Bottomline:

An exogenous increase in domestic expenditure and an exogenous increase in foreign expenditure both determine expansionary effects on the real economy, however:

An increase of domestic expenditure worsenes the trade balance, whereas an increase of foreign expenditure improves the trade balance.

Implications:

i) Exogenous shocks to a country's expenditure will also affect all its trading partners.
Greater trade interactions lead to more similar economic performance across countries.

ii) These interactions make economic policymaking more complex, especially fiscal policy…

Governments prefer to avoid trade deficits. Persistent trade deficits worsen the current account balance of the balance of payments, and continuously increase a country's external debt, forcing it to pay rising interest to the rest of the world (further deteriorating the current account).

Governments, therefore, prefer increases in foreigh demand, rather than increases in domestic demand…

But these preferences may have perverse consequences…

Consider, for example, a group of countries that are highly integrated from a trade perspective, where any increase in demand in one country is largely directed toward goods produced in other countries.

Suppose that all countries are in a recession and have a more or less balanced trade account (there are no chronic deficits or surpluses in any country).

Each country will be reluctant to implement measures to stimulate domestic demand, as these could have limited effects on output while having significant negative effects on the trade balance.

Each will delay adopting expansionary measures, waiting for other countries to act first. But if everyone waits, nothing will happen and the recession will tend to persist.

Solution?

Coordination of economic policies!

If countries coordinated and all simultaneously implemented policies to stimulate domestic expenditure, output could increase in all countries without causing trade imbalances among them, since both imports and exports would rise simultaneously in all countries as both Y and Y* increase!.

In the real world, however, **coordination is difficult** and often fails for various reasons.

i) The situation is not always so symmetrical. Coordination may require some countries (for example, those with greater fiscal space and/or a better trade balance) to intervene more than others, and they may not be willing to do so.

ii) Each country has an incentive to agree to coordination and then renege on the commitment—failing to implement the agreed expansionary measures — while benefiting from the actions of others.
But if not all countries honor their commitments and do not implement all the promised measures, the increase in spending may not be sufficient to exit the recession.

Example of coordination: the G20 of November 2008 and the fiscal stimulus of 2009

Example of lack of coordination: the European crisis in 2011–2013… (and beyond)

An example of lack of coordination

Consider the same group of countries, whose trade is highly integrated.

Suppose that some countries in the group have chronic trade deficits with other countries in the group, which instead have chronic trade surpluses.

Suppose that some of these countries (in particular those with trade deficits) are in recession, while others are not.

