universität wien

DIPLOMARBEIT

Titel der Diplomarbeit

„Monetary Policy And Its Impact On The Linkage Between Short-Term And Long-Term Interest Rates“
- An Empirical Study -

Verfasser

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Angestrebter akademischer Grad

Magister der Sozial- und Wirtschaftswissenschaften
(Mag. rer. soc. oec.)

Wien, im April 2010

Studienkennzahl lt. Studienblatt:	157
Studienrichtung lt. Studienblatt:	Internationale Betriebswirtschaft
Betreuer/Betreuerin:	Univ.-Prof. Dr. Erich W. Streissler

Abstract

The basic aim of this work is to give a review of monetary policy and also to distinguish between short-term and long-term interest rates. Monetary policy represents the entirety of all instruments used by policy-makers following specific monetary goals. In general, policy-makers are represented by central banks which have the power to influence a nation's economy. In this paper, different ways of targeting are discussed and illustrated by dint of an empirical study which covers the last three decades and the geographical areas of the United Stated of America, the United Kingdom and the Euro Area. The short-term interest rate is the most basic and important factor in this work. It is directly influenced by the monetary policy of any given central bank. Usually, these policies are employed in order to react to certain events. Hence, a data analysis of the different trends in certain areas shows specific goals. As far as the theoretical framework of this thesis is concerned, I will combine the results of short-term interest rates with long-term interest rate data, and round off this, in my opinion, precise survey, with diagrams, which are meant to exemplify the linkage between short-term and long-term interest rates.

Additionally, I would like to stress the fact that all the tables and figures used in this thesis were developed and analyzed by myself. However, the different *internet-databases* described in *Appendix A* and in the *Bibliography* provided the background and the necessary tools for the data-acquisition for this work.

Acknowledgment

In the course of this work's preparation I especially have to thank Prof. Dr. Erich W. Streissler for inspiring in me the huge interest in this specific financial topic which has its origin in the banking, financial and macroeconomics sector. *"His course Money and Banking opened up my eyes..."*

Furthermore I want to thank my family, my parents and my brother outstanding, for sustaining my tics during the work's long creation which was not that easy to handle from time to time.

I also have to give a special additional acknowledgement to all my close friends who always pushed me forward in finishing my thesis and encouraged me all along – you know who I mean.

"Thank you so much..."

Vienna, April 2010

Christian Dolenz

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List of Abbreviation

(t+m)	Time Period, Inflation-Gap
(t+n)	Time Period, Production-Gap
$(y_t - y_t^*)$	Production-Gap
$(\pi_t - \pi^*)$	Inflation-Gap
BoE	Bank of England
CAPM	Capital Asset Pricing Model
CPI	Consumer Price Index
CPI-gap	Consumer Price Index Gap
DBB	Deutsche Bundesbank
DE	Germany (Deutschland)
EA	Euro Area
ECB	European Central Bank
EMU	European Monetary Union
EONIA	Euro Overnight Index Average
ERM	European Exchange Rate Mechanism
ESCB	European System of Central Banks
E_t	Generated Expectations, Central Bank
EURIOBOR	Euro Interbank Offered Rate
EuroStat	Database, European Commission
FED	Federal Reserve System
GDP	Gross Domestic Product
I	Investment
i	Rate of Interest, Nominal

i^*	Rate of Interest, Nominal, Weighted, Observed Ex Post, Time Period *t*
i_0	Level of Interest Rate in Equilibrium
i^r	Rate of Interest, Real
i_t	Effective Rate of Interest, Nominal, Time Period *t*
L	Demand of Money
M	Supply of Money
NCM	New Consensus Macroeconomics
OECD	Organization for Economic Cooperation and Development
R	Return, Nominal
R^r	Return, Real
S	Savings
t	Time Period
UK	United Kingdom
USA	United States of America
Y	National Income
Y_0	Level of National Income in Equilibrium
y_t	Effective Gross Domestic Product, Real, Time Period *t*
y_t^*	Potential Production of one nation's economy, Real, Time Period *t*
ε^*	Normal Distributed Error, Not Correlated
θ	Weighting Factor, Inflation-Gap
π^*	Rate of Inflation of Central Bank, Targeted
π^e	Inflation, Expected
π_t	Rate of Inflation, Time Period *t*

Φ	Weighting Factor, Production-Gap
Ω_t	Bulk of Expectations

1. Introduction

1.1. Motivation

My motivation for choosing this actual financial topic with its origin in macroeconomics and banking theory was a course in university held by Prof. Dr. Erich W. Streissler named *Money and Banking*. He illustrated theoretical financial approaches by means of actual financial events. Suddenly, frameworks and complicated formulas became easy to understand, and with his long-lasting experience in this sector, he was able to mesmerize each student, including myself.

Moreover, some critical incidences in the financial sector which occurred in the last few years have also influenced my selection of this issue for my thesis. Worldwide recession, the credit crunch and the sub-prime crisis, terror attacks and wars have influenced the economy drastically. The basic question is how things are connected and how they are regulated behind the curtains.

Why do the globalization and the credibility of banks play such an important role nowadays? Why are some financial factors important in a certain decade and more or less negligible in others? Why can interest rates reach a maximum of historical importance at one point in time, and are then followed by an era of interest rate-levels in the range of zero?

As I pointed out above, these issues will be analyzed and discussed in the theoretical part and in the empirical study of this thesis.

1.2. Brief Overview

Chapter 2 of this work deals with the basic theory of Hicks. Although his ideas have their origin in the early thirties of the last century, the conclusion of his assumptions is up-to-date, so that contemporary events can be expressed by the meaning of these results. Essentially, the influence of the interrelationship between different financial and monetary factors on national economy is illustrated.

In *chapter 3*, the relation between short-term and long-term interest rates will be discussed, and hence the Taylor Rule plays an important role in this chapter. Interest rates depend on monetary policy and are regulated by central banks. The Taylor Rule is very useful for a forecast of the behavior of central banks. The money and the capital market, which constitute the stages of interest rate settlement, are also distinguished.

Monetary policy in theory is the topic of *chapter 4*. Central banks which represent monetary policy-makers are the essential topic here. Basically, it will be demonstrated which systems are used by the different banks, and which goals they are trying to achieve by targeting specific factors via open market operation.

However, the most important sector is illustrated in *chapter 5* – the connection between short-term and long-term interest rates. Because policy-makers not only regulate the short-term money market but also have influence on the capital market (on a long-term basis), I will stress how special variables are interrelated and can be guided by monetary policy.

Chapters 6 and *7* illustrate the theoretical rudiments on the basis of the empirical study. It summarizes the last three decades and tries to point the differences in monetary policy between the USA, the UK and the Euro Area. Due to the basis of the theoretical chapters before the different kinds of targeting and implementing monetary policy by the central banks are shown following the trends over specific time periods.

Finally, *chapter 8* will provide a summary of the key findings from the data analysis. Additionally, critical aspects will be addressed and thus this last chapter can be read as a conclusion of my paper.

2. The Basic Theory of Hicks

The work of John R. Hicks with the name *"A Suggestion for Simplifying the Theory of Money"* was published in London in 1935. It is based on the existence of the theory of value, from which in turn the so-called theory of money is derived. In essence, these theories deal with frameworks which serve to demonstrate how monetary systems work. Even though Hicks was not an educated economist, he tried to express his own view of the world of money, and how it can be influenced by various factors including the behavior of individuals and by various risk factors. In general, his paper criticizes the epoch's monetary theory. In my opinion, it can serve as a useful reference for contemporary economists. Especially in these turbulent times of financial crises and crashes, economists can make good use of it to broaden their horizon in terms of monetary understanding.

2.1. The Conception of Marginal Utility

Hicks first stresses that the general inability to understand what really should be taken into account, in terms of theory of value, is the limited view of economists who always only look at the same frameworks and equations that try to demonstrate how the world of money is working. The most common equation of them, *the quantity equation*, states that the price of goods multiplied by the quantity of goods equals the amount of money which is spent on them [Hicks, J. R. (1935a)]. Derived in the century before the paper of Hicks was published, this framework has evidently problems to adopt it, even more in terms of present financial and economic observations. He alludes, taking the marginal utility into account, is the only reasonable possibility to implement a framework. This idea has been taken into considerations before[1] but never been yielding to any satisfying marginal utility theory of money. Since the research of Pareto and Wicksteed, who derived a good working conception of marginal utility, it is clear that money also must have a marginal utility [Hicks, J. R. (1935b)].

[1] See Wicksell and Mises.

Later, Hicks picks up one of Keynes' theories that represent the idea of a so called price-level of investment goods. It evidently depends upon the relative preference of the investor – to hold bank-deposits or securities [Hicks, J. R. (1935b)]. This is supplemented by Hicks with the conception of *marginal utility*[2] which leads to the ability to form a theory of money.

2.2. Preferences regarding the Holding of Money

There exists a main recommendation concerning one individual's choice. If someone wants to reduce his holding of money he can do that like this:

- By spending, i.e. buying something;
- By lending money to someone else;
- By paying off debt which he owes to someone else.

For an increase of one individual's holding of money there are also three different ways to do so:

- By selling something else which he owes;
- By borrowing from someone else;
- By demanding repayment of money which is owed by someone else [Hicks, J. R. (1935c)].

These explanations actually make sense and are encouraged by one simple case. If one individual has a certain amount of money, or let me call it capital resource, he or she has the choice to deplete it for present wants or hold it for future needs. It now depends on the individual's preference of how he or she wants to act in each specific case. Usually, either one, or a combination of the above-mentioned potentials is realized. Nevertheless, it has to be mentioned that the majority of people will not spend all of their assets right away.

[2] See Pareto and Wicksteed.

In addition, another interesting thing comes up when the rate of interest is taken into account. On the one side, there is holding money, which is normally preferred, and on the other side, there are capital goods. Here, it is curious to note that capital goods have a positive rate of return, but money does not. In comparison to lending or paying off debts, the act of holding money is not very profitable.

This now leads to one of the basic pillars in terms of a theory of money: *"Why do people prefer to hold their capital resources when it evidently does not yield to a positive rate of return?"*

2.3. Cost of Transfer, Duration and Net Advantage

Now I come to the point at which transferring assets from one to another apparently indicates specific costs. These costs are the reason why individuals are generally frightened of investing only for short periods. It is, in other words, because of arising accumulating expenses. I think that a more detailed explanation is in order here.

The factor of most interest is the *net advantage* of a given amount of money which is invested. It is derived from the means of interests of profit earned minus the costs of investment. The transaction is only meaningful if the outcome is positive and amounts to less than the cost of investment. Now let me assume:

- We neglect, or better keep unaffected, the amount of money invested and the duration for which it is invested;
- We keep in mind that, with these two factors, we have increasing expected interest and;
- That the costs of investment are thoroughly autonomous of the duration, and they intensify as the amount of invested capital amplifies.

The result leads me straight to the claim that it is more profitable to hold a relatively small amount of capital resources – money – for periods with short durations, than to invest it. It is only worthwhile for investments for a specific level of invested capital and for a specific duration (both will not be allowed to be undertaken).

There are various other important factors which influence this topic, however, I am now able to point to the three main pillars through my observations: *cost of investment, expected rate of return on this investment, and the period of time until payments are made – the duration.*

To round off this part of the discussion, I would like to underline that in order to yield a low demand of money the following equation can be applied:

- The further ahead the future payments;
- The lower the costs of investment and;
- The higher the expected rate of return on the investment.

2.4. People's Expectations, Uncertainty and Upcoming Risk Factors

If one thinks about an individual's behavior regarding his or her expectations of the future, the probability that a person has precise notions of what could or should happen to his or her money is rather low. In terms of risk, a secure position is replaced by a bundle of risky ones, which might yield a much higher positive return but could also lead into a negative one – a loss. On average, people cannot know beforehand when or if they will need a specific amount of money at a specific date in the future. This is exactly the stage where risk-factors are taken into account.

The uncertainty of a specific period can be increased or decreased, both by objective facts, as well as by subjective ones. Generally, it can be said that uncertainty inhibits an individual's willingness for investments. Furthermore, the uncertainty of the yield of investments has to be mentioned. This second factor also leads to a certain feeling of inhibition for investments.

In the end it can be pointed out that these risk-factors, which act like a deterrent for investments, generally yield an increasing demand for money at the present moment.

2.5. Total Risk, the Law of Large Numbers and the Relation between Lenders and Borrowers

Until now, I have singled out and analyzed various risk-factors by themselves But what about the total risk? In order to explain this point, it is useful to keep in mind the *law of large numbers*[3], which is also used to derive the total risk of portfolios[4] in terms of *asset pricing theories*. To invest into a portfolio with several titles, which all have their own risks, will finally lead to a total portfolio-risk. This total risk can be minimized through diversification effects. In other words, the more titles there are inside a portfolio, the less the total risk of it, because the majority of titles with "good risk" will intercept the few ones with "bad risk".

In fact, however, it is not that simple to realize a reduction of total risk. The need for a suitable amount of money for investments – only few people really have these resources; and even then, the inability of individuals to diversify the total sum of it in a qualified way by using the law of large numbers has to be taken into consideration – limits the opportunities drastically. If one wants to reach a total risk-position that is close to the preferred one of the individual, the capital resources should be divided into two parts. The first one is devoted to more or less risky investments with diversification effects, and the second one is devoted to secure investments. Therefore, only a good objective sensitivity for secure and risky investments, and, on top of this, a sensitive mind about preferences and distribution, can lead to satisfaction.

There are individuals who possess an extended amount of capital resources and are able to diversify their total risk, in any form whatsoever. If these individuals decide to become borrowers, they will suddenly be "safe" because of their ability to command that specific amount of money. People without this ability will only choose to hold money if they are not offered any safe possibilities of investments. My point is that

[3] The mean of random variables in the long-term are defined through this rule. The sample mean will stay close to the expected value, if its values are repeatedly sampled, as the numbers of these observations increase, with given random variables with finite expected value.

[4] See Markowitz and the Markowitz Efficient Portfolio Theory. Further the Capital Asset Pricing Model (CAPM).

holding money is the only real substitute for safe investments. Thus, it can be concluded that as soon as safe investments turn into substitutes for holding money, the demand of money is reduced.

This basic assumption is made use of by many institutions which compete in the monetary world: banks, insurance companies, governments and other big firms. These are what I call “safe” institutions, as they offer different kinds of financial substitutes for holding capital. Normally, their promises to pay render this “circle” possible. Bank deposits are, therefore, enabled to substitute money to a greater extent, because the cost of investment is reduced by a general belief in the absence of risk [Hicks, J. R. (1935d)]. But in the present situation of financial crises and crashes, one must be aware of the inherent inability of the system to keep these promises.

That now leads me to the topic of bank credits and other contracts between borrowers and lenders. If an individual deposits capital in a bank, this does not lead to any change in his or her liquidity-position because this bank deposit is equivalent to money. On the other hand, the deposit is mainly worthwhile for the bank because that way, it can improve its liquidity-position. If one assumes that an individual with a credit which is higher than the average – in terms of rating – wants to become a borrower it only can be a more or less voluntary action, particularly if he does not really need a loan. Subsequently, he or she has to pay interest on it which puts the individual in a worse situation than without that loan. If this addressed rating of the borrower is relatively high, the liquidity of the lender – the bank – will not be impeded much. Another effect is that the demand of money by the lender – the bank – finally is less than without having made the loan.

It can be said that for obtaining a specific lender’s liquidity-position, a so-called purchase of capital goods by the borrower is the most important feature, more important than a sale of capital goods by the lender on his own. This net effect of a loan is generally described as inflationary[5].

[5] Inflation is the rate at which the general level of a good’s or service’s price is increasing.

On the other hand, it also has to be mentioned that a situation of deflation[6] is also possible. A deflation takes place if borrowers with relatively low credit – in terms of rating – enter the monetary circle. The result leads to very high rates of interest for loans offered by the lender – the bank – and this in turn causes an evident detraction of the liquidity-position and, in order to re-establish this position, in a strongly reduced offer of risky titles combined with a much higher amount of capital.

Simultaneously with this so-called voluntary borrowing and lending, which manifests in monetary expansion accompanied by increasing prices, distressed borrowing arises. This dubious policy is put into action when lenders force people to make loans they actually do not need and want, with the main aim to restore their own liquidity-position. Essentially, this method is applied during periods of world-depression[7].

2.6. Assets, Liabilities and the Banking Theory

I have already pointed out that the examined theory of money does, above all, represent an extension of the known theory of value. Now, I will analyze the situation of private individuals. The most important factors for my considerations are *income and expenditure account*, both of which are influenced by the individual so that he or she can attain his or her preferred position. Likewise, there is the production side with a profit and loss account, which is more or less similar to the previous example. As far as the theory of money is concerned, Hicks now argues that the only way to achieve a framework is to apply equal factors, however, not for income accounts, but for capital accounts. The fundamental point is to focus on the factors which affect assets and liabilities.

[6] Deflation is the extended reduction in prices that also has the potential to undermine the economy by stifling production and increasing unemployment.

[7] Depression is a period when excess aggregate supply overwhelms aggregate demand, resulting in falling prices, unemployment and economic contraction. It is the superlative of a recession which represents a temporary downturn in economic activity, usually indicated by two consecutive quarters of a falling GDP (gross domestic product).

In fact, monetary policy can be seen as a form of banking theory, but more in a general sense, as each individual is perceived as and treated like a small bank. The only difference is that banking theory is limited through legally obligatory reserve ratios.

The analysis of assets and liabilities, which can be represented through a simple balance sheet, entails an attempt to reach an equilibrium which is affected by anticipation and risk. The first one influences assets and liabilities in the same way. The second one, we already went through it before, is divided into risk influencing the period of investment, and risk influencing the yield of investment. Speaking of the factor of investment, it can be mentioned that any investment represents some sort of starting-point for a production-process. This production-process can either obtain a specific positive return if it is not interrupted or a huge negative return if an interruption takes place. As far as risk is concerned, I am now able to stress that a short run optimism will usually be enough to start a Stock Exchange boom, but for an industrial boom, long run optimism is necessary [Hicks, J. R. (1935e)].

Finally it can be said that, in terms of equilibrium, we must distinguish subjective factors which influence anticipation and objective ones that influence prices. The gap between them leads us to the assumption that the theory of value must be much more precise than the theory of money.

2.7. Wealth, Money and Prices

According to the theory of one individual's equilibrium, we can emphasize some factors that impair it: *price, anticipation and a change in total wealth*. In spite of the fact that these terms are taken from the world of the theory of money, the last one in the list, total wealth, does have an equal counterpart in terms of a theory of value, namely total expenditure. But how does one individual's demand for money react to a change in total wealth – in terms of a theory of value to a change in total value of net assets?

In the past, there have been attempts to answer these questions by employing basic assumptions, which are, I might add, quite interesting. Marrod[8], for instance, came

[8] See Marrod: "Expansion of the Bank Credit".

up with the proposition that under certain theoretical conditions, the whole banking system must have a more or less secure stability. In practice, however, this assumption was promptly refuted because it is not that simple. One special factor has to be taken into account here: *wealth*. Furthermore, it was claimed that the demand for money increases in proportion to total net assets.

Consequently, Marrod's idea of the theory of money was adopted. The attention to *anticipation*, which now had been very strictly distinguished from prices which are variables inside the theory of value framework, became more important. Finally, the statement that the demand for money increases proportionally to the total net assets lost its validity, because wealth can either lead to an increase, or a decrease in the demand of money.

In order to demonstrate the sensitivity, but also the oddity of the whole system, let me assume that the demand of money is set to be totally independent to changes in wealth. For one individual who is trying to increase the holdings of money, prices will decrease and drop down to zero, and on the other hand, an attempt to decrease the holdings of money will increase the prices up to infinity. If there is also an extremely high demand of money, this system can only work by continuous adjustments of the supply of money.

In such a peculiar environment, a fast-acting increase in savings leads to:

- The provision of better-paying money accounts than expected on the security owner's side, and to;
- Smaller ones on the consumption-good producer's side.

The exertion to restore these holdings of money will yield:

- A higher purchase of securities by security owners themselves;
- The reduction in purchasing consumption-goods on their producer's side;
- A swing of prices;
- A price-reduction of consumption-goods and;
- Increasing prices of securities.

These extensive effects can only be stopped if:

- Security owners start buying goods of the producers or;
- Producers start selling securities.

According to the facts listed above, which close the gap between money and prices, it becomes obvious that any prediction of points in time relating to an entering in such a period is very difficult to handle.

2.8. Sensitivity, Monetary Stability and the Dilemma

Until now, I have analyzed two fundamentally different conceptions of environment: a stable and an unstable one. What is really needed now is something in between these two extremes. Thus, let me assume that an increase in wealth constantly leads into an increase in demand of money. However, this time one will not be in direct proportion to the other, as opposed to the case discussed above. Furthermore, one has to bear in mind that there are two types of individuals: *the sensitive and the insensitive ones*.

This entails a higher sensitivity to changes in anticipations for the former type. Accordingly, an increase in wealth will lead to a decrease in demand of money. To characterize the second type, one has to see that it holds the majority of the community's stock, which results in an insensitivity to changes in anticipation. This implicates the absence of incentives to reduce the demand of money. In other words, an increase in wealth yields an increase in demand of money, more or less proportionally, and a decrease of it results in a reduction of that demand.

If this assumption is correct, price-fluctuations will be cranked up very easily, and Stock Exchange booms will lead into industrial booms. Additionally, a depression of Stock Exchange will then result in industrial depression. Accordingly, it can be pointed out that periods of fluctuations are on the one side characterized by distribution of sensitivity, and on the other side by a distribution of the production periods between the different kinds of industrial units.

The appearance of these increasing fluctuations is the result of insensitive individuals who keep whole circle stabile and who are trying to reduce the costs of asset-transfer, in order to create capital. This cost-reduction can only be achieved through the aid of institutions like banks, or by a more focused view of individuals on lowering costs.

The inherent dilemma here is that these capitalistic factors are an adversary of stability. An analysis of the present situation reveals that financial crises and crashes are an unavoidable result of ill economic policies which are employed to keep monetary stability, but evidently, they do not live up to that promise.

Hicks, for instance, suggests to implicate tariffs. These instruments create relatively small losses for the majority of individuals, but at the same time generate huge gains for a couple of recipients. One could call this practice unscrupulous, but in fact it works.

To sum up my investigation, it can be said that economists are having a tough time finding a relatively appropriate way to combine their conscience with the strong will to find the right conception for obtaining monetary stability.

3. The Conception of the Taylor Rule

John B. Taylor, who was born in 1946, is a teaching professor at Stanford University and indeed one of the most relevant economists of our times. He is an expert regarding the subject of monetary policy, and has served in several governmental institutions and administrations. In 1993, after years of service at the famous universities of Princeton and Columbia, he published his paper about the so-called "Taylor Rule". The main idea of this work is to provide a specific framework for all central banks which enables them to analyze monetary policy effects in terms of interest rates.

In the following years of investigation and criticism, the original rule has been adopted by some economists, but also continuously extended by others. As far as my reflection is concerned, I will provide a few new ideas which should be taken into account in my view, however, I will not go into detail with these. After all, the most important point is to understand the main concept of the rule in terms of its effects on interest rates.

First of all, it is important to understand how the Taylor rule is working.

3.1. Real and Nominal Interest Rates

In order to get a better understanding of the topic, the two basic types of interest rates have to be distinguished first. However, inflation, which is the key to the difference between real and nominal rates, will not be discussed into detail here.

The nominal rate of interest i is defined by the real rate of interest i^r to which the expected inflation π^e is added. It represents the expected changes in price level. Furthermore, the real rate is derived from the nominal rate i, from which the expected inflation π^e is subtracted. It can be expressed by the following formulas [Mishkin, F. S. (2007b)]:

$$i = i^r + \pi^e$$

Formula 1: Nominal Rate of Interest

$$i^r = i - \pi^e$$

Formula 2: Real Rate of Interest

The equation for the nominal rate of interest i is a simplification of Fisher's[9] formula:

$$i = i^r + \pi^e + \left(i^r * \pi^e \right)$$

Formula 3: Fisher's Equation

As far as this specific analysis is concerned, the real rate of interest i^r is the most important factor because it is already diminished by the impairment of inflation on the cost of borrowing. It has to be stressed here that the real costs of borrowing are represented by the real interest rate. Moreover, a very low level of the real rate of interest i^r leads to higher incentives to borrow – loans will be very cheap – and to little incentives to lend – it will not be as profitable for the lender as with high rates.

In terms of return, it can be said that the nominal rate R is derived from the real return R^r plus expected inflation π^e, and the real R^r by the nominal return R minus the expected inflation π^e. The real return R^r can now be defined as an extra amount of goods or services resulting out of holding a security.

[9] See Irving Fisher: "The Fisher Equation".

$$R = R^r + \pi^e$$

Formula 4: Nominal Return

$$R^r = R - \pi^e$$

Formula 5: Real Return

Since the importance of the real rate of interest was underestimated in the United Stated of the 1970s, only observations based on the nominal rate were carried out. Unsurprisingly, this resulted in misinterpretations. For instance, an extremely high nominal rate of interest led to a deterrence of borrowers, but in fact the real rate of interest was very low. This was actually a huge advantage for the borrower's side because the loans were very cheap.

Only in the year 1997, after the introduction of new systems, the U.S. government did start to close the gap of information, and began publishing the real rates of interest on a current basis.

