International Macroeconomics

Lecturer: Luca Benati

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Foreign-Exchange Risk, Forecasting, and International Investment

Topics we'll cover today include:

- **the 'foreign exchange risk' ...**

  (*i*) what is the foreign exchange risk;
  (*ii*) 3 different types of foreign exchange risk;
  (*iii*) alternative strategies for hedging against foreign exchange risk;
  (*iv*) the 'foreign exchange risk premium';

- **the notion of 'market efficiency'**

- **Foreign exchange forecasting, and the empirical evidence on the actual forecastability of foreign exchange rates**

- **Diversified portfolios**

  (*i*) the rationale behind diversification;
  (*ii*) the puzzling empirical fact of a 'home bias' in investors' choices ...

- **Direct foreign investments**

- **Capital inflows and capital flight**

- **Bank lending and financial crises**

Foreign exchange risk

What is the 'foreign exchange risk'?

Something very simple: doing international business—selling machine tools to China, buying Canadian 10-year Treasury bonds, ...—often involves a 'foreign exchange risk', simply because if the value of your transaction is not entirely stipulated in your own currency, it is in principle vulnerable to fluctuations in the exchange rate ...

For example:

- **my money is invested in 5 portions of about 20%-value each;**
- **each portion is invested in long-term government bonds (mostly 10-year maturity);**

- **the countries are: Germany, Canada, Sweden, Norway, and New Zealand ...**

Why am I here bearing a 'foreign exchange risk'? Because

- **if I keep the bonds up to maturity, I will get, in about 8 years' time, Euros, Canadian dollars, New Zealand dollars, etc. etc. ...**
- **if I want to sell the bonds before they reach maturity, same thing: I'll get a bunch of foreign currency ...**

The Swiss franc is floating against these currencies so, although I know exactly how many Canadian dollars, etc. I'll get, I don't know exactly what that will be worth in Swiss francs ...

That's the entire issue ...

By now, you'll have an obvious question: '*Why would you want to do that—investing in foreign assets with an uncertain return?*'

We'll see the answer later on when we'll talk about portfolio diversification ...

Intuition is: you want to 'diversify your bets', which allows you to reduce the overall risk of your portfolio of investments ...

The existence of this risk component related to fluctuations in the foreign exchange rate explains why international firms, investors, banks, etc. devote a significant amount of resources to forecasting exchange rates ...

E.g., every investment bank in the City of London, or on Wall Street, has 'foreign exchange desks', whose task is (among other things) to produce forecasts of foreign exchange rates ...

We'll see that, in fact, forecasting exchange rates is extremely difficult ...

A significant body of academic research has produced lots of evidence on the near-unforecastability of foreign exchange rate movements ...

Key result is: the best forecast of the future exchange rate is, basically, today's exchange rate ...

... which is why I just put my money there, without paying any attention to what the future value of Canadian dollar, etc., will be—there's not much of a point in doing that ...

Let's see the 3 types of foreign exchange risk ...

Three types of foreign exchange risk

We can classify 3 types of foreign exchange rate risk ...

- **Translation exposure—also called 'accounting exposure'—is the difference between foreign-currency-denominated assets and foreign-currency-denominated liabilities ...**
- **Transaction exposure: it results from the uncertain domestic currency value of a foreign-currency-denominated transaction to be completed at some future date ...**
- **Economic exposure: the risk to the value of the firm arising from exchange rate changes ...**

  This type of exposure is the most important to the firm ...

An illustration of the different types of exchange rate risk

Translation exposure occurs when a foreign-currency-denominated balance sheet is translated into the parent company's home currency ...

Cash	SAR1,000,000	Debt	SAR5,000,000
Accounts receivable	3,000,000	Equity	6,000,000
Plant and equipment	5,000,000		
Inventory	2,000,000		
	SAR11,000,000		SAR11,000,000
Dollar Translation on May 31, SAR4 = $1			
Cash	$250,000	Debt	$1,250,000
Accounts receivable	750,000	Equity	1,500,000
Plant and equipment	1,250,000		
Inventory	500,000		
	$2,750,000		$2,750,000
Dollar Translation on June 1, SAR5 = $1			
Cash	$200,000	Debt	$1,000,000
Accounts receivable	600,000	Equity	1,200,000
Plant and equipment	1,000,000		
Inventory	400,000		
	$2,200,000		$2,200,000

Why is that?

Because when the foreign currency depreciates relative to the home currency, then the owner's equity decreases ...

As an example, look at the balance sheet above for a hypothetical Saudi Arabia subsidiary of a U.S. firm ...

As a recap of the way balance sheets work,

- **on the left-hand side, you have the subsidiary's assets ...**

  Cash, plants and equipment, inventories, etc. etc.