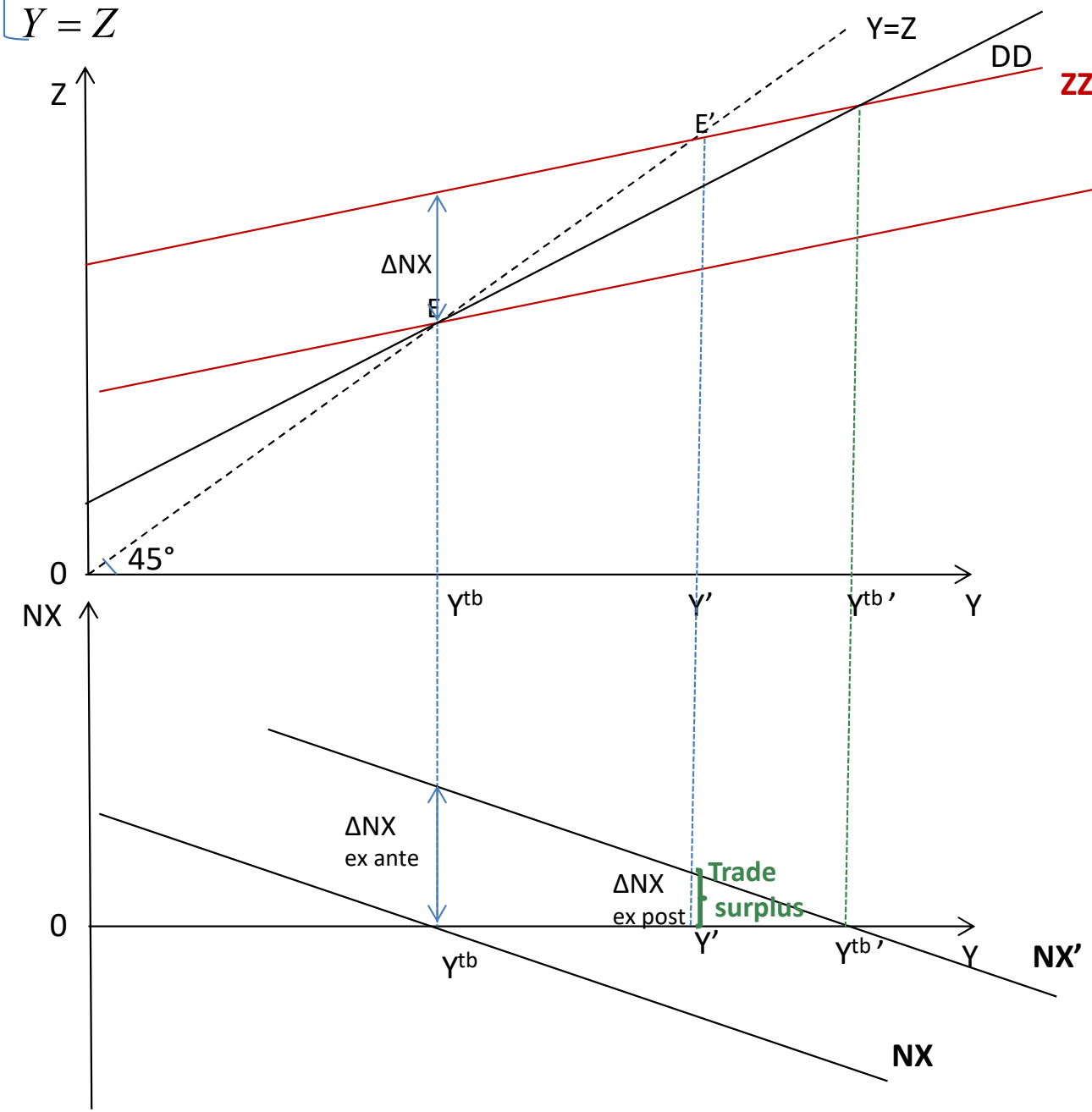
Countries already in deficit will tend to be reluctant to implement domestic demand stimulus (since this would worsen the trade deficit), and will ask other countries to bear a larger share of the adjustment…

But the other countries will have no incentive to accommodate the needs of the countries in difficulty.

This situation resembles that of Greece, Spain, and Portugal vis-à-vis Germany and the other "virtuous" northern countries after 2011.

Effects of a real depreciation ε ↓

$$\begin{cases} Z = C(Y - T^N) + I(Y, \bar{i}) + G + NX(Y^*, Y, \varepsilon) \\ Y = Z \end{cases}$$



A depreciation shifts the **ZZ curve upward** by an amount equal to the increase in net exports (NX) resulting from the change in the real exchange rate (Δε).

As a result of Δε, the **NX curve also shifts upward** by the same increase in net exports.

The **DD curve does not shift**.

Note that now **NX = 0 at a higher level of income**: $Y'_{tb} > Y_{tb}$

Macroeconomic effects:

The equilibrium moves from **E to E'**.'

The level of output increases (more than proportionally compared to the initial increase in exports).

Consumption and investment increase…

… and **the trade balance improves**! The improvement is obviously smaller than the initial increase in NX, since the rise in income (Y) leads to an increase in imports.

Effects of a Depreciation

The effects of the real depreciation on output are therefore similar to those of an increase in foreign demand .

The difference is that depreciation works by making foreign goods more expensive relative to domestic goods.

This means that, for a given income, people experience a reduction in their standard of living, since they must spend more to purchase foreign goods.

This mechanism is particularly noticeable in countries experiencing strong depreciations.

How Can ε Adjust?