3.2. Financial Markets

According to Mishkin, financial markets perform the essential economic function of channeling funds from households, firms and governments that have saved surplus funds by spending less than their income or those that have a shortage of funds because they wish to spend their income [Mishkin, F. S. (2007c)].

A differentiation of financial markets can be done in many ways. In terms of maturity I discern between short-term securities with a time-horizon up to one year and long-term securities which last more than one year.

In addition, one can distinguish between a primary and a secondary market. The first is the financial market in which only new issues of securities, such as bonds and stock, are offered to initial buyers. Normally, this type of business runs behind closed

doors. In the second market that has been mentioned, securities which have already been issued can be resold. This is the market place where individuals buy and sell.

Through this observation, the most important distinction between the money and the capital market is made visible. This difference is defined in the following way.

3.2.1. Money Market – German and International Point of View

Generally, the money market can be defined as a financial market in which only short-term debt instruments are traded. This type of financial market is so important because a monetary policy is executed through short-term operations which take place in this very context.

In literature, several definitions from different points of view are given. Schinke speaks about the English, the former German and the modern European definition [Schinke, S. (2004a)].

The English Definition of Money Market

The English version has three main pillars.

Firstly, financial instruments which are traded in the money market only have short maturities, a very good debtor's validity and thus a very low exchange risk. One result of these factors is that international transfers are followed by low transaction-costs and are easy to handle [Wilson, J. S. G. (1992a)]. Usually these securities are traded *"over night"* but also do have maturities of one day up to one year.

The second pillar relies on the different participants in the money market, which are commercial banks, central banks, corporations, brokers, households and governments [Cook, T. Q.; La Roche, R. K. (1993a)]. As far as these individuals are concerned, commercial banks are the most important ones. They operate in the money market and are responsible for the horizontal equalization of liquidity between commercial banks, which means they establish the equilibrium between demand and supply of federal funds. The determined equilibrium-price is called *Federal Funds Rate*. Central banks, on the other hand, provide central bank-money to the money market. They affect and control this market through central bank policy – which is in fact

monetary policy – by the use of open market operations to increase or decrease central bank-money reserves. Finally, there are the governments. Through fixed or variable interest-bearing obligations they borrow in the short run.

The third and ultimate pillar deals with the allocation function of the money market. The hard competition between supply and demand is followed by a better allocation of liquid funds. Furthermore, the loans traded are short-term ones, and have the characteristic of *same day money* or *over night money* which means that they are payable on the same day or in the same night [Wilson, J. S. G. (1992b)].

The German Definition of Money Market

In German literature, three different explanations are given: a narrow, a medium and an extended one.

The narrow annotation is geographically limited to the national money market and is defined as the mutual exchange of Reichsbankgeld-excess and -deficit between commercial banks [Gestrich, H. (1957a)]. It is subject to severe criticism because the role of central banks and non-banks is not taken into account. Moreover, the classification of traded securities is difficult to handle and modern financial aspects are completely disregarded.

The medium definition is characterized by operations between commercial banks and central banks and represents the sum of all transactions between these two actors. In the money market [Lipfert, H. (1975a)]. On the one hand, this specification seems to be realistic, but on the other hand it also limits the geographical context to the national market, which does not represent the actual modern situation.

Finally I would like to address the last and extend version of how the money market is defined in German literature. Here, more participants act in the market and operate via a wide range of transactions. Short-term bank-loans are given to customers, short-term distributor-loans are given to retail and whole sale, and short-term central bank-loans are given to government. Generally, it is defined as the market for short-tern loans [Deppe, H. D. (1980a)]. This whole extend concept is based on the connection between money and capital market regarding their time pattern. But it must be pointed out here that this is not that helpful, neither for scientific nor for practical uses.

In essence, it can be stressed that the former German definitions of the money market have their drawbacks. The main points in the explanation of the market serve as a good basis, but must be extended in terms of limitations and, which is the most important aspect, in terms of a modern and dynamic European thinking.

The Modern European Definition of Money Market

As regards the German definition, it is important to distinguish between the Euro money market and the money market in the Euro Area. This second expression, which is the more modern one, will be discussed later. The Euro money market, however, is part of the whole Euro-market, which is further split up into the Euro-capital market, and the Euro-credit market [Perridon, L.; Steiner, M. (1999a)]. It is independent from governmental intervention and has short run characteristics. Primarily U.S. Dollar deposits are traded in the Euro money market, the accumulation of interest is only executed through supply and demand, and central banks did not intercede. Generally speaking, specialist literature focuses on trading in which central banks are excluded.

It must also be mentioned here that there is a compound of interest between national money markets and the Euro money market. This leads to the individual's latitude concerning the right place for an execution of transactions. Debtors and creditors perform both in the national money markets and in the Euro money market, which is to say they conclude transactions in foreign currencies.

Let me stress my point with an example:

A German bank asks for a U.S. Dollar loan examining both, the U.S. and the Euro money market. Since the Euro money market is not subject to strict regulations, as it is the case in the U.S. market and the claimed interest on the loan is higher in the U.S. market than in the Euro money market, the bank receives the loan much cheaper in Europe than in the U.S.A. Generally I can quote here that U.S. interest on debt is a so-called *"upper limit"* for U.S. Dollar loans in the Euro money market.

In addition, it can be pointed out that deposits in U.S. Dollars in the U.S. money market are endued with lower interest than in the Euro money market. That leads to the claim that interests on deposit are the *"lower limit"* for U.S. Dollar loans in the Euro

money market. In fact, European commercial banks do not need to conduct minimum reserves on deposits to central banks however, banks in the U.S.A. do have to conduct them to the Federal Reserve System (FED)[10].

Finally, it can be claimed that the generation of interest in the U.S. money market occurs through the interaction of supply and demand of liquidity which also has wholesale-characteristics and a compound of interest.

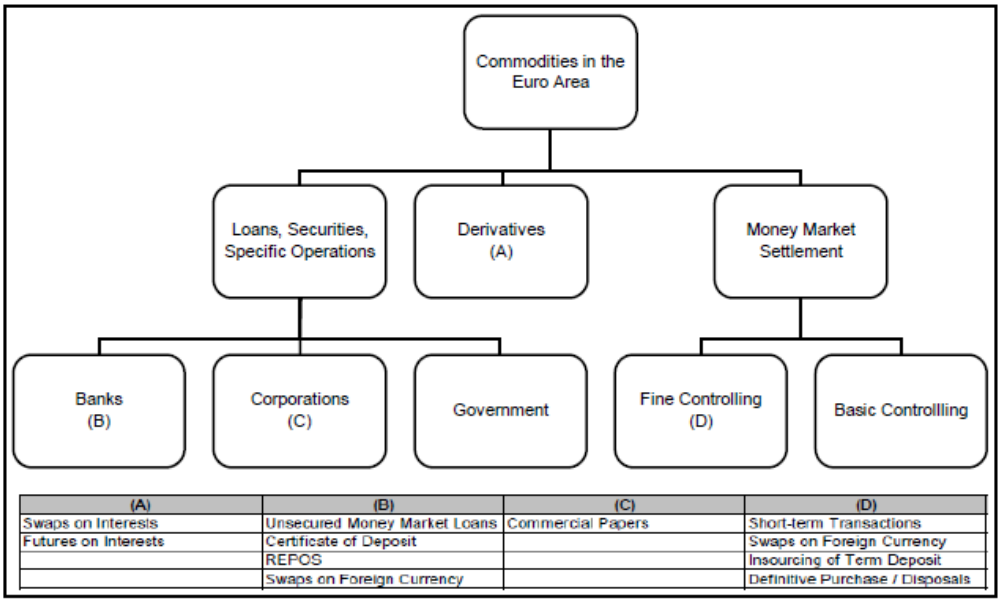
3.2.2. Money Market in the Euro Area

In this chapter several definitions will be given to distinguish the money market from the capital market. In terms of a broad modern disposition of a money market, several branches have to be taken into account: *money trade between commercial banks, business between commercial banks and central banks, the issue of short-term securities through commercial banks, corporations and governments and, last but not least, trading with derivatives.*

The European Central Bank has divided the money market into four categories: *the cash-sector, the sector in which money market securities are traded, the sector for derivatives, and the regulation sector*. Through this regulation sector, central banks are able to intervene in the money market through monetary policy [European Central Bank (2001a)].

For a better understanding of the matter, the money market will be defined according to Schinke`s view, in which it is divided into three main parts which are shown in the following illustration [Schinke, S. (2004b)].

[10] FED: The Federal Reserve System is the central bank system of the U.S.



(A)	(B)	(C)	(D)
Swaps on Interests	Unsecured Money Market Loans	Commercial Papers	Short-term Transactions
Futures on Interests	Certificate of Deposit		Swaps on Foreign Currency
	REPOS		Insourcing of Term Deposit
	Swaps on Foreign Currency		Definitive Purchase / Disposals

Figure 1: Basic Structure of the Money Market

In the course of this paper, I will only examine two of the three main pillars. Within the domain of *"loans, securities and specific operations"* shown in *figure 1*, the branches of banks and governments are the most interesting ones. Furthermore, the domain of *"money market settlement"* plays a basic role in terms of monetary policy.

3.2.3. Capital Market

Mishkin specifies the capital market as one in which long-term financial debt and equity instruments are traded. It is subject to severe price-fluctuations, in spite of the fact that the instruments which are traded in the money market are only faced with small price-fluctuations. The performing securities (stocks and long-term bonds) are held by financial intermediaries, such as insurance corporations and pension funds.

Stocks, mortgages, corporate bonds, consumer and bank commercial loans and government securities can be named as instruments that perform in the capital market. In my opinion, government securities are the most interesting ones. They are issued by governments and used to close a state's deficit. They appear in the form of bonds and

are held by individuals like households, banks and a central bank, which makes them the most liquid securities traded in the capital market.

Financial instruments in the capital market can be defined through three aspects which are characterized by Chouldhry; Johannas; Pereira; Pienaar. The first one that is mentioned is the *maturity* aspect, which is classified as "long-term" regarding maturities of ten years and longer, "middle-term" if we speak about maturities of one year up to ten, and "short-term" less than one year. The second aspect is the *size* of funding, which is described as the amount of required capital. The last aspect combines the *risk* which is borne by suppliers of financial instruments, and the *return* demanded by these individuals as the cost of bearing this risk [Chouldhry, M.; Johannas. D.; Pereira, R.; Pienaar, R. (2005a)].

Capital market instruments are, for example, stocks, mortgages, corporate bonds, government bonds, government securities, consumer and bank commercial loans. In this thesis, long-term government bonds – with a maturity of ten years – are the most interesting instruments, and thus they are also taken into account in the empirical part of this work.

3.3. The Taylor Rule

Generally, the rule developed by Taylor serves as a framework which provides recommendations for central banks. In essence, the degree of intervention of monetary policy into a state economy is represented. As I already pointed out above, this kind of policy making only affects the short-term horizon, in other words short-term interest rates. Besides the short-term goal of stabilizing the economy, the long-term goal of reaching specific inflation levels is also considered.

According to Taylor, the *real* short-term interest rate is determined through three factors:

- What is the actual level of inflation?
- How huge is the gap between economic activity and full employment level?

- What would be the level of short-term interest rate in order to achieve a situation of full employment?

These factors are addressed by different forms of monetary policy in the Taylor Rule:

- *Tight monetary policy:* high interest rates if the inflation level is above the target or if full employment is above the target; used in order to reduce the inflationary pressure.
- *Easy monetary policy:* low interest rates if the inflation level is below the target or if full employment is below the target; used in order to stimulate output.
- If the conditions are not like this (e.g.: inflation level below and full employment level above the target) the Taylor Rule advocates a support of monetary policy-makers in order to reach a suitable level of interest rate.

The Taylor Rule is not only an instrument to guide central bank decisions, but also to evaluate one specific period's monetary policy and to cede interest rate forecasts. This reaction–function uncovers, through simple equations, how sensitive central banks behave to macroeconomic parameters like economic booms and inflation. Essentially, the rule deals with the coherency between short-term interest rates, economic boom and inflation. The only problem was the implementation of the rule. In particular, it was the imperfect information about one period's data[11].

3.3.1. The Taylor Rule – Original Version

In 1993, Taylor published his reaction-function which is basically a description of the FED's monetary policy. The most important pillar is the short-term interest rate (Federal Funds Rate), which displays the basic parameter of the central bank to control

[11] 1993 - 2005: Use of the original Taylor Rule's version by the FED that also entailed imperfect information because of the data's historical point of view. Not until 2005 the FED invented the forward-looking Taylor Rule.

a nation's economy by monetary policy instruments [Taylor, J. B. (1993a)]. In this context it is vital to point out that the FED's interest rate settlement reacts to two factors:

- Deviation between effective inflation and targeted inflation[12]: *inflation-gap*.
- Deviation between effective growth and targeted growth: *production-gap*.

Now I will discuss the production-gap, or gross domestic product-gap (GDP-gap) in greater detail. A national economy's production-capability is defined through the maximum production that can be reached without importing any additional inflation-pressure. This macroeconomic production-capability depends on the quantity of production-factors (capital, labor), and on the available production-technology.

A positive production-gap is only reached if the effective gross domestic product (GDP) is above the potential growth. Similarly, a negative production-gap is reached if the effective GDP is below the potential growth.

By taking a closer look at the inflation-gap, it can be pointed out that it shows the difference between effective inflation and the targeted inflation through the central bank. It is also named consumer price index-gap (CPI-gap) because it is measured through the same.

The Equation

The following formula illustrates the original Taylor Rule of the year 1993 [Taylor, J. B. (1993b)]:

$$i_t = i^* + \phi(\pi_t - \pi^*) + \theta(y_t - y_t^*) + \varepsilon_t$$

Formula 6: Taylor rule – Original Equation

[12] In the following the inflation is described by the consumer price index CPI.

The effective nominal interest rate in period t is defined by i_t. The weighting-factors [Sauer, S.; Sturm, J.-E. (2003a)] $(\Phi > 0)$ and $(\theta > 0)$ are flowing directly into the inflation-gap $(\pi_t - \pi^*)$ and into the production-gap respectively $(y_t - y_t^*)$. π_t is the inflation-rate of period t and π^* represents the targeted inflation of the central bank, y_t stands for the effective real GDP in period t and y_t^* for the potential real production in one nation's economy during period t. Furthermore, the factor i^* is integrated into Taylor's framework and stands for the weighted nominal interest rate of period t that is observed ex post. For this framework published in the year 1993, Taylor used an observed period of time prior to the year 1990, which led to the parameters of $i^*=2$ and $\varepsilon^*=2$. The last element in the formula is ε_t. It is the not correlated normally distributed error. The used distribution for ε_t is: $\varepsilon_t \sim (0, \sigma^2_\varepsilon)$.

Understanding the Model

I will now assume a situation in which the effective inflation rate π_t equals the targeted inflation rate by the central bank π^* (inflation-gap equals zero), and in which the production-gap $(y_t - y_t^*)$ is also closed (equals zero), the nominal interest rate i_t yields the sum of the balanced nominal interest rate i^* plus the error ε_t .This is shown in the following equation:

$$i_t = i^* + \varepsilon$$

Formula 7: Nominal Interest Rate

If $(\pi_t > \pi^*)$ the central bank applies a restrictive sort of policy-making which is also called *tight monetary policy*. Because of the positive inflation-gap, the central bank reacts with an increase in interest rates in order to reduce the inflationary pressure.

If $(y_t > y_t^*)$, the central bank also follows the rules of a *tight monetary policy*, resulting in higher interest rates. This happens in a situation of economic boom (positive production-gap).

Suitable Weighting-Factors

The intensity of a central bank's monetary policy with the aim of closing the inflation- and the production-gap depends on the two weighting-factors Φ *and* θ. The value of these factors is equivalent with the "aggressiveness" of a central bank. In other words, the higher the weighting-factors, the bigger the steps in interest rates. In 1993, Taylor suggested values of $(\Phi = \theta = 0.50)$ for the weighting-factors.

As a result of various studies conducted in the late 1990s, the so-called *"Taylor Principle"* was put forward [Taylor, J. B. (1999a)]. According to this principle, the weighting-factor for the inflation-gap $(\pi_t - \pi^*)$ in the Taylor Rule framework was settled with $(\Phi > 1)$. This is based on the following facts: if a central bank administrates a stabilizing force on the economic progress in a situation of an effective inflation which is higher than the targeted inflation, it has to increase the nominal interest rate by an amount higher than the positive inflation-gap. Because economic subjects react on real interest rates, this really is the only possibility to increase the real interest rate inside a national economy.

If central banks increase the nominal interest rate by an amount smaller than the inflation-gap, the real interest rate would decrease because of the increased inflation compared to the nominal interest rate. This leads into further inflationary dynamics which do not create a stable equilibrium.

This emphasizes that only the real interest rate, as opposed to the nominal interest rate, is crucial for the economy's evolution in the real-economic sector. The nominal interest rate can be seen as a variable in the monetary policy through which an economy can keep its equilibrium.

In the context of the weighting-factor for the production-gap $(y_t - y_t^*)$, it can be claimed that it is $(\theta > 0)$. In various studies conducted by the FED, the weighting-factor for the inflation-gap has constantly been higher than the factor for the production-gap.

Critical Aspects

The concept of the original Taylor Rule has had a positive impact on monetary policy nevertheless it is interesting to note here that this framework is only based on a variety of abstract assumptions.

As far as real GDP and inflation are concerned, real-time data must be available and taken into account. In the early years, only so-called *"flash estimations"* had been available which led to huge miscalculations and to wrong results. In some cases, data from governmental institutions had to be revised several times, and seemingly accurate data turned out to be wrong after years (in the U.S. it was refuted after two years).

According to Taylor, real-time estimations of monetary policy are an impracticality. In other words, they cannot be done because of a misinterpretation of historical policies. One basic assumption in the framework is that central banks only orientate themselves by the means of historical and present data, which means that only already available data is taken into account.

However, the key factor for monetary policy decisions is the orientation towards the future. Incidentally, aspects such as expectations regarding a future economic progress were dealt with by Clarida et al., and these finally led to the *"forward-looking version of the Taylor Rule"* [Clarida, R. J. et al (1998a)].

Another valuable piece of criticism regarding Taylor`s rule is the fact that Taylor's original version concentrated on a nation's domestic economy, a so-called *closed economy*. As far as an *open economy* is concerned, it must be taken into account that factors like foreign interest rates and foreign exchange rates, which tend to have a great impact on central bank decisions, need to be mentioned and kept in mind.

3.3.2. The Taylor Rule – Forward-Looking Version

Caused by the criticism and by the shortcomings of the original Taylor Rule, Clarida et al. developed a forward-looking framework, which was, however, grounded on the historically-orientated rule. The aim of this was to close the gap of information which led into misinterpretations.

By implementing such a forward-looking Taylor Rule, central banks justify their monetary policy on inflation-gap and production-gap expectations. These expectations are defined by specific points in time: *(t+m)* for inflation-gap and *(t+n)* for production-gap where *(m = n = 1, 2, 3,...)* [Clarida, R. J. et al (1998b)].

The Equation

The central bank's reaction-function is now displayed in the following way:

$$i_t = i^* + \phi E_t(\pi_{t+m} - \pi^* | \Omega_t) + \theta E_t(y_{t+n} - y_{t+n}^* | \Omega_t) + \varepsilon_t$$

Formula 8: Taylor Rule – Forward-Looking Equation

The main parameters are the same like in the original Taylor Rule but expanded by the impact of expectation. E_t describes the generated central bank's expectations out of the bulk Ω_t that rely on the available information at the moment *t*. This equation demonstrates that, according to decisions about the nominal interest rate i_t, central banks do take expectations about future economic expansion in period *m* and in period *n* into account [Sauer, S.; Sturm, J.-E. (2003b)]. The variable i^* represents the weighted nominal interest rate of the last years. However, there are no explanations about the proper duration of that period given in relevant pieces of literature. The last factor in the formula, ε_t, displays once more the unsystematic error which is not accounted for by the equation.

The forward-looking Taylor Rule also can be interpreted as the central banks' reaction-function. The expected inflation-gap is derived by the difference between the expected inflation in moment *t+m* and the scheduled targeted inflation by the central bank. The expected production-gap is characterized by the difference between expected real GDP and the expected potential real GDP, in each case in the moment *t+n*.

The key difference is illustrated through the bulk of information Ω_t which now also takes the future evolution of economic growth into account. The sensitivity of the expected inflation- and production-gap depends on the weighting-factors Φ and θ.

4. Theory of Monetary Policy

This chapter deals with the question of how central banks can affect economies, and also with which instruments they can reach their targets. The first important step is to select and evaluate the targets. During the decision-making process, central banks should not act unsuspectingly. After all, they are only a small constituent in a democracy, and therefore they cannot act irresponsibly in the decision-making-process in terms of monetary policy. A central bank's degree of political independence influences the relative targets' significance in terms of monetary stability and full employment.

One of the key objectives is the creation of money which has an immense impact on the development of prices. In recent times, the modern interest rate policy has displaced the monetary aggregate policy. Central banks try to stimulate prices and output directly via specific interest rate instruments.

Monetary policy is constantly competing with other factors, such as political and economic concerns. On the one side, central banks strive to improve their reputation and plausibility continuously in order to prevent labor unions from imposing expansive wage-politics. After all, the constant fear of possible real wage reductions could lead to inflationary pressure. On the other side, financial politics could be interested in inflationary pressure in order to reduce state indebtedness. On top of this, one is confronted with the assent holder's request for stable monetary value.

4.1. The New Consensus Macroeconomics – NCM

In order to push my considerations forward and endow them with a state-of-the-art character, let me now turn to the *"New Consensus Macroeconomics" (NCM)* [Bean, C. (2007a)]. It was invented by Bean in the year 2007, and it deals with the following basic issues [Bain, K.; Howells P. (2009a)]:

- In the long run, monetary policy has no real effects;
- In the short run, nominal rigidities create a trade-off between output and inflation;

- Monetary policy is the principal mean of influencing aggregate demand, and policy is linked to inflation through its ability to influence the pressure of demand;
- Policy outcomes are improved under an independent central bank, and further improved if the central bank operates in an open and transparent manner;
- Ends (a specific inflation target) matter more than means (intermediate targets);
- The management of expectations is critical;
- The policy instrument is the short run nominal interest rate set by the central bank in supply and refinancing of banks' reserves.

4.2. Instruments and Goals

Targets are quantified objectives (or quantified goals), and the achievement of them increases the material well-being of the population [Bain, K.; Howells P. (2009b)]. In the following chapters, the empirical study will demonstrate how monetary goals and targeting have changed their character over the past three decades until the present.

Instruments of monetary policy are variables which the policy authorities control directly, and their value is determined independently from other variables in the system [Bain, K.; Howells P. (2009c)]. The short-term interest rate through which central banks try to stimulate the economy, are of particular importance here. Generally, it can be stressed that the longer the term of interest, the less central banks are able to influence it. Of course, the *monetary base* also can be put under control but as far as this paper is concerned, only the effect of monetary policy on interest rates will be explored.

One of the main challenges for central banks is the establishment of a connection between one specific instrument and the respective targets to obtain the best results. In the so-called *"principle of effective market classification"*, Mundell applied himself to this problem and generated a technique to approach an optimal result. According to him, the main pillars are external (balance in the balance of payments) and internal (full

employment with low inflation) balances, which describe the targets and the basic instruments consist of the monetary (interest rates), as well as the fiscal policy (budget balance) [Mundell, R. A. (1962a)]. He focused on the use of a fiscal policy to obtain internal balance and a monetary policy to obtain an external one in a fixed exchange rate system.

4.3. Open Market Operations

With the assistance of *open market operations*, central banks try to fulfill their monetary policy. Financial instruments are employed to control and guide the supply of money in order to achieve specific targets[13] (interest rates, exchange rates). These operations appear in both, the money market and the capital market[14]. As my professional expertise is limited, I will focus on the money market in the analysis, simply because the effect on interest rates in connection with the different policies is clearly visible in this context.

4.3.1. Open Market Operations in the Money Market

In modern monetary policy, open market operations are more important in the money market than in the capital market. The reason for this can be found in the higher significance of supply of money than supply of credit.

In terms of supply of money, I have to mention that this topic deals with the satisfaction of the want from banks and private economic subjects to hold money. This can be done via central banks which have the money supply monopoly.

4.3.2. The Dilemma between Capital Market versus Money Market

When talking about long-term financing activities, one problem suddenly emerges: *"How is it possible to create and strengthen the position of creditor and debtor in the capital market, which is locally controlled by the long-term interest rate?"*

[13] See chapter 4.4.
[14] See chapter 3.2.

As money supply and credit supply take place in two different markets, they should be observed in terms of monetary policy.

If central banks operated the supply of liquidity trough the capital market, technical errors and fluctuations could negatively influence the allocation-function of the interest rate of the capital market. Even short-term actions could accidentally emit signals that would have impacts on long-term investment decisions.

The central bank is one basic player in the capital market and therefore influences the supply-demand-constellation. Thus, the information-function of the capital market could be disturbed heavily. Interest rate effects could override aspects like inflation-expectations. This illustrates the dilemma between the general aim for relatively undistorted information, and the aim for direct control of interest rate constrained demand rulings for goods.

If central banks intervened directly in the capital market, the interest rate in that market would turn into a political price. Therefore, central banks are likely to be faced with a situation of political pressure, as they are able to influence the cost of interest rates.