- **On the right-hand side, you have the liabilities ...**

  Debt and equity ...

  Debt is an obvious liability: it's money which the subsidiary owes to (say) banks ...

  But why is equity recorded as a liability?? It's an accounting convention: in practice, equity—that is: the value of the firm—is the difference between assets and liabilities ...

How does foreign exchange changes enter in all this?

As we said, the parent company is American ...

So, from its own perspective—that is: when it puts the dollar value of its Saudi Arabia subsidiary in its own consolidated balance sheet, which is denominated in U.S. dollars—the value of this subsidiary depends, among other things, on the Saudi Riyal / U.S. dollar exchange rate ...

The table gives 2 examples of this:

- **at 4 SAR for 1 U.S.$, the dollar value of equity is 1,500,000 U.S.$ ...**
- **... but at 5 SAR for 1 U.S.$, the dollar value of equity is 1,200,000 U.S.$ ...**

So you see how fluctuations in the foreign exchange rate impact upon the parent company's balance sheet ...

Is this really important? It depends ...

- **If the U.S. parent company wants to sell its Saudi subsidiary tomorrow, it clearly matters ...**

  Irrespective of the fact that it will sell it to a U.S., Saudi, or whatever company, the subsidiary's current value, once translated in U.S. dollars—which is what ultimately matters for the U.S. parent company—is dictated by the current value of the SAR / U.S.$ exchange rate ...

- **However, if the U.S. parent company does not want to sell it tomorrow, fluctuations in the assets and liabilities of the subsidiary due to foreign exchange rate fluctuations are not truly important ...**

  Why is that?

Because these fluctuations in the values of assets and liabilities do not change anything substantial about the subsidiary ...

Unless you want to sell the firm tomorrow, these are just accounting changes ...

What is truly important is the ability of the subsidiary to keep generating substantial future cash-flows for the parent company ...

As long as the subsidiary remains a strong business, fluctuations in the exchange rate matter only to the extent that they affect its competitiveness, that is: its ability to sell its products in the international markets ...

That's the real issue ... **Next: transaction exposure ...**

Transaction exposure occurs when

- **the firm commits to a future transaction, from which it will receive a certain amount of foreign currency ... For example,**

  (*i*) a Swiss firm sells machine tools to a Chinese firm, and (*ii*) the contract specifies the payment, in 6 months' time, of 1,000,000 U.S. dollars (the U.S. currency is typically used in these transactions ...)

  Key point is: '*What will the value of 1,000,000 U.S. dollars be 6 months from today?*' Nobody knows, and that's the point ...

- **crucially, it does not use a 'hedging strategy' ...**

What does that mean? A 'hedging strategy' is a strategy that allows you to reduce, or even eliminate altogether, the foreign exchange risk you are bearing ...

- **The obvious, radical solution would be to specify the contract in your own currency: then you know exactly what you're going to get in terms of your own currency ...**

  This is almost always feasible if your currency is an international reserve currency such as the Dollar or the Euro ...

  However, if this is not the case, it is very likely that the contract will be specified in one of these currencies, and therefore you'll have to find another solution ...

- **Another simple solution is to use the forward market ...**

In this example, you can sell the 1,000,000 U.S. dollars on the forward exchange market for a specific amount of Swiss francs ...

Once again, you're going to completely eliminate the foreign exchange risk ...

- **Other less sophisticated strategies involve the timing of payments and the like ...**

  Suppose I have to pay 100,000 Canadian dollars for a purchase, and I believe that the Canadian dollar will depreciate ...

  Then, the rational thing to do is to make the payment as late as possible, because—if I am correct—it will cost me less than today ...

This is routinely done in business, but an important thing to stress is that this is not truly a 'hedging strategy' ...

Why is that? Because the entire point of hedging involves a reduction of the risk you're bearing ...

Here you're not really reducing anything: you are betting that the Canadian dollar is going to depreciate ...

... but what if, instead, it appreciates? Then, you'll have to pay even more than today!!!

So, bottom line is: firms do it routinely, but it is important to stress that this is not a proper 'hedge': it is what market operators call a 'directional bet'—that is: a bet on specific direction of movement of an economic variable ...

