Appendix II:
Basics of Foreign Exchange

An investment in a foreign stock is always a dual investment. You are buying the security itself and in the currency in which it is denominated. You should consider that you are investing in the currency as an asset class in its own right because it can have as big (or a bigger effect) on your total return as the return on the security.

When you invest in foreign securities, you obviously have to deal with the currency of the country where the security is issued. Foreign exchange is viewed as exotic and difficult, and this alone is enough to put off some investors. That's a pity, because there is nothing terribly difficult or complicated about currencies. In fact, you already know most of what you need to know about foreign exchange—you just need to reorganize the knowledge a little to be comfortable with foreign stock investing.

The information in this Appendix is intended to help you better understand all of the issues involved in foreign exchange—beginning with understanding the different quotation conventions and recognizing that the exchange rate is determined by the foreign broker with whom you're working. This Appendix also offers several detailed case studies to illustrate some of the challenges of foreign exchange.

The Foreign Exchange Rate is Determined by Your Broker

Foreign exchange can give you an unpleasant surprise because when you buy and sell foreign stocks, your broker gets to choose the exchange rate you are charged. For example, suppose you are buying a British stock denominated in pounds. On the very day of your purchase, you may see the UK pound quoted with as much as a two-penny variation in U.S. dollar terms, for example $1.5800-1.6000. Because currencies are always priced four places past the decimal point, this means your broker may be buying pounds at $1.5800 and "selling" them to you at $1.6000, or buying at $1.5880 and selling to you at $1.5920. It's an extra little profit-center for the broker, and you have no way of knowing how much extra you are being charged because over the course of the day, the price of pounds can actually vary as much as two cents.

Moreover, the price of pounds quoted in newspapers or on CNBC or other financial news services may be standard quotes for large amounts ($1 million and more), whereas the price of pounds for smaller amounts--like your $10,000 stock purchase--is always higher to accommodate back-office processing costs. Therefore, at each end of a foreign stock transaction, you may be losing a little (or a lot), but be assured, you are almost certainly losing something, and without recourse unless you are a really big customer and the loss is a particularly egregious one.

So why put up with such an expense when elsewhere everyone is watching transaction cost pennies? The answer is simple: Foreign stocks may offer the opportunity for higher return, or for a less volatile return. (Now we are counting in dollars, not pennies and

fractions of pennies.) What you consider to be a nuisance expense—e.g., $50 on a block of 100 shares—has to be offset by getting a higher return, or at least a less volatile return.

Understanding Different Currency Quotation Conventions

Another big issue of foreign exchange is the “quotation convention.” Of all nationalities, Americans have the hardest time with currency quotations, and not because they are provincial or lack the cross-border experience of (say) Europeans. Since WW II, the U.S. dollar has been the main world reserve and transaction currency. In fact, approximately 65% of all foreign trade is U.S. dollar-denominated. For example, oil and most commodities are denominated in U.S. dollars

Depending on where you are in the world, there are two ways to express the value of a U.S. dollar. For example, sometimes the Canadian dollar is expressed as worth "$1.45" (in U.S. dollars) and another time you will see it quoted as "0.6897.” These two numbers are actually the same price, quoted in different formats. In the interbank "spot" foreign exchange market, where participants are professionals and the amounts traded are large (i.e., a minimum of $1 million), nearly every currency is quoted as a function of the U.S. dollar. So this explains the first quotation convention above: one U.S. dollar will buy 1.45 Canadian dollars.

Alternatively, you could say each Canadian dollar is worth 68.97 U.S. cents, or $0.6897. Arithmetically, you get from one to the other by dividing into the numeral 1.00, which, divided by 1.45 equals 0.6897 and divided by 0.6897 equals 1.45. This is called the reciprocal. Some experienced currency traders can do the division in their head, but you don't have to. But you do need to know which quotation convention is being used in any particular situation.

The quotation convention challenge is even further complicated by the British pound (and often the Australian dollar). The pound is quoted in the "**American quotation convention**,” or dollars per UK pound (such as £1 = $1.65). It is very seldom quoted the other way, in the "**European quotation convention**,” whereby one dollar equals 60.61 British pence. Then along came the euro, the currency that replaced the Deutschemark, French franc, Italian lira, and other currencies of the European-11. These countries formed the European Monetary Union and “issued” the first euro (it was actually just a bookkeeping entry at that time), on the first business day of 1999. In practice, the notes and coins will not be mandatory for a few more years, but all accounting systems have to keep track of both the euro and the national currency until the transition is complete. In the meanwhile, the individual currencies still exist for domestic transactions.

Different Quotation Conventions Are Used by Different Markets

Returning to the subject of quotation conventions, the two coexist side-by-side and usage has not been standardized because the *European* quotation convention is used in the professional foreign exchange market and the *American* quotation convention is used in the Chicago and other futures markets. Although there is active and efficient arbitrage

between the two markets (ensuring that prices are almost perfectly equivalent at all times), the participants in each market are very different.

The Professional Market. The professional (or **"spot") market** is dominated by commercial and investment bank "proprietary traders" who are essentially speculating with the banks' credit lines, as well as corporations conducting transactions overseas, governments, hedge funds, and brokers buying and selling stocks and bonds for customers.

This market is the largest and most liquid market in the world, about $1.5 trillion per day, according to the Bank for International Settlements in Switzerland. This makes it bigger than all the world stock a markets put together. It is open almost twenty-four hours a day. The only downtime is a few hours between the U.S. close and the Australian open, and even that is mitigated by most big banks having overnight FX desks in every money-center city.