To sum up the arguments above, one has to say that central bank money is regulated in a money market in which central banks generally follow three basic pillars:

- The *liquidity* of the whole banking sector has to be maintained which assures that the sector is able to operate, and is not breaking down in crisis. Central banks also can appear as *"lenders of last resort"*.
- *Liquidity-constraints* have to be employed because of efficiency-matters. Central banks must conduct solvency checks, out of own concerns, to implement some sort of selection in the economy.
- If central banks want to influence the *evolution of the business circle* via reactions in the banking sector, the funding-conditions have to be adjusted in correct way, and also diversified.

4.3.3. Money Market and the Short-Term View

As regards the points above, I am now able to maintain that short-term interest rates are the main variable in the efforts of central banks to conduct monetary policy. The short-term interest rate is the rate which central banks claim from commercial banks in the refinancing-business. Operations in this sector are called *"open market operations"*. Usually they are defined as short-term inter-bank loans which are verified through securities that are deposited by commercial banks at central banks. This short maturity increases the flexibility of the whole monetary policy, which implies that conditions of refinancing-operations can be adjusted quickly.

4.3.4. Refinancing-operations

Generally, there are two different refinancing-operations that are distinguished between [Spahn, H. P. (2009a)]:

- *"Fixed interest tender or quantity tender":* Central banks fix the interest and cede the choice of money supply to commercial banks. Fluctuations in money demand do not lead to changes in interest. If central banks determine a specific upper limit for the whole business-volume, this results in a so-called *"oversubscription"*, and this leads to the fact that commercial banks only get a fraction of the desired amount of money.

- *"Interest tender":* Central banks fix an upper limit for the volume of the refinancing loans and usually a minimum interest. On the one side, this implicates that a specific amount of money is auctioned, and on the other side this causes increasing interest rates for an increasing demand of money. There are various types of interest tenders, like the Dutch and the American, for example [Spahn, H. P. (2009b)].

If there is no apparent need for central banks to intervene via stabilizing monetary policy actions, they will choose an action known as *"quantity tender"*, which denotes an elastic refinancing of commercial banks for a fixed interest. Therefore, a change in the policy of a central bank to the *"interest tender"* implicates a restrictive money supply with increasing interest rates. In practice, the difference between the two

kinds of policies does not have a drastic impact on the shortage of central bank money. In connection with this, one important point for central banks is to estimate the commercial banks' need for central bank money in an accurate way. Because the demand of money tends to fluctuate ambiguously, the minimum reserve-obligation stabilizes the demand for central bank money. Therefore, the minimum reserve-obligation assists a better forecast of central bank money. Hence, liquidity is not a prime issue in monetary policy anymore.

4.4. Monetary Policy Targets

In this chapter, several targeting-techniques will be explored. For this paper, the most important one is *inflation targeting*, and thus I will refer to this technique in greater detail. In fact, this alternative intervention of the central bank plays a major role in many countries since the beginning of the 1990s. I will now introduce the advantages and disadvantages of the different techniques of targeting.

4.4.1. Inflation Targeting

Within the scope of policy-making, central banks set a specific level (specific numerical value) for the inflation over an upcoming period in time. Already in the late 1800s, economists like Marshall and Wicksell developed a system with which they wanted to bring the purchasing power of the currency close to an absolute standard.

In the 1990s, the UK implemented this system and it was followed by other countries in Europe. Inflation targeting generally obeys the characteristics below:

- The most important issue is the focus of policy-makers on what they want to achieve, rather than the question of which critical parameters could influence the system or might lead to conflicts. In other words, it is established that a clear aim has to be formulated.
- The specification of an inflation target entails that policy-makers must have a clear notion of their expectations. They can only act under this proposition. Generally, it can be said that decisions which rely on

superior information are more precise than those which do not. One of the key pillars of inflation targeting is to adjust the target. If agents have accurate pieces of information about the inflation level they want to reach, the adjustment process will be shorter.

- The credibility of policy-makers (like central banks) is one other important factor. Sometimes the publication of an inflation target itself can increase the trust in them. This means that clear and transparent targeting makes it easier for others to judge and measure the performance. Therefore, policy-makers always try to reach the aspired target, as their own reputation is at stake.

Due to the arguments mentioned above, policy-makers might be forced to invent a more conservative kind of monetary policy while trying to specify a target. *Formula 9* describes the *loss function* and represents the attempt to implement such a conservative policy [Bain, K.; Howells P. (2009d)][15]:

$$L = (\mathrm{Y}_{t+1} - \mathrm{Y}^{*})^2 + \lambda(\pi_{t+1} - \pi^{T})^2$$

Formula 9: Loss Function

The most interesting point here is how the loss function is formulated and where the target comes from.

Although inflation targeting is the most popular and important kind of targeting, some critical aspects must not be disregarded.

Choice of the target: Usually monetary policy-makers use a target in the area of 2 percent p.a. increase in the general price level [Bain, K.; Howells P. (2009e)]. The main idea in defining the target is to avoid negative inflation. Normally shocks have impacts on policymaking, and therefore the best output for central banks is to obtain a

[15] General loss function which represents the interest rate in terms of Taylor, in order to reduce that loss.

means, for a certain period of time, that is more or less equal to the target. In order not to change the price level, it is clear that policy-makers therefore try to target a positive inflation rate, as they also have to keep the existence of variance in mind.

However, extreme situations are likely to arise if the target is set too close to zero. This then leads to falling prices, which is particularly bad, since prices should not be changed. This fact has its origin in the monitoring of the index and in the use of different update periods. For instance, an increase in the price of specific goods or services affects the cost of living in the way the weights are set prior to the price rise.

Another problem emerges in the context of labor market thoughts. Normally the market has a clearing function when it is in equilibrium. If one assumes that a decrease in nominal wages is not possible this will lead into a situation in which the equilibrium in real wages is not given. The effect is that the market is not cleaned. Therefore, prices have to be increased, as this is practically the only way to handle the problem, dealing with a low level of positive inflation.

If policy-makers yield a positive inflation, negative real rates of interest can be established. Therefore, if prices are decreasing, with a zero nominal bound of interest rate, the whole monetary policy-making can become ineffective. In terms of the present economic situation, and the fact that we are in a deep recession, negative real rates are needed but cannot be obtained.

Choice of the measure-index of inflation: The biggest challenge is to find an index, which represents the changes in the level of prices of individuals most precisely. Each index represents change in a different way, and comparing one to another also poses problems. Most central banks use the CPI[16] because it is the most common measure of inflation worldwide.

Characteristic of the target: The last basic issue is whether to use a specific point of target or a specific range in which the target should be bordered. Generally speaking, a point sounds more plausible, but central banks like the ECB[17] operate by means of ranges because the loss of specific points of targets always entails additional

[16] CPI: Consumer Price Index.
[17] ECB: European Central Bank.

expenses, and harms the reputation of central banks. For instance, the ECB dictates *"below but close to 2 percent"* and the BoE18 a range *"between 1 and 3 percent"*.

At this point, another aspect which I will not discuss in greater detail has to be mentioned: *symmetry*. It does not matter if the BoE overshoots or undershoots a target by 1 percent point, and here one has to keep in mind that I am talking about a range, in both cases the same penalty will be executed. Nevertheless, in case the ECB undershoots a target, no execution will be induced. As a result, it can be stressed that the ECB follows a monetary policy with a downward tendency, and it also leads to a lower inflation target than the BoE.

4.4.2. The Inflation Forecast as Target

Svensson [Svensson, L. (1997a)] described inflation targeting as *inflation forecast targeting* because of the long reaction time in the monetary policy sector and the huge delays regarding the publication of reliable data. Here, the basic idea is to establish an accurate way to define the policy-making instrument for a forward-looking point of view, based on a forecast horizon for the expected inflation.

For instance, the Bank of England freely defines the target horizon. This entails some sort of independence in terms of performance measure of the bank itself, because it chooses the horizon ex ante and then it is judged ex post. However, even if central banks are not constricted regarding the choice of their policy horizons, it is a tough topic, as accurate definitions and forecasts of inflation are difficult to make. The most hazardous errors in this respect are over- and underestimations of future prospects.

The Bank of England has made several mistakes in the settlement of assigned forecasts over the last three decades. In the time period between 1971 and 1996, their forecast was too low and, between 1993 and 1996, the forecasts were too high, reaching an error for eight quarters ahead of +3.31 and -1.04 respectively. So the question arises if central banks should be inspected by independent institutions in defining targets by

[18] BoE: Bank of England.

objective handling. Another sensible point is whether to include the private sector or not.

The FED generally outperforms the private sector forecasts. This brings up another critical fact. If the private sector cannot or does not trust the FED's data forecast, there is no second opinion and errors are obligatory. The provision of accurate forecasts and data are the main incentives for central banks because their own credibility is measured by these parameters. Slight errors denote an accurate policy, in contrast to huge ones, which reveal policy-makers inaccurate forecasts over periods of time. It also has to be pointed out here that the divergence of the forecast from the target can be seen as a means of measure for the credibility of a central bank.

4.4.3. Nominal Income Targets

The act of targeting a specific nominal income also serves as an alternative to the implementation of monetary policy. Although there are some advantages, the disadvantages prevail. Some of them are specified below:

- For exact forecasts, a monthly basis should be a premise, but nominal income targeting is connected with quarterly available datasets. This makes it difficult to respond for monetary policy-makers.
- The invention of this kind of monetary policy is followed by giving equal percentage weights to real output and to the divergence of prices from the price level target [Hall, R.E. (1986a)]. Hall also addresses the advantages of including the parameters of unemployment and price level instability, in terms of a social welfare function.
- One of the basic problems, as far as nominal income targets are concerned, is the conflict between monetary policy-makers – the central banks – and governments.
- Nominal income is also influenced by fiscal policies. This kind of policy-making is not subject to the central bank's supervision.

- The major problem in targeting a nominal income is expressed by the fact that it is not easy to influence two parameters at the same time. Balancing a decrease in output could therefore cause an increase of prices.

4.4.4. Targeting an Index of Monetary Conditions

The act of targeting an index of monetary policy conditions is characterized by taking more variables, for instance the exchange rate, into account. Making use of the exchange rate is, on the one hand, a very thoughtful thing to do, but on the other hand, it raises the question of who should be in charge of this index on global scale. Who should be responsible for changes in this factor?

The main problems in the invention or formation of a policy which targets an index of monetary conditions are the selection of variables which should be taken into account, and finding responsible institutions that are able to control them. At the moment, there seem to be no answers to these questions.

5. The Linkage between Short-Term and Long-Term Interest Rates and the Impact of Monetary Policy

5.1. Brief Overview

If the risk of inflation is manageable, the majority of central banks follow a monetary policy strategy with the goal to stimulate the economic growth and therefore employment. This *real effect* can be illustrated in connection with the Phillips Curve[19] discussion:

- Expansive monetary policy in short-term concerns is able to increase national economy's GDP[20].
- However, in the long run this is accompanied by inflation.

Expansive monetary policy in the short run is expressed by several points of view. On the one side, if the nominal GDP increases, the increase in value of money is likely to be followed by expectations about inflation. On the other side, the circulating value of money inside a national economy could be held short by individuals themselves in order to escape the danger of inflation. This argument has already been addressed in *chapter 2* in connection with the Theory of Hicks.

The most important point here is that short-term monetary policy does have an impact on *real and nominal growth* and therefore influences employment. The Taylor Rule, which is discussed in *chapter 3*, is able to give the right explanation here. It is used to give the participators in the market the ability to forecast the future monetary policy of central banks.

[19] Phillips Curve illustrates the inverse relationship of inflation rate and unemployment in an economy. In the sort run a tradeoff between inflation and unemployment can be observed which does not appear in the long run. In general it can be stressed that the lower the rate of unemployment, the huger the increases in nominal wages.

[20] Gross Domestic Product: GDP.

5.2. Monetary Policy and the IS-LM Model

The model is used to illustrate the effectiveness of monetary policy (short run), and its impact on the real economy (long run) in terms of economic growth and employment.

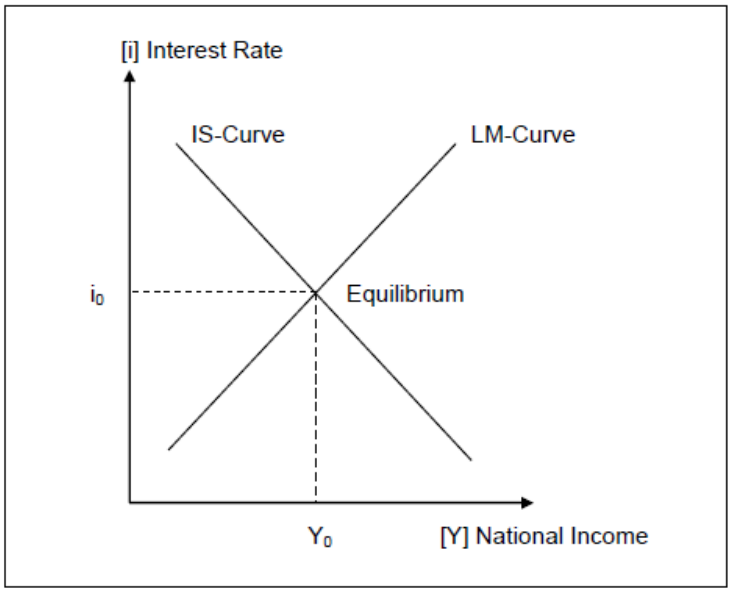


Figure 2: IS-LM Model (Original Source: Löchel, H. [2009] "Praxiswissen Volkswirtschaft in Banking & Finance", page 80)

I: Investment

S: Savings

L: Demand of Money

M: Supply of Money

Y: National Income

i: Interest Rate

Y_0: Level of National Income in Equilibrium

i_0: Level of Interest Rate in Equilibrium

The IS-curve represents the equilibrium between supply and demand of capital in the capital market, in the long run context, and it has a negative slope.

The LM-curve represents the equilibrium between supply and demand of money in the money market, which equals the short run, and has a positive slope. It can be said that a rise in short-term interest rates in the money market leads to an increase in national income, because of the higher inflation rate, and vice versa.

The model combines the two different curves and brings them together. The interception between the IS-curve and the LM-curve expresses the equilibrium between the money (short-term) and capital market (long-term). Thus, the national economy can be said to be characterized by the level of national income and the level of interest rate in the equilibrium. This is underlined by the fact that a reduction in interest rates leads to an increase in national income followed by an increase in investment. This illustrates the positive impact of expansionary monetary policy.

5.3. The Feasible Malfunction of Monetary Policy

As far as the expansionary monetarism of central banks is concerned, two problems arise: the appearance of *the investment* and *the liquidity trap*.

The *investment trap* emerges when the investment of firms is no longer elastic in terms of interest rates. This is illustrated by situations in which no reactions to interest rate cuttings become apparent. The reason for this is the bad expectation by companies. Big companies argue that the fear of high interest rates accompanied by a high cost of capital is outperformed by problems regarding the value of business circle, return and benefit.

Generally this can be stressed via an extreme example. If short-term interest-rates decrease, interest rates in the long-term increase. However, the important long-term interest rate in the capital market, which is relevant for the real economy, does not increase as sharply as the short-term interest rates in the money market.

If monetary policy loses its power to impair economy, this is called the *liquidity trap*. This liquidity trap is characterized by situations where interest rates cannot be decreased any longer because they have already reached a very low level. An example is the credit crunch, with its origin in the sub-prime crises in 2007. The level of short-term interest rates had already reached a level ranged between 1.00 and 0.00 percent. So

the real effect on national income remains absent. Especially in relatively uncertain periods of time, such effects might appear because neither households nor firms spend money for consumption or for savings. Basically, their only goal is to hold liquidity.

However, these issues have already been discussed in *chapter 2* by dint of Hicks' theory.

5.4. Interest Rates and the Term Structure

Interest rates are a crucial variable within a national economy because they combine the money market (financial market) with the capital market (real market) accompanied by the assignation of investment and consumption costs. It has already been pointed out that central banks always aim to have a specific influence on the capital market in the long run, mostly by regulating the short-term rates in the money market. The accurate interest rates in the capital market are determined via supply and demand in the bond market, but guided by settlements in the short run. Bonds are defined to be the long-term financial products with durations longer than one year.

5.5. Summary of Key Facts

Short-term interest rates which are settled by central banks in the money market have a specific impact on long-term rates in the capital market and this is expressed by the bond market in this work. Long run factors like economic growth, rate of inflation and the expectation about benefits are affected.

Generally, it can be stated that a rise in short-term interest rates leads to an increase in economic growth because of higher investment, and vice versa.

If short-term interest rates decrease, stock prices increase, and vice versa. The bond market is also influenced by short run interest rate changes in the money market. Bond prices rise with decreasing short-term interest rates and vice versa. Thus, with diminishing short-term interest rates the yield on bonds and long-term interest rates are decreasing and vice versa.

Keynes` invention of the IS-LM model combines the capital market of the national economy with the money market. The impact of monetary policy is exemplified by the argument that relatively low interest rates lead to an increase in investment into real capital, as well as to a higher growth in employment, and vice versa.

The danger of the liquidity and investment trap also has to be mentioned here. The best example in this context is the sub-prime crisis with its origin in the year 2007, subsequently followed by a worldwide recession. Monetary policy was not able to react to this outstanding event sufficiently. The reason for this is grounded in the low short-term interest rate level, which was at that time in a range between 1,00 and 0,00 percent. Therefore, a cut in short-term interest rates was not possible at that point.

6. Empirical Study A

6.1. Brief Overview

The basis of this paper is an empirical study. The main idea is to show how interest rates, particularly long–term and short–term interest rates, react over a specific period of time. At first, I intended to portray and analyze a time span of 15 years, however, I soon realized that in order to gain a better insight into the dynamics of interest rates, so to say, it is necessary to look at a longer period of time. This is why I decided to focus on a time period of 30 years instead. In essence, it can be said that it is easier to identify changes in a 30-year period than in a 15-year period.

Nevertheless, I decided to split the total time in two 15-year periods. For the first period, I analyzed data from 1979 to 1993, and here it is important to note that this data consists of yearly observations. The second part of data, covering the time between 1994 and 2008, is based on monthly observations because of the enormous importance in this time.

For the present study, I chose three different geographical areas: the United States of America, the United Kingdom and the Euro Area. The last area on the list has to be explained in greater detail. The reason why I will not deal with the development of the Euro area in this work is the fact that an analysis of data from a changing number of member states is quite difficult. In consequence, I chose to obtain data from available databases for the so-called Euro Area[21].

The following analysis of data is divided into three main parts. At the beginning, I will deal with the whole span of time, all in all three decades, followed by a more detailed portrayal of the first 15 years from 1979 to 1993. The second half of the time series analysis, ranging from 1994 to 2008, will be discussed in the end.

At this point, I would like to stress that this main chapter 6 (*Empirical Study A*) will deal with the differences in Monetary Policy in the three geographic areas mentioned above. This means that only short-term rates are observed in this context.

[21] Euro area: EA11-2000, EA12-2006, EA13-2007, EA15-2008, EA16.

However, in chapter 7, I will focus on the connection between short-term and long-term rates.

6.1.1. Description of Long–Term Interest Rates

Maastricht Criterion[22] bond yields are long-term interest rates, used as a convergence criterion for the European Economic and Monetary Union (EMU)[23] (central government bond yields on the secondary market[24], gross of tax, with around 10 years residual maturity). In the available data set, one can find 10-year government bond yields, which are reference rates, based on government bonds with a maturity close to ten years. These bonds used for the calculation of the yields can only be issued by governments itself.

In specialist literature, long-term interest rates are defined as interest rates with a maturity of ten years or longer [Mishkin, F. S. (2007a)].

6.1.2. Description of Short–Term Interest Rates

The short–term interest rates used in this work are day–to–day money market interest rates[25] which are defined as average rates for the Euro Area. The time horizon which was taken for the analysis stretches over 3–month periods. This is due to the

[22] The Maastricht criteria (also known as the euro convergence criteria) are essential for European Union member states to enter the third stage of European Monetary Union. Third stage's main scope of duties is to adopt the euro as the single official currency. The four main criteria are laid down in the European Community Treaty: inflation rate, government finance (annual government deficit, government debt), exchange rate, long–term interest rates.

[23] European Monetary Union (EMU): All European Union member states have to be a part of the EMU. Its aim is to adopt the euro as a single official currency and covers over three stages (1 July 1990 to 31 December 1993, 1 January 1994 to 31 December 1998, 1 January 1999 and continuing).

[24] The secondary market is a financial market in which securities that have been previously issued can be resold [Mishkin, F. S. (2007a)].

[25] Day–to–day money market interest rate represents the average for the Euro Area (Euro Overnight Index Average – EONIA): 1-, 2-, 3-, 6- and 12-month interest rate averages for the Euro Area (EURIBOR).

restraint of data availability in the United States of America and the United Kingdom (EURIBOR)[26].

Once again, I would like to point out that interest rates are short-term if the maturity is less than a year. Long-term interest rates have already been discussed above. However, in case the maturity is between one and ten years, one speaks of intermediate-term interest rates [Mishkin, F. S. (2007a)].

6.2. Monetary Policy in the USA

The Federal Reserve System (FED)[27] is the central bank of the United States and the most powerful central bank in the whole world. In the last chapters, I elaborated on monetary policy and on its definition. Now, I would like to take a closer look at the last three decades, and particularly at the different aims the FED was trying to achieve.

In the context of this work, I am mainly interested in short-term and long-term interest rates as main parameters. Firstly, I will analyze the short-term data because this data is a vital aspect of monetary policy. Afterwards, I will take a closer look at the combination of short-term and long-term rates.

In terms of U.S. short-term rates, there is the Federal Funds Rate or the Fed Funds Rate. It has a huge effect on all other short-term rates.

[26] Euro Interbank Offered Rate (EURIBOR): daily updated rate based on the average rates at which banks lend other banks funds in the interbank money market.

[27] Federal Reserve System: FED is the central bank of the USA.

6.2.1. Analysis of Data from 1979 - 1993

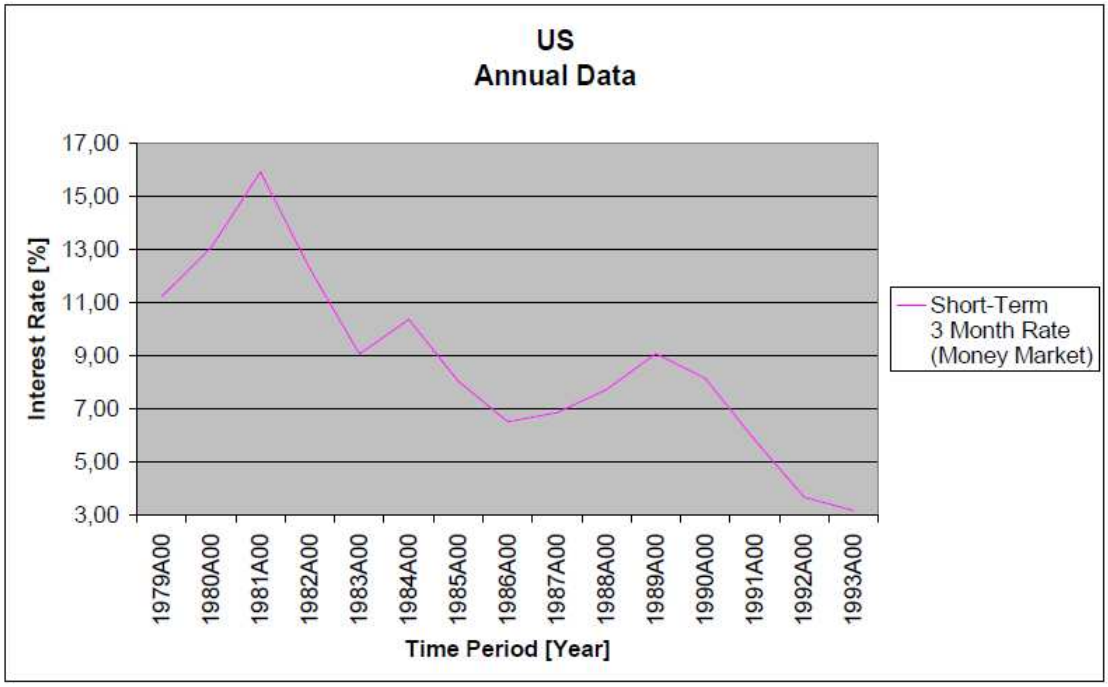


Figure 3: USA; Short-Term Rates; 1979 – 1993

Since the beginning of the 1980s, the FED's monetary policy was characterized by one specific aim: *price stability*. In comparison to other central banks this was not encouraged through a certain level of a target rate of inflation. In 1979, the FED started to operate employing a theory that was later called *practical monetarism* [Fazzari, S.; Minsky, H.P. (1984a)]. Within this theory, the medium-term target of monetary policy is defined through the quantity and the rate of change of monetary aggregate. As a result of this, the known interest rate targets were replaced by reserves targets. The idea behind this was that an increase in the demand of reserves, which was no longer restricted by interest rates targets, would be accompanied by an increase in the Federal Funds Rate (in terms of this work in short-term interest rates). For outsiders, this shift in the FED's monetary policy heralded a trend of *monetary base control*. However, the FED still had a huge problem to solve: *how to handle the reserve growth*.

In 1982, an attempt to avoid the effects of this problem by *targeting borrowed reserves* was made – but it failed. The FED's Funds Rate was decreasing because of the increase in demand of the reserves. As a result, they turned back to interest rate targeting.

