Chapter 4
Primary Commodities and the Real Exchange Rate

The Brazilian nominal and real exchange rates

- The graph represents the exchange rate of the real relative to the US dollar that is the price of one dollar in reais, from January 1st 2002 to now.
- At the beginning of the period the price of one dollar was about 2.4 to 2.5 reais. The real lost much of its value after summer 2002, when the price of one dollar almost became 4 reais.
- From fall 2002 to summer 2008 the real steadily appreciated up to a price of a little more than 1.5 reais for one dollar.

The Brazilian nominal and real exchange rates

- The subprime crisis of 2008 was accompanied by a fast depreciation of the real, with the dollar reaching a peak value of more than 2,5 reais.
- This depreciation was short-lived; progressively the real came back to its previous range of values, 1,53 reais in mid-2011.
- Finally, the real depreciated again and the price of one dollar is currently about 2,3 to 2,4 reais.

The Brazilian nominal and real exchange rates

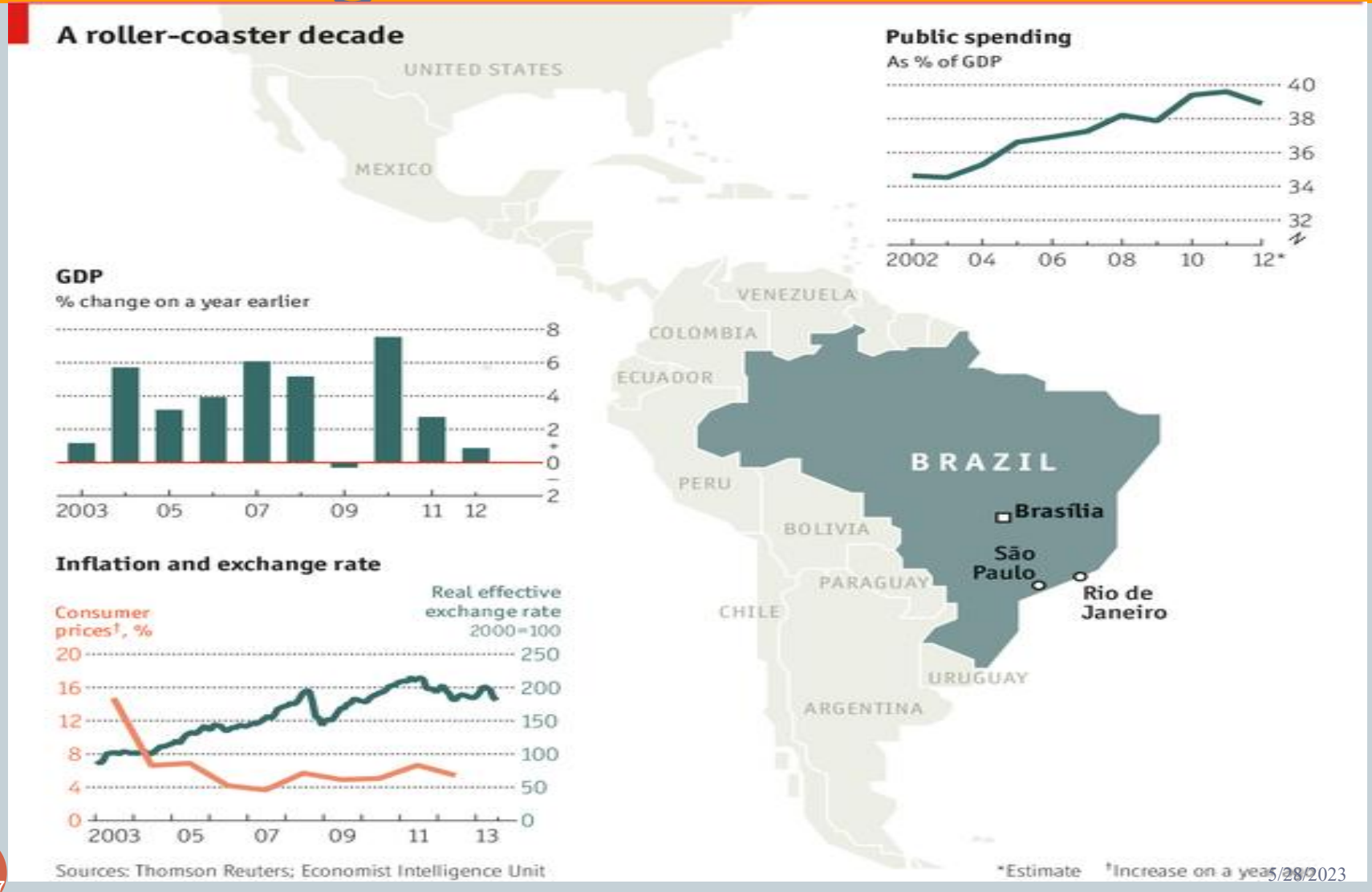
The Brazilian nominal and real exchange rates