Futures Markets. In contrast, futures markets are patronized by smaller businesses whose transactions are not big enough for the professional market (or they do not qualify for bank credit lines) and speculators of all levels of expertise, from the amateur day-trader working from a downstairs den to sophisticated proprietary traders at banks and brokerages. In the U.S., currency futures are traded at the International Monetary Market (IMM) division of the Chicago Mercantile Exchange as well as other exchanges. The cross-rates (e.g., the euro/yen) are traded at the Finex, a division of the New York Cotton Exchange, and contracts one-half the usual size are traded at the Mid-Am, a market affiliated with the Board of Trade in Chicago. Electronic trading is offered to the public by many brokers, but only for the so-called day session, which at the IMM starts at 7:20 AM Central Time and ends at 2 PM. To trade outside these hours, the customer has to call the broker and the broker is the one who enters the trade electronically, in a system named **Globex.**

To make life more complicated, FX trading outside IMM hours can be conducted in two ways. Globex trading is an auction-style matching system rather than the open-outcry system used on the floor of the exchange; that is, it has less liquidity, although the Exchange hired market makers to ameliorate this problem. The hours are not continuous and you cannot place a stop order on Globex, although some brokers will allow a stop order on their EFP desk, if they have one, as a control on a position in the Globex market. [Note that as of 2004, this is no longer the case and you can place stops on Globex. BR].

To fill in or as a substitute, orders may also be executed in the professional spot market and then converted to futures contracts when Chicago opens. This method of executing transactions is called **"exchange for physical,"** or EFP, a dreadful name that means an imaginary futures contract is created in the cash market (the "physical") and will be exchanged into a futures contract as soon as Chicago opens. The cash market contract is the same size as the futures contract itself, but technically it does not enjoy the same customer protections as a real futures contract, which is guaranteed by the Exchange.

There's a lot of process in the background that you, as an average investor, do not need to know about, but be aware that if you trade currencies--either as a stand-alone asset class or to hedge foreign equity positions--your brokerage statements will sometimes show price quotes in the spot market quotation convention and other mysterious and indecipherable information. This is because a limit order may have been executed in the EFP market—if you did not specify Globex—and the trade was actually done in the cash market and exchanged for a futures contract at the Chicago open. But don't worry--it's a highly regulated and very efficient process.

American v. European Quotation Conventions

If you look at a CNBC screen and see that the UK pound has gone up, you know that your shopping trip to London just became more expensive. In contrast, however, when you see that the Japanese yen just went up, it means exactly the opposite. If yesterday, one dollar would buy 110 yen and today it will buy 115, the yen *quotation number* went up, but the yen *value* went down. This is because the pound is quoted in the American convention (i.e., dollar per foreign unit) and the yen is quoted in the European convention (i.e., foreign units per dollar). To make matters even more confusing, if you are looking at a spot market quotation, the price is for a transaction in which money will change hands in two days. If today is Monday, the party selling pounds will deliver them on Wednesday and expect to carry away the equivalent dollars.

If the futures screen is displayed, you can breathe a sigh of relief--at least every quotation is denominated in U.S. dollars and cents--but you must also consider that it is for actual payment on some date *in the future*. The standard contract dates are March, June, September and December. So if it is now January, the **"front-month"** contract is March—i.e., the payment will be made in March. The spot quotation for the pound (2-day delivery) may be $1.6000 but when you check the futures quote, you see $1.6040. What accounts for the extra 40 points? (Note: These points are not the same as **"basis points."** That is a term that applies to interest rates, not currencies. In foreign exchange, the term is simply "points" or **"pips.,"** This last arises from the British terms for the seeds in oranges or lemons--thus, something very small.)

As for the extra 40 points, understanding them is relatively simple and straightforward. The futures contract quote differs from the spot quote because it embodies the interest rate differential between the two countries. In a futures contract, you are agreeing today to a price at which you will exchange pounds for dollars on some date in the future; in the meanwhile, you get to earn interest on your dollars, and the counterparty gets to earn interest on his pounds.

For example, let's say you can earn 1% flat on your dollars in two months (6% p.a. / 12 months x 2 = 1%). You are a buyer of pounds today for delivery in two months. The seller of the pounds gets to keep the interest he will make over those two months. (The outright two-month interest rate in Britain is 0.75%.) At the current spot price of $1.60 per pound, one UK pound futures contract of £62,500 is equal to $100,000. Here's the math:

You earn: $100,000 x 0.01 = $1,000; $100,000 + $1,000 = $101,000.
The counterparty earns: £62,500 x 0.075 = £468.75; £62,500 + £468.75 = £62,968.75.
Now divide your $101,000 by his £62,968.75, and you get $1.6040.

The pounds you will be getting are slightly more expensive to make up for the fact that you earned a little more interest while you were still holding the counterparty's dollars ahead of delivery to him. If the pound were not more expensive for future delivery, everybody and his brother would buy dollars to earn the extra 0.25% interest and still be able to sell their dollars without penalty (and U.S. money supply would balloon).

All Futures Contract are Forward Contracts

All forward or future exchange rates are set this way. A **forward rate** is the exact same thing as a **future rate** and they will be identical values for the same delivery date. The only difference is that in the professional foreign exchange market, you can name your delivery date, whereas in the futures market, you are limited to the delivery dates specified by the exchange. In the professional market, the process by which the interest rate differential and the forward rate are continuously kept in this balance is named **"covered interest arbitrage."** In other words, a forward or future rate is *not* a forecast of what the price will be in the future, but solely a function of the two interest rates.