Even in 1984, when the FED picked up the idea of *contemporaneous reserve accounting*, the problem of handling the reserve growth was not solved. Through this inability, short-term interest rates rose up and the FED tried to react through changing their monetary policy strategy in terms of controlling banks once more, by the replacement of quantities by prices. Some economists call it the era of *experimental monetarism* because the first and foremost aim of the FED in terms of monetary policy was to convince the public and the government to accept higher interest rates.

In 1989, and in the early 1990s, short-term interest rates (Federal Funds Rate) had a higher level than in the 1980s, with 8.15 percent. The beginning of the 1990s was characterized by several rate-cuttings by the FED because of the overall economic slump in all branches. In 1991, the Federal Open Market Committee (FOMC)[28] cut the rates to 3.68 percent, leading to a minimum of 3.17 percent in the year 1993.

[28] Federal Open Market Committee: FOMC.

6.2.2. Analysis of Data from 1994 - 2008

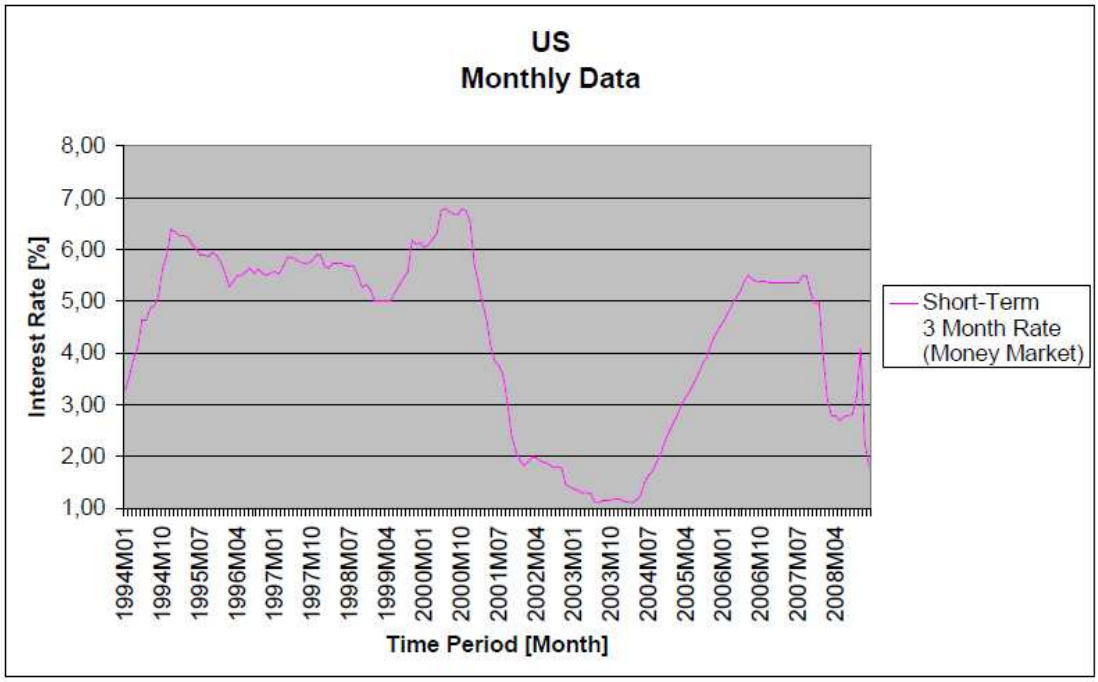


Figure 4: USA; Short-Term Rates; 1994 – 2008

After the enormous cuttings up to the year 1993, the U.S. economy was recovering, and this resulted in increasing short-term rates for a longer period of time. In 1994, the Funds Rate was increased by a use of monetary policy several times with the result of an almost doubled level from 3.28 percent to 6.34 percent in the beginning of 1995. After this overmastered year, the FED was cutting the rates once more in order to calm the economy down, and this led to 5.75 percent in late 1995.

The period from 1996 to the third quarter of 1998 was also characterized by relaxing aims. Towards the end of 1998, the situation changed because of the emergence of a serious financial crisis, which had its origin in Asia, and spread to Latin America, Russia and subsequently influenced all other economies. In the end of 1998, the FED reacted quickly, and cut the short-term rate to a level of 5.22 percent to counter this dangerous situation of a beginning financial crash. Incidentally, the big crash failed to appear, and so the FED started to increase the rates again, namely to 6.54 percent by

the end of 2000. The impact of increasing oil prices, as well as of increasing energy costs resulted in a general fear of a possible overall economic recession, and thus the FED implemented extreme interest rate cuttings to 3.85 percent by the middle of 2001.

In spite of the fact that the FED's only aim was to keep the economy out of a huge recession, this dangerous downward-sloping trend was unavoidable since it was accompanied by the attack on the World Trade Center and the Pentagon in September 2001, and followed by rates under 3.00 percent to 1.92 percent by the end of 2001. In the following two years, the U.S.-led invasion of Afghanistan, and the *Second Gulf War* reduced the rates once more to a historical minimum of 1.11 percent in August 2003.

Once again, I would like to stress here that this paper deals with short-term interest rates, which are led by the Federal Funds Rate, which is a short-term rate itself. This explains the gap between the original Funds Rate of 1.00 percent and the short-term rate of 1.11 percent, which is also used in this paper, in August 2003. The difference between these two rates is based on the idea of this work, which is to compare the short-term rates of three aspiring geographic areas which all have the same characteristics.

Until the end of the second quarter of 2004, the FED tried to stabilize the rate around 1.00 percent, and this action was subject to disapproval, but nevertheless followed by a period of high increase. The reason for this was the change in the housing market. Prices increased dramatically in relation to people's income which was guarded by high interest rates. The housing boom continued until July 2006, and was followed by increasing interest rates with a maximum of 5.50 percent. The FED foresaw the cooling down of the housing market and therefore did not increase the target rate for the following month.

The *sub-prime crisis* already announced itself in early 2007 however the FED did not decrease the short-term rates because the economy still seemed to grow in a modest way. Thus, short-term interest rates amounted to about 5.30 percent. After September 2007, rates fell because suddenly the adverse effect of the sub-prime market on economic growth destroyed the future expectations of investors. This resulted in the anticipation of a short-term interest cutting. After September 2007, the FED finally reacted with a series of enormous cuttings, from a rate of 5.49 percent to a temporary

minimum of 2.69 percent in June 2008. After a short high which amounted to 4.06 percent by the end of October 2008, an absolute minimum was reached by the end of the year at a level of 1.80 percent.

6.2.3. Summary of Data from 1979 - 2008

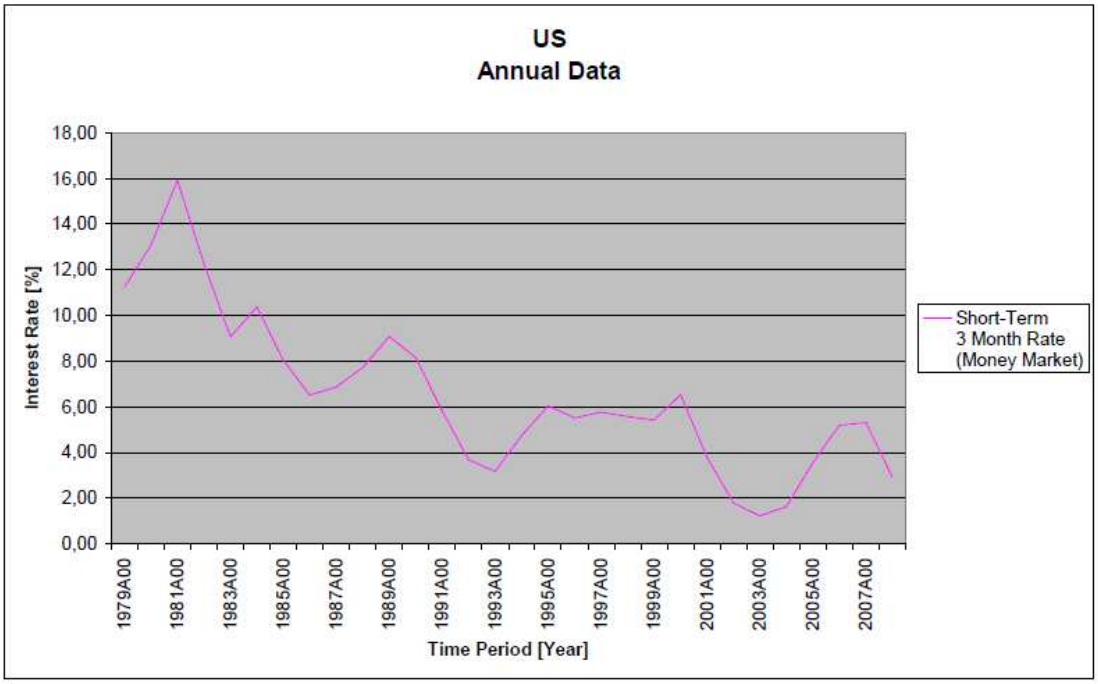


Figure 5: USA; Short-Term Rates; 1979 – 2008

Now that I have explored the details of the policies employed by the FED, I will now turn to a more general view of the three decades and the different aspects of how FED tried to lead U.S. economy. In the 1980s, FED tried to intervene into the U.S. economy by using different kinds of monetary policy. The result was a relatively huge fluctuation in short-term interest rates, which were directly linked to the central bank's monetary policy. However, the FED's policy of the 1980s was to inflective the reserves via open market operation. The result was an entire downward-sloping trend in short-term rates.

The 1990s were characterized by a relaxing of the intensity of the economy. Consequently, the Funds Rate was subject to reduction in the period between 1990 and 1993, and this period was followed by an upstream-trend lasting until 1995.

The decade since the year 2000 saw several serious impacts. A threatening recession reduced the rates in the first two years, and peaked in 2001, the year of 9/11, which was followed by the beginning of the war on terror. In 2003, the rates rose again, but were subject to a huge dilemma, the *sub-prime crisis*, which caused the worldwide economy to collapse and forced it into a deep recession in the year 2007.

6.3. Monetary Policy in the UK

It is vital for the analysis of the monetary policy of the Bank of England to point out that the basic system was changed in the mid-1980s. After these changes, the Deutschmark became the benchmark for British policy until the introduction of the Euro.

6.3.1. Analysis of Data from 1979 - 1993

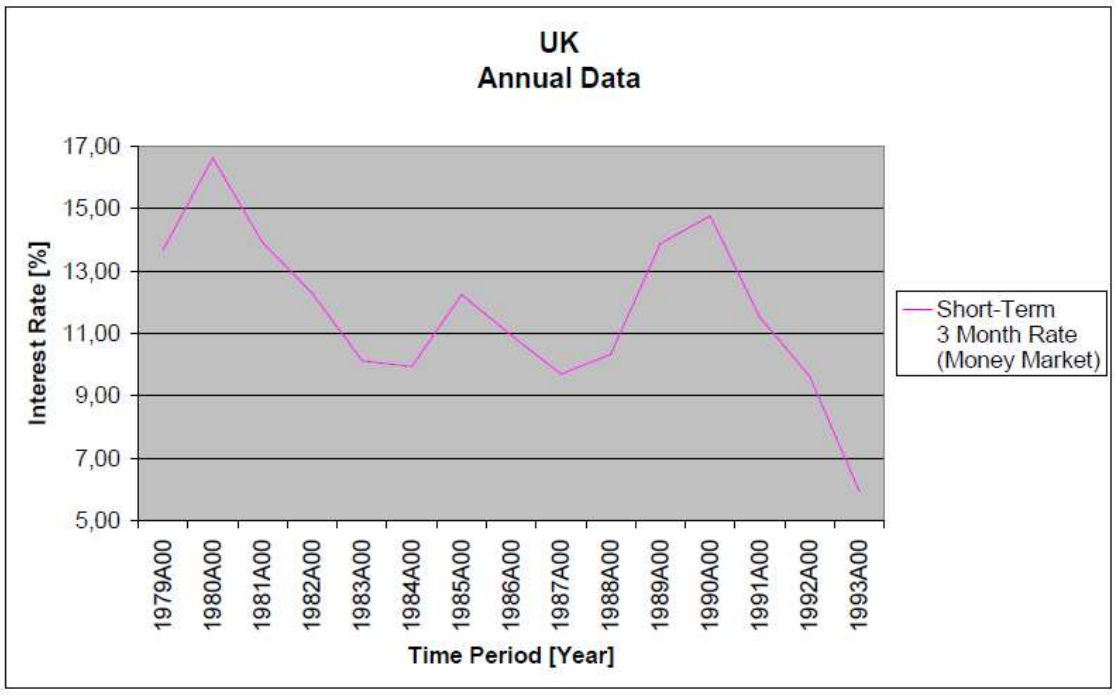


Figure 6: UK; Short-Term Rates; 1979 – 1993

Monetary policy in the UK had not been subject to dramatic changes since World War II. The main goal in the period until the mid-1980s was to lead and control the monetary aggregates. The idea was to have suitable aggregates with the desired effect on the economy in general. Moreover, the quantity of money was to be regulated via monetary policy. However, it was known that factors like exchange rates, availability of credit and interest rates also had an enormous significance in this context.

One basic aim in early 1980 was to target a specific monetary growth rate via the increase of the short-term interest rate up to a level of 16.62 percent in the year 1980. However, the Bank of England was not certain if factors like nominal income and monetary growth were that closely connected, and if interest rates would be able to inhibit monetary growth. During the 1980s, exchange rates were very high. The reason for this was the fact that there was a relatively high level of interest rates at the beginning of that decade, and the fact that the UK became a crucial oil producer. By the end of 1980, short-term rates were reduced to 14.00 percent as a result of decreasing inflationary pressure. During the year 1982, interest rates fell again to a level of 12.29 percent because of exchange rate concerns and a strictly deflationary budget. In order to make the whole system more efficient, monetary policy-makers invented a new plan with the aim to characterize monetary institutions more precisely. The *monetary sector* was born. Just like in the U.S. system, all members had to deposit some sort of reserve into the Bank of England in order to boost the influence over short-term interest rates. In December 1982, the approaching political elections resulted in short-term interest rates with a level of 10.13 percent. In the following years, concerns about the value of specific targets were voiced, and in 1985, it became apparent that monetary policy-makers were no longer able to target a certain money stock by the use of interest rates. A reduction in the velocity of money was the result. Finally, in 1986, the Bank of England declared the period of formal targeting to be finished with accompanying short-term interest rates of 9.70 percent. It is interesting to note here that the idea of targeting the rate of growth of money stock by the use of short-term interest rates had its origin in the 1970s, but was already abandoned in the mid-1980s. The reason for this

was the inability of monetary policy-makers to control interest rates efficiently in order to have a positive impact on the aggregates of money.

There are two different factors which are often used to explain the proceedings in the first half of the 1980s, and why monetary policy failed in that period: *financial innovation* and *liability management*. I will now turn to the second term for further elaborations on the matter.

Until the middle of the 1980s, the basic aim consisted of the desire to control the aggregates of money. This was done via *quantity control (direct control)* or *price control (market control)*. Both incentives were meant to influence the desire of the community to hold deposits, to limit the demand in borrowing, and to restrict the ability of banks to lend [Bain, K.; Howells P. (2009f)]. The all-overlapping keyword was *deregulation* which was characterized by the entry of banks into the mortgage market in 1981.

The then following chapter in this so-called *era of monetary targeting* was characterized by deregulation. It began in the year 1981, when banks were entering the mortgage sector, accompanied by decreasing short-term interest rates with a minimum of 9.94 percent in 1984. In 1986, the *Building Society Act* was established, in which guidelines for funds and their channels were set up. Financial institutions, especially banks, were entertained which had to pay interest on selected check accounts in the time between 1983 and the intervention of the act. By the implementation of the act, policy-makers started to have greater influence on monetary aggregates. Now, however, the Bank of England wanted to diminish the connection between short-term interest rates and deposits, yielding a rate of 10.94 percent in 1986.

The basic goal was to eliminate targets which had become irrelevant. Now, the main aims of policy-makers were declared to be price stability and the minimization of inflation. In this process, one factor became very prominent in the period to follow: the *exchange rate*. Because of the strength of the British Pound, the Bank of England started a policy which granted a greater extent of independence to the British currency. As I already pointed out above, the Pound had been linked to the *Deutschmark* before. Since 1985, British short-term interest rates were applied on the basis of the connection between these two currencies, and this was expressed through the exchange rate.

Exchange rate targeting was the conception for the following years. Until the year 1987, the Bank of England was continuously cutting short-term interest rates as far as to the minimum of 9.70 percent, in order to react to various events like the stock market crash of October 1987. The problem of inflationary pressure and increasing prices in the housing sector resulted in an increase of rates, although the British Pound remained to be a strong currency.

In 1990, the UK became a member in the European Exchange Rate Mechanism (ERM)[29] and the short-term rates reached a maximum of 14.77 percent. In the following year, an incipient recession emerged accompanied by a cut of the rate to a level of 11.52 percent. Once again, the authenticity of the British Pound in the ERM and the falling house prices were the origin of the problems. These were represented by decreasing rates of 9.62 percent in 1992 – the crisis started.

6.3.2. Analysis of Data from 1994 - 2008

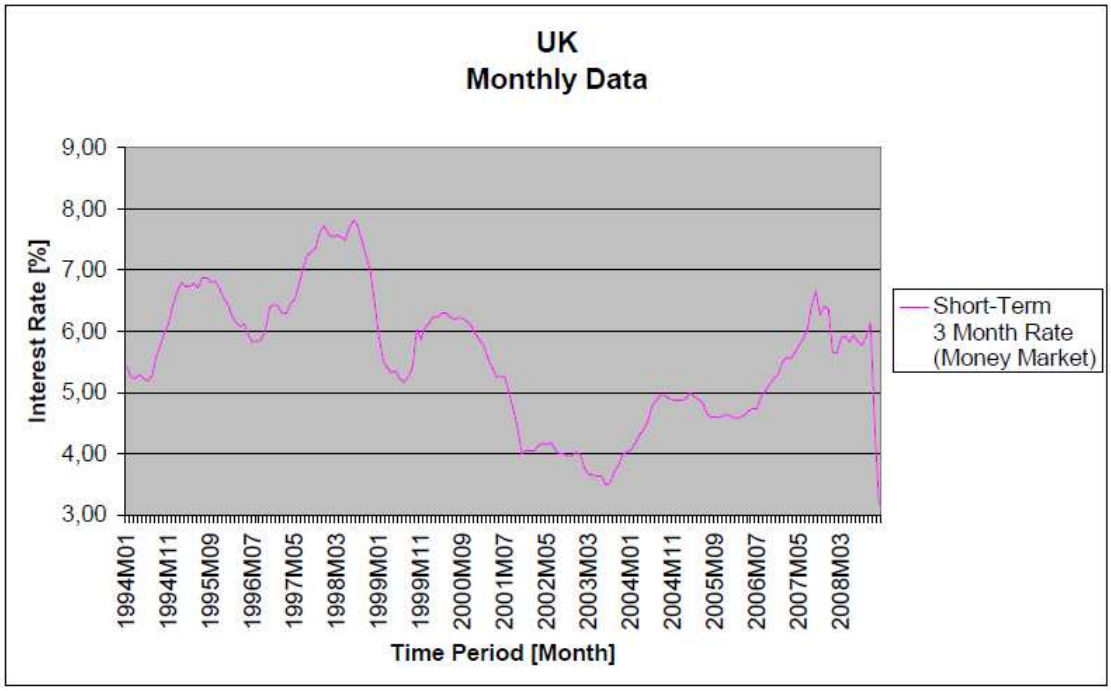


Figure 7: UK; Short-Term Rates; 1994 – 2008

[29] European Exchange Rate Mechanism: ERM.

As I pointed out before, the crisis had its origin in the year 1992, and the problems which arose after that were the reason why the UK left the ERM. The years from 1994 to 1996 can be termed the first period of *inflation targeting* with relatively big fluctuations in short-term interest rate. In 1997, the need for a greater extent of independence of the Bank of England led to the establishment of the Bank of England Act in 1998. Due to the establishment of the act the responsibility of setting interest rates was given from the Bank of England to a so called Monetary Policy Committee.

In the year 1997, which was characterized by increasing short-term interest rates up to a level of 7.72 percent, the need for a general European Monetary Union became apparent. The time from 1998 until 2008, which marks the end of my empirical study, will be discussed in the following chapter about the Euro Area, as the aims of monetary policy, as well as the challenges that it was confronted with, were tightly interwoven with this general topic.

The first big step was the introduction of the Euro currency in 1999, based on the *Maastricht Treaty* from 1992, after which it became the only currency inside the Euro Area resulting in temporarily increasing short-term interest rates in the UK. The only countries which did not accept the Euro were the UK, Sweden and Denmark. The UK bargained for special conditions, so to say, with the objective that the British Pound would persist as official domestic currency. The reason for this can be found in the UK Treasury evaluation from 1997 to 1998. Generally speaking, the UK was willing to join the European monetary system, but the results of the five different tests during that evaluation caused concerns regarding the compatibility of the different systems. Basically, the skepticism was based on the era of the UK membership in the European Exchange Rate Mechanism between 1990 and 1992. During that time, the UK economy went into recession various interest cuttings followed. In the year 1992, the former Deutsche Bundesbank increased their short-term interest rates and the Bank of England had to follow in order to hold up the exchange rate of the British Pound against the Deutschmark because of its exchange rate targeting. This boost in interest rates by the Deutsche Bundesbank led to worries about an increase of inflation after the German reunification towards the end of 1989. Thus, the 1997 UK Treasury evaluation reached

the conclusion that the British economy seemed to be extremely different from the remaining European one. That was finally represented by UK short-term interest rates of 7 to 8 percent in contrast to the European rates between 3 and 4 percent. These different levels of short-term interest rates seemed to confirm the UK's fear that European rates might be too low for the British domestic economy. Moreover, the following inflationary boom discouraged an entry into the European system.

Between 2002 and 2003, another evaluation was carried out by the UK Treasury. Once again, the predominating argument by the British was that the domestic economy as a whole might be incompatible to the economies from other member-states regarding variables like taxes, wages, production and selling. However, critics argued that the British evaluation did not take some important geographic areas of their own country into account, and therefore they advocated an observation from another point of view. In connection with the British labor market flexibility, one particular result came to the surface: *"The slower the progress in flexibility within the rest of the Euro Area, the more important a high level of domestic labor market flexibility in the UK."* [Bain, K.; Howells P. (2009g)].

In 2001, the huge impact of the terror attacks in the USA left its traces in the UK, as short-term interest rates achieved a level of 4.05 percent towards the end of that year, but were then followed by a short recovery.

There had not been another evaluation since 2003, but the situation remained the same: the Bank of England still competed against the European Central Bank in terms of monetary policy. In 2008, the Bank of England announced that a new evaluation of the business cycle through the UK Treasury would lead to the result that British economy now tended to be closer to the European one. This proximity would be expressed via UK inflation rates which came closer to European inflation rates, and by a British growth rate of more or less the same level as in the year 2004.

Nevertheless, there was a serious problem in short-term interest rates. As I already mentioned before, the UK rates had levels higher than those in the rest of the Euro Area. European supporters in the UK stressed that this was the result of the credibility-problem of the monetary policy of the Bank of England, and that an entrance

into the Euro Area would lead to a remaining inflation rate, but at the same time to a lower level of interest rates.

Some argued that the British Pound was too high against the Euro, and that an entrance into the Euro Area at such an exchange rate would lead to problems in terms of a long-term development in the UK.

Finally it can be mentioned that for the supporters of an inclusion of the UK in the Euro Area, the year 2008 would have been the best year ever with a UK short-term interest rate of 4.25 percent towards the end of that year – not that far away from the European rate of 4.24 percent.

6.3.3. Summary of Data from 1979 - 2008

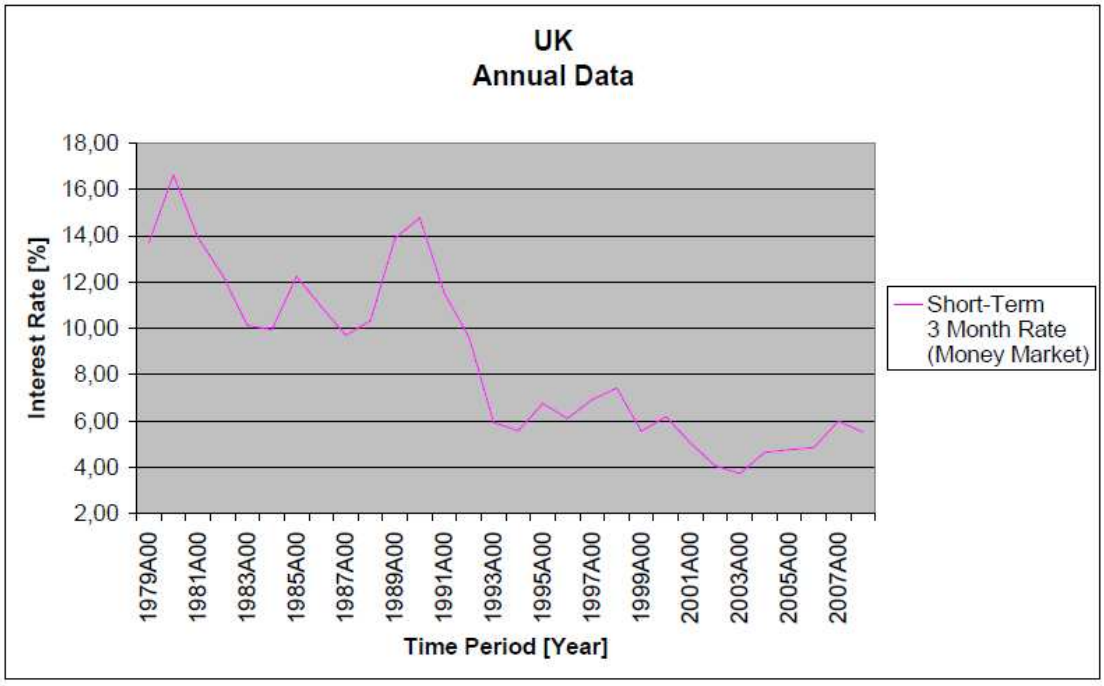


Figure 8: UK; Short-Term Rates; 1979 – 2008

In order to summarize my analysis of the UK data, I would like to point out some of my findings. Prior to the 1980s, the plan of *fixed income regimes* failed and was followed by a so-called *active* monetarism. This incentive was characterized by the aim to control money.