- The graph represents the effective RER of Brazil. We chose the same base year for Brazil and its trade partners (2000), and collect their consumption price indices (all equal to 100 in 2000). We convert the price index of each Brazilian trade partner in reais, by using the exchange rate index of its currency. We compute the weighted average of these price indices, the weights being proportional to the importance of trade with Brazil. Finally, we divide the consumption price index of Brazil by this weighted average (as in chapter 3).

The Brazilian nominal and real exchange rates

- The Brazilian RER has steadily appreciated from mid-2004 to the 3rd quarter 2008. Then, we observe a sharp but brief depreciation . Then, the RER appreciates again until mid-2011, when its value is more than twice higher than in mid-2004. Finally, the RER displays a slow and limited depreciation.

The Brazilian nominal and real exchange rates



The Brazilian nominal and real exchange rates

- The graph plots two primary commodity indices, respectively with and without fuel commodities.
- Both indices are very similar, between them, but also with the Brazilian RER.

The Brazilian nominal and real exchange rates

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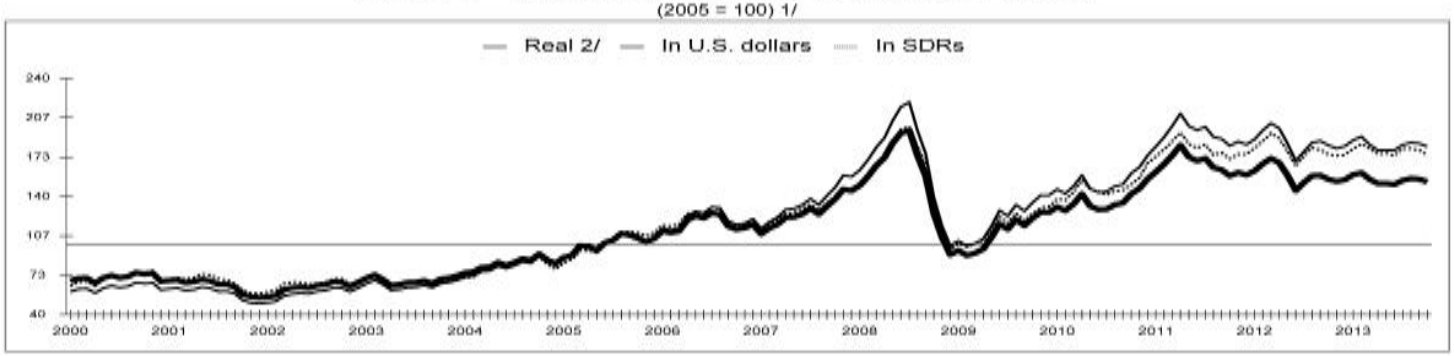
CHART 1. INDICES OF PRIMARY COMMODITY PRICES