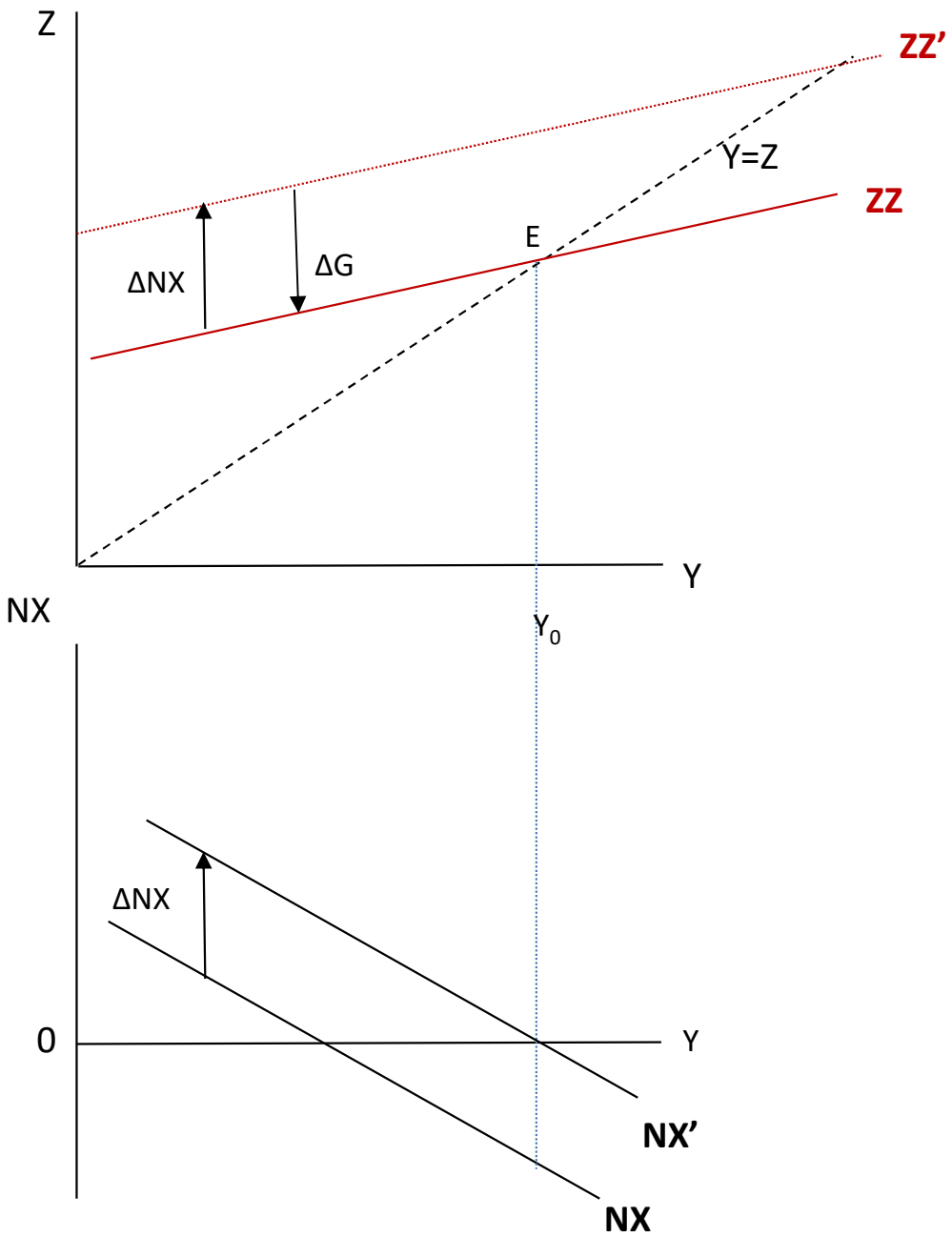
$$\varepsilon = E\frac{P}{P*}$$

i) In the short run, through an adjustment in E (nominal depreciation)

ii) In the medium run, through an adjustment in the ratio (P/P*) (a process of internal deflation)

Let us assume that policymakers are able to control the real exchange rate (which would then become a possible policy instrument).

Fiscal policy and Exchange rate policy



$$\begin{cases} Z = C(Y - T^N) + I(Y, \bar{i}) + G + NX(Y^*, Y, \varepsilon) \\ Y = Z \end{cases}$$

Goal of macroeconomic policy:
reduce the trade deficit while maintaining the level of output Y unchanged.

Available policy instruments:
Real exchange rate (which we assume is controlled by policymakers)
Fiscal policy (changes of G and/or T^N that affets aggregate expenditure

What policy mix should be adopted?

Real devaluation and fiscal contraction:
decrease ε) + decrease G and/or increase T^N

Devaluation alone would not be enough: it improves the trade balance (upward shift of NX curve), but it has expansionary effects on real output …

Fiscal contraction alone would improve the trade balance through a reduction of real output and import compression (movement north-west along the NX curve)

Is a quick reduction of the trade deficit a good signal for macroeconomic performance?

$$NX = X(\underset{+}{Y^*}, \underset{-}{\varepsilon}) - \frac{1}{\varepsilon} Q^M(\underset{+}{Y}, \underset{+}{\varepsilon}) = NX(\underset{+}{Y^*}, \underset{-}{Y}, \underset{-}{\varepsilon})$$

An improvement in the trade balance can occur either through a contraction in domestic demand (and output) or through a real depreciation.