In the early 1980s, up until 1985, the limitation of monetary growth was a big challenge. It was conducted by scheduling target rates in order to give more credibility to commitment. The consequence was the insufficiency of interest rate instruments.

In 1986, the system changed its priorities and turned into an exchange rate targeting system, but only until 1992, when the UK left the European Exchange Rate Mechanism. The current goal in this modern period of monetarism is inflation rate targeting. In 1997, first indications towards a European Monetary Union with a system based on the one by the Deutsche Bundesbank appeared.

What is most important in this context, however, is that since 2003, UK short-term interest rates were always kept at a higher level than the European rates in order to defend the exchange rate risk of the British Pound. This exchange rate risk was measured via the connection to the Deutschmark, and later to the Euro. An entry of the Euro Area would have led to a decrease of the cost of capital for British companies however the critics had always been stronger than the supporters.

At the end of the decade, even Euro-pessimists had to admit that an entrance into the Euro Area with all its regulations would lead, with a relatively high probability, to an increase in quality and quantity of investment in the UK.

6.4. Monetary Policy in the Euro Area

Before I start my analysis of the Euro Area, I would like to point to the fact that the data related to events before 1993 was obtained from the former Deutsche Bundesbank and therefore relates primarily to Germany. For the remaining data from the years 1994 to 2008, I based my analysis on the European Area and the European Central Bank. Furthermore, this period of time is dealt with in a more detailed manner because of the topicality of my findings.

After the Euro Area was born, the introduction of the Euro as the unitary currency followed in 1999. Generally speaking, the European System of Central Banks (ESCB)[30] consists of the central banks of all member states, which are guided and led

[30] European System of Central Banks: ESCB.

by the European Central Bank (ECB)[31]. The whole European monetary system has three basic aims [Bain, K.; Howells P. (2009h)]:

- Determination of the inflation rate target level.
- Whether to target the rate of inflation directly or to target an intermediate variable like the rate of growth of money supply.
- The choice of adequate monetary instruments.

6.4.1. Analysis of Data from 1979 - 1993

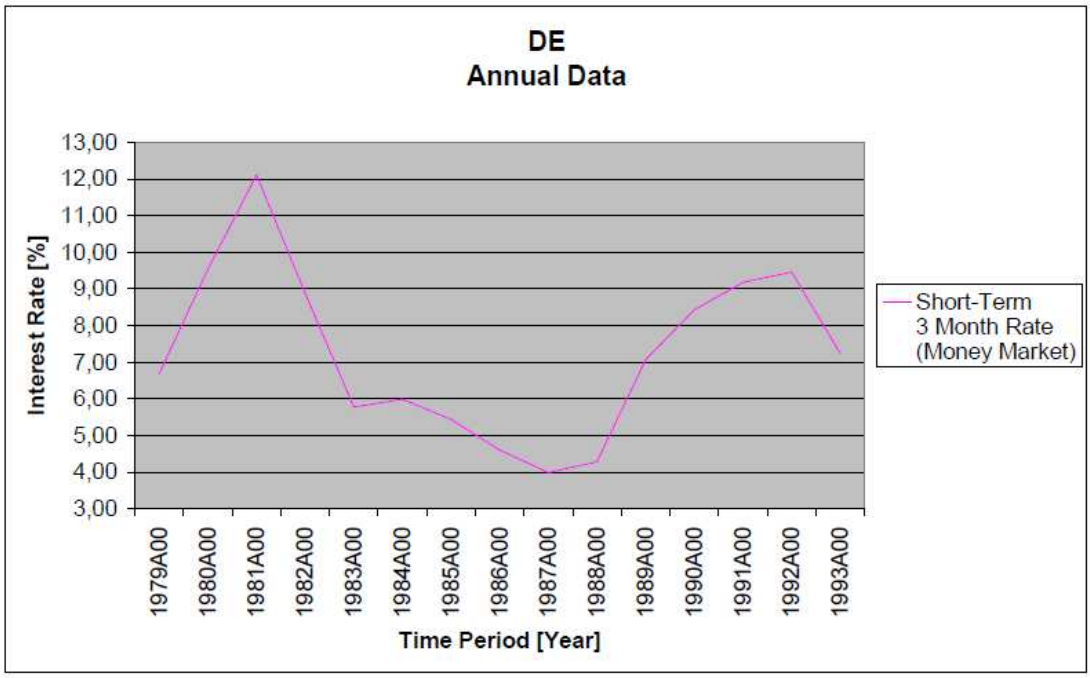


Figure 9: Euro Area; Short-Term Rates; 1979 – 1993

The monetary policy of the Deutsche Bundesbank after the World War II between 1948 and 1999 is characterized by a strict bounder until 1973 in which the so called *Bretton Woods System* collapsed. Until that year, the central bank's main task was to handle the topic of external exchange rate stability, and to fight against domestic

[31] European Central Bank: ECB.

inflation. Since 1973, the new aim of the Deutsche Bundesbank was the control and guidance of domestic price stability.

From the mid-1970s onwards, German policy-makers had to counter the rising inflation by an increase of the short-term interest rate. At that time, monetary policy was quite successful, and the German government supported the Bundesbank in its policies with the result of minimizing inflation. The oil crisis in the late 1970s was the reason for the establishment of a tougher monetary policy. Moreover, criticism regarding the alleged boost of the recession of 1980 to 1981 arose. In those years the short-term interest level reaches a level of 12.11 percent. By the end of 1981, the interest rate level was dropping even more.

The following period was characterized by decreasing interest rates. They fell until they reached a minimum of 3.99 percent in 1987. The second half of the 1980s was characterized by a cagey slow-down of the business cycle and by a reduction of pressure on inflation. The Bundesbank reformed its monetary policy system and open market instruments became more important.

By the end of the 1980s, the level of short-term interest rates increased, and reached 8.43 percent in the year 1990. The German reunification also had a deep impact on the increase of interest rates in 1989 and in 1990.

As I already pointed out in the last chapter, the Maastricht Act was designed in 1992. Its basic objective was to guarantee and support the European Union with a unified economy and a common currency. This is represented by a 1992 short-term interest rate of 9.46 percent.

6.4.2. Analysis of Data from 1994 - 2008

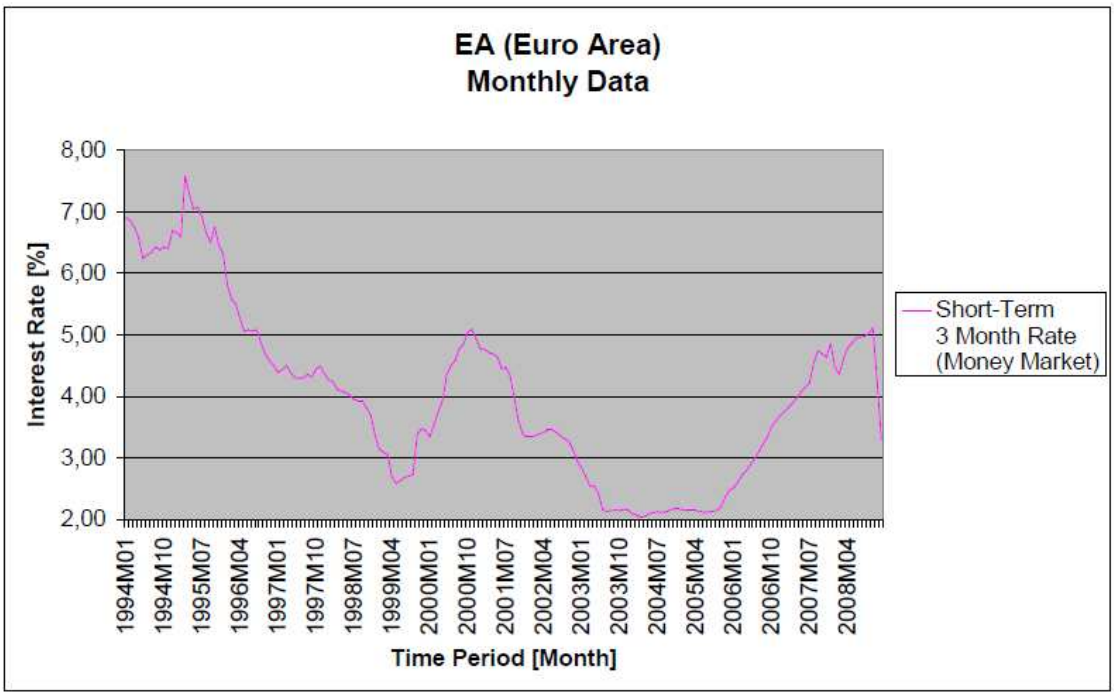


Figure 10: Euro Area; Short-Term Rates; 1994 – 2008

From 1999 to 2000, with the establishment of the Euro Area and the plan of introducing the Euro as an official currency, monetary policy did quite well, mainly because decisions were based on data from former national policy-makers. Enormous efforts were made in order to fulfill the Maastricht criteria, and these actions paved the way for the ECB`s increase in power. However, nobody could forecast how the ECB would perform in the future. The result was a decrease in Euro short-term interest rates until the third quarter of 1999, because European companies started to invest intensively in the US economy in order to prevent possible losses within the newly founded Euro Area. The US economy was growing rapidly and the Dollar was getting stronger, and thus the value of the new Euro currency fell. This situation was illustrated by several short-term interest cuttings in the USA by the Federal Reserve from the beginning of 1999 until the middle of 2000. However, until the middle of the year 1999, the ECB tried to keep their short-term interest rates at a low level in order to help the newly

united European economy in its starting phase. The rates decreased from initially 3.14 percent to 2.63 percent by July in that year. In October the rates started to increase rapidly although the inflation rate lasted unchanged

In 2000, the ECB also increased their short-term rates, and was willing to support the Euro currency with the aid of Japan and the USA. The effect, however, was minimal, and thus the rates did not change dramatically over the next short period. In October 2000, the US became aware of a threatening recession, which could have affected the economy on a global scale. The inflation rates were under pressure and the situation in the oil market deteriorated, and so the Federal Reserve started to cut down interest rates in an aggressive manner. The reactions of the ECB were slow, but it followed via a monetary policy in the end.

In 2001, the FED cut down its rates, however, the ECB did nothing and kept its rates untouched because monetary growth rose with a short-term interest rate of 4.35 percent in August. The terror attacks of September 2001 functioned as a catalyst for a worldwide recession. The ECB reacted and decreased the rates to a level of 3.98 percent. It was argued by critics that in comparison to US monetary policy-makers, the ECB reacted too slowly to the fear of a world-wide recession after 9/11. The September rates amounted to 3.56 percent in the USA and 5.00 percent in the UK. Even the Bank of England reacted to the new situation although the domestic economy was better off than the European one.

The year 2002 did not bring any interesting changes in the policy making strategy of the ECB. However, European rates were cut down to a level of 2.94 percent by the end of December, but this decrease did not have the desired impact on the economic situation. The Euro followed its upward trend in value.

In 2003, further cuttings were conducted, and this was illustrated by rates of 2.15 percent in the Euro Area, and 1.11 percent in the USA. The Federal Funds Rate was close to 1.00 percent for the very first time in its history, and the Euro still increased its value.

The year 2004 brought little difference in the situation. Now the interest rates increased again, the US rates increased by 1.50 percent, the UK rates by 4.79 percent, and in continental Europe by 2.11 percent. Once again, the ECB did not follow the

policy of other central banks in a sufficient way, and only kept its rates in a range between 2.09 and 2.17 percent with no extensive upward movements. Although the FED increased the short-term interest rates, the US Dollar was weak. In October 2004, for the first time in history, the US rate became higher than the European one, and this resulted in November-levels of 2.31 percent in the USA and only 2.17 percent in the Euro Area. The ECB reacted to these developments, and argued that further upward movements of short-term interest rate levels would only put pressure on the Euro currency.

This situation continued in 2005. The political pressure on the ECB's strategy related to its monetary policy increased dramatically by the end of that year, and led to several interest rate mark-ups with a level of 3.68 percent by December 2005.

This trend continued in 2006 and in 2007. Both the ECB and the FED increased their rates, which were framed by a weak Dollar and a strong Euro. In June 2007 (with an Euro rate of 4.15 percent) another serious problem arose: the *sub-prime crisis* and the *credit crunch*, with its origin in the US system, emerged. Suddenly, the fear of a worldwide recession spread from Europe to the rest of the world. The FED tried to react, and cut down its short-term rate resulting in a huge pressure on the US Dollar and, once more, in an increase in the value of the Euro. In January 2008, the European short-term interest rate with a level of 4.48 percent exceeded the US rate of 3.92 percent for the first time. Other demographic effects were, for example, the rising prices in the food and oil sector.

Of all these events and implemented measures, the trend of inflation targeting set by the ECB was, and still is, the most important of all actions. Moreover, the worldwide recession with its origin in the US financial sector had, and also still has, a huge influence on the behavior of central banks.

The trend of European short-term interest rates was dramatically sloping downward during the 1990s, and until the introduction of the Euro as the official currency in Europe.

In 2001, the terror attacks on the World Trade Center and on the Pentagon were followed by a worldwide recession which lasted until 2004, when monetary policy tried to calm down the economy. Consequently, the interest rate increased. Then the sub-

prime crisis with its origin in the US financial system spread to Europe, and was followed by a huge worldwide recession, and by sharp cuttings in interest rates.

6.4.3. Summary of Data from 1979 - 2008

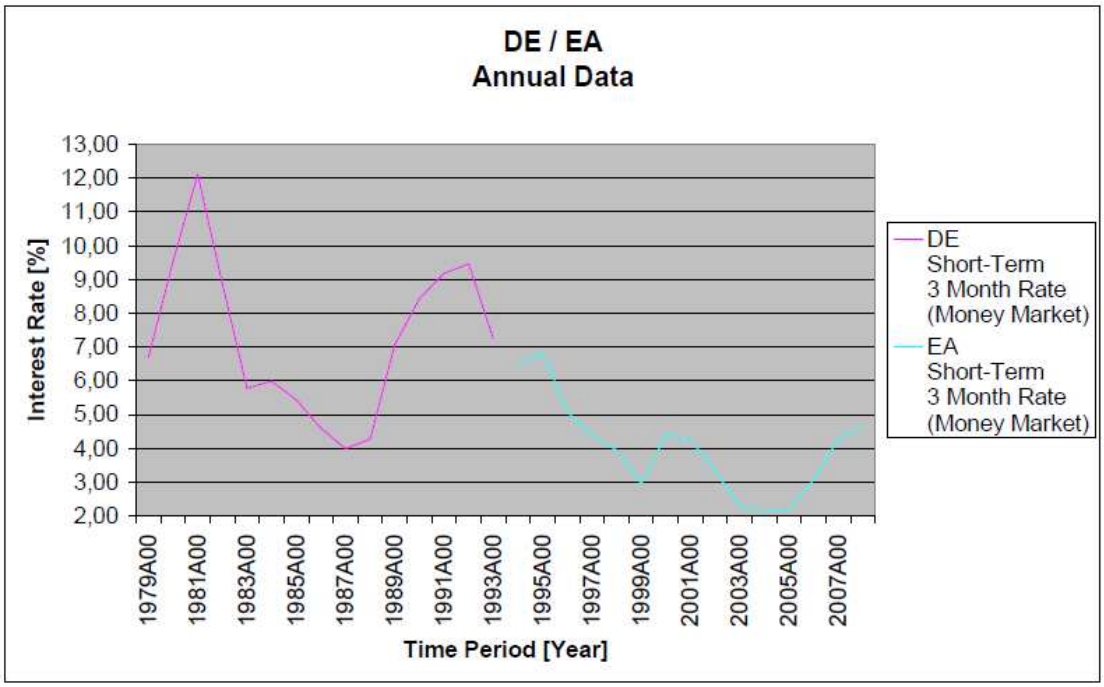


Figure 11: Euro Area; Short-Term Rates; 1979 – 2008

As far as the monetary policy in Europe over the last three decades is concerned, it becomes obvious that one has to distinguish between the time when the Deutsche Bank was in charge, and the time when the European Central Bank took over.

In the 1980s, the ultimate goal of the Deutsche Bank was to achieve price stability. By the end of the decade, a political event had a deep impact on monetary policy: *the reunification of Germany*. In 1992, the settlement of the Maastricht Act paved the way for the European Union to freely restrict monetary policies.

6.5. Comparison of the Different Examined Monetary Policies

Once again, this sub-chapter illustrates the different trends in short-term interest rates over the last three decades, and compares the different rate levels of the three different geographic areas. However, I have already carried out an in-depth analysis in the previous chapters. *Figure 11*, *figure 12* and *figure13* are only meant to provide further information for a better understanding of what was going on during the last 30 years in terms of monetary policy.

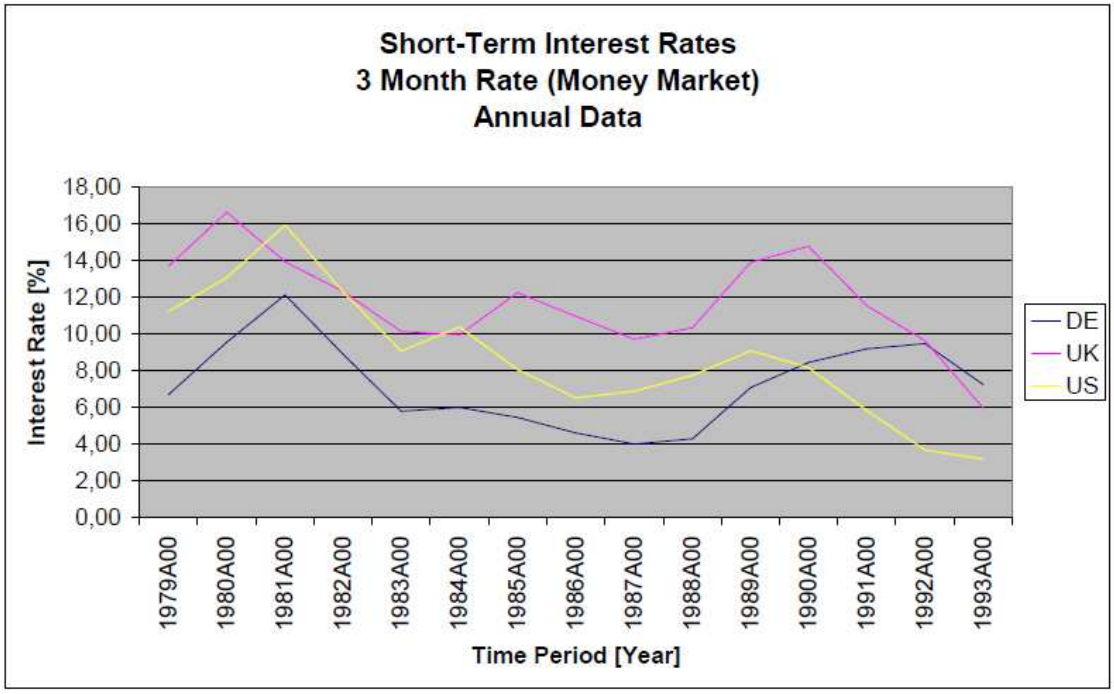


Figure 12: Comparison of Short-Term Rates; 1979 – 1993

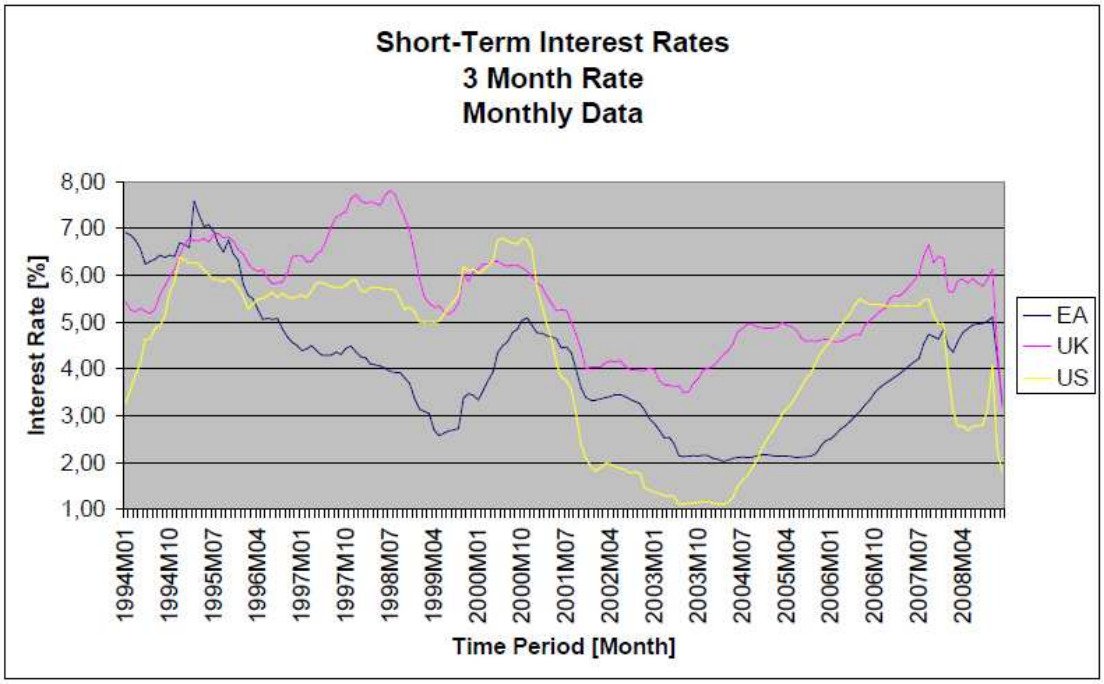


Figure 13: Comparison of Short-Term Rates; 1994 – 2008

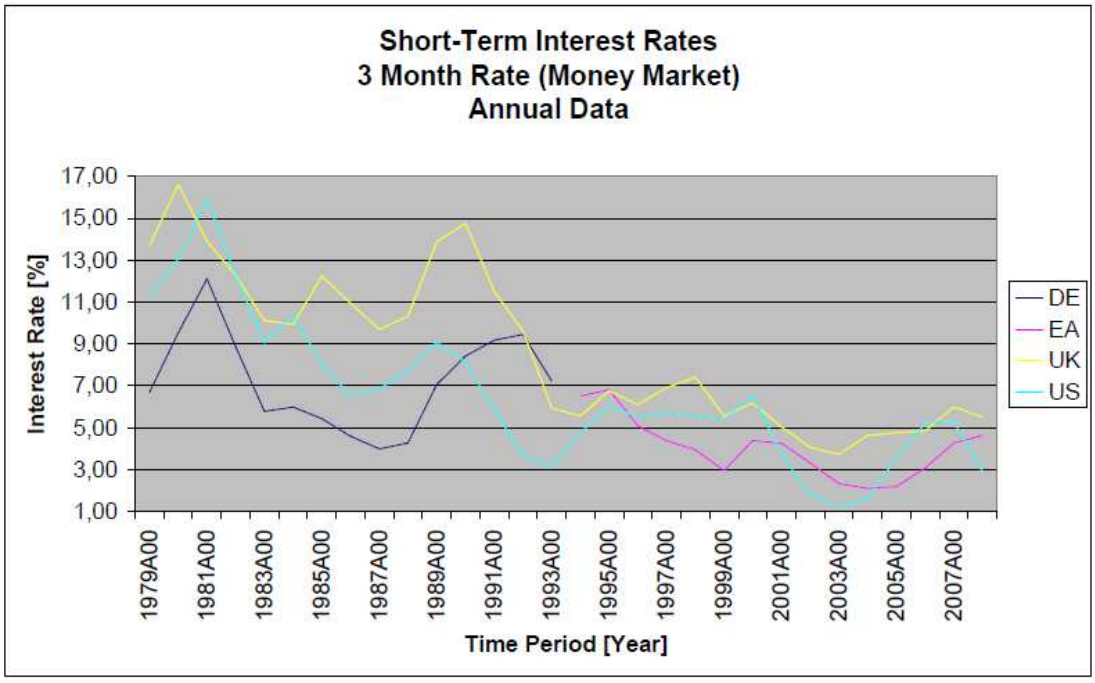


Figure 14: Comparison of Short-Term Rates; 1979 – 2008

7. Empirical Study B

7.1. Overview of Long-Term Interest Rates

As I already mentioned in *chapter 5*, the connection between short-term and long-term interest rates is quite obvious. In the money market (financial market), short-term interest rates are regulated by central banks through monetary policy. In the capital market (real market), the long-term interest rates are influenced by the equilibrium between the supply and demand in the bond market.