To say that a forward rate is an unbiased predictor of the future rate is to miss this critical point. Many Ph.D. dissertations have tortured the arithmetic to make the forward rate a predictor of the future rate, usually without much luck. Something else is happening, though, that often makes the forward rate a predictor of the future rate, because the reason for the high interest rate is high inflation. The country with a higher interest rate usually has either higher inflation or an expectation of higher inflation. Higher inflation countries usually experience a drop in their exchange rates because of the mechanism described below. A country's higher inflation rate causes its currency to sell at a forward discount (i.e., less valuable in the future), and its currency falls because its purchasing power is being eroded by inflation.

How Exchange Rates are Determined

In a world where trade in physical goods dominates the determination of exchange rates, that country's goods are (or will become) more expensive via price inflation than every other country's goods. Therefore, it will not be able to export, and it will have to use foreign currency *reserves* to pay for imports. When its reserves run low, it will be forced to depreciate its currency in order to restore purchasing power parity.

The purchasing power parity/balance of foreign trade model dominated exchange rate analysis at a time when exchange rates were fixed and in the early days of floating rates (which started in 1974). At that time, government-imposed capital controls prevented a free flow of capital into and out of countries. Gradually, starting in the early 1970's and continuing even today, capital controls were relaxed. For example, if you were a Briton who wanted to invest in the U.S. stock market, you had to pay a premium of 15-25% to

buy the dollars to do it. Upon being elected prime minister in 1979, Margaret Thatcher made good her campaign promise of abolishing that capital control.

Nowadays, we have mostly free capital flows among the major countries. This means that a country can run a huge trade surplus and not face a decline in its currency as long as capital is flowing in. This is, of course, the situation in the U.S. today. Some analysts persist in saying the dollar must fall because we buy so much more from overseas than we sell. Others point out that foreigners have an undiminished appetite for American government and corporate bonds, Wall Street stocks, and direct purchases of U.S. companies and real estate. Very little of the capital inflow is **"hot money"** (able to exit on short notice)—less than 10% of the U.S. stock market is owned by foreigners. In 1999, the inflow was more than double the trade deficit.

Forecasting Exchange Rates

Combining analysis of trade flows and capital flows, as well as other domestic conditions such as inflation, leads to the forecasting challenge. Forecasting corporate earnings pales in comparison to the complexity of forecasting exchange rates. Every month, we hear that the U.S. trade deficit has risen again to a historic high level, and commentators say the dollar should fall. But month after month, it fails to fall. Then one month it does fall, but only a little and only for a short time.

The capital flow model of exchange rate determination says that the country with the highest interest rate will get the biggest inflows (all other things being equal), and they will more than offset the trade deficit. This is true, up to the point where foreigners own as many U.S. assets as they want in their portfolios. As Mr. Greenspan and other Federal Reserve Bank officials have reminded us, at some point you have to wonder when they will feel they have as much as they could possibly want.

As noted above, the country with the higher interest rate sells at a **forward discount**, that is, it is cheaper for delivery on a date in the future. The country with the lower interest rate sells at a **forward premium**, that is, it is more expensive for delivery in the future. It's important not to attach value judgments to the words "discount" and premium." The dollar currently sells for a forward discount because it has a higher interest rate, *not* because it is expected to fall and actually be worth less in the future. If that were true, you'd have a hard time figuring out how much less. This arises from the different quotation conventions described at the beginning of this appendix.

In the professional interbank market, a two-month forward rate for the Canadian dollar may be a 0.46% premium to the spot rate, while in futures the same two-month rate may be 0.62% different from the **spot price**--solely because when you calculate a percentage difference, it does matter arithmetically whether you are using numbers with values less than one or more than one. Academicians consider this a puzzle of finance. It's not—it's simple arithmetic.

For this reason, you need to be wary of statements that forecast future exchange rates using the interest rate differential. For example, some might say that the 2-month interest rate for Greek drachmas is 10% while the 2-month rate for euros is 3.75%, and therefore the drachma must devalue by the interest rate differential of 6.25%. This is not true. The interest rate differential equalizes the principal-plus-interest of money invested in short-term instruments in each country where the interest rate is accessible to all (i.e., there are no capital controls) *and the foreign exchange risk is hedged with a forward or futures contract.* The differential equalizes the cash flows, not the exchange rates.

A SAMPLE HEDGING EXERCISE

In the following example, the Swiss franc is quoted using the European quotation convention. Each dollar is worth 1.6703 francs at the start, or $0.5987. The forward price for delivery in two months is 1.6663, a lower number but a higher value--$0.6001. The dollar has the higher interest rate and sells at a discount, while the franc has a lower interest rate and sells at a premium. Suppose a Swiss millionaire decides he should investigate the U.S. money markets to maximize the return on his investments. He has Swiss francs (SF), and he decides to invest SF 1,000,000 in the domestic Swiss money market for one month at 2.93%:

SF 1,000,000 x 2.93% = SF 29,300/365 x 30 (days) = SF 2,408.22

He could choose, instead, to invest in the U.S. market. He can sell his SF 1 million in the spot market at 1.6703 and invest the principal at 5.88%, today's one-month Eurodollar rate. The math would look like this:

SF 1,000,000/1.6703 = $598,694.85 x 5.88% = $35,203.26/365 x 30 = $2,893.42

Our Swiss millionaire now has a foreign currency exposure. What if the dollar depreciates against the Swiss franc? After all, the only reason to make an investment in a foreign currency is to get a real return in the *home* currency. The millionaire needs to know the amount that the dollar can depreciate and still allow him to break even with the Swiss franc investment. In simple terms, the answer is:

5.88% U.S. investment rate p.a.
2.93% Swiss investment rate p.a.
2.95% Break-even U.S. dollar depreciation / 12 months = 0.2450%

He will be indifferent between the two investments if he can be sure the dollar will depreciate exactly 0.2450% over the one month of his U.S. investment. Applying this percentage change to the spot price, we get the following:

1.6662 (0.002450 x 1.6703 = .0041; 1.6703 - 0.0041 = 1.6662).