In the first case the trade balance improves because lower domestic demand reduces output and imports (**import compression**).

In the second case the trade balance improves because real depreciation increases the competitiveness of domestic goods, raises exports, and reduces imports.

Therefore, an improvement in the trade balance can be a **"good sign"** if it reflects real depreciation and increased competitiveness. However, it may **not** be a good sign if it reflects a contraction in output and domestic demand, i.e., a reduction in imports due to economic weakness.

Trade balance in the "peripheral" Eurozone countries, 2000-2014

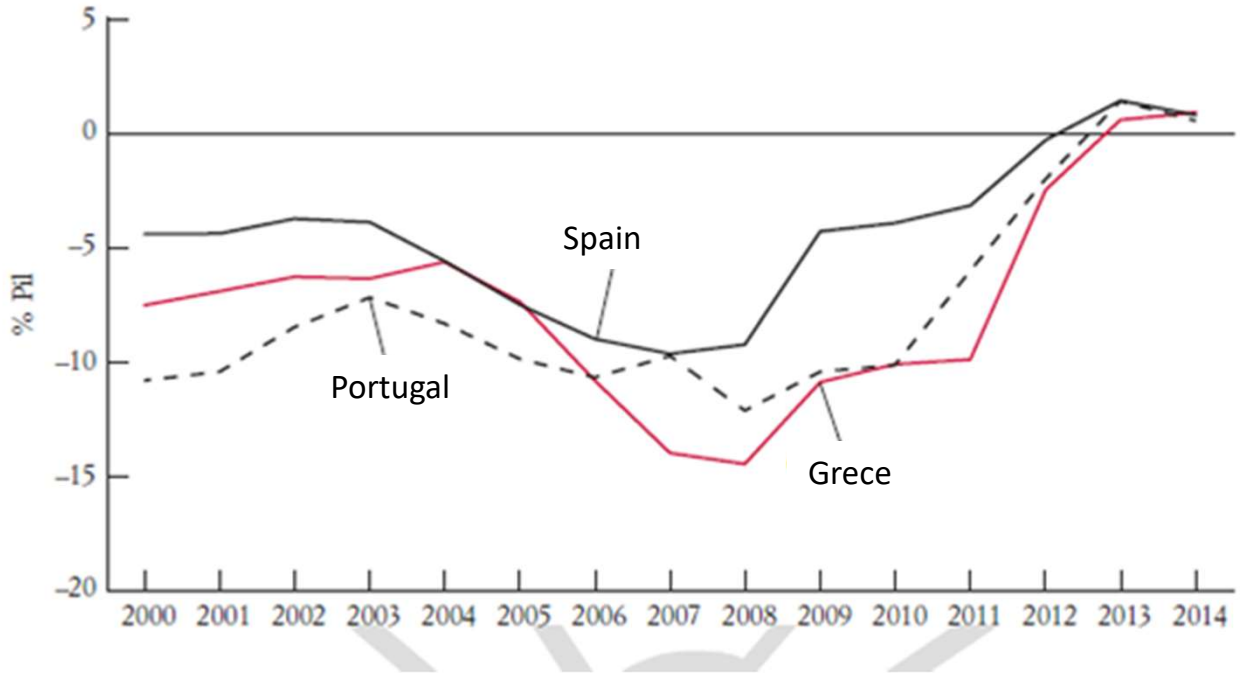
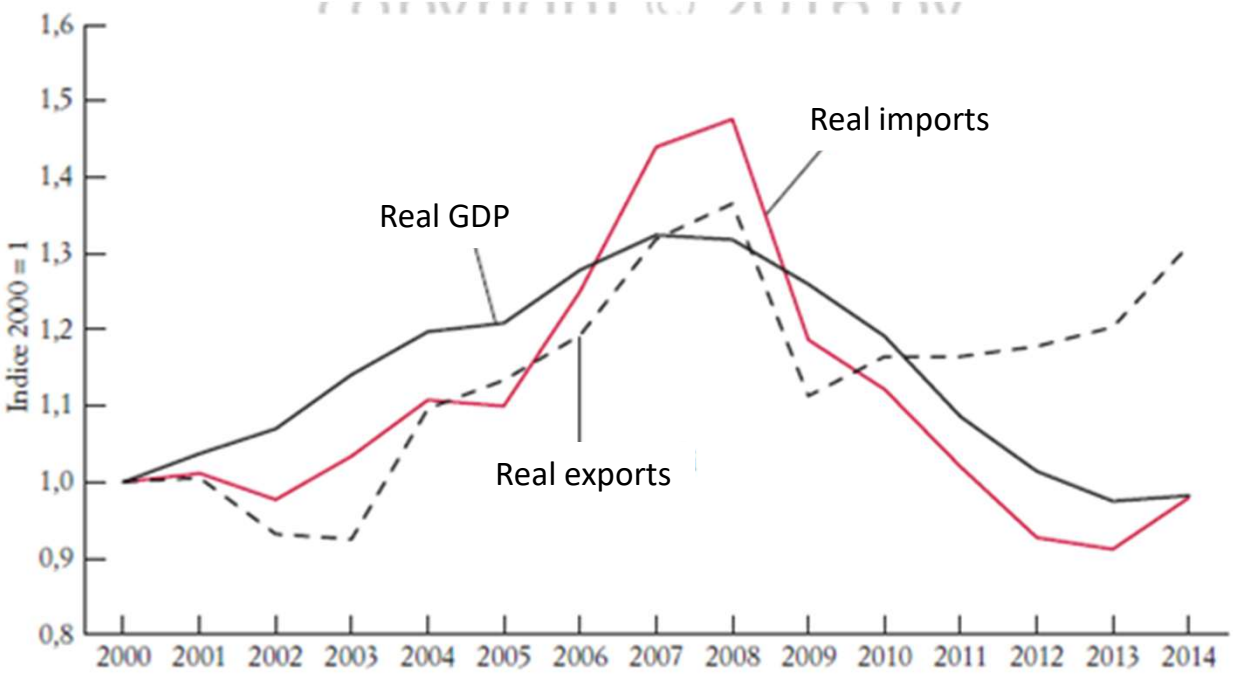


