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1 Structure and Tasks of the ECB

It might be helpful to first show the two monetary systems the ECB is involved in before starting to write about the structure and tasks of it. What are those two monetary systems? Well, the first one is the **Eurosystem**, and the second one is the **European System of Central Banks (ESCB)**.

But what is the difference?



As of today (2017), the European Union still consists of 2 groups of member countries: those which already have introduced the euro as official currency and those which have not. You can see the latter ones marked dark blue, while the euro countries are medium blue (and the grey ones representing the non-EU countries).

Consequently, the **Eurosystem** contains the ECB and the national central banks of all countries that have adopted the euro, and the **European System of Central Banks** consists of the ECB and all national central banks of any EU member state whether they have adopted the euro or not.

http://www.ecb.europa.eu/ecb/history/ec/html/index.en.html

Here is a survey to show the structure of the two systems and the ECB as the very core of both of them (as of 2017):



Based on: Schuster/Boller: Handlungsorientierte AWL für Bankkaufleute, p. 609

2 Domestic Value of the Euro within the Euro Area / Germany

Domestic value of the euro means nothing more than: What is one euro worth within the euro area, or: How much can we buy for it? With price stability as a vital goal of monetary policy one can also say that this leads to a preservation of the domestic value of the euro: stable prices imply that we can still buy the same amount of a good with one euro.

Thus this book first explains how prices are a result of the counterbalance of supply and demand in the market, and shows how the Consumer Price Index is calculated and serves as an indicator for price changes. We will then focus on how much money is in circulation, as this amount is closely linked to the demand on the market, and how money can be created by both the ECB and commercial banks. Finally, we will learn about how the ECB is able to control and steer the money supply to reach the ultimate goal of monetary policy, which is, as mentioned above: **price stability**!

2.1 Price Stability as the Main Goal of Monetary Policy

In general, prices are determined through supply and demand in the market. From an economic perspective that means that the sum of all offered goods and services (= supply) face a certain amount of money supply (= demand), since those goods and services usually aren't for free. According to that there are 3 possible constellations:



How an imbalance of supply and demand can lead to inflation or deflation, respectively, and what negative influence those two might have on the economy will be explained by the following two examples (based on a starting year, in which the complete supply of goods and services consists of 10 chocolate bars. Those bars cost $1 \in$ each, and the money supply sums up to $10 \in$):

Inflation:

Next year only 8 chocolate bars are produced. Due to the lower supply and unchanged demand the price goes up to 1.25€

Result of higher prices:

demand decreases => companies yield lower turnover and are forced to rationalize => workers get fired => less income of the people will lower the demand even more => companies lose even more turnover and fire workers => ... => the economy suffers!

Deflation:

Next year 12 chocolate bars are produced. Due to the higher supply and unchanged demand the price goes down to 0.83€

Result of lower prices:

Really, demand should go up, but when prices go down people wait for them to fall even more => companies yield lower turnover and are forced to rationalize => workers get fired => => ... (see inflation) => the economy suffers!

b) Possibility to perceive Inflation

- ba) **"Visible Inflation":** Everybody is able to recognize the inflation, e.g. a bottle of milk costs €1.20 instead of €1.00
- bb) **"Hidden Inflation":** Instead of raising the price of that bottle of milk the producer keeps the price unchanged but lowers the content of the bottle, so it still is €1.00, but it only contains 0.7 liters instead of 0.75 as before. Hence, same price for less content equals higher price, but is less perceivable than actually setting a higher price

Words you should know

crawling inflation	schleichende Inflation
trotting inflation	trabende Inflation
galloping inflation	galoppierende Inflation
equestrian	Reiter, Pferdeliebhaber
visible inflation	offene Inflation
hidden inflation	verdeckte Inflation

2.4 "How much money is in circulation really?"

"... we are the guardian of the currency...

2.4.1 Creation and Destruction of Central Bank Money

2.4.1.1. How the ECB Creates or Destroys Cash and Book Money

Meaning: only the ECB is allowed and able to put money (euros) into circulation! Although you will see in the course of this chapter that the commercial banks can create money themselves, the origin of each single euro (be it cash or book money) lies within the ECB which alone decides how large the central bank money supply (that is the complete sum of all issued euros in cash or book

(Jean-Claude Trichet, President of the ECB,

If the ECB puts money into circulation it is called central bank money creation, if it extracts money from circulation it is called destruction of central bank money. How does that work? Here are some examples:

Creation of Cash

money) really is.