Finally, economic exposure—as I said, this type of exposure is the most important for the firm …

Intuition: other things equal, exchange rate fluctuations map into changes in the firm's competitiveness on international markets …

What does that mean? Suppose you are a Swiss firm, and you sell machine tools to Germany …

For a given price of your product which you set in Swiss Francs, an appreciation of the Franc vis-à-vis the Euro automatically implies that the price expressed in Euros increases …

Therefore, you automatically become less competitive compared to Euro area firms which make the same product …

… and as a result you sell less …

That's the essence of the economic exposure: exchange rate fluctuations automatically translate into changes in competitiveness, and therefore in the amount you export abroad …

Notice that I assumed that you set your product's price in Swiss Franc, which means that the price in the Euro area—expressed in Euros—automatically changes with fluctuations in the Franc/Euro exchange rate …

What if, on the other hand, you set your price in Euros? Now, by definition, fluctuations in the exchange rate do not imply any change in competitiveness …

… but you end up with another problem …

Since (say) 1 year from now you will end up getting a certain amount of Euros, you end up with the foreign exchange risk we previously discussed: transaction exposure …

That is: you know how many Euros you will get, but you do not know to how many Swiss Francs that corresponds to …

So the point here is that, one way or another, when you transact with the rest of the world, you always bear some foreign exchange risk …

Market efficiency

An efficient market is a market where prices reflect all available information ...

What does that mean in practice? It means that whenever new information is revealed, it is typically incorporated in asset prices—foreign exchange prices, stock prices, bond prices, ...—within minutes, rather than days or hours ...

Let me give you some specific examples of this ...

The single most important example of asset prices immediately incorporating the new information which is being revealed to the markets pertains to the press conferences that the heads of major central banks routinely give after the banks have taken monetary policy decisions ...

Both at the U.S. Federal Reserve, and at the European Central Bank, economists have produced strong evidence that central banks' chiefs press conferences 'move markets' immediately ...

That is: even during the press conference, as (say) the FED's Chairman or the ECB's President are speaking, several asset prices move to incorporate the new information which is being revealed ...

If (say) the FED announces that it is raising interest rates—and, crucially, this move was not perfectly anticipated by markets—the following typically happens:

- **stock prices decrease,**
- **the dollar appreciates,**
- **bond prices fall,**
- **etc.**

Notice that I said 'if this move was not perfectly anticipated by markets' ...

Why?? Because if—and this is an entirely hypothetical situation—the move had been perfectly anticipated by markets, it would have already been incorporated in asset prices ...

To put it differently, if I did know for sure that (say) the ECB is going to increase interest rates, I would sell stocks and bonds, and I would buy the Euro against (say) the dollar ...

What would the impact be if everybody does this? Stocks and bonds prices would fall, and the Euro would appreciate ...

Then, when the ECB President announces the policy move nothing happens, simply because it has already happened ...

This case—called 'perfect foresight'—is uniquely of theoretical interest: in practice, nobody has perfect foresight ...

However, in reality almost all of central banks' policy moves are, to a certain extent, anticipated ...

Why is that? Because central banks do not act randomly—they do not just 'flip a coin'—but rather react systematically to the state of the economy ...

As a result, market operators can typically anticipate, to a certain extent—and sometimes, pretty accurately ...—what central banks will do, and will therefore act in advance ...

This means that typically, central bank press conferences move markets by much less than they would do if their actions were completely unforecastable ...

Two stark illustrations of this related to the financial crisis are the following ...

- **The launch of 'quantitative easing' on the part of the FED—that is: printing money to buy assets, in order to stimulate the economy ...**

  These moves have been systematically pre-announced to the markets *via* careful sequences of speeches on the part of top officials ...

  Key reason for this is that central banks do not want to 'shock markets', and therefore they try to clearly announce their intentions in advance ...

  As a result of this (for example) asset prices started to move well in advance of the official announcement ...

This was strikingly clear during the late Summer of 2011 with the so-called 'Operation Twist', an intervention aimed at lowering U.S. long-term interest rates in order to stimulate the economy ...

As soon as Bernanke hinted at it in a speech in late August, markets started to rally ...

When, later on, there was the official announcement, most of the final impact was already 'priced in' the markets ...

- **An even starker example was a press conference Mario Draghi gave in London 7 years ago, when there were strong fears of a break-up of the Euro area ...**

  He said: '*The ECB will do whatever it takes to keep the Euro together, and believe me, it will be enough ...*'

The impact was instantaneous and dramatic: markets rallied uniquely on this press conference, in the expectation of strong policy moves ...

These are 2 dramatic examples: under normal circumstances you can see the impact on asset prices of the release of new information almost every day ...

Why is that? Because macroeconomic data are released essentially on a continuous basis: typically, every day there is some important release (GDP, unemployment rate, CPI, ...) for some important country, so every day you can see the impact of the release on asset prices ...

Question: '*Has market efficiency been tested?*' Yes ...

Market efficiency has a strong and direct implication: if markets are efficient—that is: prices reflect all available information—it should be impossible to make money based on publicly available information ...

So tests for market efficiency typically involve testing whether (say) over the last 30 years I could have made money by exploiting information which was readily available (e.g., the unemployment rate) ...

These tests typically give mixed results, but mostly produce evidence which is not incompatible with market efficiency ...