FIG. 1. I disavanzi della bilancia commerciale nella periferia dell'Eurozona dal 2000.

Question: is the rapid disappearance of trade deficits a «good sign» in this case?

Imports, Exports and GDP in Greece, 2000-2014
(index, 2000=1)



Fiscal policies and Exchange rate policies

Question:
A typical policy prescription proposed by the International Monetary Fund for developing countries (in order to be financed) is to devalue (depreciate) the exchange rate and cut public spending.
Under what set of macroeconomic circumstances can this "recipe" be appropriate, and why?

A real depreciation is usually necessary when the economy is operating with an excessive trade deficit.

If it is simultaneously experiencing a trade deficit and a negative output gap (output below potential), then depreciation is desirable, but fiscal contraction would not be appropriate, as it would further reduce output below the potential level.

If instead the level of economic activity is above potential (positive output gap), depreciation would not be necessary: the fiscal contraction would reduce output (eliminating the output gap), thereby decreasing imports and improving the trade balance.

If output is at the potential level (zero output gap), then a policy mix which improves the trade balance without changing the level of output is necessary.
In this case the policy mix proposed by the IMF is appropriate.

Financial markets in an open economy

Choice between domestic and foreign bonds

Let i_t be the return to national bonds, i_t^* the return to foreign bonds and E_t the nominal exchange rate (units of foreign currency per unit of domestic currency).
t is the current period.

If one invests 1 euro in domestic bonds in period t, one will obtain $1+ i_t$ euros in period t+1

How much will one obtain by investing1 euro in foreign bonds?

i) Note that foreign bonds are expressed in foreign currency. With 1 euro, given the current exchange rate, one can buy E_t units of foreign currency.

ii) By investing E_t in foreign bonds, one obtains $E_t(1+i_t^*)$ units of foreign currency in t+1 …

iii) … corresponding to $\frac{1}{E^e_{t+1}} E_t(1+i_t^*)$ euros, where E^e_{t+1} is the expected exchange rate in t+1.

In summary, **the expected return (expressed in euros) of the two alternatives is:**

Domestic bonds:

$$1+i$$

Foreign bonds

$$(1+i^*)\frac{E_t}{E^e_{t+1}}$$

The uncovered interest parity condition (UIP)

Suppose there is **perfect mobility of financial capital** (that is, there are no controls on international capital movements and no transaction costs).
Also suppose that financial **investors are risk-neutral** and purchase assets with the highest expected return. They will be indifferent between holding domestic and foreign assets, and therefore will hold both in their portfolios when the two returns are equal.