Another way to calculate this is on a cash basis:

Principal + interest in SF = SF 1,002,408.22
Principal + interest in $ = $601,588.27

The breakeven exchange rate is therefore P + i (SF)/P + i ($) = 1.6663.

The one-point difference is due to rounding. Let's say our Swiss millionaire doesn't want to take a chance on the future value of the dollar. To avoid the dollar exposure, he can sell the U.S. dollars one month forward instead of holding the dollar asset unhedged. This would be a **swap**--the simultaneous purchase of dollars for one date (now) and the sale of the same currency for another date (30 days). If he does this, he has engaged in **covered interest arbitrage.** He has no exchange rate exposure and he has "covered," or hedged, his investment.

The cost of a one-month forward is quoted by the forward dealer at 44 points. We subtract the points from the spot rate to derive the outright forward rate:
1.6703 - .0044 = 1.6659.

The hypothetical break-even rate calculated above is 1.6663, and the actual one-month forward rate available in the market is 1.6659. In other words, the actual rate is *worse* than the indifference point. The Swiss millionaire would get fewer Swiss francs per dollar using the forward market than he needs for a break-even status with the Swiss investment. That the two rates are nearly the same is, however, testimony to the efficiency of the market. Hedging via the swap market is not the only option; he can still do the deal unhedged.

Look at Table B.1, which shows forecasted possible Swiss franc rates. (The formula used is at the top of the relevant columns.)

P + i Earned ($) *times*	**Possible SF Rates** *Equals*	**New SF Amount** *minus*	**SF Principal** *equals*	**Imputed Interest (SF)**	**Imputed Interest %**
$601,588	1.8000	1,082,850	1 MM	82,850	8.29%
$601,588	1.7500	1,052,779	1 MM	52,799	5.28%
$601,588	1.7000	1,022,699	1 MM	22,699	2.27%
$601,588	1.6703	1,004,832	1 MM	4,832	.48%
$601,588	1.6693	1,004,230	1 MM	4,230	.42%
$601,588	1.6663	1,002,426	1 MM	2,426	.24%
$601,588	1.6649	1,001,583	1 MM	1,583	.16%

$601,588	1.6000	962,540	1 MM	(37,460)	(3.75%)
$601,588	1.5500	932.461	1 MM	(67,539)	(6.75%)
$601,588	1.5000	902,382	1 MM	(97,618)	(9.76%)
$601,588	1.4500	872,302	1 MM	(127,698)	(12.77%)

If the dollar were to depreciate to 1.4500 against the Swiss franc, the unhedged position would result in a cash loss of SF 127,698, which can be likened to a negative interest rate of 12.77%. On the other hand, if the dollar were to rise to 1.8000, he would get interest earnings of SF 82,850, which is the equivalent of an effective interest rate of 8.29%.

The forward and futures markets are always available. If the underlying exchange rate moves in the Swiss millionaire's favor, he can call his bank or broker at virtually any time for execution of the second leg of the swap. Of equal interest to him is that if the interest rate changes in either country, the cost of the forward-to-close will also change--in his favor if it narrows and against him if it widens.

For U.S.-based investors in foreign stocks, there are a few lessons in this story. First, the direct case of how professionals equalize cash flows between countries illustrates that the forward rate is not a forecast, a guess or a hope. It is the result of hardheaded exploitation of small arbitrage opportunities. In other words, there is no point in criticizing the forward rate for being “wrong.” It can’t be wrong: It is set by the interest rate differentials, and nothing else.

Second, you may buy a stock in a foreign country, and although the stock continues to rise and you are happy with it, the currency starts to fall. Should you hedge your currency exposure? The only way to know whether to hedge is to estimate your break-even point. To what level can the currency fall so that it exactly offsets the investment gain you have made in the stock? At that break-even point, you are starting to take a net loss if the currency continues to fall.

HOW TO FORECAST EXCHANGE RATES

Unlike gold, currencies do not have intrinsic value. There’s no book value in currencies. Logically, each currency has a country (or a group of countries, in the case of the euro), and each country has a government that is more or less solvent. Just as we assume a company is a “going concern” (i.e., it will stay in business), we assume countries are going concerns, too. The ongoing finances of a country depend on its ability to tax the public. The ability to raise extra money by privatization of government-owned businesses is a one-time thing, but often useful. (If we evaluated countries like companies, the United Kingdom would have to be the best among the major world countries when judged by the going concern criterion. Not only does it have a budget surplus, it also has a fully funded social

security program. It is the only major country of which this can be said.) And yet, fiscal excellence is only one contributing factor of all those by which currencies are judged.

