hong Kong (HK)	1.37	8.02	0.133	1.19	4.24	0.208	0.075	(56.4)	0.60	(7.20)
Italy (IT)	1.17	6.93	0.072	1.21	4.44	0.121	0.049	(68.1)	0.34	(4.08)
Japan (JP)	0.53	5.35	0.067	1.01	5.29	0.160	0.093	(138.8)	0.50	(6.00)
Netherlands (NL)	1.06	5.06	0.137	1.17	4.17	0.191	0.054	(39.4)	0.27	(3.24)
Sweden (SD)	1.37	6.41	0.155	1.23	4.09	0.209	0.054	(34.8)	0.35	(4.20)
Switzerland (SW)	0.91	4.37	0.155	0.98	4.54	0.165	0.010	(6.5)	0.04	(0.48)
United Kingdom (UK)	1.09	4.57	0.134	1.18	4.42	0.159	0.025	(18.7)	0.11	(1.32)
United States (US)	1.04	4.36	0.152	1.07	4.20	0.164	0.012	(7.9)	0.05	(0.60)

Effects of Changes in the Exchange Rate

- The realized dollar return for a U.S. resident investing in a foreign market will depend not only on the return in the foreign market but also on the change in the exchange rate between the U.S. dollar and the foreign currency.

Effects of Changes in the Exchange Rate: Equation

- The realized dollar return for a U.S. resident investing in a foreign market is given by

$$R_{\$} = (1 + R_i)(1 + e_i) - 1$$
$$= R_i + e_i + R_i e_i$$

Where

R_i is the local currency return in the ith market

e_i is the rate of change in the exchange rate between the local currency and the dollar

Effects of Changes in the Exchange Rate: example

- For example, if a U.S. resident just sold shares in a British firm that had a 15% return (in pounds) during a period when the pound depreciated 5%, his dollar return is 9.25%:

$$R_{\pounds\$} = (1 + .15)(1 - 0.05) - 1 = 0.925$$
$$= .15 + -.05 + .15 \times (-.05) = 0.925$$

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Effects of Changes in the Exchange Rate: Risk

- The risk for a U.S. resident investing in a foreign market will depend not only on the risk in the foreign market but also on the risk in the exchange rate between the U.S. dollar and the foreign currency.

$$\mathrm{Var}(R_{\pounds\$}) = \mathrm{Var}(R_i) + \mathrm{Var}(e_i) + 2\mathrm{Cov}(R_i, e_i) + \Delta\mathrm{Var}$$

The ΔVar term represents the contribution of the cross-product term, $R_i e_i$, to the risk of foreign investment.

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Effects of Changes in the Exchange Rate: Risk Decomposition

$$\text{Var}(R_{\$}) = \text{Var}(R_i) + \text{Var}(e_i) + 2\text{Cov}(R_i, e_i) + \Delta\text{Var}$$

- This equation demonstrates that exchange rate fluctuations contribute to the risk of foreign investment through three channels:
  - Its own volatility, $\text{Var}(e_i)$.
  - Its covariance with the local market returns $\text{Cov}(R_i, e_i)$.
  - The contribution of the cross-product term, ΔVar.

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International Bond Investment

- There is substantial exchange rate risk in foreign bond investment. This suggests that investors may be able to increase their gains if they can control this risk, for example with currency forward contracts or swaps.

- The advent of the euro is likely to alter the risk-return characteristics of the euro-zone bond markets, enhancing the importance of non-euro currency bonds.

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EXHIBIT 15.8 Decomposition of the Variance of International Security Returns in U.S. Dollars (monthly data: 1990.1–2015.12)

		Components of Var$(R_{i\$})$[b]			
	Var$(R_{i\$})$	Var(R_i)	Var(e_i)	2Cov(R_i, e_i)	ΔVar
Bonds					
Australia	13.81	4.57 (33.09%)	11.20 (81.10%)	−2.08 (−15.06%)	0.12 (0.87%)
Canada	7.60	3.47 (45.66%)	4.90 (64.47%)	−0.79 (−10.39%)	0.02 (0.26%)
Germany	10.97	2.86 (26.07)%	9.19 (83.77%)	−1.22 (−11.12%)	0.14 (1.28%)
Japan	12.73	1.98 (15.55%)	9.93 (78.00%)	0.69 (5.42%)	0.13 (1.03%)
Switzerland	12.55	2.07 (16.49%)	10.82 (86.22%)	−0.57 (−4.54%)	0.23 (1.83%)
U.K.	9.91	4.17 (42.08%)	7.57 (76.39%)	−2.02 (−20.38%)	0.19 (1.92%)
U.S.	4.55	4.55 (100%)	0.00 (n.a.)	0.00 (n.a.)	0.00 (n.a.)
Stocks					
Australia	37.75	16.36 (43.34%)	11.20 (29.67%)	10.39 (27.52%)	−0.20 (−0.53%)
Canada	31.35	18.25 (58.21%)	4.90 (15.61%)	8.51 (27.14%)	−0.31 (−0.96%)
Germany	44.44	37.58 (84.56%)	9.19 (20.67%)	−2.54 (−5.72%)	0.21 (0.49%)
Japan	39.85	34.45 (86.46%)	9.93 (24.91%)	−5.07 (−12.72%)	0.54 (1.35%)
Switzerland	24.54	20.75 (84.58%)	10.82 (44.08%)	−7.27 (−29.65%)	0.24 (0.99%)
U.K.	25.77	18.88 (73.28%)	7.57 (29.36%)	−0.86 (−3.34%)	0.18 (0.70%)
U.S.	20.27	20.27 (100%)	0.00 (n.a.)	0.00 (n.a.)	0.00 (n.a.)