Suppose the ECB is at the beginning of the introduction of the euro and intends to put 60 monetary units (MU) into circulation. Everybody can imagine that the ECB won't hand out any money for free, so it buys assets, here in form of foreign currencies (40MU) and securities (20MU), and pays cash.

The first simplified balance of ECB would look like this now:

Assets	Simplified B	Simplified Balance 01		
Foreign Currencies	40MU	Cash Circulation	60MU	
Securities	20MU			
	<u>60MU</u>		<u>60MU</u>	

2.4.2.2. Active Multiple Book Money Creation

2.4.2.2.1 Part One: Individual Rates of Cash Reserves

When receiving new deposits from passive book money creation, a bank will normally try to lend that money as a loan to somebody else for reasons of profit: in general, banks have to pay deposit rates on the savings accounts of their customers, thus they have to cover these interests as well as a certain interest margin (to gain some profit) through lending rates they yield by lending money to customers.

Therefore, when banks use the deposits to grant loans to other customers, their financial scopes increase so they are able to spend additional money, which, again, ends in other people's hands...

Here's a little situation to show how active multiple book money creation really works:

Customer Smith puts €10,000 into his savings account at bank A. The bank would really like to lend the complete amount to somebody else, but there are restrictions to consider: First of all the ECB stipulates all commercial banks to keep back a certain percentage of customers' deposits which currently is at 1% (2017). This rate again has to be deposited at the ECB as the so-called minimum reserve (see chapter 2.6.2.3: Minimum Reserve Policy...). Second, each bank has to keep back an additional percentage of customers' deposits as so-called cash reserve. This is based on experiences of each individual bank, and it is necessary as customers could withdraw their deposits any time, hence the banks have to keep a certain level of liquidity.

Let's assume following data:

Bank A keeps a cash reserve of 20%, grants a loan to customer Myers who transfers the complete amount of the loan to Miss Miller who is customer of bank B. Bank B operates with cash reserves of 30% and grants a loan to Miss Snyder by lending the highest possible amount here.



How much book money has been created out of the original €10,000 in this situation? Think for yourself and find the correct answer in the answer section right after **6**].

Words you should know

deposit rate	Einlagenzinsen (Sparzinsen)		
interest	Zinsen		

2.6.2.3.2 Process of Minimum Reserve System

The ECB's Minimum Reserve System is a constantly ongoing process on a roughly monthly basis. The ECB specifies so-called reserve maintenance periods (varying between 40-50 days and usually for the following two years) which are published online.

Those periods are determined by two deadlines:

First we have the **date of survey** when banks have to report the amounts of respective deposits on which then the **nominal value of the minimum reserve** is calculated. The average of this nominal value has to be kept by the referring bank each day of the maintenance period under review which ends with the **settlement day**. On this day, the **actual value of the minimum reserve** is calculated for each bank so it is possible to do a **target-performance-comparison** to see if a bank's minimum reserve requirements were fulfilled. Then the next period starts...



2.6.2.3.3 Nominal Value of Minimum Reserve

When banks report their amounts of deposits on the date of survey to calculate the nominal value of their minimum reserve, it is important to know which of the reserve coefficients is applicable, so those deposits are divided into three categories:

- > Deposits charged with regular reserve coefficient currently 1% (since 2012)
- > Deposits charged with reduced reserve coefficient currently 0% (since 2012)
- > Deposits with no minimum reserve required

Deposits charged with **regular reserve coefficient** are any deposits **up to a 2-year term**, be it overnight deposits, deposits with both agreed maturity or period of notice of 2 years at most, debt securities issued with maturity up to 2 years or any liabilities (bonds and others) issued by the referring bank on the money market (which, again, represents any financial means up to 2 years).

2.6.2.3.5 Assignments

19) The controller of the Bavaria Bank has reported the following final balances on the date of survey for the minimum reserve period which ends on 27 March:

There are €400m of demand deposits, €130m deposits with remaining maturity of more than two years, issued bonds with remaining maturity of up to 2 years including money market papers amounting to €350m, whereas deposits with stipulated term of notice below two years are €120m. €110m is the amount of deposits with remaining maturity up to 2 years, and deposits with stipulated term of notice extending 2 years sum up to €78m.