Getting back to the foreign exchange market, what is the consequence of market efficiency?

The consequence is that spot and forward exchange rates will adjust quickly to new information, with the result that the forward rate will differ from the expected future spot rate by only a risk premium ...

Next, question: What is the foreign exchange risk premium?

Foreign exchange risk premium

To understand the foreign exchange risk premium, consider the following example ...

Suppose you are a British investor, and you are considering whether to invest your money in U.K. *versus* U.S. 1-year government bonds ...

The data upon which you are going to base your investment decision are the following:

- **the government bonds in the 2 countries pay an interest rate equal to $i_{U.S.}$ and $i_{U.K.}$, respectively, and**
- **your expectation of the change in the dollar/pound exchange rate over the next 12 months is**

$$\frac{E^*_{t+1} - E_t}{E_t}$$

where E_t is the exchange rate, and E_{t+1}* is your expectation

Key point: it doesn't matter at all whether your expectation makes sense, is correct on average, etc. ...

What matters is that this is the expectation you base your decision upon ...

Why does exchange rate expectation matter? Because if you invest in U.S.$, one year from now you want to convert your money back in U.K.£, and the value of the £/$ rate matters to compute your overall rate of return in pounds ...

The difference between the expected rates of return on the two investments is equal to

$$i_{\text{U.S.}} - \frac{E^*_{t+1} - E_t}{E_t} - i_{\text{U.K.}}$$

taking into account of interest rates differentials and expected change in the exchange rate ...

Key point is: if you are indifferent to risk—that is: to you, winning or losing is the same (which typically for people is not ...)—the expression in the previous slide is going to be equal to zero ...

This implies that the expected returns on the 2 investments is going to be identical ...

In reality, however, most people are risk averse, which means that

- **they do not value gains and losses symmetrically ...**

  Example: people typically will not take a proposition such as: '*We flip a coin, and if it is tail I give you 10 Swiss francs, if it is heads you give me 10 Swiss francs* ...'

- **As a result of this, people will typically want to be compensated to bear risk, demanding what is called a 'risk premium' ...**

In the present case, we will therefore have that the expected return differential will be equal to the risk premium:

$$i_{\text{U.S.}} - \frac{E^*_{t+1} - E_t}{E_t} - i_{\text{U.K.}} = f(\text{risk aversion, risk})$$

The risk premium is a function of 2 things:

- **the amount of risk—a standard way of quantifying this is by the volatility of the expected return (e.g., as captured by its standard deviation) ...**

  Intuition is straightforward: the more volatile the expected return, the greater the risk I am bearing ...

In the limit, if the volatility shrinks to zero—the return is certain—there is no risk ...

- **The extent of risk aversion ...**

  People are different: when facing the very same risk, some individuals require a very high compensation to bear it, others require a smaller compensation ...

  Concrete example: the people who trade assets, commodities, etc. have a much greater tolerance for risk than the average person ...

  That's a key reason why they went to work in (say) a hedge fund in the first place ...

  Let's see a slightly different way of interpreting all this, starting from what is called 'covered interest rate parity' ...

What is covered interest rate parity? It is this:

$$i_{\text{U.S.}} - i_{\text{U.K.}} = \frac{F - E_t}{E_t}$$

where $i_{\text{U.S.}}$, $i_{\text{U.K.}}$ and E_t have the same meaning as before, and F_t is the forward exchange rate, which—key point—is certain (that is: there is no risk attached to it) ...

What does that mean? It means that (e.g.) I buy 1 million dollars to be delivered to me 1 month from now at a price which is set today, and so today it is certain …

This relationship obviously holds as an arbitrage condition ...

Why? Because there is no risk involved …

If it did not hold people could buy and sell U.S. and U.K. government bonds, and buy and sell forward the dollar and the pound, until this relationship held ...

Then, if you add and subtract the expected change in the exchange rate to this, you get:

$$i_{\text{U.S.}} - \frac{E^*_{t+1} - E_t}{E_t} - i_{\text{U.K.}} = \frac{F - E_t}{E_t} - \frac{E^*_{t+1} - E_t}{E_t}$$

which means that

$$i_{US} - [(E^*_{t+1} - E_t)/E_t] - i_{UK} = (F - E^*_{t+1})/E_t$$

The quantity on the right-hand side—the percentage difference between the forward and expected future spot rate—is known as the 'forward exchange premium' ...

The natural interpretation is as a foreign exchange risk premium market operators ask in order to be compensated for entering into a transaction with an uncertain return ...

Economists have tested whether the forward rate (F_t) is an unbiased predictor of the future spot rate (E_{t+1}) ...

Why? Because under the hypotheses of

- **market efficiency—all relevant information is incorporated in asset prices—and**
- **no risk premium**

it must be the case that, on average, F_t is not a systematically biased predictor of the future spot rate ...

