International Monetary Policy

11 Balance of Payments and National Accounting [1]

Michele Piffer

London School of Economics

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Lecture topic and references

- In this lecture we understand the main transactions that occur across countries, synthesized in the balance of payments. We subsequently develop the basic national accounting for an open economy

- Krugman-Obstfeld, Chapter 12

Review of previous lecture

- Nominal exchange rate:

$$E_{\mathcal{D}c,\mathcal{F}c} = \text{price of the foreign in terms of domestic} =$$
$$= \text{number of domestic per 1 unit of foreign} =$$
$$= \frac{\#\mathcal{D}c}{1\mathcal{F}c}$$

- Real exchange rate:

$$\epsilon = \frac{E \cdot P*}{P}$$
$$\%\Delta\epsilon = \%\Delta E + \pi^* - \pi$$

International Transactions

- We have seen that the nominal exchange rate is the obvious first step when moving from closed to open economy
- Exchange rates reflect the equilibrium on the Forex Market resulting from demand and supply of foreign vs. domestic currency
- It is then necessary to understand what determines demand and supply of currencies. The underlying forces are the international transactions that reflect international payments

Balance of Payments

- International payments occur mainly in exchange of trading in goods/services or in the purchase/selling of assets
- The accounting tool that registers all transactions across countries is called the *Balance of Payments* (BoP)
- The BoP is composed of two accounts, depending on whether the payment reflects non-financial transactions (Current Account: CA) or financial transactions (Capital Account: KA)

$$\text{Balance of Payment} = \text{Current Account} + \text{Capital Account}$$

- Let's understand the different items separately

Current Account

- The biggest part of the CA reflects flows from exports (X) and imports (IM) of goods
- Call this the Trade Balance (TB)

$$\text{Trade Balance} = \text{Exports} - \text{Imports}$$

- Exports represent payments entering the domestic country, hence will enter the domestic BoP with the (?) [ ] sign
- Imports represent payments leaving the domestic country, hence will enter the domestic BoP with the (?) [ ] sign

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- Imports represent payments leaving the domestic country, hence will enter the domestic BoP with the negative sign

Current Account

- Non-financial transactions include also payments for services for input factors like labour or capital
- A domestic worker offering consultancy to a foreign firm is (?) [ ] his working services; a domestic firm demanding for a foreign worker is actually (?) [ ] his working service
- Similarly, an asset held by a domestic citizen will earn an interest rate that reflects the export of the capital service
- A citizen issuing a bond to a foreign citizen will have to service his debt paying interests in exchange to the imported capital service

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Current Account

- To simplify things, consider only services from the remuneration of capital factors. These are the interest rate paid or earned on financial assets
- Note, the payment is refered to the interest rate payments. Not to the principal, which goes into the capital account
- Call Net Foreign Assets (NFA) the difference between international assets issued by the rest of the world held by the domestic economy and the international asset issued by the domestic economy and held by the rest of the world
- The first ones will (?) [ ] interest payments to the domestic economy, the second ones will (?) [ ] the interest rate to the economy

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Current Account

- The services on the the capital input factors that the domestic economy will receive/pay are

$$r * \text{NFA}$$

- The current account is given by the sum of the Trade Balance and the payments on services

$$\text{CA} = \text{X} - \text{IM} + r * \text{NFA}$$

- A positive net foreign asset position means that the economy receives net interest payments, which will (?) [ ] the current account

- A negative net foreign asset position means that the economy pays more interest rates than it receives, hence (?) [ ] the current account

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- A negative net foreign asset position means that the economy pays more interest rates than it receives, hence reducing the current account

Capital Account

- The second half of the BoP is given by the capital account KA
- A foreign citizen investing in domestic assets represents an (?) [ ] of money to the domestic economy, hence enters with positive sign in the domestic BoP
- A domestic citizen buying foreign assets represents an (?) [ ] of money from the domestic economy, hence enters with negative sign in the domestic BoP
- Define the capital account as the difference between inflow and outflow of capital

$$KA = K_{in} - K_{out}$$

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Capital Account

- Note, when the domestic economy exports more capital than it is importing, it means that it is (?) [ ] foreign assets.
- As a result, NFA will increase and the current account will increase: payments on the new foreign assets will imply a positive inflow to the domestic economy
- Similarly, when the domestic economy imports more capital that it is exporting, it means that it is (?) [ ] its foreign assets
- As a result, NFA decreases and the current account decreases: there will be an outflow of payments due to the interest rate on assets issued against the rest of the world

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- Similarly, when the domestic economy imports more capital that it is exporting, it means that it is reducing its foreign assets
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Balance of Payments