As a rule, the country with the highest interest rate will lure the most money from other countries, but it doesn't do this without regard for other factors. That country also has to have:

- A stable and honest government,
- The confidence of the financial sector that the central bank is pro-active against inflation,
- Non-punitive taxation,
- Other conditions conducive to foreign investment--including such mundane things as a telephone system that always works and competent bankers--as well as loftier attributes of civilized society such as the rule of law and commercial codes of conduct that are actually enforced.

This last point is not trivial. For example, a bank in Nigeria may offer 150% for one-month deposits, but how confident are you that you will get back your dollars at the end of one month with the interest payment? Nigeria has been the source of several international frauds and scams; the Nigerian Consul General often has to run ads in newspapers (such as the New York Times) warning people that promises of extraordinary gains are seldom true, and they should not trust specific offers coming from Nigeria.

Whenever you make an investment in a foreign country, you will want to evaluate beforehand whether the exchange rate is fair, and by how much it is likely to change over your expected holding period. We have already learned that the forward rate is not an unbiased predictor of the future rate. Just because a country has a higher interest rates does not *ensure* that its currency will remain high via capital flows. It may actually develop real inflation despite the efforts of the central bank (recall the one-time oil shocks of 1973 and 1978), or foreign investors may simply have as much of that currency as they deem appropriate for their portfolios. The Fed now fears this response toward the U.S. dollar.

For example, the Fed raised U.S. rates by 50 basis points on May 17, 2000; two days later the dollar fell against the Japanese yen from 109.50 to 106.90. At the time, the Japanese short-term interest rate equivalent of Fed funds was *zero*. This makes no sense at all under the capital flow theory. The reason? A Japanese research institute had just forecast that first quarter GDP growth would be 13.1%, extremely high under any circumstances and especially high in the context of Japan's 10-year recession. If the forecast is correct, the Bank of Japan will be able to abandon the zero interest rate policy sometime in the next six to nine months. The interest rate differential will still be in favor of the U.S. dollar by a huge amount, but by less than it was before. Ergo, traders rush to "buy on the rumor" well in advance of any actual "fact."

You have to face the unhappy fact that currencies can be undervalued or overvalued for long periods of time, and establishing fair value is an endless and often fruitless quest. For example, the Australian dollar is highly correlated with commodity prices. When

commodity prices fell dramatically after the Asian crisis of 1997, the Australian dollar fell and has continued weak into 2000. And yet Australia's interest rates are almost as high as those in the U.S., and Australia qualifies as a foreign investment destination on the criteria named above—phones that work, rule of law, stable society, and so on.

Estimating the Value of Foreign Currency: The "Big Mac Price Test"

Let's say you are able to travel internationally and you decide to make your own estimation of the fair value of a currency by traveling to the country and comparing the price of things to the price of things in your home country. For example, you would deem a foreign currency undervalued if a can of Coke that costs $1.00 at home costs 50¢, and overvalued if it costs $2.00. This is a dangerous approach. There are many factors that render the comparison invalid—transportation expense, for one, not to mention import tariffs, lack of local demand for the item, and so on. Cornflakes cost $30 a box in Nairobi. That doesn't mean the Kenyan shilling is overvalued.

The *Economist* magazine publishes a purchasing power comparison based on the price of a McDonalds' Big Mac in 39 countries around the world. This started out 14 years ago as a tongue-in-cheek exercise and has become wildly popular—and often correct. For example, if a Big Mac cost $2.50 in the U.S. and $5.00 in some other country, that country's currency is up to 100% overvalued. The most recent "Big MacCurrencies" index (April 29, 2000) shows that the Japanese yen, for example, "should" be at 117 per dollar, while it is actually at 106—11% overvalued. The following chart is an excerpt from the Big MacCurrency Index.

Big MacCurrency Index

Country	Dollar Price	Implied Purchasing Power Parity	Actual Exchange Rate (04/25/00)	Undervaluation (-) or Overvaluation Against the U.S. Dollar
Australia	1.54	1.03	1.68	-38%
Britain	3.00	1.32	1.58	+20%
Canada	1.94	1.14	1.47	-23%
Germany	2.37	1.99	2.11	-6%
Japan	2.78	117	106	+11%
Switzerland	3.48	2.35	1.70	+39%
Argentina	2.50	1.00	1.00	0
Indonesia	1.83	5,777	7,945	-27%
South Africa	1.34	3.59	6.72	-47%

Source: *The Economist,* April 29, 2000, p. 75.

Does this comparison mean that stocks in Switzerland are 39% overvalued solely because of the exchange rate, and stocks in Australia are 38% undervalued for the same reason? No, not exactly. Currencies can be overvalued and undervalued on a purchasing power basis for long periods of time, even when considering a larger basket of goods than a McDonalds' meal. For example, Switzerland has appeal to many foreigners because of bank secrecy and political neutrality. It is a "safe haven" in times of world troubles, whatever its interest rate. At one time in the 1970s, you had to pay Swiss banks to take your money—a negative interest rate, so to speak. Thus, the Swiss franc is almost always overvalued against the U.S. dollar, year after year.

In contrast to Switzerland, Australia is a different kettle of fish. The Australian dollar is considered a "commodity currency," like the Canadian dollar. If and when commodity prices start to rise again, the A$ will probably follow, and may overshoot to the upside.

Over the past 15 years, the A$ has been as high as 87.92¢ and as low as 58.10¢. If you draw a linear regression (which is the ultimate trendline) over those 15 years, the value is 69¢ as of May 20, 2000. The current spot price is 57.50¢. Does that mean the A$ should go up by 11.5¢ cents to meet the long-term trend? That would be a 20% rise. The best answer we can give is a resounding "maybe." It may also rise the 38% it is undervalued on the MacCurrency basis, which would take it to 82.14¢.