This does not mean that it is always correct, that is $F_t = E_{t+1}$ ...

Rather, it means that it will typically be an incorrect predictor, but the forecast errors will be, on average, close to zero ...

That's what it means to be an unbiased predictor: 'correct on average' ...

However, evidence overwhelmingly rejects this: F_t is not an unbiased predictor of E_{t+1} ...

... and the most logical explanation is the presence of a foreign exchange risk premium which introduces a systematic 'wedge' between F_t and the future expected spot rate ...

Let's see an example of this ...

Suppose E_t = 2.00 U.S.$, E_{t+1}* = 2.03 U.S.$, and F_t = 2.05 U.S.$.

Then, the forward discount on the pound is equal to

$$\frac{F_t - E_t}{E_t} = \frac{\$2.05 - \$2.00}{\$2.00} = 0.025, \text{ or or } 2.5\%$$

whereas the expected change in the exchange rate is equal to

$$\frac{E^*_{t+1} - E_t}{E_t} = \frac{\$2.03 - \$2.00}{\$2.00} = 0.015, \text{ or } 1.5\%$$

On the other hand, the percentage difference between the forward and expected future spot rate—i.e., the 'forward exchange premium', which we take as a measure of the foreign exchange risk premium—is equal to

$$\frac{F_t - E^*_{t+1}}{E_t} = \frac{\$2.05 - \$2.03}{\$2.00} = 0.01, \text{ or } 1\%$$

So you see that, out of a 2.5% overall forward discount, only 1% comes from the foreign exchange risk premium …

Foreign Exchange Forecasting

The key question here is: *'What makes for a good forecast?'*

The natural answer would appear to be: *'A good forecast is a forecast which*

- ***on average is unbiased—that is, no systematic forecast errors here—and***
- ***has small forecast errors.'***

That is a strictly statistical definition: in practice, however—that is, in concrete business situations—what truly matters is to be on the correct side of a given trade ...

To put it differently, a forecast is 'good' only of it induces you to make the correct market trade: the fact that it is more or less biased, in practice, is pretty much irrelevant ...

Let's consider the following example of two forecasts predicting the movements in the spot rate one year from today:

Current spot rate:	**Yen 150 = 1 U.S.$**
Current 12-month forward rate:	**Yen 145 = 1 U.S.$**
Ms. A forecast:	**Yen 130 = 1 U.S.$**
Ms. B forecast:	**Yen 148 = 1 U.S.$**
Realized (i.e., true) future spot rate:	**Yen 144 = 1 U.S.$**

A Japanese firm receives a 1,000,000 U.S.$ payment in 12 months, and uses Ms. A's and B's forecasts to decide whether

- **to cover its transaction with a forward contract, at the rate of Yen 145 = 1 U.S.$, or**
- **to wait and sell the dollars in the spot market in 12 months**

If you look at the two forecasts errors made by Ms. A and Ms. B, the second one, with an error of 144 - 148 = -4, is clearly better than the first, with an error of 144 - 130 = 14 ...

This is from a strictly statistical point of view: B's forecast is 'better' because it is closer to the truth ...

However, check the profits the firm gets by following the advice resulting from the two forecasts: here things are different ...

- **If you believe in Ms. B's forecast, at 148, you're not going to buy the Yen forward at 145, because you think: *'I just have to wait, and I will make more money ...'***

  By waiting (that is: taking a long position on the U.S. dollar), you get 144 ...

- **If you believe in Ms. A's forecast, at 130, a forward rate of 145 is attractive to you: given this forecast, it's the best you can do ...**

  So you buy the Yen forward (that is: you take a short position on the U.S. dollar), and you get 145, which is better than what you can do in the other case ...

Bottom line here is: in real-world situations, what really matters is getting the trade right ...

In this case, the right trade is to buy the Yen forward, even if, *ex post*, the forecast that induces you to do so turns out to be statistically inferior to the other one ...

While a smaller forecasting error is preferable to a larger error, it is more important to be on the correct side of a forward rate than to have a small forecast error ...

The closer you are to the actual rate from the correct side, the more money you can make ...

If you cross beyond the actual rate on the wrong side, you lose money ...

Having said this, what is the statistical evidence on the forecastability of foreign exchange rates?

Forecastability of foreign exchange rates

Research on the forecastability of foreign exchange rates started with a classic paper by Meese and Rogoff in the early 1980s ...

Their key finding is that foreign exchanges are essentially unforecastable: to be precise, they found that the best forecast of tomorrow's exchange rate is today's exchange rate ...

This finding has natural interpretation in terms of what we said when we spoke about market efficiency ...

Logical explanation for why we cannot use readily available information to forecast exchange rates is because, as soon as such information is revealed to the markets, it is immediately incorporated in the price of foreign exchange ...

