An example of inflation and wealth with trade

Context

A number of people outside my classes have asked me to help them understand inflation and wealth. After presenting the usual economic arguments on the topic, some of them were left unsatisfied. It is indeed difficult to understand these advanced topics without having seen basic macroeconomic models and definitions.

It occurred to me that some Economists used to present new economic concepts with the help of an imaginary island. In this setting, we can study the impact of specific economic events on our subject of interest. That's a good way to introduce the ever-lasting assumption of *ceteris paribus* we love so much in Economics.

Situation

Let's start with two islands, Island-X and Island-Y, that trade with each other. They initially produce only one good each. Island-X produces 100 units of Good-1 and Island-Y produces 100 units of Good-2. Let's assume that both goods are desired equally by all individuals.

To simplify everything even more, let's say that both islands want at least 50 units of Good-1 and 50 units of Good-2 to satisfy the desires of their populations.

Finally, let's say that each island has its own currency. Currency-X for Island-X and Currency-Y for Island-Y.

Please note that our findings are going to be a very rough estimate of what happens in the real world. With this exercise, I'm not trying to show exact figures, I'm trying to help you understand the general principles of Economics that we use to analyse real-life situations.

There is a lot to consider in the real world and I don't want to create an overcomplicated example that was meant as a simplification. If you are really interested on the topic, I suggest you take a course in International Economics.

I think we're good to go... now let's see how different economic events can change an island's wealth and inflation levels!!!!

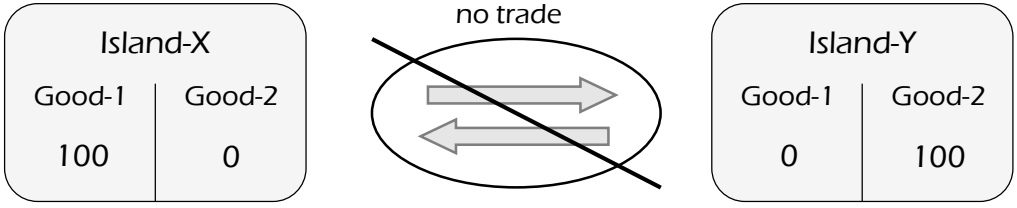
An example of inflation and wealth with trade

Finding the equilibrium in autarky

Autarky is when countries, islands in our case, are isolated from each other. In our specific example, it would simply mean that our islands don't trade with each other and that there is no migration between them.

Before we start throwing changes at our newborn islands, we have to let them reach an equilibrium. In Economics, we use an abstract version of the scientific process to try to understand how different events can change things.

Economics is a social science that studies change. In our models, we take a stable theoretical situation, we change one thing, and we see what should happen... let's find our stable state!



As you can probably see here, isolation is not such a great thing for our islands. They can't get enough of both goods to be 'happy'.

An example of inflation and wealth with trade

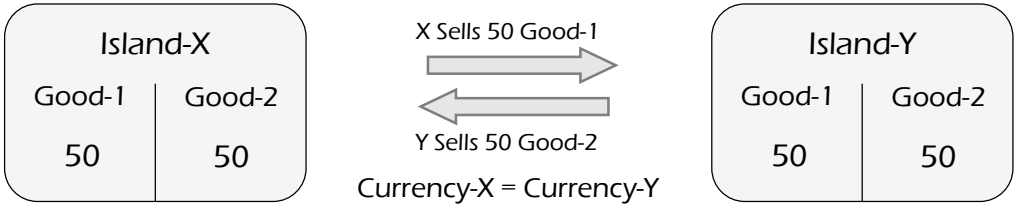
Finding the initial equilibrium with trade

Let's see what happens when they decide to trade. For now, we assume that both currencies are worth the same thing... it just makes things so much simpler.

Island-X can thus sell some of its Good-1 in exchange for some Good-2
Island-Y can sell some of its Good-2 in exchange for some Good-1

Since both goods are equally valued (remember that people want 50 of each), both islands should be able to trade one Good-1 for one Good-2

With no transportation costs and no loss of products when traded, the new equilibrium should be the following:



Perfect, this is our neutral point, we can compare everything we do to this situation!!!! Let's start shaking things around by imposing economic events on our model.