So, we have the A$ at 57.50¢ with a long-term trend value of 69¢ and a purchasing power value of 82.14¢. To get to the bottom line, Australian stocks are probably undervalued in U.S. dollar terms and an American investor will probably get a 20-38% gain from an investment there from the currency effect alone, even if the stock does not change in price. If the stock goes up, the investor will get a double benefit. If the stock falls but the A$ rises, the American investor could break even. The question is: how long might it take for the A$ to rise to its trend or purchasing power level? Nobody knows. It might not happen at all—currencies can be mispriced for long periods of time.

How Professional Investors Handle Exchange Rates and Currency Valuation

When professional fund managers allocate funds to foreign equities, they agonize over whether foreign stocks should be hedged against falling currency values which result in unfavorable translation of returns in dollar terms. A lot depends on whether their firms judge performance in local currency terms, where the managers may have excelled in stock picking, or in dollar terms, where the same excellent stock picks may show a net loss solely because of translation into dollars. Major newspapers such as the *Wall Street Journal, Barron's, Financial Times* and *New York Times* show stock index performance in both local currency and dollar terms. There's a further argument, though. Some professionals consider that the exchange rate at any one time is immaterial. If you have a permanent holding period, the currency will always be incorrectly valued--currencies almost never trade at an equilibrium rate. To keep it hedge when you plan never to remit the funds back into dollars is to waste time and money. In other words, you would want to hedge a foreign investment only if you have a short-term investment horizon.

As with other investment decisions, whether to hedge or not to hedge is a function of the expected holding period. If the expected holding period of the currency is "forever" because asset allocation rules mandate some portion of the portfolio always in that country and currency, there is no pressing need to hedge the currency exposure.

As noted throughout this book, what's appropriate for the professional is not necessarily appropriate for the individual investor. For example, let's say you invest in Stock A in a foreign country in which the currency is undervalued, by your estimation. Stock A rises 40% and the currency rises 40%, too. Now you have a windfall gain of 80%. 80% is obviously an extraordinary return, far above the "expected return" in any country over a short time frame. If you do not take profit on this dual investment, and if both the stock and the currency revert to their means, you will be passing up an extraordinary opportunity. (Of course, once you have taken profit, then you have to search out another opportunity, but that is a separate issue.)

Suppose you then invest in Stock B in a foreign country--a country that you feel has overvalued its currency. The currency reverts to its long-term mean, falling 20%. Your Stock B rises 20%. You have therefore made no net gain, and you have incurred the opportunity cost of tying up your money in an investment with a zero net return when it could have been employed elsewhere to better total effect. In this case, if you had hedged the currency, i.e., sold it forward, you would have protected the 20% gain on the stock. In terms of asset and liability management, you are "long" the stock (denominated in the foreign currency) and "short" its currency. You have no net foreign exchange position, but in cash terms, the loss from translating the value of the stock into dollars would be offset by the gain on the currency contract.

To clarify this hypothetical example, let's consider two examples.

Case Study #1: Investing in SmithKline (SBH). SmithKline is a British pharmaceutical company. You buy it as an ADR, denominated in U.S. dollars, but it's actually denominated in British pounds in its home country, so you correctly consider that you have a hidden pound exposure. You buy the stock on October 1, 1999 when the stock is at a low of $56.50 and the pound is $1.6496. You decide to sell it on December 3 when the price reaches a high of $69.88. You have a gain of $13.38. But the pound on December 3 is at $1.5992. This is a 50 cent drop ($0.50). If you had sold the pound forward (or in the futures market), you would have made a profit on the short sale (buying it back when it was less expensive), and gained the additional 50 cents. A similar situation developed in early 2000, when you could have bought SmithKline at the low of $53 on February 16 and sold it on April 4 at $70.50. The decline in the pound then was only $0.0035—less than a penny. The gain would have been negligible or even a loss, depending on transaction costs.

But wait a minute—the ADR is denominated in dollars. You have no real foreign exchange risk. To hedge the currency is to add an unnecessary level of complexity to the trading or investing decision. This is perfectly true. The only reason to hedge an ADR is

to acknowledge that it is a foreign stock and there is an indirect, underlying exposure to a currency risk. If the UK pound were to fall dramatically, say to $1.35, U.S. professional fund managers may reduce their exposures to all British stocks, or may sell the pound forward to hedge their positions if they need to hold them for strategic reasons. Either way, the dollar price of the British stock is likely to fall. Because you can't hedge a single stock (so far), you hedge the currency.

Case Study #2: Investing in Sony (SON). This is another ADR; Sony is the famous Japanese electronics firm. You buy the stock at $63.81 on August 30, 1999. You note that the yen is at 111.01 to the dollar. You sell the stock on February 29, 2000 at $156.80, and the yen is at 109.92. In this instance, the change in the yen is trivial--less than one U.S. cent--but the gain in the stock is significant. Hedging the yen would have been a waste of time and money—although it is not always so.

Sometimes both the stock and the currency are in the same upward trend and it is definitely not in your best interests to hedge. For example, on January 6, 1986, Sony sold for $9.091 and the yen was at 202.60 to the dollar. By April 4, 1995, the stock had risen to $24.75, or 172.2%, while the yen had risen to 83.85 to the dollar, a gain of almost 250%. This is an instance in which it would have been preferable to have invested directly in Sony in Japan, with the investment denominated in yen. You would have not only made the stock gain, but also directly made the currency gain.