And so, there is no information left that you can use to forecast exchange rates and make money out of that ...

Since Meese and Rogoff, this result has been broadly confirmed by many researchers ...

Two important qualifications to this are the following:

- **some researchers have produced evidence of so-called 'long-horizon forecastability'—that is: there appears to be some forecastability at (say) the 10-year horizon ...**

  On this, however, there is no broad agreement ...

- **A very interesting finding by Engel and West is that, although macro variables do not forecast exchange rates—the classic Meese and Rogoff result—the opposite is true: exchange rates have information on future macro variables**

The explanation for this is very simple: as we said, as soon as new information is revealed, it is incorporated in the prices of foreign exchanges ...

Then, consider the following hypothetical situation: the U.S. economy accelerates, and the U.S. unemployment rate jumps down ...

This gets immediately reflected in the dollar, which appreciates with respect to other currencies ...

In general, movements in macro variables are autocorrelated—meaning that a fall in the unemployment rate is typically followed by a series of other decreases ...

What does this imply?

We have that

(*i*) the unemployment rate decreases today;
(*ii*) this causes the dollar to appreciate;
(*iii*) the initial fall in the unemployment rate is followed by other decreases in the future ...

This means that the jump in the value of the dollar is followed by other decreases in the unemployment rate, and therefore, from a statistical point of view, it has forecasting power for such future changes in the unemployment rate ...

The bottom line is that the ability of foreign exchange rates to forecast macro variables is a direct implication of market efficiency ...

By the same token, key thing to remember: a key reason why it is so difficult to forecast exchange rates is because in general asset prices—in this particular case, the price of foreign exchange, but this also holds (e.g.) for stock prices, etc.—incorporate all available information ...

Next: international investment and diversified portfolios ...

International Investment and Diversified Portfolios

There are 2 key reasons for international investment:

- **the presence of an interest rate differential between (say) the government bonds issued by the domestic and foreign governments ...**
- **The desire to hold a diversified portfolio, in order to reduce the overall volatility of its expected return ...**

This brings us back to the issue of risk aversion we previously spoke about ...

The intuition is that agents are risk averse, and therefore do not want to 'put all of their eggs in one basket', in order to diversify their risks ...

The return on the portfolio, R_p, is a weighted average of the returns on the individual assets, R_A and R_B, with weights a and b equal to the shares of the portfolio that you've been allocating to the 2 assets (that is, $a + b = 1$):

$$R_p = aR_A + bR_B$$

Expected future return of the portfolio

The expected future return of the portfolio is then determined by the expected future returns on the individual assets:

$$R_p^* = aR_A^* + bR_B^*$$

Variability of the portfolio's return

As a measure of the variability of the portfolio's return, we use the variance of such return ...

Remember:

- **the variance of a variable is a measure of its dispersion around its mean ...**
- **... whereas the covariance between 2 variables is a measure of how they co-move (positively or negatively) around their means—or they do not co-move (in which case, the covariance is zero) ...**

The variance of the portfolio is given by:

$$\mathrm{var}(R_p) =$$
$$= a^2\,\mathrm{var}(R_A) + b^2\,\mathrm{var}(R_B) + 2ab\,\mathrm{cov}(R_A, R_B)$$

So you see that the overall variability of the portfolio return depends on two things:

- **the variances of the returns of the two assets ...**

  That's obvious: other things equal, an increase (say) in the variance of the return of asset A will increase the variance of the return of the overall portfolio ...

- **The covariance between the returns on the two assets ...**

  Intuition is straightforward: consider the extreme example in which the returns on the 2 assets A and B are perfectly negatively correlated ...

  What does this mean? It means that $R_B = -K * R_A$, where K is a positive number ...

  Then it can be easily shown that it is possible to completely eliminate the risk from the portfolio ...

How can we do that? We have that

$$\begin{aligned} R_p &= aR_a + bR_b = aR_a + b[-KR_a] = \\ &= R_a[a - bK] \end{aligned}$$

and if we set

$$a = bK$$

we have $R_p = 0$ and we have completely eliminated the risk from the portfolio, because the return will be equal to a fixed number—zero—no matter what R_A and R_B ultimately turn out to be ...

This is a 'dumb' example because (*i*) the correlation between the two returns is perfect, and (*ii*) in the end return on the portfolio is zero—which is not that great ...

But the general principle holds: by investing in assets whose returns are negatively correlated, you can reduce the variability of the rate of return on your portfolio ...

Systematic risk versus non-systematic risk

What is systematic and non-systematic risk?

