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** ...

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** 4 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**) ...

This **relationship** obviously **holds** as an **arbitrage condition** ...

Why? Because **since** 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,

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

The forward discount on the pound is equal to

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

The **expected change** in the **exchange rate** is equal to

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

This **leads us** to the **next topic**: **foreign exchange forecasting** ...

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** recent 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:

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

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

$$R_p = aR_a + bR_b = aR_a + b[-KR_a] =$$
$$= R_a[a - bK]$$

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:

- now, Western countries' economies are in a comparatively difficult predicament, whereas
- emerging countries are 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 have been **setting 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 as 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 investments** (what we saw before) ...

As a **result** of the **crisis**, these **purely 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 several **Western countries** in **response** to the **crisis** ...

Capital inflows issues

You may have seen that Guido Mantega—the former 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 is printing huge amounts of money to lower long-term interest rates, thus stimulating the economy ...

Since interest rates in the U.S. are so low, a significant part of this money ends 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 get all this money?

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

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

  This is obviously going to negatively impact upon Brazilian firms' ability to export ...

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

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

(ii) it **can 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

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

Again, getting to a real-world example you are certainly **aware** of, that is, **Greece** ...

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** have **several causes** which are **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** …