- The only missing thing from our understanding of the BoP are the (official) International Reserves IR
- International Reserves correspond to the amount of foreign currency held by the central bank
- We can finally understand the complete expression for the BoP: the sum of the current account and the capital account must coincide with the variation in the international reserves

$$\text{BoP} = \text{CA} + \text{KA} = \Delta \cdot \text{IR} \tag{1}$$

Balance of Payments

- Let's finally use the Balance of Payments to understand the determinants of demand and supply of foreign currency
- Exports and capital inflows demand (?) [ ] currency and supply (?) [ ] currency
- Imports and capital outflow supply (?) [ ] currency and demand (?) [ ] currency

$$\text{BoP} = \text{CA} + \text{KA} =$$

$$= \overset{D_{\mathcal{D}c}, S_{\mathcal{F}c}}{X} - \overset{D_{\mathcal{F}c}, S_{\mathcal{D}c}}{IM} + \overset{D_{\mathcal{D}c}, S_{\mathcal{F}c}}{K_{in}} - \overset{D_{\mathcal{F}c}, S_{\mathcal{D}c}}{K_{out}} = \Delta \cdot \text{IR}$$

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Balance of Payments

- $\Delta \cdot \text{IR} > 0$ means that the central bank is accumulating foreign currency
- This is the case when the inflow of foreign currency from a positive current account is not fully matched by a (?) [ ] capital account
- The economy is not investing in the rest of the world the full amount of foreign currency that it receives from the current account

Balance of Payments

- $\Delta \cdot \text{IR} > 0$ means that the central bank is accumulating foreign currency
- This is the case when the inflow of foreign currency from a positive current account is not fully matched by a negative capital account
- The economy is not investing in the rest of the world the full amount of foreign currency that it receives from the current account

Balance of Payments

- The only way for the international reserves to remain unchanged is for the capital account to be the same size (and opposite sign) of the capital account
- This happens when, say, the need for foreign currency due to a negative current account is perfectly matched with the extra foreign currency that the domestic economy receives from net capital inflows
- Alternatively, this happens when the net inflow of foreign currency due to a positive current account is perfectly reinvested in foreign assets

Balance of Payments

- From equation (1) we can gain a better understanding of the current account. Rewrite it as

$$\text{CA} = \Delta \cdot IR - \text{KA} = \Delta \cdot IR + K out - K_{in} = \Delta \text{NFA}$$

- An economy with a positive current account attracts from exports (?) [ ] foreign currency that it is using for imports (of either goods or services). The difference will go to accumulate foreign assets

- The increase in net foreign assets is either through a capital outflow that exceeds capital inflow, or from an accumulation of international reserves

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Balance of Payments

- As we will see, variations in the international reserves are active only under fixed exchange rates
- In fact, they will reflect interventions on the Forex market in order to stabilize the interest rate
- This means that under flexible exchange rates $\Delta \cdot IR = 0$

Balance of Payments

- Note, under flexible exchange rates a country with a negative current account will have to (?) [ ] capital from the rest of the world
- This will imply a reduction in the net foreign asset and a subsequent decrease in the current account (the domestic economy will have to pay the interest on the newly issued debt)
- This can enter into a vicious circle: negative current accounts can increase over and over, requiring a subsequent, possibly fast and painful adjustment

Balance of Payments

- Note, under flexible exchange rates a country with a negative current account will have to import capital from the rest of the world
- This will imply a reduction in the net foreign asset and a subsequent decrease in the current account (the domestic economy will have to pay the interest on the newly issued debt)
- This can enter into a vicious circle: negative current accounts can increase over and over, requiring a subsequent, possibly fast and painful adjustment

Exercise 1 on Balance of Payments

- An economy that registers a positive capital account is accumulating / decumulating its net foreign assets. This is the counterpart of a positive / negative current account, resulting from exports of goods and services being higher / lower than imports of goods and services

Exercise 2 on Balance of Payments

- Under fixed exchange rates, if capital inflows exceed capital output and the current account is in surplus. it means that the economy is accumulating / decumulating its international reserves

National Accounting

- There is a key difference between gross domestic product and gross national product
- Gross domestic product (GDP) is the value of final goods produced within the country, independently on whether the input factors were held by domestic or foreign citizens

National Accounting

- Gross national product (GNP) is the value of final goods produced by factors of production of a country, independently on whether the production occurred within or outside the national borders
- Of course the two concepts coincide in a closed economy model. In general, GNP equals GDP plus the net receipts of factor income from the rest of the world

National Accounting

- In any economy, the national product must be equal to the national income
- In a closed economy aggregate demand (which equals aggregate product) comes from consumption, investments or government expenditure
- At the same time, this national income can be spent on consumption or taxes, or can be saved

$$Y^d = \underbrace{C + I + G}_{\text{Sources of income}} = \underbrace{C + S + T}_{\text{Uses of income}}$$

National Accounting

- The above expression can be rearranged into

$$I = S + T - G =$$
$$= S^{\text{Private Savings}} + S^{\text{Public Savings}}$$

- Interpretation: domestic investments can be financed either with (?) [ ] savings or with (?) [ ] savings