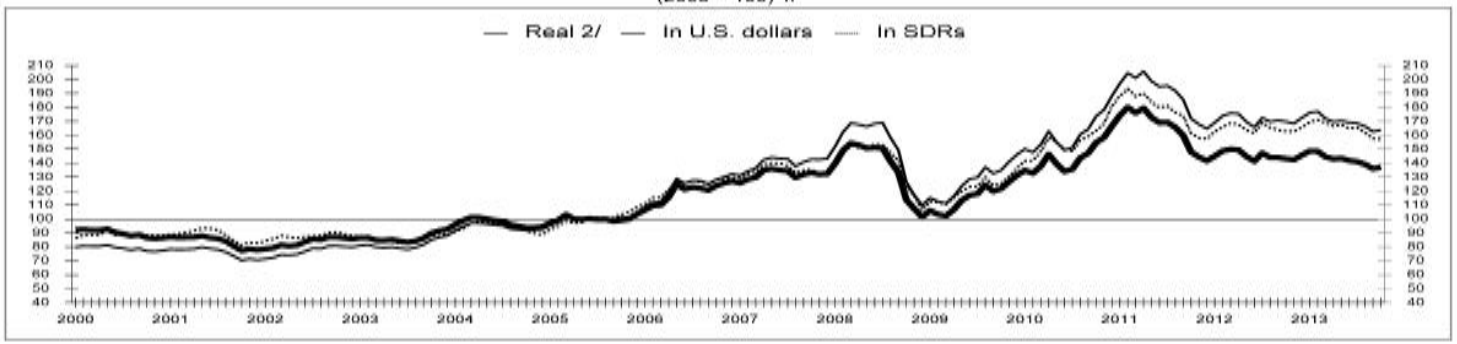
(2005 = 100) 1/



1/ Combines indices of non-fuel primary commodity prices and petroleum prices.
2/ Deflated by U.S. CPI.

CHART 2. INDICES OF NON-FUEL PRIMARY COMMODITY PRICES

(2005 = 100) 1/



1/ Indices comprise 60 price series for 44 non-fuel primary commodities. Weights are based on the 2002-2004 average of world export earnings.
2/ Deflated by US CPI.

What does an appreciation of the RER mean?

- *The Economist* published in september 2013 a very interesting *special report* on Brazil.
- A cheese pizza can cost as much as 30 US dollars in San Paolo. A windowless bedroom in a hotel costs 250 dollars.
- When Lula became president in 2003, the value of a dollar was 3.5 reais; In mid-2011 this value only was 1.53 dollars.
- The purchasing power of the real relative to the dollar was in 2011 one third of its value in 2003 (the RER relative to the dollar depreciated and inflation was higher in Brazil than in the US).
- Brazilian tourists are big buyers: they spent 22.2 billion dollars in foreign countries in 2012, and still more in 2013.

The Brazilian agriculture

- Brazilian agricultural output has steadily increased from 1991 to nowadays.
- One reason has been the development of research in agriculture by EMBRAPA, a Federal government organization created in 1973.
- New technologies allow for the development of agricultural production, especially of exports products such as maize, soybean and cotton, in the *cerrado*, a wide area in Brazil's north-east, which used to be very poor.
- Brazil has also increased a lot its exports of beef and chicken meat, sugarcane and ethanol.

The Brazilian agriculture

- Brazilian agriculture benefits from none other support or protection from the government, and operates on world free competition markets

The Brazilian industry

- A part of Brazilian industry is much protected from international competition, for example the car industry, which would not survive without protection.
- Protectionism finds its origin in the old imports substitution industrialization policy.
- This protection does not prevent manufacturing imports from being significant. For instance the share of imported cars in total sales increased from 5% in 2005 to 22% in 2011.
- This has to be related to the fact that the price of one dollar decreases from 2.5 to 1.5 reais over the same period.

The Brazilian industry

- The low competitiveness of protected manufacturing can be explained by the high cost of labor, which is itself related to the high living cost in Brazil.
- There are of course plenty of other reasons that you know better than I:
  - High taxes, much higher than in other countries with similar income per capita.
  - Lack of skilled labor. Education spending on primary and technical education is too low (in comparison to the spending on tertiary education).
  - Infrastructure is insufficient (this is also a handicap for the exports of agricultural commodities)

The Dutch disease

- The bright performances of Brazilian agricultural exports are a major cause of the high living cost and of the disappointing performances of a large share of manufacturing.
- However, there exist industrial firms, which are neither protected nor subsidized and which succeed well, for instance cosmetics (Natura), clothing brands and aeronautics (Embraer).
- The Brazilian GDP has grown at about 5% per year from 2004 to 2008. Growth became slightly negative in 2009 (in quarterly data the trough was in the 4th quarter of 2008, and the recession was short).

The Dutch disease

- The yearly growth rate bounced back to almost 8% in 2008, decreased to 2.7% in 2011 and to 0.9% in 2012. A moderate growth is expected for 2013.
- Growth performances of Brazil are much weaker than those in Eastern Asia.
- The fluctuations of the growth rate seem to reflect those of commodity prices. The recent decrease in GDP growth probably results from the decrease in the price of primary commodities exported by Brazil, agricultural goods, but also iron ore.