In *figure 17*, the declining trend illustrates the situation during the three decades. As I already illustrated, short-term interest rates have an impact on economic growth, on the rate of inflation and on benefit, which is illustrated by the long-term 10-year government bond.

In 2009 Löchel explained some important facts which are also shown in the following three figures [Löchel, H. (2009a)]:

- An increase of households in wealth and income leads to an increase in demand of bonds. Therefore a given bond supply rises the prices and reduces the return and vice versa.
- Expectations of benefits by firms increase the supply of bonds which leads into deflation and a higher return because more capital is needed and vice versa.
- An increase in the expectations of interest rates is accompanied by a reduction in the bond demand, by falling prices and by a rising demand of bonds and vice versa.
- The result of rising expectations in inflation rate are followed by a reduction in demand of bonds and the resulting cheap refinancing costs yield an increase in the supply of bonds and vice versa.

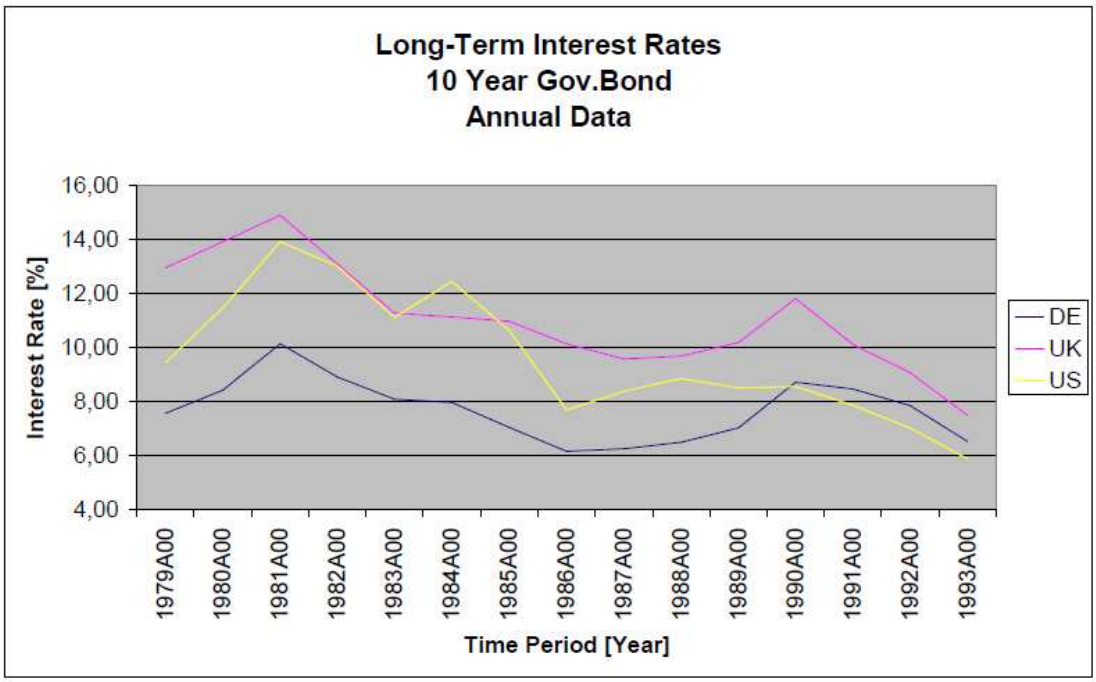


Figure 15: Overview of Long-Term Rates; 1979 – 1993

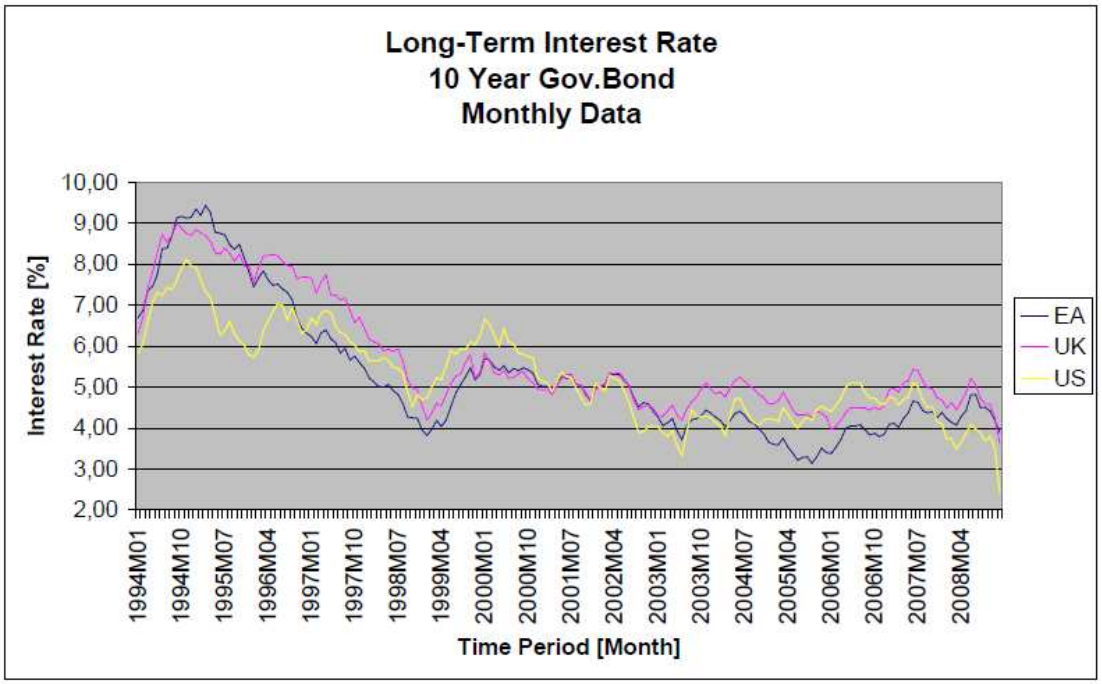


Figure 16: Overview of Long-Term Rates; 1994 – 2008

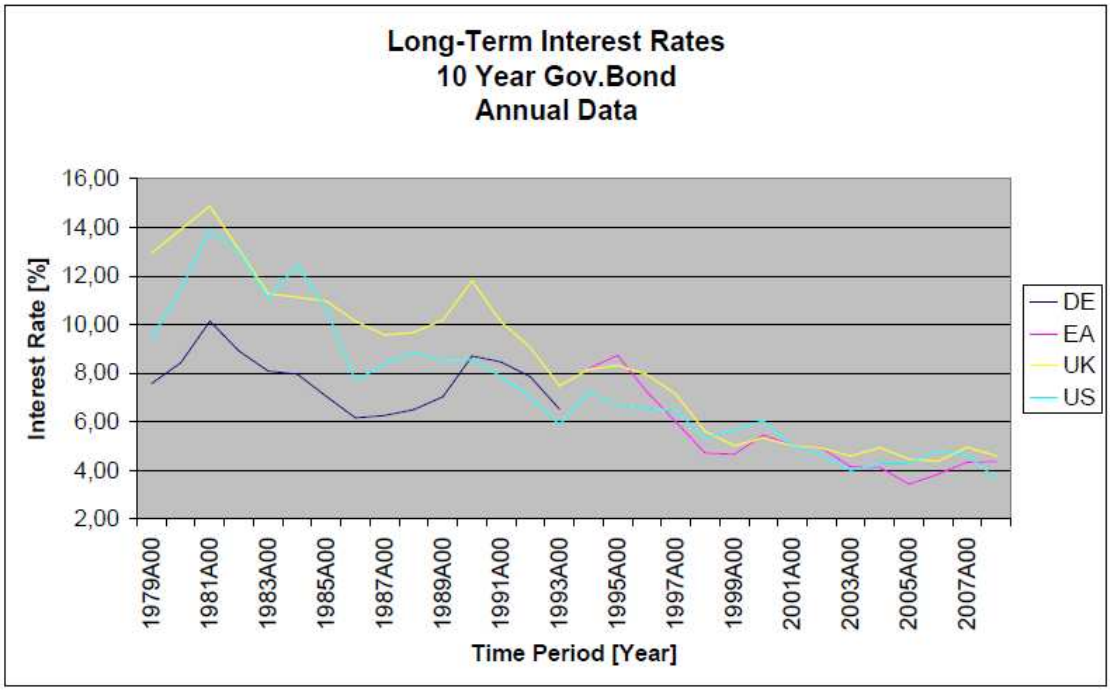


Figure 17: Overview of Long-Term Rates; 1979 – 2008

7.2. Short-Term vs. Long-Term Interest Rates in the USA

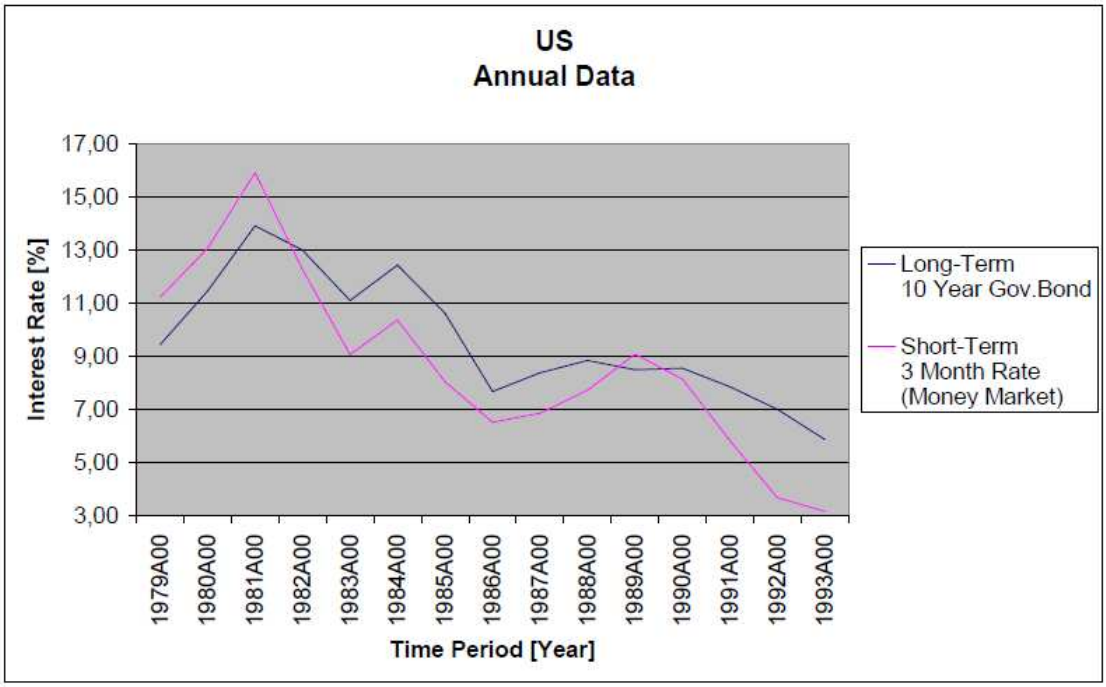


Figure 18: USA; Short-Term vs. Long-Term Rates; 1979 – 1993

Figure 18 shows the development of short-term and long-term interest rates during the 1980s. In terms of short-term interest rates, this era was characterized by relatively high fluctuations in the rate and various level cuts.

Generally, it can be stressed that increasing short-term interest rates in the money market lead to increasing long-term interest rates in the capital market. This is followed by rising prices for capital, and these also increase the demand in the goods market with congruent effects for the price level, and vice versa.

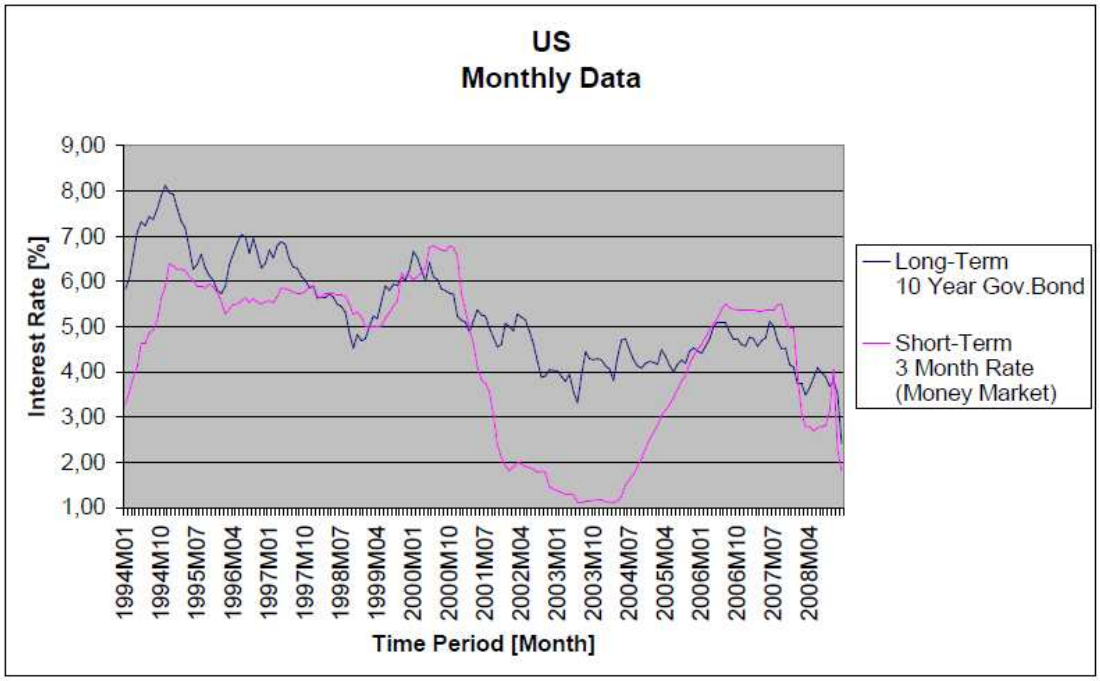


Figure 19: USA; Short-Term vs. Long-Term Rates; 1994 – 2008

During the 1990s and up to the year 2000, the development of the trend of long-term interest rates was similar to the short-term rates' one. In 2000, harbingers of a deep recession were detected, and therefore the FED tried to react to this situation, and supported the economy by cutting the short-term interest rates dramatically. This continued until the year 2003, when the problem of the *liquidity trap* emerged. The short-term rates were set to a range between 1.00 and 0.00 percent and therefore could not be cut further. In 2004, a boost in short-term interest rates began. This trend in monetary policy was not followed by long-term interest rates in the capital market. Because of the high level of uncertainty of rates in the long run, and because they are determined by the supply and demand in the bond market, the long-term rates were held relatively high to the short-term ones. FED had to react to the impact of 9/11, but the credibility in long-term bond was still unbroken and so rates had high levels.

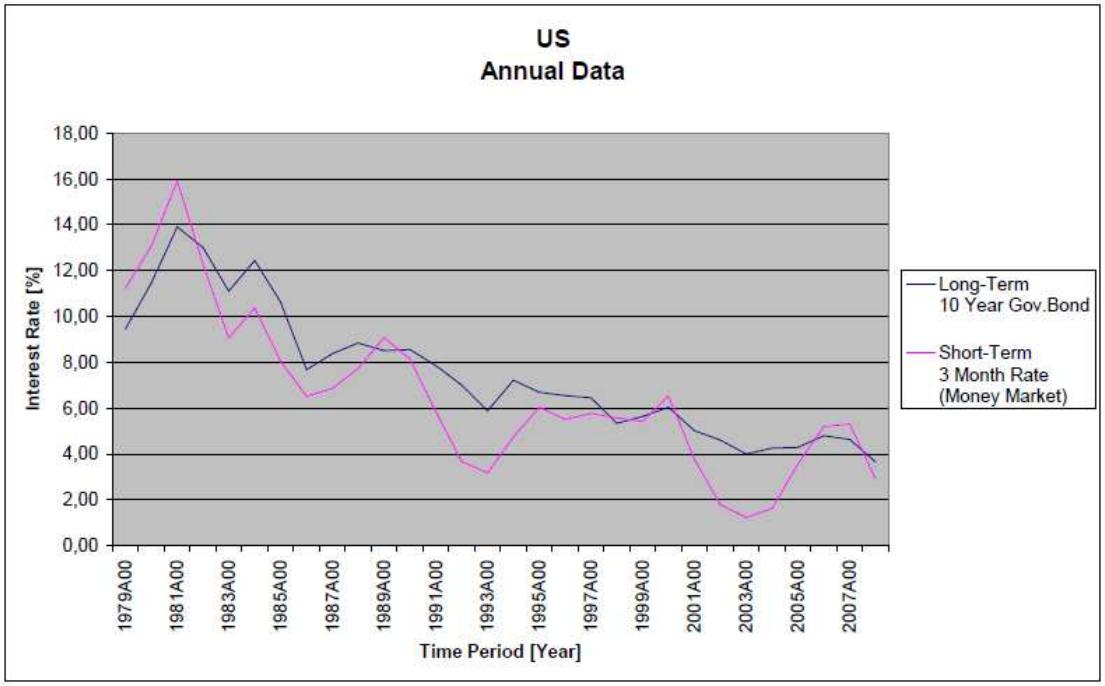


Figure 20: USA; Short-Term vs. Long-Term Rates; 1979 – 2008

Figure 20 illustrates the trend of the whole period observed for the study. Here, it can be stressed that the relative trend of short-term and long-term interest rates was nearly equivalent. If one takes a closer look at the last ten years of the study, the impacts of both 9/11 and the credit crunch do not seem to be as significant as expected.

7.3. Short-Term vs. Long-Term Interest Rates in the UK

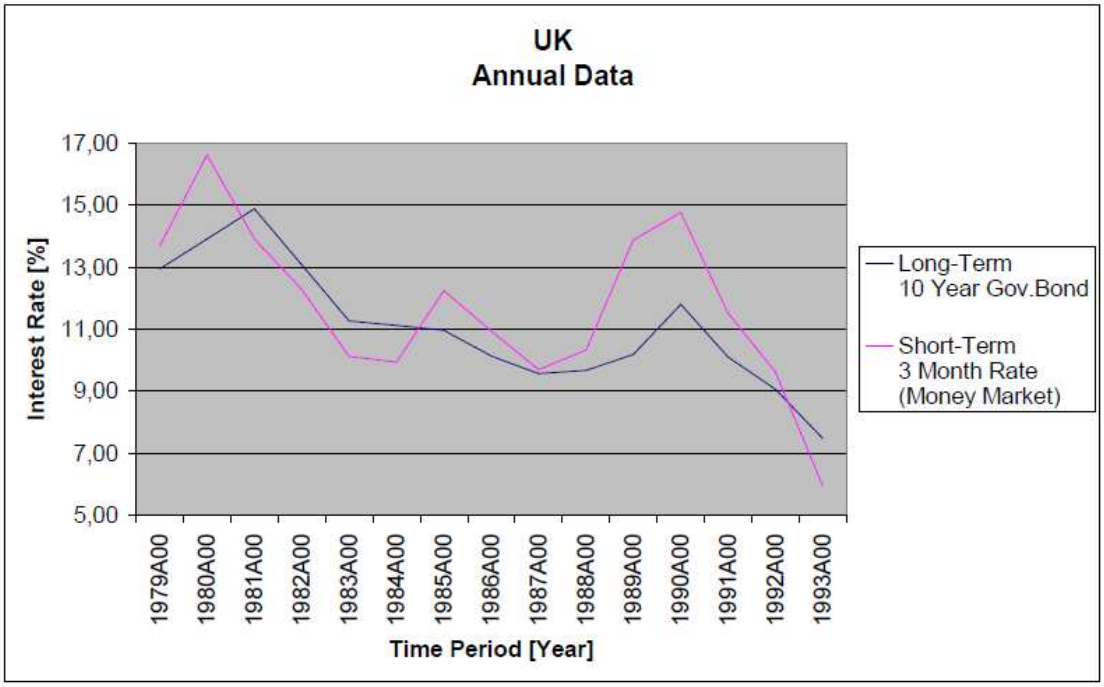


Figure 21: UK; Short-Term vs. Long-Term Rates; 1979 – 1993

During the 1980s and up until 1999, the Bank of England kept its short-term interest rates above the former German rates. That came because the Deutschmark was a strong currency and British policy-makers wanted to strengthen the domestic national economy. The predicted trend of long-term interest rates following the movements of short-term rates came true. In 1990, the UK became a member of the European Exchange Rate Mechanism. Because of the British aversion against European policy making, a conflict surfaced in short-term interest rate cuttings. Thus, long-term rates which already had a lower level than the short-term ones, also decreased.

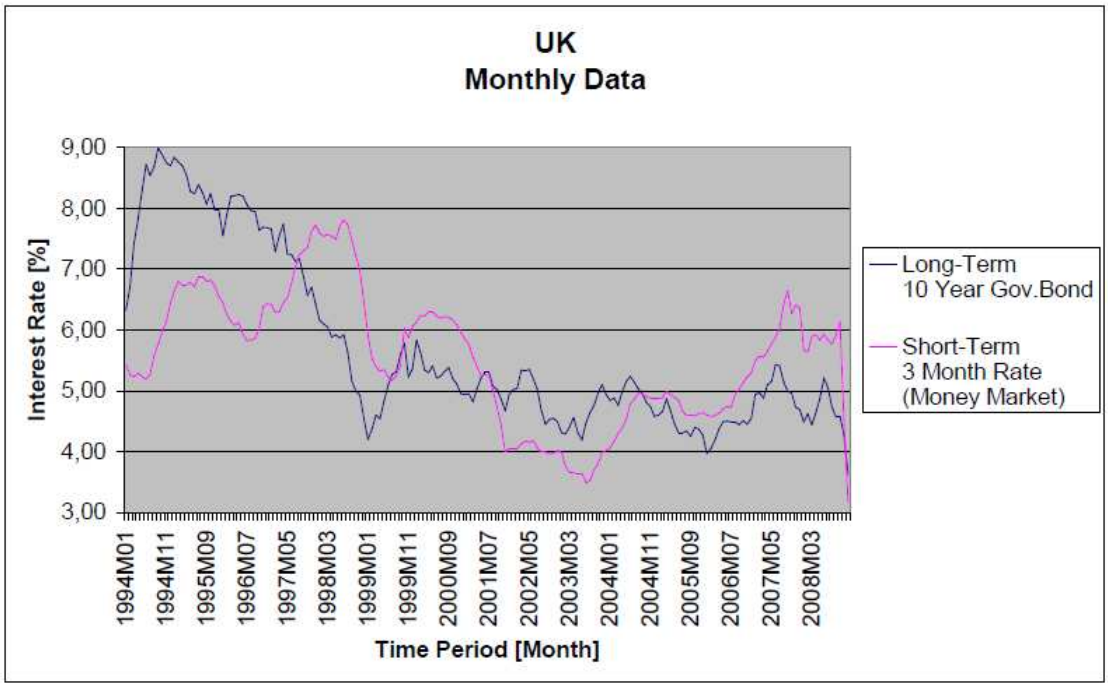


Figure 22: UK; Short-Term vs. Long-Term Rates; 1994 – 2008

The 1990s were characterized by huge fluctuations in short-term interest rates which were followed by reactions in long-term levels in the same way. The only difference between both trends appeared between 1994 and 1997. This difference was based on a certain change in the monetary policy making of the UK, as well as on the first period of inflation targeting. Essentially, that period was characterized by various huge short-term interest rate fluctuations. Generally speaking, the long term rates remained constant at a relative high level. In 1999, a minimum of long-term interest rates of 5.17 percent was reached followed by recovering. This era was shaped by enormous fluctuations in the long-term rate until 2006. The money market rate was still at a higher level than the bond related rate, but both changed their shape at the same time.

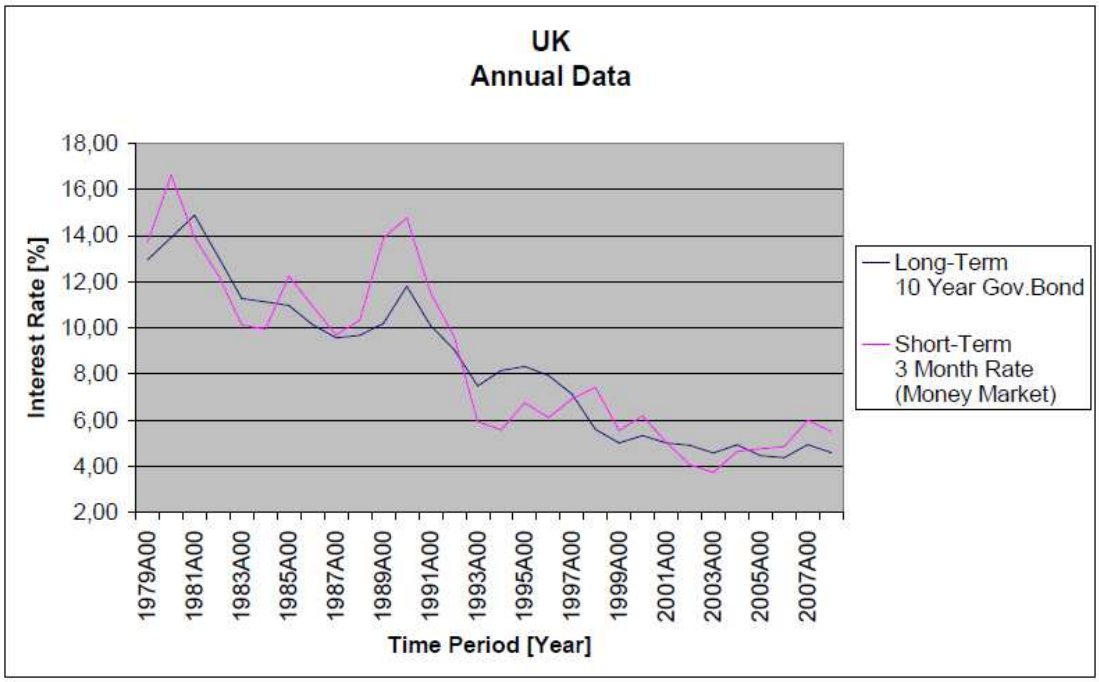


Figure 23: UK; Short-Term vs. Long-Term Rates; 1979 – 2008

To sum up my observations of the UK, I have to conclude that short-term and long-term interest rates seem to be closely connected to each other. *Figure 23* represents the continuously declining trend, but in comparison to the USA where differences between the two rates seem to be quite high, the UK`s rate divergence appears to be smaller.