EXHIBIT 15-9 Summary Statistics of the Monthly Returns to Bonds and the Composition of the Optimal International Bond Portfolio (in U.S. dollars, 1990.1–2015.12)

	Correlation Coefficients									Optimal International Portfolio[a]
Bond Market	AU	CN	GM	JP	SW	UK	Mean (%)	SD (%)	SHP	(Weight)
Australia (AU)							0.81	3.71	0.152	0.2559
Canada (CN)	0.69						0.62	2.76	0.138	0.1309
Germany (GM)	0.51	0.44					0.61	3.31	0.112	−0.3400
Japan (JP)	0.29	0.22	0.44				0.48	3.56	0.067	−0.0679
Switzerland (SW)	0.42	0.32	0.80	0.49			0.67	3.54	0.122	0.2888
United Kingdom (UK)	0.47	0.50	0.70	0.33	0.59		0.70	3.15	0.144	0.2907
United States (US)	0.35	0.36	0.45	0.38	0.37	0.41	0.53	2.13	0.135	0.4416
Optimal International Portfolio:							0.68	2.24	0.194	

International Mutual Funds: A Performance Evaluation

- A U.S. investor can easily achieve international diversification by investing in a U.S.-based international mutual fund.
- The advantages include:
  – Savings on transaction and information costs.
  – Circumvention of legal and institutional barriers to direct portfolio investments abroad.
  – Professional management and record keeping.

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EXHIBIT 15.10
International Mutual Funds: A Performance Evaluation

| Fund	Mean (%)	SD (%)	β_{US}	R^2	SHP[a]
ASA	1.75	11.88	0.80	0.08	0.084
Canadian Fund	0.91	4.64	0.75	0.47	0.035
International Investors	2.34	10.09	0.72	0.09	0.157
Japan Fund	1.72	7.02	0.59	0.13	0.138
Keystone International	1.14	4.29	0.69	0.47	0.091
Merrill Lynch Pacific	1.82	5.45	0.32	0.06	0.196
New Perspective	1.47	3.99	0.80	0.73	0.179
Oppenheimer Global	1.94	6.35	1.02	0.47	0.186
Putnam International	1.64	5.91	0.62	0.20	0.150
Scudder International	1.46	4.23	0.50	0.26	0.168
Sogen International	1.48	3.36	0.70	0.78	0.217
Templeton Growth	1.48	4.13	0.84	0.74	0.176
United International Growth	1.41	3.86	0.71	0.61	0.172
Average	1.58	5.78	0.69	0.39	0.150
U.S. MNC Index	1.34	4.38	0.98	0.90	0.135
S&P 500	1.17	4.25	1.00	1.00	0.099
MSCI World Index	1.46	3.80	0.70	0.61	0.186

[a]The Sharpe measure is computed using the risk-free rate of 0.752%, which is the average monthly Treasury bill rate during the sample period.

Source: Eun, C.; Kolodny, R.; Resnick, B., "U.S.-Based International Mutual Funds: A Performance Evaluation."

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EXHIBIT 15.11
Performance of International Mutual Funds:
1977.1−1986.12
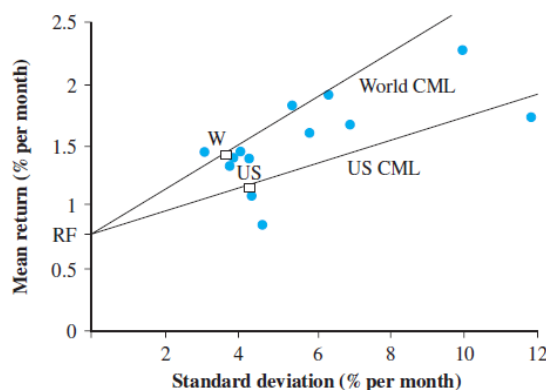
International Diversification Through Country Funds

- Recently, *country funds* have emerged as one of the most popular means of international investment.
- A country fund invests exclusively in the stocks of a single county. This allows investors to:
  - Speculate in a single foreign market with minimum cost.
  - Construct their own personal international portfolios.
  - Diversify into emerging markets that are otherwise practically inaccessible.