€65m of the issued bonds are securely reported to be kept by other banks that are bound to minimum reserve requirements.

During the reserve maintenance period under review Bavaria Bank has kept final balances on its ECB account as follows: From 11 – 17 February €6.8m, from 18 - 25 February €12.8m, from 26 February – 04 March €4.6m, from 05 – 10 March €14.3m, from 11 – 20 March €8.9m and from 21 – 27 March €11.2m.

- **19.1)** Based on the reserve coefficients used so far in this book, calculate the nominal value of minimum reserve for Bavaria Bank (**note: no leap year => no 29 February!**)
- **19.2)** Do a target-performance-comparison based on your result and the reported final balances
- **19.3)** Assume the controller of Bavaria Bank checks on the final balances on 24 March. How many euros would the bank have to keep on the ECB account on average each remaining day of the period to meet the minimum reserve requirement just exactly?

19.4) By how many euros would Bavaria Bank's capacity of granting loans change if ECB raised the regular reserve coefficient by 1% and the reduced one by 0.5%?

20) Assume the ECB only doubles the regular reserve coefficient, leaving the reduced one unchanged: what would be the consequence for Bavaria Bank's book money creation? Explain your opinion based on the following situation: A new customer deposits €50,000.00 to his savings account, Bavaria Bank operates on a cash reserve percentage of 9%.

2.6.2.4 Contingent Policy (Open Market Operations)



Here is another example to see how the ECB allots money by means of a **variable rate tender** (American auction procedure):

22) The ECB plans to put €115m into circulation the following week (again: contingent not published) and initiates a variable rate tender, minimum interest rate still being 0.25%. After 24h the following bids have been placed (in million €):

Bank A:5 for 0.29%, 5 for 0.28%, 15 for 0.27%, 10 for 0.26% and 3 for 0.25%Bank B:3 for 0.30%, 8 for 0.29%, 5 for 0.28%, 25 for 0.27%, 4 for 0.26% and 5 for 0.25%Bank C:1 for 0.30%, 1 for 0.29%, 5 for 0.28%, 15 for 0.27%, 8 for 0.26% and 8 for 0.25%Bank D:5 for 0.30%, 5 for 0.29%, 15 for 0.28%, 40 for 0.27%, 5 for 0.26% and 6 for 0.25%

Note: the ECB allots the contingent according to the interest rates offered, highest ones served first, then second highest and so on until the last interest rate (called **marginal interest rate**) is reached at which banks still get money, even if only a certain percentage (called **allotment rate**) of their original bid.

22.1)

Just to revise: What kind of policy does the ECB pursue here comparing the two MROs, and what might be a reason for that?

^{22.2)} Try to figure out both the marginal interest rate and the referring allotment rate at this marginal interest rate. The table below should support you while "playing ECB":

Bids (in million euros)							
Interest rate p.a.	Bank A	Bank B	Bank C	Bank D	Sum of bids per interest rate	Rest of planned contingent	
					-		
	liete	pr -r	TITSC	he	Augus	st 2017	
					i dgd		
Total							

22.3) How much money does each bank get here?

Finally, this example shows the difference between **Dutch** and **American auction procedures**:

Dutch:	The complete allotted amount is debited with one uniform interest rate, and that is the marginal interest rate that derives from each tender. In this case, how much interest would bank A have to pay here?
American:	Each allotted amount is debited with the individual interest rate the bank offered in the respective bid. So, what would be the interest here for bank A?
	(In order not to reveal the solution here you find the matching interest rates back in the answer of 22.3) as well!)

22.4) Calculate for bank D how much interest it would have to pay in this situation for both the Dutch and the American auction procedures. (Remember: the ECB uses the "euro interest rate method (act/360)" for calculating interest in open market operations, that means each month is calculated per calendar, but the year is considered to have 360 days in total)

3 External Value of the Euro

3.1 Introduction

Chapter 2 and all its topics have one thing in common: the focus on the domestic value of the euro, expressed by both the inflation rate and the change of purchasing power or, to be exact: How much value has 1 euro in the euro area, or: How much can I possibly buy with it there?