The conclusions of the analysis of chapter 3

- We developed a model of a country exporting a primary commodity at price *p**. If this price (or the volume of exports) *temporarily* rises we have the following results:
  - A permanent appreciation of the RER and a permanent increase in the wage rate (measured in traded good units).
  - A permanent contraction of the production of traded (industrial) good (Dutch disease). It is related to the increase in the wage rate, which reduces the competitiveness of the tradable sector.
  - A transitory surplus of the current account balance, followed by a return to equilibrium, a permanent higher stock of foreign assets and a permanent deficit of the trade balance.

An example of Dutch disease

- Years ago I taught a class in the beautiful city of Merida (Venezuela), toured around a lot during the weekends and learned a bit.
- Oil was discovered in the area of Maracaibo Lake (not far from Merida if you are a good climber) in 1918 under the dictatorship of General Juan Vincente Gomez.
- Before oil discovery Venezuela produced coffee beans (especially near Merida) and exported them.
- Many workers left the coffee plantations to work in oil extraction. The production and the exports of coffee beans (a tradable good) collapsed.

Why is the Dutch disease worrisome?

- The Dutch disease is just a dramatic name for an adjustment of an economy to changes in its environment. Under the assumption of free competition, the new equilibrium is efficient and we should not worry. But……
- *First argument*. Some people believe that a country cannot develop without industrializing. Maybe, but debatable and a bit dogmatic.
- *Second argument*. The prices of primary commodities fluctuate a lot. It is impossible to foresee and to hedge against these fluctuations.

Why is the Dutch disease worrisome?

- For instance the residents of a country can foresee that its exports income will steadily increase for a long period of time. They will anticipate their expected future income rise by immediately increasing their consumption. So, the current account will turn into deficit and the country will borrow from the rest of the world (remember Arezki-Sheng and giant oil discoveries in chapter 2).
- Then, they realize that their expectations were wrong: the rise in the prices of primary commodities is small and short-lived. Hence, they will have to adjust their consumption downward.

Why is the Dutch disease worrisome?

- However, they have accumulated large foreign debt. To keep it constant and finance its cost they will have to balance their current account that is to run a permanent surplus of their trade balance. To obtain this result they will have to decrease their consumption still more.
- Of course there are tons of horror stories, showing that the rebalancing of the economy will be much more difficult in the real world than in our nice neoclassical world. We will tell some of them later.
- *Third argument*. When the workers left the coffee plantations near Merida something terrible happened.

Why is the Dutch disease worrisome?

- Coffee trees grew on the slopes of the Andean cordillera. Coffee tree love shadow and they grew under the protection of bigger trees with big leaves and deep roots (to prevent the erosion). The big trees died, the good earth fell down along the slopes, and coffee trees cannot grow anymore but for heavy investments in soil treatment.
- Irreversibility is the last argument. I guess that Brazilian firms suffer a lot when the cost of labor and the prices of non tradable inputs fluctuate so much. When a firm closes down it is difficult for it to come back to business. When a firm stops exporting to some foreign markets it will be difficult to reenter these markets when the Brazilian RER and wages are lower.

A first policy: protection

- A first policy to help firms hit by the Dutch disease is to protect them from foreign competition, for instance by taxing the imports of products similar to what they produce.
- This is an idea similar to import substitution industrialization, except that protection is limited to the time of high primary commodity price that is temporary.
- Brazilian car industry has been protected since the opening of its first factory in 1952. This industry produces about 3.5 millions cars per year. A little more than 500,000 cars are exported each year, 75% of them to Argentina, the main partner in Mercosul.

A first policy: protection

- The agreement with Argentina is that trade in cars and car components between Brazil and Argentina should be approximately balanced (try to find a convincing economic reason for that).
- The appreciation of the real has made the Brazilian car industry less and less competitive, and the Brazilian imports of car have increases (see earlier).
- Mexico and Brazil signed a free trade agreement in 2002. The agreement has totally freed trade in cars between the two countries. Mexico has specialized in larger models and Brazil in smaller ones.