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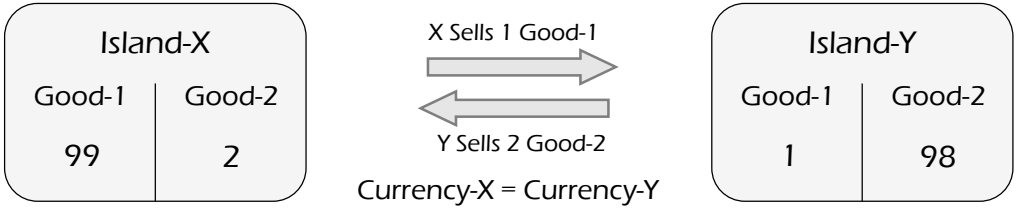
Economic event 1: residents of Island-Y want more of Good-1

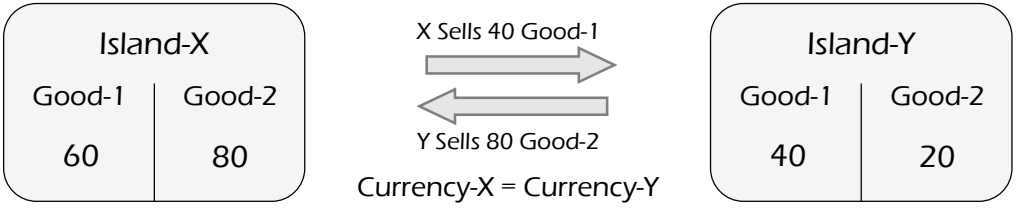
Remember that we assumed that both islands could satisfy their populations by getting 50 units of each good. This implies that both goods are liked equally or that they are used together in equal proportions.

What if the people of Island-Y developed a strong preference for Good-1, making them want twice more Good-1 than Good-2? In this case, Island-Y would be willing to sell two units of Good-2 to get one unit of Good-1

Starting from our equilibrium in autarky, Island-Y would offer the following to Island-X:



If Island-X is happy with this trade, Island-Y can offer to trade more Good-2 for Good-1. Depending on the preferences of the people of Island-X, trade could become:



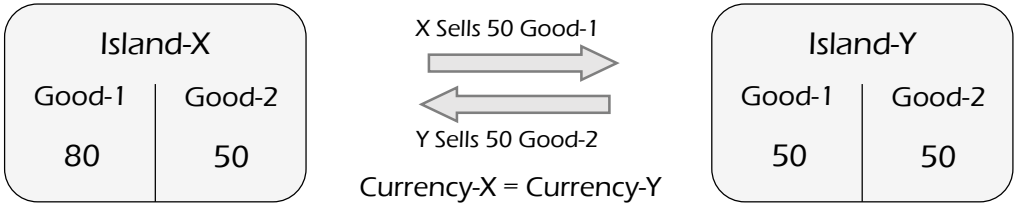
As you can see, Island-X gets access to more products in total (up to 140) when compared to before (100). An increase in preferences for an Island's goods generally leads to an increase in wealth for the population of that island.

Note that the final agreement is difficult to predict in the real world. The exact exchange rate of products and the exact amount exchanged can be vastly different depending on trade partners. We are however fairly confident that Island-X ends up with more goods than before. Islands that do not produce goods they desire more tend to lose wealth.

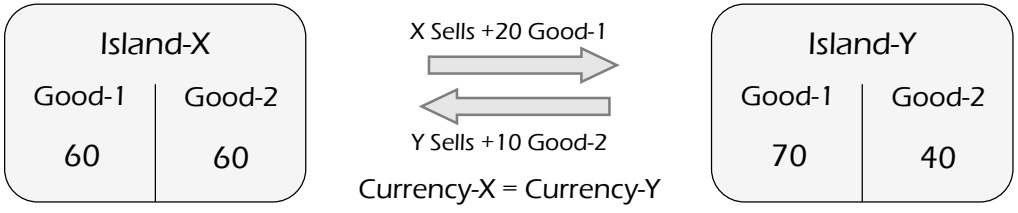
An example of inflation and wealth with trade

Economic event 2: Island-X produces more units of Good-1

Let's start from the equilibrium in autarky. What would happen if Island-X could produce an extra 30 units of Good-1? This could be thanks to an increase in productivity or to finding new natural resources for example. The new situation with trade could become:



If Island-Y would like more Good-1 in exchange for some Good-2, we can get a new equilibrium with trade. The exact exchange rate between the two goods can vary greatly depending on the case. For simplicity, let's say that both islands agree to exchange two Good-1 for one Good-2 from then on. The final result could look like this:



As you can probably see, both countries now have access to more total products than before. Island-X is clearly better off since it has more of both goods while Island-Y can also be better off if this exchange suits them.