- **systematic risk is the risk that is common to all investment opportunities ...**

  Since it is common, there is no way you can eliminate it 'by investing in something else' ...
- **non-systematic risk is risk which is specific to each individual investment, and can therefore be 'diversified away' by buying something different ...**

Home bias

What is the so-called 'home bias'?

It is the empirical fact that investors seem to prefer domestic assets to foreign assets ...

This finding is puzzling, because international portfolio diversification should, in principle, allow investors to reduce the overall variability of their portfolios' returns ...

Why is that? Because economic conditions are not perfectly synchronized at all across the globe ...

Typical example:

- **in 2008-2009, Western countries' economies were in a comparatively difficult predicament, whereas**
- **emerging countries were still growing quite strongly ...**

So, if (say) back in July 2007—before the outbreak of the crisis—you had diversified your portfolio by putting 50% of your money in Western countries' assets, and 50% in emerging countries assets, you would have been able to reduce the variability of your returns ...

In practice, people seem to put their money in foreign assets by much less than what should be dictated by returns, and the variability of returns, in the various countries' assets ...

Another way of putting this is: investors are diversifying their portfolios internationally by less than it would be dictated simply by economic 'fundamentals' ...

Why might a home bias exist? There are several possible (and non-mutually exclusive) explanations ...

Key explanation is the presence of transaction costs of various nature ...

Costs associated with such a diversification include

- **the actual transaction costs associated with the buying and selling of foreign currency ...**

  Typically, the bank asks you a non-negligible transaction fee for selling you foreign currency, which is implicit in the rate at which it sells you the currency ...
- **Limited transparency of the overall framework of the countries in which you are thinking of investing ...**

  E.g.: limited clarity about legal framework under which the government issues its bonds, so that it is not clear whether (say) 3 years from now it can default with impunity ...

Or there can be the possibility that, if you invest (say) in stocks of an oil refinery in a foreign country, 6 years from today the government nationalizes it, so that you lose all of your money ...

Defaults on national and private debts, nationalizations, etc. tend to happen, historically over and over again, so that this is not something an investor should take lightly …

What does this imply? It implies that, *ex post*, is may seem there are obvious untapped gains from diversification …

… but they have not been tapped precisely because, *ex ante*, there were risks such as default and nationalizations, which did not actually materialize, but were a distinct possibility when the investor was thinking what do …

Direct foreign investment

Direct foreign investment is the spending on the part of domestic firms in order to establish foreign operating units ...

E.g., Switzerland's *Novartis* building a plant to produce medicines in Turkey ...

So, notice the difference with what we just saw: here we are not talking about buying (say) foreign stocks and bonds ...

... we're talking about building plants in foreign countries ...

This begs an important question: '*Why would a domestic firm want to do that, rather than just produce the goods here and export them in the foreign country?*'

One reason is that there may be barriers to trade—tariffs, or quotas—which by definition do not apply to domestic goods ...

... so you set up a plant in the foreign country, you produce there, and you avoid the tariffs and quotas altogether ...

This is clearly even more attractive if the foreign local (state or region or city) government gives the domestic firm incentives—that is: money—to set up shop there ...

This is done routinely—and then the competitors complain about an 'unfair advantage', etc. ...

Another reason for investing in a foreign firm directly is that just buying a non-controlling fraction of its shares leaves you vulnerable to the risk that the local management takes your money, and then runs the firms for its own benefit ...

If you buy the firm—which is equivalent to set up shop in the foreign country—the managers will do as you say ...

Other reasons are

- **a cost advantage in the foreign country: that's obvious, and that's the entire reason why many firms from around the world set up subsidiaries in countries such as China and India ...**
- **'Local knowledge': to succeed in a foreign market, local knowledge is often key ...**

  Simply way to do that is to set up a subsidiary staffed with a lot of local people: you just can't do that from (say) Basel or London ...

Until the international financial crises of the mid-to-late-1990s—Mexico, in 1994; several Asian countries, in 1997—foreign direct investment flows were dwarfed by portfolio (i.e., financial) investments ...

As a result of the crisis, financial investments came to be seen as comparatively riskier ...

... whereas foreign direct investments—that is: to invest money to produce real stuff (cars, Ipods, etc.), as opposed to shuffling paper around—came to be seen as less risky ...

Also—and this is very important—local governments came to definitely prefer foreign direct investment to what came to be labelled as 'hot money'—financial inflows which can turn into outflows in a split second ...

This brings us to the issue of capital inflows, which is currently a very hot and debated topic because of the expansionary monetary policies pursued by several Western countries in response to the crisis ...

Capital inflows issues

During the financial crisis Guido Mantega—the then Brazilian Treasury Minister—had been repeatedly fulminating against the extraordinarily expansionary monetary policies pursued by the U.S. Federal Reserve ...

Why is that? Reason is very simple, and it cuts to the core of the issue of capital inflows ...