This third chapter, however, puts the stress on the external value of the euro. How should we consider the value of the euro abroad or how much can we purchase with one euro in other countries? The external value is expressed by the exchange rates at which the euro trades for another currency on the foreign exchange market: if the euro trades higher than, for example, the dollar, then the external value of the euro has increased in comparison to the dollar, and we get American products cheaper now.

There will be some information about quotations and the exchange rates themselves to enable the reader to understand the development of exchange rates, possible reasons and possible consequences deriving from it.

3.2 Forms of Quotations

There are two possible forms of quotations with which it is possible to compare the exchange rates of two currencies:

Indirect Quotation	Direct Quotation		
Fixed base: domestic currency Variable base: foreign currency With indirect quotation the exchange rate defines the amount of foreign currency you get for 1 unit of domestic currency.	Fixed base: foreign currency Variable base: domestic currency With direct quotation the exchange rate defines the price in domestic currency you have to pay for 1, 100 or 1000 unit(s) of foreign currency.		
From 01 January 1999 this form of quota- tion (that has its origin in the Anglo-Saxon area) has been used in the euro area	Before the euro was introduced on 01 Ja- nuary 1999 this form of quotation had been used in Germany and other countries		
Example: 1 EUR = 1.2575 USD	Example: 1 USD = 0.7952 EUR		

27) Try to find any relation between the two examples and explain it thoroughly!

The following chapter will only deal with the indirect quotation as it is the one which is applied throughout the euro area.

quotation	Kursnotierung
exchange rate	Wechselkurs
indirect quotation	Mengennotierung
direct quotation	Preisnotierung
fixed base	feste Bezugsgröße
domestic currency	Binnenwährung
foreign currency	Fremdwährung
Anglo-Saxon area	angelsächsischer Raum

Words you should know

4 Answers

1)

CPI 01 =	3×3.30 € + 2 × 2.10€ + 4 × 1.05€ × 3 × 3.00€ + 2 × 2.00€ + 4 × 1.00€	100 = <u>18.30€ x 100</u> = 17,00€	= <u>107.65%</u>
CPI 02 =	3×3.30 € + 2 × 2.00 € + 4 × 0.90 € × 3 × 3.00 € + 2 × 2.00 € + 4 × 1.00 €	100 = <u>17.50€ x 100</u> = 17.00€	= <u>102.94%</u>

Don't forget: No matter how much was bought in the year under review, always use the quantity of each good/service of the starting year since only the change in price is to be measured, not the change in quantity!

2)

Periode 01:

 $\Delta P01 = \frac{107.65}{100} \times 100 - 100 = + \underline{7.65\%} \quad \Delta KK01 = \frac{100}{107.65} \times 100 - 100 = \underline{-7.11\%}$ Periode 02: $\Delta P02 = \frac{102.94}{107.65} \times 100 - 100 = \underline{-4.38\%} \quad \Delta KK02 = \frac{107.65}{102.94} \times 100 - 100 = \underline{+4.58\%}$

€230.00

3)

Year 2:

Year 1: $50 \ge 1.00 + 2 \ge 0.00 = 0.000$

2 x €85.00

50 x €1.20

€230.00 - €210.00 = <u>€20.00</u> 1 7 <u>€20.00 × 100</u> = <u>9.52%</u> €210.00

4.1)

Lily's basket of goods	Price / unit in starting year	Quantity in starting year	Value in starting year	Price / unit in year 1 under review	Value in year 1 under review	Price / unit in year 2 under review	Value in year 2 under review
News- papers	€7.50	2	€15.00	€8.00	€16.00	€8.20	€16.40
chocolate	€1.00	20	€20.00	€1.10	€22.00	€1.20	€24.00
soft drinks	€1.50	30	€45.00	€1.40	€42.00	€1.60	€48.00
cosmetics	€1.00	30	€30.00	€1.10	€33.00	€1.20	€36.00
cinema	€6.00	2	€12.00	€6.00	€12.00	€6.50	€13.00
Value of of go	basket oods		€122.00		€125.00		€137.40
Consum Inc	er Price lex		100%		102.46%		112.62%
Inflatio Raise of A	n Rate / Allowance		0%		2.46%		9.92%

=>