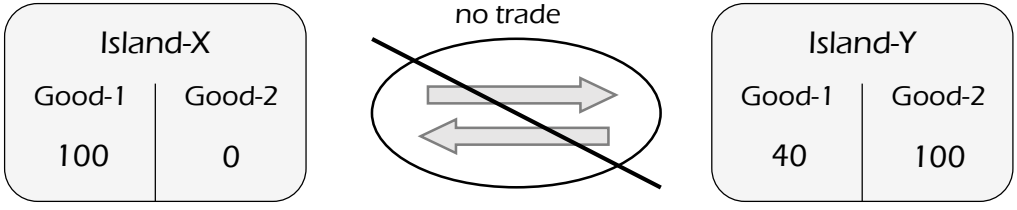
Another possibility is that another island, let's call it Island-Z, sells a luxury good called Good-3. Island-X could now buy some of these new products with their extra Good-1 and get more wealth this way.

Please note that the opposite result would arise if Island-X lost production capacity instead of gaining it. Natural disasters or political instability in either island would likely lead to a decrease in wealth for both islands.

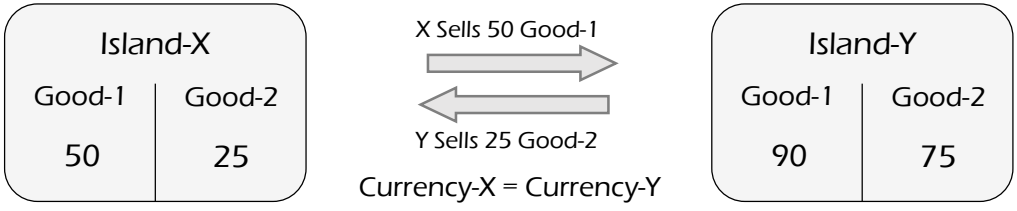
An example of inflation and wealth with trade

Economic event 3: Island-Y also produces Good-1

Let's start again from the equilibrium in autarky. What would happen if Island-Y found new natural resources and could produce 40 units of Good-1? The new situation in autarky is:



Since Island-Y already has a lot of Good-1 and Island-X has more than it needs, the exchange value of that good is going to be very low. Let's assume again that the final exchange rate between goods becomes two Good-1 for one Good-2. The new equilibrium could become:



As you can see, Island-Y has gained a substantial amount of wealth from this economic event. Similarly to our previous case, it can now have access to more of both products.

Island-X, however, has lost a substantial amount of wealth by having access to only half of Good-2 compared to our neutral point. That happened because Island-X lost part of what we call its comparative advantage. It is not longer the only country producing Good-1, which makes it less needed in trade.

As all other cases before, this economic event can lead to a change in the value of each country's currency. We're going to talk about currencies and inflation in the next two cases.

An example of inflation and wealth with trade

Economic event 4: Island-X prints more Currency-X

Starting from the equilibrium in autarky, let's show how changes in the value of a currency can affect trade. We'll focus on a fairly simple case in which Island-X decides to double the amount of Currency-X... let's see how that works!

First, some more simplifying assumptions: Let's say that initially, the price of Good-1 is one Currency-X and the price of Good-2 is one Currency-Y. When both currencies are of equal value, as was the case up until now, nothing important changes.

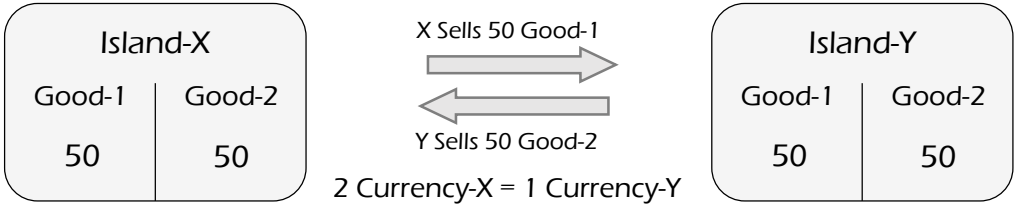
Second, let me explain a bit how international exchanges work when there are different currencies. If consumers of Island-X want to buy Good-2, they likely need to pay producers of Island-Y with Currency-Y. This is not always the case but it's very often true in real-life.

In our original example, consumers of Island-X sell 50 Currency-X to buy 50 Currency-Y. With this they buy 50 units of Good-2 from producers of Island-Y. In addition, consumers of Island-Y are happy to sell 50 Currency-Y in exchange for 50 Currency-X since they need it to buy 50 units of Good-1.

SO!!!!!! What if Island-X had the brilliant idea to print twice as much money to be able to buy more of Good-2?

Remember that both islands trade on the basis of products, not on the basis of currency. If the number of Currency-X is doubled, it doesn't change the fact that Island-Y wants to exchange 50 units of Good-2 for 50 units of Good-1.