This ensures that, **in aggregate, the following arbitrage condition will hold:**

$$(1+i) = (1+i^*)\frac{E_t}{E^e_{t+1}}$$

UNCOVERED INTEREST PARITY CONDITION (UIP)

How would arbitrage work if expected returns were different?

If $(1+i) < (1+i^*)\frac{E_t}{E^e_{t+1}}$ All investors will sell domestic bonds and buy foreign bonds. The price of domestic bonds will decrease and the price of foreign bonds will increase: the return on domestic bonds, i, will increase and i* will fall up to the point where expected returns are equal.

se $(1+i) > (1+i^*)\frac{E_t}{E^e_{t+1}}$ All investors will buy domestic bonds and sell foreign bonds. The price of domestic bonds increases and the price of foreign ponds decreases.
The return on domestic bonds (i) will decrease and the return on foreign bonds will decrease up to the points where the expected returns are the same.i

Note: ***UIP corresponds to the bonds market equilibrium conodition***

The uncovered interest parity condition (interpretation)

UIP> $$(1+i) = (1+i^*)\frac{E_t}{E^e_{t+1}}$$

Note: i =i* if E^e_{t+1}=Et
i.e. domestic and foreign interest rates are equal if there are no expected changes of the exchange rate….

Note that: $$\frac{E_t}{E^e_{t+1}} = \frac{1}{1+\frac{E^e_{t+1}-E_t}{E_t}}$$ We can therefore rewrite the UIP condition as:

Expected depreciation rate

UIP> $$(1+i) = \frac{(1+i^*)}{1+\frac{E^e_{t+1}-E_t}{E_t}}$$

If interest rates and expected depreciation rates are not too high, this expression can be approximated by:

UIP> $$i = i^* - \frac{E^e_{t+1}-E_t}{E_t}$$

Implication:
Domestic and foreign interest rates tend to move together, unless the markets expect significant depreciations or appreciations of the exchange rate.

The Uncovered Interest Parity Condition

UIP> $$(1+i) = (1+i^*)\frac{E_t}{E^e_{t+1}}$$

The assumption that financial investors only hold bonds with the highest return is obviously too restrictive, for at least two reasons:

i) It ignores the existence of risk, and the fact that risk-averse agents will require a risk premium on top of the interest rate in order to be willing to hold risky assets

ii) It ignores transaction costs

However:

a) The UIP explains reasonably well the movements of financial capital beween the main international financial markets (New York, Frankfurt, London, Tokyo)
(where even small variations of interest rates or of expectations on exchange rates determine huge movements of capital within a few minutes)

b) The UIP can be extended to account for i) and ii) ….

UIP as a condition on the exchange rate

What factors determine tha exchange rate *E (the price of domestic currency in terms of foreign currency)* ?

Intuitively, E will depends on demand and supply of domestic currency on the foreign exchange markets.

Demand for euros in the forex markets	- Exports of goods and services from the euro area - Exports of financial assets from the euro area (capital inflows)
Supply of euros in the forex markets	- Imports of goods and services into the euro area - Imports of foreign financial assets into the euro area (capital outflows)

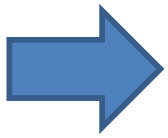
However, as we mentioned (see slides on open economy group 1), nowadays transactions in euros in forex markets which derive from financial flows are huge with respect to those originating from trade flows (imports and exports of goods and services) (98% versus 2%)

UIP as a condition on the exchange rate

Most of the demand and supply of euros in the foreign exchange markets originates from international financial flows.

This implies that we can interpret the UIP condition as a condition on the exchange rate:

$$(1+i) = (1+i^*)\frac{E_t}{E^e_{t+1}}$$



$$E_t = \frac{(1+i)}{(1+i^*)} E^e_{t+1}$$

The current exchange rate depends on the domestic interest rate, on the foreigh interest rate and on the future expected exchange rate:

If i increases (decreases), *ceteris paribus* , the exchange rate tends to appreciate (depreciate)

If i* increases (decreases) , *ceteris paribus* , the exchange rate tends to depreciate (appreciate)

If E^e_{t+1} increases (decreases), *ceteris paribus* the exchange rate tends to appreciate (depreciate)

UIP as a condition on the exchange rate

UIP> $$(1+i) = (1+i^*)\frac{E_t}{E^e_{t+1}}$$ $$\Rightarrow \quad E_t = \frac{(1+i)}{(1+i^*)} E^e_{t+1}$$

Example: Suppose that, starting from an initial equilibrium, the domestic interest rate increases.

i ↑ (i* and E^e_{t+1} remain constant)

The return of domestic bonds is now higher than the return of foreign bonds.