- A government budget that runs a deficit ($T < G$) subtracts private savings to private investments

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National Accounting

- In an open economy the possible uses of income are the same. But aggregate output will have an additional component, the net export of goods and services:

$$Y^d = \underbrace{C + I + G + CA}_{\text{Sources of income}} = \underbrace{C + S + T}_{\text{Uses of income}}$$

- Rearranging the terms, and remembering that $-CA = KA = K_{in} - K_{out}$, we get

$$\begin{aligned} I &= S + T - G - CA = \\ &= S^{\text{Private Savings}} + S^{\text{Public Savings}} + \text{KA} \end{aligned} \tag{2}$$

National Accounting

- This means that in an open economy savings and investments do not have to be the same: domestic investment can be financed with either domestic savings or (?) [ ]
- Note, one can rearrange equation (2) to obtain

$$S^{\text{Private}} = G - T + I + \underbrace{K_{out} - K_{in}}_{-KA}$$

- Domestic savings can be used either to finance government deficit, domestic investments or the foreign economy.

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Current Account, to sum up

- To sum up, the current account is equivalently defined as (assume constant international reserves)

$$\begin{aligned} \text{CA} &= \text{X} - \text{IM} + \text{X}_{\text{services}} - \text{IM}_{\text{services}} && (3) \\ &= \text{X} - \text{IM} + r * \text{NFA} \\ &= -\text{KA} = K_{out} - K_{in} = \Delta\text{NFA} && (4) \\ &= S^{\text{Private Savings}} + S^{\text{Public Savings}} - I && (5) \end{aligned}$$

- These definitions are equivalent, but offer alternative interpretations for CA surpluses and deficits

Current Account, to sum up

- A country running a CA deficit is absorbing domestically (?) [ ] than it produces, hence will require to import from the rest of the world
- To consume and invest more than it is domestically produced, the economy must attract capital from the rest of the world. This comes from the fact that the domestic economy must borrow from the rest of the worlds the extra foreign currency required to finance its excess in imports of goods and services
- High current account deficits might come equivalently from a (?) [ ] level of domestic investment, a (?) [ ] government deficit or a (?) [ ] level of investments

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- High current account deficits might come equivalently from a low level of domestic investment, a high government deficit or a high level of investments

Exercise 3 on Balance of Payments

- The current account is defined as net exports of services plus / minus net exports of goods
- The current account coincides with the difference between capital outflows and capital inflows / capital inflows and capital outflows
- The current account coincides with the net increase / decrease in net foreign assets (assume flexible exchange rates)
- The current account coincides with domestic investments plus / minus government deficit (not savings!) plus / minus private savings

Exercise 4 on Balance of Payments

Private savings are defined as

1. GNP + T - C
2. GNP - T + C
3. GNP - T - C

Exercise 5 on Balance of Payments

Private savings coincide with

1. I + CA + G - T
2. I - CA + G + T
3. I + CA - G - T
4. I - CA - G - T

An Application

- We can use equation $S^{\text{Private}} = G - T + I + CA$ to think about the results of economic policies
- The identity shows that, for given domestic savings and investments, an increase in the government deficit will imply a current account deficit

An Application

- This is because as government deficit increases, resources are (?) [ ] from private savings to domestic investments. If the savings remain unchanged, the only way to finance the same level of investments is to attract capital from the rest of the world with a current account deficit
- This theory is called Twin Deficit theory
- Let's see a possible application

An Application

- This is because as government deficit increases, resources are subtracted from private savings to domestic investments. If the savings remain unchanged, the only way to finance the same level of investments is to attract capital from the rest of the world with a current account deficit
- This theory is called Twin Deficit theory
- Let's see a possible application

An Application

- Many European countries had to cut government debt as a necessary requirements for joining the Euro area in January 1999
- Under the twin deficit theory, we would expect the EU's current account surplus to increase sharply as a result of fiscal change
- As the following table shows, this did not happen. Why?

An Application

European Union (percentage of GNP)

Year	*CA*	*S_private*	*I*	*G-T*
1995	0.6	25.9	19.9	5.4
1996	1	24.6	19.3	4.3
1997	1.5	23.4	19.4	2.5
1998	1	22.6	20	1.6
1999	0.2	21.8	20.8	0.8

An Application

- The table shows that investments remained unchanged, but savings decreased considerably, offsetting the effect of a decrease in government deficits
- A possible interpretation lies in the Ricardian Equivalence (RE)
- In short, RE states that as government cut taxes and raises deficits, people will respond anticipating future higher taxes and will increase savings today
- In reverse, a decrease deficits through an increase in taxes, leaving government expenditure unchanged, reduces savings. This is what happened in Europe in 1990s

Plan for the Future

- Now that we know the basic concepts from international economics we can finally see what changes to monetary policy under open economy. This is our next topic