To Hedge or Not to Hedge? That Is the Question

How do you know in advance whether to hedge or not? You don’t--not for sure, anyway. At the launch of the euro, just about every professional foreign exchange forecaster predicted the euro would rise to $1.30. People believed the new single European currency would foster a rush of cross-border M&A deals, productivity gains, and other efficiencies that would make Europe a wonderful place to invest, drawing in foreign capital flows. Moreover, foreign countries would want to hold euros in their official reserves.

It didn’t happen, though, partly because the euro came into existence at an inflated price, according to the MacCurrencies reckoning. Other causes contributed to its decline, too, including the problem of a one-speed interest rate being applied to multiple-speed economies that have not yet “harmonized” their growth and inflation rates. As of September 1, 2000, the euro was at $0.8884.

In addition to seeking diversification of your portfolio, you probably want to invest in foreign stocks to obtain a return higher than the one available in the home market, or a return that is less risky because the foreign market is less volatile. Translation of the investment into your home currency should not show inordinate variability of return due to translation alone, or you are violating the purpose of the foreign investment in the first place. You may not know your holding period in advance, but you will know it when you see it. Either you have taken the maximum possible loss you are willing to take with that particular amount of money, or you have made such an extraordinary gain that you feel to hold any longer is only to risk losing the gain.

The only reason to make an investment is to get a cash return--not to get a big percentage gain on paper that vanishes when you have to convert the foreign currency into home currency cash. There's no point in making, say, 50% on the stock and losing 75% on the currency.

Currency risk can enhance or diminish overall home currency *returns*. You do not have to make a currency hedging decision at the same time as you make the investment decision, but the hedging decision does have to be a dynamic process of continuous re-evaluation of the currency trend. As stated at the very beginning of this Appendix, every foreign stock investment is really a dual investment in the currency as well. By definition, it doubles the work you have to do. If you decide to hedge, your purpose is to protect the expected return on the underlying security. It is not to make money in currencies as a tradable asset class in their own right, although they *are* a tradable asset class. It's important to maintain clarity on this point.

THE MECHANICS OF HEDGING

When you hedge a foreign stock position, you will always be selling the foreign currency against your home currency. When you buy a security denominated or based on a foreign currency, you are long the foreign currency. A hedge of a foreign stock holding is always a forward sale of the foreign currency. Let's say the foreign currency starts to rise. As a dynamic investor, you remove any hedge you may have placed (a forward sale of the foreign currency), because it is not needed at the moment. If you also put on a long position in the currency, you are now a currency speculator, not a hedger. To go long the currency is to increase your exposure to the currency, not to hedge it. If you are an American buying Australian stocks, you will always be a seller of Australian dollars in the forward or futures market, never a buyer, when you are wearing your "stock investor" hat. If you are an Australian buying American stocks, you will always be a seller of U.S. dollars, if you are putting on a true hedge.

Of course, it may happen that you have a real talent for spotting currency market trends. You may switch from being a foreign stock market investor to being a currency trader. Actually, you may inadvertently become a currency market speculator when you become a hedger, anyway. This may happen because the interbank forward market, in which you could customize the amount and the forward date, is essentially closed to individuals with smaller amounts to hedge. Gradually, brokers and new specialized non-bank FX trading firms are starting to accommodate such trades, but in practice the amounts are usually restricted to the standard contract sizes and contract dates prevailing in the futures market. Unless you are a very high-net-worth individual, chances are your foreign stock market ventures will be smaller than the standard contract sizes listed in Table B.3.

Chicago Mercantile Exchange IMM Currency Futures Contracts
As of May 19, 2000

Currency	Local Currency Amount	U.S. Dollar Equivalent

Australian Dollar	100,000	$57,340
UK Pound	62,500	$92,850
Canadian Dollar	100,000	$66,900
Euro	125,000	$112,587.50
Japanese Yen	12,500,000	$117,662.50
Swiss Franc	125,000	$71,675

Source: www.cme.com

In some contracts, an "e-mini" contract half these sizes is available. The Chicago Mercantile Exchange (CME) site (www.cme.com) is educational and worth a visit. The CME and other exchanges will also mail you helpful free materials on using currency futures. Note that the list in the chart is not complete—you can also hedge or trade in the South African rand, Russian ruble, French franc, Mexican peso, Brazilian real, and other currencies. You will not, however, find futures contracts in so-called exotic currencies such as the Indonesian rupiah, Czech krone or Turkish lira. Stock market investments in those currencies are essentially unhedgeable.

This picture is changing. New services are springing up to allow the individual to hedge equity investments (or to speculate) in the spot and forward market in smaller sizes than in the professional market or the futures market. Some worthwhile sites to visit are matchbook.com, gaincapital.com and midas.dk.

A word of caution: you may see advertisements that say currency trading is easy, cheap and low-risk. *It isn't.* You may have to put up only a small amount of capital to be allowed to execute a trade, and trades can be executed electronically for low commissions, but if the position goes against you, you could owe a truly large amount of money. For example, a one penny change in the euro futures contract is the equivalent of $1250. The average daily high-low range in the euro over the past 18 months has been 1.03 cents. If you had sold the euro to hedge an equity investment and it moved against you by this amount on each of 10 days without your paying attention, your loss would be $12,875. If you had ten contracts, the loss would be $128,750. Trade very carefully.