7.4. Short-Term vs. Long-Term Interest Rates in Euro Area

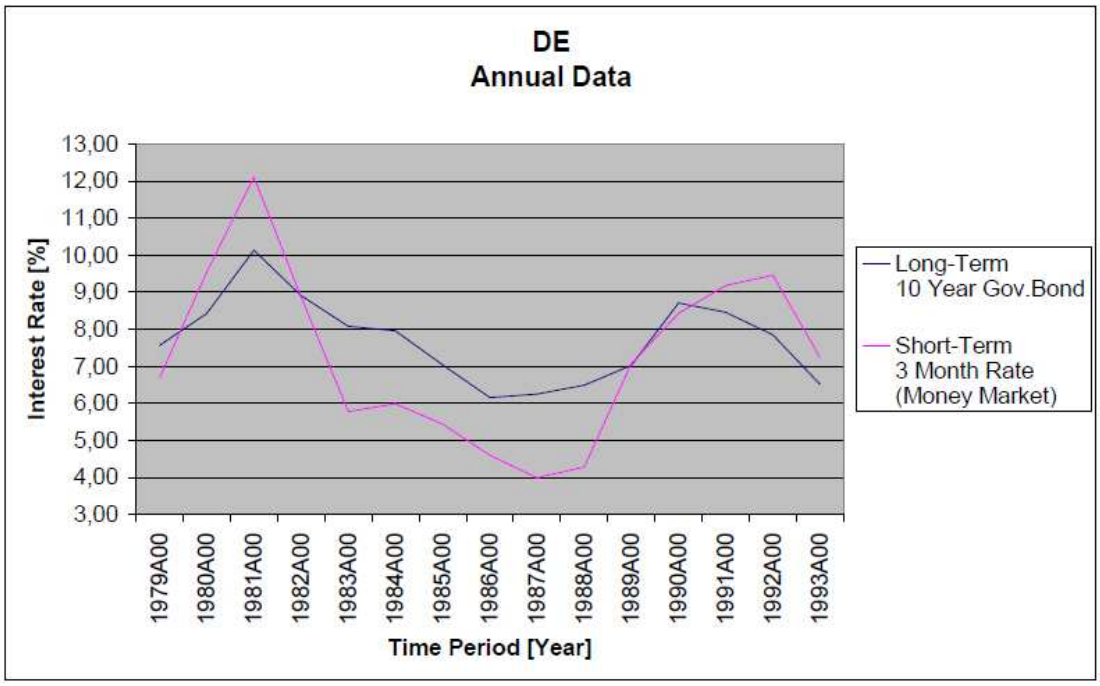


Figure 24: Euro Area; Short-Term vs. Long-Term Rates; 1979 – 1993

During the first part of the 1980s, the main trend that can be detected was a decline in short-term interest rates. In this period, the long-term rates remained at a higher level until 1989. At the time of the German reunification, both rates were rising, and continued to do so until 1990. The interesting aspect here is that both rates had almost similar levels. After this boom, the interest rates of that era were cut once more in reaction to economic problems and in order to strengthen the national economy.

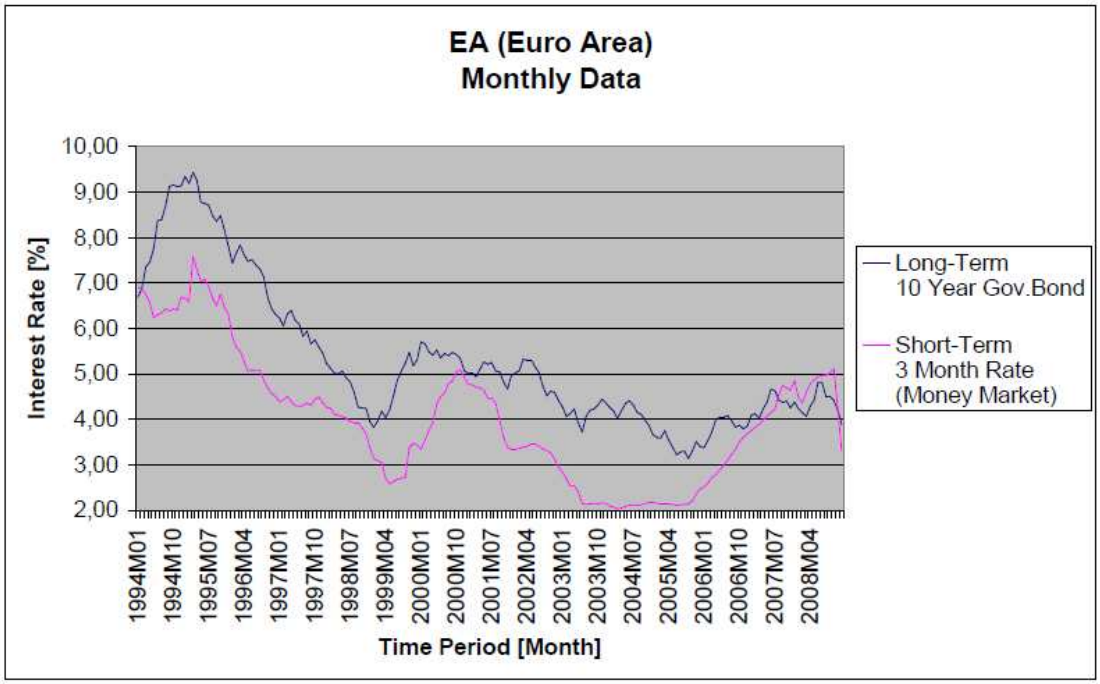


Figure 25: Euro Area; Short-Term vs. Long-Term Rates; 1994 – 2008

From the mid-1990s to 2008, parallel shifts in both interest rates occurred. Long-term rates constantly outperformed short-term ones. Only in the last two years did the money market rate get higher. It is interesting to note here that the fluctuations in long-term rates seem to be very high in comparison to the movements of the short-term rate. Even in the period between 2003 and 2006, the short-term interest rate was practically frozen at a level slightly above 2.00 percent, and the long-term capital market rates fluctuated heavily. In 2006, both rates started to increase, just like in the other two geographic contexts mentioned before.

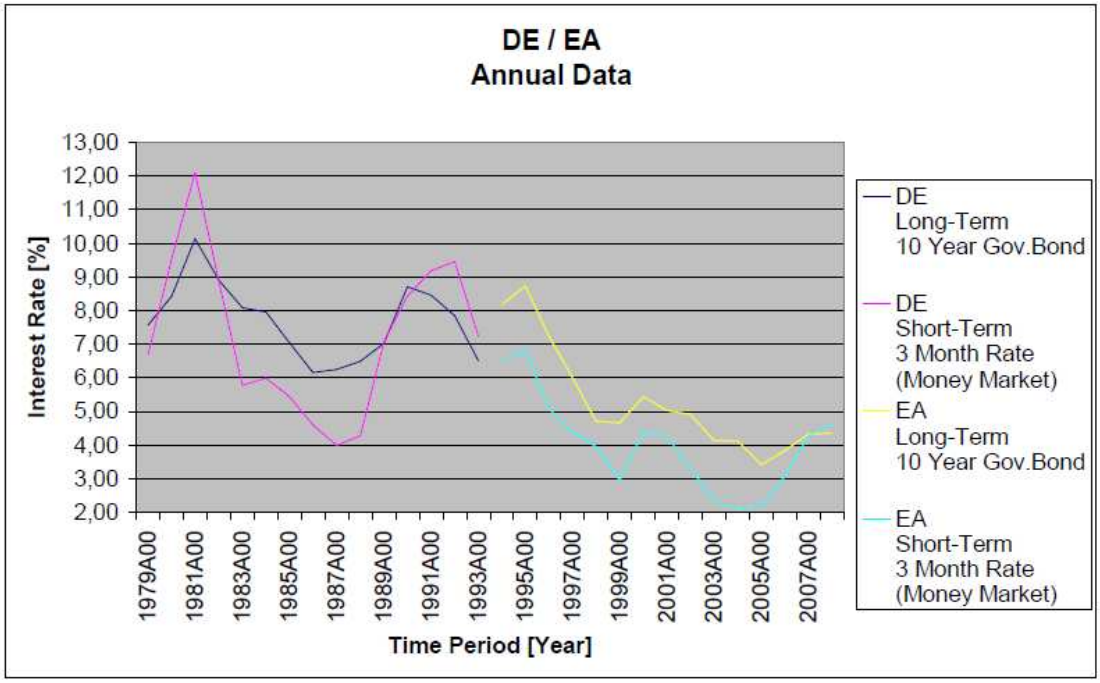


Figure 26: Euro Area; Short-Term vs. Long-Term Rates; 1979 – 2008

In conclusion, the three decades of monetary policy in the Euro Area were characterized by a high divergence between short-term and long-term rates. This was especially the case in the time between 1979 and 1993, in contrast to a relatively small divergence from 1994 onwards. Maybe this outcome is rooted in the use of two different rates in the context of the Euro Area. Until 1993, the former German rate was used, and for the time sector between 1994 and 2008, the up-to-date European rate was taken into consideration. Nevertheless, there are parallels in the shift of the curve in the period since 1994 illustrated in *figure 26*.

8. Conclusion

In the context of this work, I tried to give an overview of monetary policy in three main geographic areas, and I attempted to combine my results with theoretical approaches. The main challenges were the collection of data for the empirical study, the difference between short-term and long-term interest rates, and the question of rate selection. I have to admit that the collection of data turned out to be tougher than I thought, mainly because data sets about the time prior to 1985 are very difficult to obtain. The first challenge was to browse the internet for websites of central banks, and to collect enough material for my work. After I had obtained the basic data for my empirical study, I still had to do research concerning the topic of monetary policy. Here, I primarily focused on the article by Hicks from 1935. It is interesting to note that he thought about issues like the connection between economic factors and their interaction within a national economy as early as in 1935.

The Taylor rule is the second pillar of this work so to speak. First, I learned about the original one, and then I discovered the more modern and future-oriented theory, which argues that severe mistakes were made for decades. To me, it seems a bit blue-eyed to base a framework like the original version of the Taylor Rule only on historical data, as we live in a world of a dynamic economy nowadays. Thus, I concentrated on the future-oriented theory, which takes more factors into account.

Chapter 4 serves as a basis for my work, as it explains the structure of monetary policy, and therefore helps the reader to gain some insight into the topic. To me, it seemed impossible to be able to distinguish between short-term and long-term interest rates without knowing anything about monetary policy-makers. Once I was able to differentiate between money market and capital market, it was easy to understand how short-term and long-term interest rates interact.

In my view, another important aspect is in which markets the different rates are settled. The short-term interest rate is connected to the money market (financial market) and is constituted by the central bank. The long-term interest rate belongs to the capital market in which the supply and demand for bonds determine the level of the rate.

The empirical data analysis underlines the effects of different targeting within monetary policy making. I pointed out in my work that nearly each period had its own targets, and I demonstrated that central banks used to experiment with their policies. Moreover, I believe that the figures in the last two chapters enhanced my explanations even more. Important events in the 30-year period covered by this paper were, for example, the UK membership in the European Exchange Rate Mechanism, the implementation of the Maastricht Act, the German reunification, the introduction of the Euro as an official currency, 9/11, and finally the worldwide recession.

To me, monetary policy seems to be a valuable instrument to influence a national economy. But I think it cannot be the only tool to set interest rates because its limits have already been reached. For instance, in 2003 when the level of short-term interest rate was near zero percent in the USA, the FED was unable to react. I believe an option model should be implemented to support and control the activities of central banks.

Furthermore, an exact definition of the connection between long-term and short-term interest rates is also a tough challenge. Generally speaking, long-term rates tend to follow the trend of short-term rates, but in certain periods they act differently. In *Chapter* 7, I portrayed several approaches which deal with the way variables interact within a national economy. Via the IS-LM model, the interception between the two curves can be classified.

On a personal level, central banks and their monetary policies bear a frightful potential. The consequences of their business, whether successful or not, cannot be estimated so easily. On the one hand, central banks are seemingly able to improve the economies of countries, but on the other hand, they are unable to react and remain passive. This dilemma is expressed by the liquidity trap and by the investment trap.

Finally I have to admit that this thesis does not provide any new information on monetary policy, but rather illustrates the policy of central banks of the last three decades. Essentially, my paper consists of discussions of dependencies of financial variables.

I hope my thesis contributes to the work that has already been published in order to provide a valuable interpretation of monetary policy, and the connection between short-term a long-term interest rates.

Appendix A

Datasets 1979 – 1993 (Annual Data)

Database				
EuroStat	ECB	BofE	OECD	DBB
Long-Term Interest Rates **10 Year Gov.Bond** **Annual Data** **1979-2008** **Extracted on 24.02.2009**				
geo/time	DE	EA	UK	US
1979A00	7,57		12,95	9,44
1980A00	8,43		13,91	11,46
1981A00	10,13		14,88	13,91
1982A00	8,91		13,09	13,00
1983A00	8,08		11,27	11,11
1984A00	7,96		11,13	12,44
1985A00	7,04		10,97	10,62
1986A00	6,16		10,14	7,68
1987A00	6,25		9,57	8,38
1988A00	6,49		9,68	8,85
1989A00	7,03		10,19	8,50
1990A00	8,71		11,80	8,55
1991A00	8,46		10,11	7,86
1992A00	7,85		9,06	7,01
1993A00	6,52		7,48	5,87
1994A00		8,18	8,15	7,21
1995A00		8,73	8,32	6,69
1996A00		7,23	7,94	6,54
1997A00		5,99	7,13	6,45
1998A00		4,71	5,60	5,33
1999A00		4,66	5,01	5,64
2000A00		5,44	5,33	6,03
2001A00		5,03	5,01	5,01
2002A00		4,91	4,91	4,60
2003A00		4,14	4,58	4,00
2004A00		4,12	4,93	4,26
2005A00		3,42	4,46	4,28
2006A00		3,84	4,37	4,79
2007A00		4,33	4,94	4,63
2008A00		4,36	4,59	3,65

Database				
EuroStat	ECB	BofE	OECD	DBB
Short-Term Interest Rates **3 Month Rate (Money Market)** **Annual Data** **1979-2008** **Extracted on 24.02.2009**				
geo/time	DE	EA	UK	US
1979A00	6,69		13,69	11,23
1980A00	9,54		16,62	13,07
1981A00	12,11		13,91	15,91
1982A00	8,88		12,29	12,27
1983A00	5,78		10,13	9,07
1984A00	5,99		9,94	10,37
1985A00	5,44		12,24	8,05
1986A00	4,60		10,94	6,52
1987A00	3,99		9,70	6,86
1988A00	4,28		10,33	7,73
1989A00	7,07		13,88	9,09
1990A00	8,43		14,77	8,15
1991A00	9,18		11,52	5,84
1992A00	9,46		9,62	3,68
1993A00	7,24		5,94	3,17
1994A00		6,52	5,57	4,75
1995A00		6,82	6,75	6,04
1996A00		5,09	6,11	5,51
1997A00		4,38	6,92	5,76
1998A00		3,95	7,42	5,57
1999A00		2,96	5,55	5,42
2000A00		4,39	6,19	6,53
2001A00		4,26	5,04	3,77
2002A00		3,32	4,06	1,79
2003A00		2,33	3,73	1,22
2004A00		2,11	4,64	1,62
2005A00		2,19	4,76	3,56
2006A00		3,08	4,85	5,20
2007A00		4,28	6,00	5,30
2008A00		4,63	5,51	2,91

Database				
EuroStat	ECB	BofE	OECD	DBB
DE / EA **Annual Data** **1979-2008** **Extracted on 24.02.2009**				
geo/time	**DE Long-Term** 10 Year Gov.Bond	**DE Short-Term** 3 Month Rate (Money Market)	**EA Long-Term** 10 Year Gov.Bond	**EA Short-Term** 3 Month Rate (Money Market)
1979A00	7,57	6,69		
1980A00	8,43	9,54		
1981A00	10,13	12,11		
1982A00	8,91	8,88		
1983A00	8,08	5,78		
1984A00	7,96	5,99		
1985A00	7,04	5,44		
1986A00	6,16	4,60		
1987A00	6,25	3,99		
1988A00	6,49	4,28		
1989A00	7,03	7,07		
1990A00	8,71	8,43		
1991A00	8,46	9,18		
1992A00	7,85	9,46		
1993A00	6,52	7,24		
1994A00			8,18	6,52
1995A00			8,73	6,82
1996A00			7,23	5,09
1997A00			5,99	4,38
1998A00			4,71	3,95
1999A00			4,66	2,96
2000A00			5,44	4,39
2001A00			5,03	4,26
2002A00			4,91	3,32
2003A00			4,14	2,33
2004A00			4,12	2,11
2005A00			3,42	2,19
2006A00			3,84	3,08
2007A00			4,33	4,28
2008A00			4,36	4,63

Database				
EuroStat	ECB	BofE	OECD	DBB

UK
Annual Data
1979-2008
Extracted on 24.02.2009

geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
1979A00	12,95	13,69
1980A00	13,91	16,62
1981A00	14,88	13,91
1982A00	13,09	12,29
1983A00	11,27	10,13
1984A00	11,13	9,94
1985A00	10,97	12,24
1986A00	10,14	10,94
1987A00	9,57	9,70
1988A00	9,68	10,33
1989A00	10,19	13,88
1990A00	11,80	14,77
1991A00	10,11	11,52
1992A00	9,06	9,62
1993A00	7,48	5,94
1994A00	8,15	5,57
1995A00	8,32	6,75
1996A00	7,94	6,11
1997A00	7,13	6,92
1998A00	5,60	7,42
1999A00	5,01	5,55
2000A00	5,33	6,19
2001A00	5,01	5,04
2002A00	4,91	4,06
2003A00	4,58	3,73
2004A00	4,93	4,64
2005A00	4,46	4,76
2006A00	4,37	4,85
2007A00	4,94	6,00
2008A00	4,59	5,51

Database				
EuroStat	ECB	BofE	OECD	DBB

US
Annual Data
1979-2008
Extracted on 24.02.2009

geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
1979A00	9,44	11,23
1980A00	11,46	13,07
1981A00	13,91	15,91
1982A00	13,00	12,27
1983A00	11,11	9,07
1984A00	12,44	10,37
1985A00	10,62	8,05
1986A00	7,68	6,52
1987A00	8,38	6,86
1988A00	8,85	7,73
1989A00	8,50	9,09
1990A00	8,55	8,15
1991A00	7,86	5,84
1992A00	7,01	3,68
1993A00	5,87	3,17
1994A00	7,21	4,75
1995A00	6,69	6,04
1996A00	6,54	5,51
1997A00	6,45	5,76
1998A00	5,33	5,57
1999A00	5,64	5,42
2000A00	6,03	6,53
2001A00	5,01	3,77
2002A00	4,60	1,79
2003A00	4,00	1,22
2004A00	4,26	1,62
2005A00	4,28	3,56
2006A00	4,79	5,20
2007A00	4,63	5,30
2008A00	3,65	2,91

Datasets 1994 – 2008 (Monthly Data)

Database							
EuroStat	ECB	BofE	OECD	DBB			
Long-Term Interest Rates **10 Year Gov.Bond** **PART 01** **Monthly Data** **1994-2008** **Extracted on 29.01.2009**							
geo/time	EA	UK	US	geo/time	EA	UK	US
1994M01	6,69	6,32	5,83	1997M01	6,23	7,66	6,69
1994M02	6,88	6,71	6,06	1997M02	6,06	7,29	6,52
1994M03	7,35	7,42	6,58	1997M03	6,32	7,55	6,80
1994M04	7,46	7,82	7,09	1997M04	6,39	7,74	6,87
1994M05	7,75	8,29	7,31	1997M05	6,18	7,25	6,82
1994M06	8,37	8,72	7,23	1997M06	6,09	7,24	6,49
1994M07	8,39	8,54	7,43	1997M07	5,83	7,13	6,32
1994M08	8,68	8,69	7,37	1997M08	5,94	7,17	6,29
1994M09	9,12	8,99	7,60	1997M09	5,66	6,88	6,11
1994M10	9,16	8,88	7,89	1997M10	5,75	6,57	6,02
1994M11	9,12	8,75	8,12	1997M11	5,59	6,70	5,86
1994M12	9,14	8,70	7,96	1997M12	5,46	6,43	5,89
1995M01	9,34	8,84	7,93	1998M01	5,22	6,16	5,63
1995M02	9,19	8,76	7,61	1998M02	5,12	6,10	5,65
1995M03	9,43	8,70	7,33	1998M03	5,01	6,05	5,64
1995M04	9,26	8,55	7,18	1998M04	5,00	5,88	5,72
1995M05	8,78	8,28	6,74	1998M05	5,06	5,92	5,65
1995M06	8,75	8,24	6,27	1998M06	4,91	5,87	5,49
1995M07	8,71	8,39	6,38	1998M07	4,82	5,92	5,45
1995M08	8,47	8,26	6,60	1998M08	4,59	5,63	5,32
1995M09	8,36	8,07	6,30	1998M09	4,27	5,16	4,87
1995M10	8,48	8,24	6,13	1998M10	4,25	4,99	4,52
1995M11	8,16	7,97	6,02	1998M11	4,24	4,93	4,82
1995M12	7,82	7,97	5,79	1998M12	3,95	4,54	4,69
1996M01	7,44	7,55	5,73	1999M01	3,82	4,20	4,73
1996M02	7,66	7,90	5,89	1999M02	3,97	4,37	4,99
1996M03	7,83	8,20	6,37	1999M03	4,18	4,60	5,23
1996M04	7,62	8,21	6,62	1999M04	4,04	4,54	5,18
1996M05	7,48	8,23	6,85	1999M05	4,20	4,83	5,54
1996M06	7,51	8,20	7,03	1999M06	4,53	5,09	5,90
1996M07	7,39	8,06	6,99	1999M07	4,86	5,27	5,80
1996M08	7,31	7,96	6,62	1999M08	5,06	5,31	5,94
1996M09	7,13	7,95	6,95	1999M09	5,24	5,60	5,91
1996M10	6,68	7,64	6,64	1999M10	5,47	5,78	6,10
1996M11	6,43	7,69	6,30	1999M11	5,18	5,23	6,03
1996M12	6,31	7,68	6,40	1999M12	5,30	5,36	6,26

Database							
EuroStat	ECB	BofE	OECD	DBB			
Long-Term Interest Rates **10 Year Gov.Bond**				**PART 02**			
Monthly Data **1994-2008** **Extracted on 29.01.2009**							
geo/time	EA	UK	US	geo/time	EA	UK	US
2000M01	5,70	5,83	6,66	2003M01	4,27	4,31	4,02
2000M02	5,66	5,63	6,52	2003M02	4,06	4,29	3,90
2000M03	5,49	5,34	6,26	2003M03	4,13	4,41	3,79
2000M04	5,41	5,30	6,00	2003M04	4,23	4,56	3,94
2000M05	5,52	5,41	6,42	2003M05	3,92	4,31	3,56
2000M06	5,35	5,21	6,10	2003M06	3,72	4,19	3,32
2000M07	5,45	5,24	6,04	2003M07	4,06	4,47	3,93
2000M08	5,40	5,32	5,83	2003M08	4,20	4,64	4,44
2000M09	5,47	5,38	5,80	2003M09	4,23	4,76	4,29
2000M10	5,42	5,20	5,74	2003M10	4,31	4,96	4,27
2000M11	5,34	5,11	5,72	2003M11	4,44	5,10	4,29
2000M12	5,07	4,95	5,23	2003M12	4,36	4,94	4,26
2001M01	5,01	4,94	5,14	2004M01	4,26	4,84	4,13
2001M02	5,02	4,95	5,10	2004M02	4,18	4,88	4,06
2001M03	4,94	4,82	4,89	2004M03	4,02	4,76	3,81
2001M04	5,10	5,03	5,13	2004M04	4,19	4,99	4,32
2001M05	5,26	5,21	5,37	2004M05	4,35	5,15	4,70
2001M06	5,21	5,30	5,26	2004M06	4,41	5,24	4,73
2001M07	5,25	5,30	5,23	2004M07	4,31	5,14	4,48
2001M08	5,06	5,07	4,97	2004M08	4,15	5,03	4,27
2001M09	5,04	5,02	4,76	2004M09	4,11	4,95	4,13
2001M10	4,82	4,86	4,55	2004M10	3,98	4,81	4,08
2001M11	4,67	4,67	4,61	2004M11	3,86	4,74	4,19
2001M12	4,96	4,94	5,07	2004M12	3,66	4,58	4,23
2002M01	5,02	5,02	5,00	2005M01	3,60	4,60	4,21
2002M02	5,07	5,04	4,90	2005M02	3,59	4,66	4,16
2002M03	5,32	5,34	5,28	2005M03	3,75	4,87	4,49
2002M04	5,30	5,33	5,21	2005M04	3,54	4,67	4,34
2002M05	5,30	5,35	5,15	2005M05	3,39	4,45	4,14
2002M06	5,16	5,19	4,90	2005M06	3,22	4,31	4,00
2002M07	5,03	5,02	4,62	2005M07	3,28	4,31	4,16
2002M08	4,73	4,67	4,24	2005M08	3,30	4,34	4,26
2002M09	4,52	4,45	3,88	2005M09	3,14	4,25	4,19
2002M10	4,62	4,53	3,91	2005M10	3,30	4,40	4,45
2002M11	4,59	4,55	4,04	2005M11	3,51	4,37	4,53
2002M12	4,41	4,49	4,03	2005M12	3,40	4,27	4,46