Consumers of Island-X now have 100 Currency-X to buy 50 Currency-Y, which will let them buy 50 units of Good-2... the value of each Currency-X will then be halved. The final result will be exactly the same as our neutral case, except that Currency-X will be weaker and prices in Island-X will be higher.



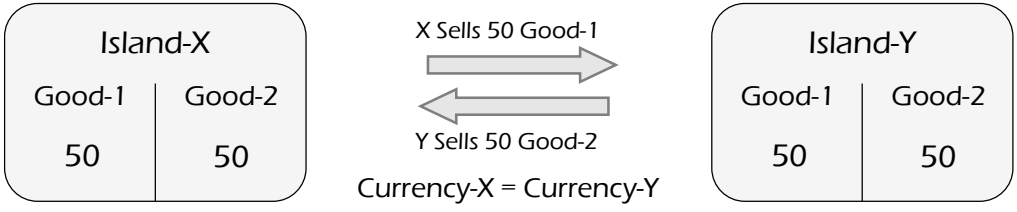
An example of inflation and wealth with trade

Economic event 5: Island-X increases the price of Good-1 with low competition

Let's start again from the equilibrium in autarky. What would happen if Island-X decided to increase the price of Good-1 to two Currency-X? An island may decide to increase the price of a product in the hopes of making more money from its sales.

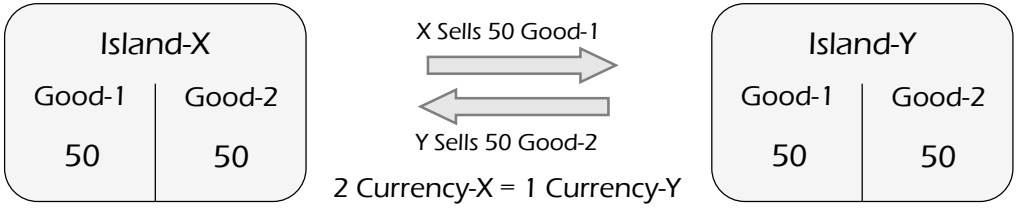
This case gets a bit more complicated... results depend on the level of competition Island-X is facing. Let's keep the assumption that no one else produces Good-1.

In this case, Island-Y still wants to sell 50 units of Good-2 and buy 50 units of Good-1. If the exchange rate between currencies is fixed at one Currency-X for one Currency-Y, then Good-1 now costs two Currency-X. To be able to buy the desired amount, Island-Y also needs to increase the price of Basic-2 to two Currency-Y. The result will be the following:



As you can see, nothing changed from our neutral case except that there was inflation in both countries (prices have doubled). If wages of workers in both islands have less than doubled, people's welfare will also decrease.

Another possibility is for Currency-X to lose value, proportional to the increase in price of Good-1. In this case, Currency-X would again be worth half of what it was before and we get to the same situation as our previous economic event.



This time, prices would be higher in Island-X only.

An example of inflation and wealth with trade

Economic event 5: Island-X increases the price of Good-1 with high competition

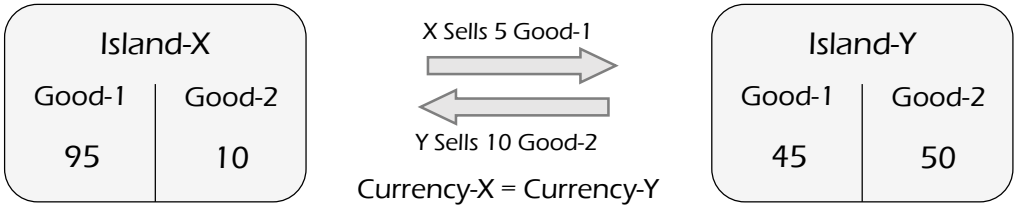
Now, what would happen if Island-X was a minor producer of Good-1? Again from a situation of autarky, what would happen if Island-X decided to increase the price of Good-1 to two Currency-X?

Since other islands also sell Good-1, Island-Y can chose whom to buy from. If the quality of Good-1 is the same, Island-Y will simply buy from the island that sells at the lowest price. Since Island-X now doubled its price, it is unlikely that Island-Y continues to buy the same amount from them as before.

The exact change in quantity purchased from Island-X depends, amongst other things, on the price elasticity of demand of Good-1 (see unit 3 of my course for more details).

Island-X will probably be faced with a surplus of production as it cannot sell all it wants to sell (see unit 1 of my course for that concept).

With a constant exchange rate, the final situation might look like this:



Note that Island-Y trades the rest of its goods with other partners at the original price.

Alternatively, Currency-X can again lose value, leading to an increase in prices only for Island-X.