A first policy: protection

- In 2011 the exports of cars from Mexico to Brazil reached 2 billion dollars. The opposite trade flow was only 372 million dollars.
- In March 2012 Brazil introduced an import quota on cars imports from Mexico, which is a violation of the FTA. Foreign car producers had settled car factories in Mexico, to export to Brazil (and other places Mexico signed a FTA with) from there and benefit from the FTA. In 2011, 2.1 of the 2.6 million of cars produced in Mexico were exported (compare to the numbers I gave you for Brazil in the last slide). After the setting of the import quota some of them (e.g. Ford) opened car factories in Brazil.

A first policy: protection

- In 2011 Brazil increased by 30 percentage points the import duties on cars produced outside Mexico and Mercosul. This violates the rules of the WTO. This duty targeted China, which exported more and more cars to Brazil. Its purpose is to induce foreign car producers to produce their cars in Brazil. This seems to be working.

A second policy: the sovereign wealth funds

- The government also benefits from higher prices of exported primary commodities: its tax or royalty income increases. It should smooth its spending that is stabilize it at a higher permanent level. Hence, he must accumulate foreign assets when primary commodity prices are high and spend their income afterward.
- As the future is uncertain, the government also must,, accumulate a precautionary saving as the private sector (chapter 2).

A second policy: the sovereign wealth funds

- Hence, when the government's income is temporarily high because of a rise in primary commodity prices, a part of this income must be invested in foreign assets. So, he decouples its current spending from its volatile revenue. The vehicle it uses for this investments is sovereign-wealth fund
- The sovereign-wealth funds sell a part of their assets and give the money back to the government when its income has decreased because of lower primary commodity prices.
- These policies contribute to stabilize government spending, but also the RER.

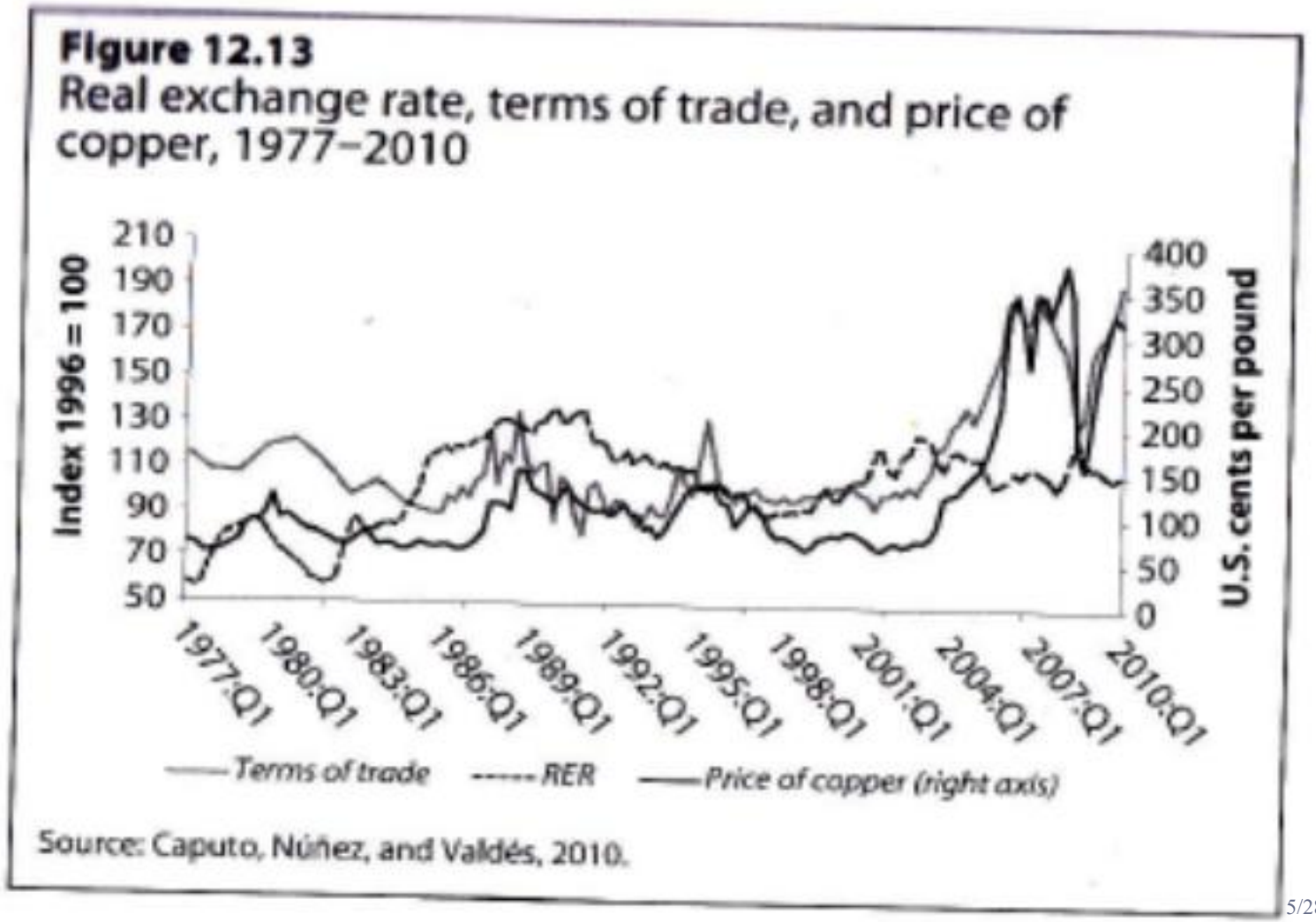
A second policy: the sovereign wealth funds