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EXHIBIT 15.12 U.S. and Home Market Betas of Closed-End Country Funds and Their Net Asset Values

Country	Average Fund Premium (%)	Fund Share Value			Net Asset Value			Sample Period
		β_{US}	β_{HM}	R^2	β_{US}	β_{HM}	R^2	
Australia	−14.77	0.62	0.48	0.13	0.25	0.81	0.60	1986.1−90.12
Brazil	−24.72	0.11	0.16	0.02	0.32	0.65	0.60	1988.4−90.12
Canada	−6.29	0.04	0.47	0.03	−0.19	0.29	0.11	1986.6−90.12
Germany	1.80	0.73	0.53	0.11	0.15	0.69	0.40	1986.7−90.12
India	−2.66	0.87	0.26	0.04	−0.27	0.66	0.40	1988.8−90.12
Italy	−12.49	0.89	0.68	0.21	0.13	0.57	0.28	1986.3−90.12
Korea	63.17	1.00	0.63	0.19	0.24	0.76	0.62	1985.1−90.12
Malaysia	−0.36	1.34	0.60	0.24	0.58	0.68	0.79	1987.6−90.12
Mexico	−21.14	0.99	0.53	0.13	0.33	0.75	0.62	1985.1−90.12
Spain	−1.57	1.56	0.28	0.14	0.39	0.75	0.65	1988.7−90.12
South Africa	12.16	0.00	0.35	0.13	0.08	0.85	0.59	1985.1−90.12
Switzerland	−7.65	0.79	0.47	0.25	0.33	0.65	0.75	1987.8−90.12
Taiwan	37.89	1.46	0.39	0.26	0.19	0.40	0.13	1987.2−90.12
Thailand	−6.86	1.20	0.44	0.14	0.63	0.85	0.75	1988.2−90.12
U.K.	−16.55	1.04	0.62	0.36	0.55	0.73	0.37	1987.8−90.12
Average		0.84	0.46	0.16	0.25	0.67	0.51	

International Diversification Through American Depository Receipts

- Foreign stocks often trade on U.S. exchanges as ADRs.
- An ADR is a receipt that represents the number of foreign shares that are deposited at a U.S. bank.
- The bank serves as a transfer agent for the ADRs.

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American Depository Receipts

- There are many advantages to trading ADRs as opposed to direct investment in the company's shares:
  - ADRs are denominated in U.S. dollars, trade on U.S. exchanges, and can be bought through any broker.
  - Dividends are paid in U.S. dollars.
  - Most underlying stocks are bearer securities and the ADRs are registered.
- Adding ADRs to domestic portfolios has a substantial risk reduction benefit.

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World Equity Benchmark Shares

- In April 1996, the American Stock Exchange (AMEX) introduced a class of securities called **World Equity Benchmark Shares (WEBS)**, designed and managed by Barclays Global Investors.
- In essence, WEBS are **exchange-traded funds (ETFs)** that are designed to closely track foreign stock market indexes.
- Currently, there are 23 WEBS tracking the Morgan Stanley Capital International (MSCI) indexes for the following individual countries: Australia, Austria, Belgium, Brazil, Canada, Chile, China, France, Germany, Hong Kong, Italy, Japan, Korea, Malaysia, Mexico, the Netherlands, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, and the United Kingdom.

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International Diversification with Exchange Traded Funds

- Using exchange traded funds (ETFs) like WEBS and spiders, investors can trade a whole stock market index as if it were a single stock.

- Being open-end funds, WEBS trade at prices that are very close to their net asset values. In addition to single country index funds, investors can achieve global diversification instantaneously just by holding shares of the S&P Global 100 Index Fund that is also trading on the AMEX with other WEBS.

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International Diversification with Hedge Funds

- Hedge funds which represent privately pooled investment funds have experienced phenomenal growth in recent years.

- This growth has been mainly driven by the desire of institutional investors (such as pension plans, endowments, and private foundations) to achieve positive or absolute returns, regardless of whether markets are rising or falling.

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International Diversification with Hedge Funds

- Unlike traditional mutual funds that generally depend on "buy and hold" investment strategies, hedge funds may adopt flexible, dynamic trading strategies, often aggressively using leverages, short positions, and derivative contracts, in order to achieve their investment objectives.
- These funds may invest in a wide spectrum of securities, such as currencies, domestic and foreign bonds and stocks, commodities, real estate, and so forth.
- Many hedge funds aim to realize positive returns, regardless of market conditions.