With perfect capital mobility and risk neutral investors, this will determine a massive capital inflow from abroad (as all investors want to buy domestic bonds)

Capital inflows will determine an appreciation of the exchange rate
(in order to buy domestic bonds investors will demand euros in exchange for foreign currency in the foreign exchange markets. This will increase the price of the euro in terms of other currencies)

Note: we are assuming that the change in domestic i does not influence the expectations on the future exchange rate. This implies that given a current appreciation one expects a future depreciation. The ipothesis is plausible if and only if the increase in i is temporary.
At any rate, the assumption could be relaxed without changing the central result: increases (decreases) of the domestic interest rate determine appreciations (depreciations) of the exchange rate.

UIP as a condition on the exchange rate

CPTI> $$(1+i) = (1+i^*)\frac{E_t}{E^e_{t+1}}$$ ⇒ $$E_t = \frac{(1+i)}{(1+i^*)} E^e_{t+1}$$

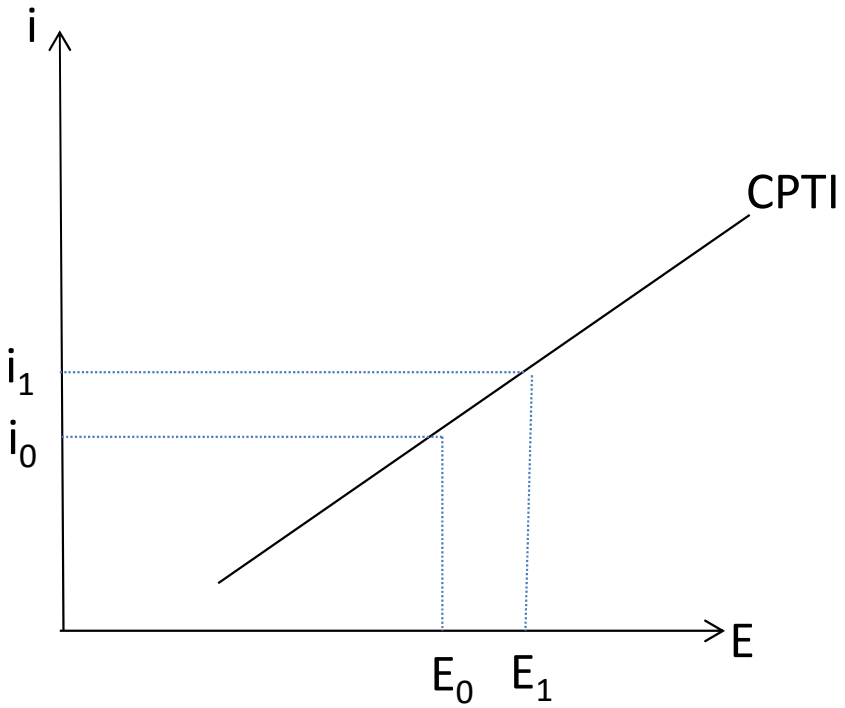
$i^* \uparrow$ *(ceteris paribus)* ⇒ *The return of foreign bonds is now higher than the return of domestic bonds* ⇒ Capital outflows ⇒ **Depreciation of the exchange rate: $E_t \downarrow$**

$E^e_{t+1} \uparrow$ *(ceteris paribus)* ⇒ *The return of foreign bonds is now lower than the return of domestic bonds* ⇒ Capital inflows ⇒ **Appreciation of the exchange rata: $E_t \uparrow$**

UIP : graphic representation

UIP> $$E_t = \frac{(1+i)}{(1+i^*)} E^e_{t+1}$$

UIP can be represented on the (i,E) plane for given values of $\bar{i}^*$ and $\bar{E}^e_{t+1}$



Note: changes of i^* or E^e_{t+1} shift the UIP curve.

For example: an increase in i^* shifts the UIP leftwards (E decreases for any given level of i)

An increase in E^e_{t+1} shifts the UIP to the right (E increases for any given level of i)