- Managing a sovereign fund is difficult. It can invest in safe assets, as American Treasury bonds, but their return will be very low. It can invest in foreign equities, or take major participations in foreign firms, but it will face competition from private-equity firms and other financial actors, which may have more expertise than it in this lucrative but risky activity.
- As a fund represents a government instead of private interest, foreigners can be reticent at allowing it to invest in their country because they can worry that the fund also has political goals.

A second policy: the sovereign wealth funds

- A major difficulty is that the government must behave responsibly. It must exclude from its budget income the increases in taxes and royalties induced by higher prices of primary commodities. Hence, it has to set and follow strict budget rules. No cheating.
- Chili is a country, which has seriously applied this policy with much sophistication since 2000. Chili is a major copper producer, and the variations of copper price induce wide changes in the RER, and are a source of Dutch disease.
- The graph plots the copper price, Chilean terms-of trade and Chilean RER from 1997 to 2010.

A second policy: the sovereign wealth funds



A second policy: the sovereign wealth funds

- Since the mid 1990s, the RER is relatively stable (fluctuates much less than the copper price and the terms of trade).
- From 2000 to 2010, the price of copper has fluctuated on a range going from 0.8 to 3.6 dollars per pound.
- About 16 percent of government income comes from the production of copper (the rent earned by the public mining company and the tax revenue from private mining companies).
- At the end of 2008, when the copper price is at its peak value, Chile had accumulated 19.5 percentage points of GDP in sovereign funds.

A second policy: the sovereign wealth funds

- During the recession, from the end of 2008 to the beginning of 2009, Chile used a part of its sovereign-wealth funds to finance a fiscal expansion equal to 3 percentage points of GDP.
- Mexico, Peru and Bolivia have similar funds, but only Chile has been able to use them to organize an efficient stabilization policy of the economy.
- A panel of independent experts compute the long run trend of copper price (and the GDP). A structural budget is computed assuming that copper price and GDP will be at these long run hypothetical values.

A second policy: the sovereign wealth funds

- Public spending is set so that this structural budget satisfies a long run target balance (which was a surplus of 1 percent of GDP at the beginning of the 2000s, and a strict balance at the end of the 2000s).
- The Chilean administration estimates that this double system of automatic stabilizer has decreased the GDP volatility by one-third over the 2000-2005 period.
- Norway uses a slightly different principle, based on the Hartwick rule, since 2001. The rule sets that a nation must invest all rent earned from exhaustible resources currently extracted in other forms of capital. Then it can spend each year the long-run real return of this investment.

A second policy: the sovereign wealth funds

- More precisely, the Norway government targets a *cyclically adjusted* non-oil deficit, which must be equal to 4 percent of the value of its sovereign-wealth fund (so the return on this fund is estimated to 4 percent per year). The *actual* non-oil deficit in general deviates from this 4 percent target that is this system embodies an automatic stabilizer.