U.S. FED was printing huge amounts of money to lower long-term interest rates, thus stimulating the economy ...

Since interest rates in the U.S. were low, a significant part of this money ended up in developing countries, 'searching for yield'—that is: searching for higher interest rates than those available in the United States ...

Isn't it great that developing countries got all this money?

Well, not really, because 2 things happen—and that's why Mantega had been complaining:

- **the Brazilian real was subject to strong pressures to appreciate—same problem affected other emerging countries ...**

  This obviously negatively impacted upon Brazilian firms' ability to export ...

- **If the Brazilian government didn't want to let that happen, it could do 2 things:**

  (*i*) it could start doing like the FED, that is, printing money: this is not good, because it threatens an inflationary upsurge (situation in Brazil was different from U.S.);

(*ii*) it could impose capital controls: capital controls go, by definition, against market efficiency, and this has been part of the so-called 'Washington consensus' up until recently ...

That's why institutions such as the *International Monetary Fund* have been consistently opposed to the introduction of capital controls ...

During the Asian crisis of 1997, however, countries that did not impose such controls—and were therefore 'at the mercy of the financial markets'—had a much tougher experience than those which defied the *IMF* and introduced such controls ...

So there has been recently a reassessment of capital controls, and the current consensus among policymakers is that they are sometimes useful to protect the economy ...

Capital flights

This leads us to the issue of capital flights …

What are capital flights? They are large capital outflows resulting from unfavorable investment conditions in a specific country ...

A real-world example you are certainly aware of is Greece (or, currently, Argentina) ...

In 2014, there were many reports in the financial press about Greeks 'bringing their money out of the country' because of the risk that Greece may exit the Euro area, and 'Greek Euros' may be denominated overnight, by law, into devalued Drachmas ...

This is typical example of this problem: standard triggers for capital flights are: a bad macroeconomic situation, poor macroeconomic governance, etc. etc. ...

Estimated Capital Flight, International Debt Crisis Period 1977–1987 (billions of U.S. dollars)

Country	Capital Flight	Gross External Debt (1984)
Argentina	20	46
Brazil	20	104
Mexico	45	97
Venezuela	28	34
Nigeria	9	20
Philippines	8	24

SOURCE: Morgan Guaranty Trust Company and World Bank.

This table gives you an idea of the scale of the problem in some selected episodes ...

Last column shows the overall gross external debt of the country, in order to give you an idea of the scale of the capital flight compared to the country's overall debt position ...

As you can see, the scale of the problem is typically not negligible at all ...

International lending and crises

The period since the early 1980s—which has been characterized by a dramatic extent of financial liberalization—has also been characterized by a series of financial crises ...

- **Latin American debt crisis in 1980s**
- **Asian financial crisis of 1997–98**
- **Russian bond default of 1998**
- **Argentine financial crisis of 2002**

One way to gauge an idea of the extent of the crisis is to look at 'how big' U.S. banks' loans to the crisis countries were as a fraction of the banks' capital ...

As the table in the next slide shows, they were pretty large ...

U.S. Bank Loans in Financial Crisis Countries
(as a percentage of U.S. bank capital)

Latin America in 1982:	
Argentina	12%
Brazil	26%
Chile	9%
Mexico	37%
Mexico in 1994:	11%
Asia in 1997:	
Indonesia	2%
Korea	3%
Thailand	1%

What does this imply? It implies that, since U.S. banks lent huge amounts of money to these countries—as a percentage of their capital—default on the part of one or more countries could wipe out the banks' capital, leaving them bankrupt …

This is conceptually akin (e.g.) to what Spanish and Irish banks did when they lent hugely to their respective housing construction sectors ...

A non-negligible part of the loans went sour, and many banks became insolvent …

Underlying causes of the Asian financial crises

The Asian financial crises of 1997 had several causes which were common to all the countries involved ...

- **Flaws in the domestic financial systems**

  In many of these countries, domestic banks often gave loans not on the basis of a careful assessment of the costs and benefits, but rather on the basis of personal connections or political considerations …

  As long as the economy was booming, this problem was hidden from view …

  … but as soon as the crisis started to bite, the problems appeared …

- **Domestic macroeconomic policies—first and foremost, the establishing of fixed exchange rates with respect to a 'currency of reference', typically the U.S. dollar …**

  During the good times this encouraged capital inflows within the countries, which were typically not hedged because the pegged rate was thought to be solid and immutable …

  … but when the crisis started to bite, market operators started to bet on a collapse of the peg, and the pressure became so great that the pegs ultimately collapsed, bringing havoc to the economy …

- **Idiosyncratic triggers—e.g., the devaluations of the Chinese Renminbi and the Japanese Yen, which negatively impacted upon other Asian countries' competitiveness …**