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International Diversification with Hedge Funds

- Hedge funds tend to have relatively low correlations with various stock market benchmarks and thus offer diversification.
- In addition, hedge funds allow investors to access foreign markets that are not easily accessible.
  – For example, JPMorgan provides access to the Jayhawk China Fund, a hedge fund investing in Chinese stocks not readily available in U.S. markets.
- Also, hedge funds may allow investors to benefit from certain global macroeconomic events. In fact, many hedge funds are classified as "global/macro" funds.
  – Examples of global/macro funds include such well-known names as George Soros' Quantum Fund, Julian Robertson's Jaguar Fund, and Louis Bacon's Moore Global Fund.

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International Diversification with Hedge Funds

- Legally, hedge funds are private investment partnerships. As such, these funds generally do not register as an investment company under the Investment Company Act and are not subject to any reporting or disclosure requirements.
  - As a result, many hedge funds operate under rather opaque environments.
- While investors may benefit from hedge funds, they need to be aware of the associated risk as well.
  - Hedge funds may make wrong bets based on the incorrect prediction of future events and wrong models.
  - The failure of Long Term Capital Management provides an example of the risk associated with hedge fund investing.

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International Diversification with Hedge Funds

- Hedge fund advisors typically receive a management fee, often 1-2 percent of the fund asset value, as compensation plus a performance fee that can be 20-25 percent of capital appreciation.
- Investors may not be allowed to liquidate their investments during a certain lock-up period.
- In the United States, only institutional investors and wealthy individuals are allowed to invest in hedge funds.
- In many European countries, however, retail investors are also allowed to invest in these funds.

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Home Bias in Portfolio Holdings

- As previously documented, investors can potentially benefit a great deal from international diversification.
- The actual portfolios that investors hold, however, are quite different from those predicted by the theory of international portfolio investment.
- Home bias refers to the extent to which portfolio investments are concentrated in domestic equities.

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Home Bias in Equity Portfolios

Country	Share in World Market Value	Proportion of Domestic Equities in Portfolio
Australia	1.70	78.91
Brazil	0.71	100.00
Canada	2.67	28.67
Germany	3.21	29.35
Japan	9.29	98.50
Sweden	1.00	48.56
United Kingdom	7.64	42.95
United States	44.86	86.88

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Why Home Bias in Portfolio Holdings? Explanations

- Three explanations come to mind:
  - Domestic equities may provide a superior inflation hedge.
  - Home bias may reflect institutional and legal restrictions on foreign investment.
  - Extra taxes and transactions/information costs for foreign securities may give rise to home bias.

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Why Home Bias in Portfolio Holdings? Explanations

- A recent study of the brokerage records of tens of thousands of U.S. individual investors shows that wealthier, more experienced, sophisticated investors are more likely to invest in foreign securities.

- Another study shows that when a country is remote and has an uncommon language, foreign investors tend to stay away.

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International Diversification with Small-Cap Stocks

- Current research suggests that investors can clearly enhance the gains from international investment by augmenting their portfolios with foreign, small-cap stocks.

- In response, investment companies have introduced many small-cap-oriented international mutual funds.

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Summary

- International portfolio investment (IPI) has been growing rapidly in recent years due to (a) the deregulation of financial markets, and (b) the introduction of such investment vehicles as international mutual funds, country funds, and internationally cross-listed stocks.

- Investors diversify to reduce risk; the extent to which the risk is reduced by diversification depends on the covariances among individual securities making up the portfolio. Since security returns tend to covary much less across countries than within a country, investors can reduce portfolio risk more by diversifying internationally than purely domestically.

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Summary (continued)

- Investors can gain from international diversification in terms of "extra" returns at the "domestic-equivalent" risk level.
  - Empirical evidence indicates that regardless of domicile and the numeraire currency used to measure returns, investors can capture extra returns when they hold their optimal international portfolios.
- Foreign exchange rate uncertainty contributes to the risk of foreign investment through its own volatility as well as through its covariance with local market returns.
  - Generally speaking, exchange rates are substantially more volatile than bond market returns but less so than stock market returns. This suggests that investors can
    enhance their gains from international diversification, when they hedge exchange risk using, say, forward contracts.

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Summary (concluded)

- U.S.-based international mutual funds that investors actually held did provide investors with an effective global risk diversification. In addition, the majority of them outperformed the U.S. stock market index in terms of the Sharpe performance measure.
- Closed-end country funds (CECFs) also provided U.S. investors with an opportunity to achieve international diversification at home. CECFs, however, were found to behave more like U.S. securities in comparison with their underlying net asset values (NAVs).
- Despite sizable potential gains from international diversification, investors allocate a disproportionate share of their funds to domestic securities, displaying "home bias".

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