When the European Monetary Union launched the new currency, the euro, on the first day of 1999, the majority of analysts believed that it would bring new efficiencies to Europe, facilitating cross-border trade and investment, and becoming a rival to the U.S. dollar as a currency of denomination for commodities and official government reserves. Instead, the euro fell form an initial valuation of $1.1713 to as low as $0.84 in September 2000. It was not a completely unbroken fall and several times over the course of its first seven quarters the euro seemed to be pulling out of its slide, but each time resumed the decline. On September 22, the European Central Bank intervened in the foreign exchange market in coordination with the central banks of Japan, the United States, Great Britain and Canada. It was the first coordinated intervention since June 1998, when the U.S. cooperated with the central bank of Japan to halt the yen weakening. (The Bank of Japan and other central banks occasionally intervene on their own.) The foreign exchange market is the only market in the world in which governments openly intervene to try to

influence prices. Coordinated intervention is therefore extremely rare. It is, however, a risk you take when investing in foreign currency-denominated securities.

You will read that currencies are highly trended and it's therefore easy to apply technical analysis to foreign exchange. (See Appendix A for a primer in technical analysis.) But just as there is more than one fundamental theory about what determines exchange rates, there are several technical approaches. For example, the Elliott Wave theory happens to be popular in the foreign exchange market at the moment, but other ideas are important, too, including longer-term moving averages and support-and-resistance. Big financial institutions—Goldman Sachs, Deutsche Bank, Citibank, Merrill Lynch and others--forecast exchange rates for their clients using both fundamental and technical approaches. Some of this proprietary research makes its way into the financial press. You can sometimes find it incorporated into the FX market reviews from the Far East, Europe and the U.S. at www.marketcenter.com. Bridge News Service provides these reviews, along with real-time quotes. [Note that Bridge went bankrupt two years after publication of this book. Today IU would recommend www.reuters.com. BR] www.bloomberg.com is another site that lists all the currencies with updated quotes every few minutes.

How Currency Woes Have Affected Corporate and Professional Investors

The earnings of many global titans have been hit by currency woes in 2000. They arose chiefly from the unexpected 25% fall in the euro since its launch at the beginning of 1999 to the spring of 2000. These companies include IBM, Coca-Cola Enterprises, McDonald's, Xerox, Eastman Kodak, Lexmark International, and Unisys. In 1997 and 1998, Asian currency devaluations hit many companies, including Procter & Gamble and Gillette. Companies take a hit two ways: (1) lower sales and earnings when translated and transmitted into dollars, and (2) from competition from foreign suppliers whose costs are lower. According to S&P Compustat, 220 companies of the S&P 500 have high enough foreign sales and earnings to break it out in their financial statements.

The negative impact of adverse foreign exchange movements can be costly. For example, in 1988, 3M caused an uproar among its shareholders when the company admitted that the strong dollar had cost it $1.8 billion in revenue and $330 million in profits over the prior three years. 3M doesn't hedge at all. The company figures it all comes out even in the end and hedging is not only hard to do, but expensive. Only about one-third of U.S. multinationals hedge currency exposure. Honeywell and Merck are two that do, in an effort to reduce the volatility of earnings.

The same picture can be seen among fund managers. Some feel that currency risk is part and parcel of any foreign investment and should not be hedged away. To some extent, this is a function of a very long time frame. Global funds allocate their investments according to the MSCI benchmarks, prominently the "EAFE" index (Europe/Africa/Far East) against which their performance is judged. The benchmark takes foreign currency-denominated values of fixed income and equity investments and translates them back into dollars at accounting period ends. The fund managers want to beat the index by their

asset selection, not through some accident of currency pricing at quarter-ends and year-ends.

Fund managers have more or less discretion in maintaining their allocations to different countries and regions, but over time, they will always have some capital allocated to each area. For example, if investments in country A are failing to come up to snuff, fund managers can shift capital to country B in the same region without changing the allocation. To a large extent, the permanence of the investment makes the professional fund managers indifferent to currency changes.

Other global fund managers, however, care passionately about currency valuation and take care to select countries where currency risk is either minimal or can be managed. These managers perform some very sophisticated analysis, and they are more likely to use complex currency options than outright forwards.

One form of currency management is the **"carry-trade."** Here, fund managers borrow in a currency with a very low interest rate (say Japan) and invest in a currency with a higher interest rate (say the U.S.). They are therefore short the currency borrowed and long the asset denominated in the other currency. The risk in a carry trade manifests itself when the currency borrowed starts becoming expensive in terms of the currency in which the fund manager has invested. Fund managers who execute carry trades will always have a break-even exchange rate calculated in advance that tells them where the carry-trade stops being profitable. Then they have to liquidate the asset in order to pay back the now appreciating currency loan—and so does everybody else engaged in the same carry-trade.

The process of buying back the borrowed currency raises its price, which then induces others to buy the currency, too. Soon, the price is snowballing. Carry-trades have been blamed for some of the very big one-day and one-week moves in the Japanese yen and Swiss franc in recent years. From the outside, it looks like a mania or a panic, when in fact the currency move is based on a sound rationale, market discipline and careful calculations.

Summing Up

Allocating your investments to foreign assets, hedging or not hedging the foreign exchange component—all of this activity is the pinnacle of international finance. To do it well, you need to have a grasp of basic economics and the political and institutional environment that will determine interest rates. It is from interest rates that much other economic activity derives its direction. In the absence of a single coherent theory of exchange rates, you also have to know what ideas are uppermost at any one time. They will be a key influence (even if they are wrong). It is an endlessly fascinating process, but to add currency hedging more than doubles the work of international investing.

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