Database				
EuroStat	ECB	BofE	OECD	DBB
Long-Term Interest Rates				
10 Year Gov.Bond				**PART 03**
Monthly Data				
1994-2008				
Extracted on 29.01.2009				
geo/time	EA	UK	US	
2006M01	3,38	3,97	4,41	
2006M02	3,54	4,05	4,56	
2006M03	3,72	4,19	4,72	
2006M04	3,99	4,37	4,99	
2006M05	4,05	4,49	5,10	
2006M06	4,05	4,50	5,10	
2006M07	4,08	4,49	5,10	
2006M08	3,96	4,49	4,88	
2006M09	3,83	4,44	4,72	
2006M10	3,87	4,51	4,73	
2006M11	3,79	4,45	4,60	
2006M12	3,85	4,54	4,57	
2007M01	4,09	4,94	4,76	
2007M02	4,12	4,97	4,73	
2007M03	4,02	4,88	4,56	
2007M04	4,23	5,10	4,69	
2007M05	4,37	5,15	4,75	
2007M06	4,66	5,43	5,11	
2007M07	4,63	5,41	5,01	
2007M08	4,43	5,15	4,68	
2007M09	4,37	4,99	4,51	
2007M10	4,40	4,96	4,52	
2007M11	4,25	4,73	4,16	
2007M12	4,38	4,69	4,10	
2008M01	4,23	4,49	3,73	
2008M02	4,14	4,62	3,73	
2008M03	4,07	4,44	3,49	
2008M04	4,28	4,64	3,65	
2008M05	4,42	4,87	3,87	
2008M06	4,81	5,21	4,09	
2008M07	4,81	5,05	3,98	
2008M08	4,50	4,73	3,89	
2008M09	4,50	4,57	3,68	
2008M10	4,42	4,58	3,79	
2008M11	4,20	4,26	3,52	
2008M12	3,89	3,62	2,42	

Database							
EuroStat	ECB	BofE	OECD	DBB			
Short-Term Interest Rates							
3 Month Rate (Money Market)				**PART 01**			
Monthly Data							
1994-2008							
Extracted on 04.02.2009							
geo/time	EA	UK	US	geo/time	EA	UK	US
1994M01	6,91	5,44	3,28	1997M01	4,39	6,42	5,57
1994M02	6,86	5,26	3,55	1997M02	4,43	6,29	5,53
1994M03	6,75	5,23	3,88	1997M03	4,50	6,30	5,67
1994M04	6,57	5,29	4,11	1997M04	4,39	6,45	5,85
1994M05	6,24	5,23	4,64	1997M05	4,30	6,53	5,84
1994M06	6,30	5,19	4,64	1997M06	4,29	6,76	5,81
1994M07	6,34	5,27	4,86	1997M07	4,30	7,04	5,76
1994M08	6,43	5,58	4,92	1997M08	4,36	7,24	5,73
1994M09	6,38	5,77	5,13	1997M09	4,31	7,30	5,74
1994M10	6,43	5,97	5,63	1997M10	4,44	7,36	5,78
1994M11	6,40	6,13	5,88	1997M11	4,49	7,63	5,89
1994M12	6,69	6,43	6,39	1997M12	4,37	7,72	5,90
1995M01	6,66	6,64	6,34	1998M01	4,26	7,59	5,67
1995M02	6,59	6,80	6,26	1998M02	4,24	7,54	5,64
1995M03	7,58	6,73	6,27	1998M03	4,11	7,57	5,74
1995M04	7,29	6,74	6,24	1998M04	4,09	7,54	5,74
1995M05	7,04	6,78	6,11	1998M05	4,06	7,49	5,73
1995M06	7,08	6,71	6,01	1998M06	4,02	7,71	5,69
1995M07	6,92	6,88	5,90	1998M07	3,95	7,81	5,69
1995M08	6,66	6,88	5,90	1998M08	3,93	7,73	5,68
1995M09	6,50	6,80	5,86	1998M09	3,93	7,47	5,50
1995M10	6,75	6,82	5,94	1998M10	3,81	7,22	5,27
1995M11	6,45	6,72	5,88	1998M11	3,69	6,97	5,32
1995M12	6,32	6,55	5,75	1998M12	3,37	6,46	5,22
1996M01	5,81	6,45	5,55	1999M01	3,14	5,92	5,01
1996M02	5,58	6,25	5,28	1999M02	3,09	5,53	5,00
1996M03	5,50	6,14	5,39	1999M03	3,05	5,40	5,01
1996M04	5,27	6,08	5,49	1999M04	2,70	5,32	5,00
1996M05	5,06	6,12	5,50	1999M05	2,58	5,35	5,02
1996M06	5,08	5,93	5,57	1999M06	2,63	5,22	5,18
1996M07	5,06	5,82	5,64	1999M07	2,68	5,17	5,31
1996M08	5,08	5,84	5,53	1999M08	2,70	5,25	5,45
1996M09	4,86	5,86	5,62	1999M09	2,73	5,41	5,57
1996M10	4,69	6,02	5,54	1999M10	3,38	6,03	6,18
1996M11	4,57	6,39	5,50	1999M11	3,47	5,87	6,10
1996M12	4,50	6,43	5,55	1999M12	3,44	6,06	6,13

Database							
EuroStat	ECB	BofE	OECD	DBB			
Short-Term Interest Rates							
3 Month Rate (Money Market)				**PART 02**			
Monthly Data							
1994-2008							
Extracted on 04.02.2009							
geo/time	EA	UK	US	geo/time	EA	UK	US
2000M01	3,34	6,13	6,04	2003M01	2,83	3,98	1,37
2000M02	3,54	6,24	6,10	2003M02	2,69	3,75	1,34
2000M03	3,75	6,23	6,20	2003M03	2,53	3,66	1,29
2000M04	3,93	6,30	6,31	2003M04	2,54	3,65	1,30
2000M05	4,35	6,30	6,75	2003M05	2,41	3,63	1,28
2000M06	4,50	6,23	6,79	2003M06	2,15	3,64	1,12
2000M07	4,58	6,19	6,73	2003M07	2,13	3,49	1,11
2000M08	4,78	6,22	6,69	2003M08	2,14	3,52	1,14
2000M09	4,85	6,21	6,67	2003M09	2,15	3,70	1,14
2000M10	5,04	6,16	6,78	2003M10	2,14	3,80	1,16
2000M11	5,09	6,09	6,75	2003M11	2,16	3,98	1,17
2000M12	4,93	5,96	6,54	2003M12	2,15	4,02	1,17
2001M01	4,77	5,85	5,73	2004M01	2,09	4,06	1,13
2001M02	4,76	5,76	5,35	2004M02	2,07	4,17	1,12
2001M03	4,71	5,55	4,96	2004M03	2,03	4,30	1,11
2001M04	4,69	5,40	4,63	2004M04	2,05	4,39	1,15
2001M05	4,64	5,25	4,11	2004M05	2,09	4,53	1,25
2001M06	4,45	5,26	3,83	2004M06	2,11	4,79	1,50
2001M07	4,47	5,25	3,75	2004M07	2,12	4,86	1,63
2001M08	4,35	5,00	3,56	2004M08	2,11	4,96	1,73
2001M09	3,98	4,73	3,03	2004M09	2,12	4,95	1,90
2001M10	3,60	4,43	2,40	2004M10	2,15	4,90	2,08
2001M11	3,39	4,00	2,10	2004M11	2,17	4,88	2,31
2001M12	3,34	4,05	1,92	2004M12	2,17	4,87	2,50
2002M01	3,34	4,05	1,82	2005M01	2,15	4,87	2,66
2002M02	3,36	4,05	1,90	2005M02	2,14	4,89	2,82
2002M03	3,39	4,13	1,99	2005M03	2,14	4,99	3,03
2002M04	3,41	4,17	1,97	2005M04	2,14	4,94	3,15
2002M05	3,46	4,15	1,91	2005M05	2,13	4,89	3,27
2002M06	3,46	4,18	1,88	2005M06	2,11	4,84	3,43
2002M07	3,41	4,06	1,85	2005M07	2,12	4,66	3,61
2002M08	3,35	3,99	1,78	2005M08	2,13	4,59	3,80
2002M09	3,31	3,99	1,80	2005M09	2,14	4,60	3,91
2002M10	3,26	3,96	1,78	2005M10	2,20	4,59	4,17
2002M11	3,12	3,97	1,46	2005M11	2,36	4,62	4,35
2002M12	2,94	4,02	1,41	2005M12	2,47	4,64	4,49

Database				
EuroStat	ECB	BofE	OECD	DBB
Short-Term Interest Rates				
3 Month Rate (Money Market)				**PART 03**
Monthly Data				
1994-2008				
Extracted on 04.02.2009				

geo/time	EA	UK	US
2006M01	2,51	4,60	4,60
2006M02	2,60	4,58	4,76
2006M03	2,72	4,59	4,92
2006M04	2,79	4,63	5,07
2006M05	2,89	4,70	5,18
2006M06	2,99	4,74	5,38
2006M07	3,10	4,73	5,50
2006M08	3,23	4,94	5,42
2006M09	3,34	5,03	5,38
2006M10	3,50	5,13	5,37
2006M11	3,60	5,23	5,37
2006M12	3,68	5,29	5,36
2007M01	3,75	5,49	5,36
2007M02	3,82	5,57	5,36
2007M03	3,89	5,55	5,35
2007M04	3,98	5,65	5,35
2007M05	4,07	5,77	5,36
2007M06	4,15	5,88	5,36
2007M07	4,22	6,02	5,36
2007M08	4,54	6,42	5,48
2007M09	4,74	6,65	5,49
2007M10	4,69	6,27	5,15
2007M11	4,64	6,41	4,96
2007M12	4,85	6,36	4,97
2008M01	4,48	5,66	3,92
2008M02	4,36	5,64	3,09
2008M03	4,60	5,89	2,78
2008M04	4,78	5,92	2,79
2008M05	4,86	5,83	2,69
2008M06	4,94	5,93	2,77
2008M07	4,96	5,83	2,79
2008M08	4,97	5,77	2,81
2008M09	5,02	5,91	3,12
2008M10	5,11	6,13	4,06
2008M11	4,24	4,45	2,28
2008M12	3,29	3,17	1,80

Database					
EuroStat	ECB	BofE	OECD	DBB	
EA **Monthly Data**				**PART 01**	
1994-2008 **Extracted on 04.02.2009**					
geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)	geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
1994M01	6,69	6,91	1997M01	6,23	4,39
1994M02	6,88	6,86	1997M02	6,06	4,43
1994M03	7,35	6,75	1997M03	6,32	4,50
1994M04	7,46	6,57	1997M04	6,39	4,39
1994M05	7,75	6,24	1997M05	6,18	4,30
1994M06	8,37	6,30	1997M06	6,09	4,29
1994M07	8,39	6,34	1997M07	5,83	4,30
1994M08	8,68	6,43	1997M08	5,94	4,36
1994M09	9,12	6,38	1997M09	5,66	4,31
1994M10	9,16	6,43	1997M10	5,75	4,44
1994M11	9,12	6,40	1997M11	5,59	4,49
1994M12	9,14	6,69	1997M12	5,46	4,37
1995M01	9,34	6,66	1998M01	5,22	4,26
1995M02	9,19	6,59	1998M02	5,12	4,24
1995M03	9,43	7,58	1998M03	5,01	4,11
1995M04	9,26	7,29	1998M04	5,00	4,09
1995M05	8,78	7,04	1998M05	5,06	4,06
1995M06	8,75	7,08	1998M06	4,91	4,02
1995M07	8,71	6,92	1998M07	4,82	3,95
1995M08	8,47	6,66	1998M08	4,59	3,93
1995M09	8,36	6,50	1998M09	4,27	3,93
1995M10	8,48	6,75	1998M10	4,25	3,81
1995M11	8,16	6,45	1998M11	4,24	3,69
1995M12	7,82	6,32	1998M12	3,95	3,37
1996M01	7,44	5,81	1999M01	3,82	3,14
1996M02	7,66	5,58	1999M02	3,97	3,09
1996M03	7,83	5,50	1999M03	4,18	3,05
1996M04	7,62	5,27	1999M04	4,04	2,70
1996M05	7,48	5,06	1999M05	4,20	2,58
1996M06	7,51	5,08	1999M06	4,53	2,63
1996M07	7,39	5,06	1999M07	4,86	2,68
1996M08	7,31	5,08	1999M08	5,06	2,70
1996M09	7,13	4,86	1999M09	5,24	2,73
1996M10	6,68	4,69	1999M10	5,47	3,38
1996M11	6,43	4,57	1999M11	5,18	3,47
1996M12	6,31	4,50	1999M12	5,30	3,44

Database					
EuroStat	ECB	BofE	OECD	DBB	
EA **Monthly Data**				**PART 02**	
1994-2008 **Extracted on 04.02.2009**					
geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)	geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
2000M01	5,70	3,34	2003M01	4,27	2,83
2000M02	5,66	3,54	2003M02	4,06	2,69
2000M03	5,49	3,75	2003M03	4,13	2,53
2000M04	5,41	3,93	2003M04	4,23	2,54
2000M05	5,52	4,35	2003M05	3,92	2,41
2000M06	5,35	4,50	2003M06	3,72	2,15
2000M07	5,45	4,58	2003M07	4,06	2,13
2000M08	5,40	4,78	2003M08	4,20	2,14
2000M09	5,47	4,85	2003M09	4,23	2,15
2000M10	5,42	5,04	2003M10	4,31	2,14
2000M11	5,34	5,09	2003M11	4,44	2,16
2000M12	5,07	4,93	2003M12	4,36	2,15
2001M01	5,01	4,77	2004M01	4,26	2,09
2001M02	5,02	4,76	2004M02	4,18	2,07
2001M03	4,94	4,71	2004M03	4,02	2,03
2001M04	5,10	4,69	2004M04	4,19	2,05
2001M05	5,26	4,64	2004M05	4,35	2,09
2001M06	5,21	4,45	2004M06	4,41	2,11
2001M07	5,25	4,47	2004M07	4,31	2,12
2001M08	5,06	4,35	2004M08	4,15	2,11
2001M09	5,04	3,98	2004M09	4,11	2,12
2001M10	4,82	3,60	2004M10	3,98	2,15
2001M11	4,67	3,39	2004M11	3,86	2,17
2001M12	4,96	3,34	2004M12	3,66	2,17
2002M01	5,02	3,34	2005M01	3,60	2,15
2002M02	5,07	3,36	2005M02	3,59	2,14
2002M03	5,32	3,39	2005M03	3,75	2,14
2002M04	5,30	3,41	2005M04	3,54	2,14
2002M05	5,30	3,46	2005M05	3,39	2,13
2002M06	5,16	3,46	2005M06	3,22	2,11
2002M07	5,03	3,41	2005M07	3,28	2,12
2002M08	4,73	3,35	2005M08	3,30	2,13
2002M09	4,52	3,31	2005M09	3,14	2,14
2002M10	4,62	3,26	2005M10	3,30	2,20
2002M11	4,59	3,12	2005M11	3,51	2,36
2002M12	4,41	2,94	2005M12	3,40	2,47

Database				
EuroStat	ECB	BofE	OECD	DBB
EA **Monthly Data** **1994-2008** **Extracted on 04.02.2009**				**PART 03**

geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
2006M01	3,38	2,51
2006M02	3,54	2,60
2006M03	3,72	2,72
2006M04	3,99	2,79
2006M05	4,05	2,89
2006M06	4,05	2,99
2006M07	4,08	3,10
2006M08	3,96	3,23
2006M09	3,83	3,34
2006M10	3,87	3,50
2006M11	3,79	3,60
2006M12	3,85	3,68
2007M01	4,09	3,75
2007M02	4,12	3,82
2007M03	4,02	3,89
2007M04	4,23	3,98
2007M05	4,37	4,07
2007M06	4,66	4,15
2007M07	4,63	4,22
2007M08	4,43	4,54
2007M09	4,37	4,74
2007M10	4,40	4,69
2007M11	4,25	4,64
2007M12	4,38	4,85
2008M01	4,23	4,48
2008M02	4,14	4,36
2008M03	4,07	4,60
2008M04	4,28	4,78
2008M05	4,42	4,86
2008M06	4,81	4,94
2008M07	4,81	4,96
2008M08	4,50	4,97
2008M09	4,50	5,02
2008M10	4,42	5,11
2008M11	4,20	4,24
2008M12	3,89	3,29

Database					
EuroStat	ECB	BofE	OECD	DBB	
UK **Monthly Data**				**PART 01**	
1994-2008 **Extracted on 04.02.2009**					
geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)	geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
1994M01	6,32	5,44	1997M01	7,66	6,42
1994M02	6,71	5,26	1997M02	7,29	6,29
1994M03	7,42	5,23	1997M03	7,55	6,30
1994M04	7,82	5,29	1997M04	7,74	6,45
1994M05	8,29	5,23	1997M05	7,25	6,53
1994M06	8,72	5,19	1997M06	7,24	6,76
1994M07	8,54	5,27	1997M07	7,13	7,04
1994M08	8,69	5,58	1997M08	7,17	7,24
1994M09	8,99	5,77	1997M09	6,88	7,30
1994M10	8,88	5,97	1997M10	6,57	7,36
1994M11	8,75	6,13	1997M11	6,70	7,63
1994M12	8,70	6,43	1997M12	6,43	7,72
1995M01	8,84	6,64	1998M01	6,16	7,59
1995M02	8,76	6,80	1998M02	6,10	7,54
1995M03	8,70	6,73	1998M03	6,05	7,57
1995M04	8,55	6,74	1998M04	5,88	7,54
1995M05	8,28	6,78	1998M05	5,92	7,49
1995M06	8,24	6,71	1998M06	5,87	7,71
1995M07	8,39	6,88	1998M07	5,92	7,81
1995M08	8,26	6,88	1998M08	5,63	7,73
1995M09	8,07	6,80	1998M09	5,16	7,47
1995M10	8,24	6,82	1998M10	4,99	7,22
1995M11	7,97	6,72	1998M11	4,93	6,97
1995M12	7,97	6,55	1998M12	4,54	6,46
1996M01	7,55	6,45	1999M01	4,20	5,92
1996M02	7,90	6,25	1999M02	4,37	5,53
1996M03	8,20	6,14	1999M03	4,60	5,40
1996M04	8,21	6,08	1999M04	4,54	5,32
1996M05	8,23	6,12	1999M05	4,83	5,35
1996M06	8,20	5,93	1999M06	5,09	5,22
1996M07	8,06	5,82	1999M07	5,27	5,17
1996M08	7,96	5,84	1999M08	5,31	5,25
1996M09	7,95	5,86	1999M09	5,60	5,41
1996M10	7,64	6,02	1999M10	5,78	6,03
1996M11	7,69	6,39	1999M11	5,23	5,87
1996M12	7,68	6,43	1999M12	5,36	6,06

Database					
EuroStat	ECB	BofE	OECD	DBB	
UK **Monthly Data**				**PART 02**	
1994-2008 **Extracted on 04.02.2009**					
geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)	geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
2000M01	5,83	6,13	2003M01	4,31	3,98
2000M02	5,63	6,24	2003M02	4,29	3,75
2000M03	5,34	6,23	2003M03	4,41	3,66
2000M04	5,30	6,30	2003M04	4,56	3,65
2000M05	5,41	6,30	2003M05	4,31	3,63
2000M06	5,21	6,23	2003M06	4,19	3,64
2000M07	5,24	6,19	2003M07	4,47	3,49
2000M08	5,32	6,22	2003M08	4,64	3,52
2000M09	5,38	6,21	2003M09	4,76	3,70
2000M10	5,20	6,16	2003M10	4,96	3,80
2000M11	5,11	6,09	2003M11	5,10	3,98
2000M12	4,95	5,96	2003M12	4,94	4,02
2001M01	4,94	5,85	2004M01	4,84	4,06
2001M02	4,95	5,76	2004M02	4,88	4,17
2001M03	4,82	5,55	2004M03	4,76	4,30
2001M04	5,03	5,40	2004M04	4,99	4,39
2001M05	5,21	5,25	2004M05	5,15	4,53
2001M06	5,30	5,26	2004M06	5,24	4,79
2001M07	5,30	5,25	2004M07	5,14	4,86
2001M08	5,07	5,00	2004M08	5,03	4,96
2001M09	5,02	4,73	2004M09	4,95	4,95
2001M10	4,86	4,43	2004M10	4,81	4,90
2001M11	4,67	4,00	2004M11	4,74	4,88
2001M12	4,94	4,05	2004M12	4,58	4,87
2002M01	5,02	4,05	2005M01	4,60	4,87
2002M02	5,04	4,05	2005M02	4,66	4,89
2002M03	5,34	4,13	2005M03	4,87	4,99
2002M04	5,33	4,17	2005M04	4,67	4,94
2002M05	5,35	4,15	2005M05	4,45	4,89
2002M06	5,19	4,18	2005M06	4,31	4,84
2002M07	5,02	4,06	2005M07	4,31	4,66
2002M08	4,67	3,99	2005M08	4,34	4,59
2002M09	4,45	3,99	2005M09	4,25	4,60
2002M10	4,53	3,96	2005M10	4,40	4,59
2002M11	4,55	3,97	2005M11	4,37	4,62
2002M12	4,49	4,02	2005M12	4,27	4,64

Database				
EuroStat	ECB	BofE	OECD	DBB
UK **Monthly Data** **1994-2008** **Extracted on 04.02.2009**				**PART 03**

geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
2006M01	3,97	4,60
2006M02	4,05	4,58
2006M03	4,19	4,59
2006M04	4,37	4,63
2006M05	4,49	4,70
2006M06	4,50	4,74
2006M07	4,49	4,73
2006M08	4,49	4,94
2006M09	4,44	5,03
2006M10	4,51	5,13
2006M11	4,45	5,23
2006M12	4,54	5,29
2007M01	4,94	5,49
2007M02	4,97	5,57
2007M03	4,88	5,55
2007M04	5,10	5,65
2007M05	5,15	5,77
2007M06	5,43	5,88
2007M07	5,41	6,02
2007M08	5,15	6,42
2007M09	4,99	6,65
2007M10	4,96	6,27
2007M11	4,73	6,41
2007M12	4,69	6,36
2008M01	4,49	5,66
2008M02	4,62	5,64
2008M03	4,44	5,89
2008M04	4,64	5,92
2008M05	4,87	5,83
2008M06	5,21	5,93
2008M07	5,05	5,83
2008M08	4,73	5,77
2008M09	4,57	5,91
2008M10	4,58	6,13
2008M11	4,26	4,45
2008M12	3,62	3,17

Database					
EuroStat	ECB	BofE	OECD	DBB	
US **Monthly Data**				**PART 01**	
1994-2008 **Extracted on 04.02.2009**					
geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)	geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
1994M01	5,83	3,28	1997M01	6,69	5,57
1994M02	6,06	3,55	1997M02	6,52	5,53
1994M03	6,58	3,88	1997M03	6,80	5,67
1994M04	7,09	4,11	1997M04	6,87	5,85
1994M05	7,31	4,64	1997M05	6,82	5,84
1994M06	7,23	4,64	1997M06	6,49	5,81
1994M07	7,43	4,86	1997M07	6,32	5,76
1994M08	7,37	4,92	1997M08	6,29	5,73
1994M09	7,60	5,13	1997M09	6,11	5,74
1994M10	7,89	5,63	1997M10	6,02	5,78
1994M11	8,12	5,88	1997M11	5,86	5,89
1994M12	7,96	6,39	1997M12	5,89	5,90
1995M01	7,93	6,34	1998M01	5,63	5,67
1995M02	7,61	6,26	1998M02	5,65	5,64
1995M03	7,33	6,27	1998M03	5,64	5,74
1995M04	7,18	6,24	1998M04	5,72	5,74
1995M05	6,74	6,11	1998M05	5,65	5,73
1995M06	6,27	6,01	1998M06	5,49	5,69
1995M07	6,38	5,90	1998M07	5,45	5,69
1995M08	6,60	5,90	1998M08	5,32	5,68
1995M09	6,30	5,86	1998M09	4,87	5,50
1995M10	6,13	5,94	1998M10	4,52	5,27
1995M11	6,02	5,88	1998M11	4,82	5,32
1995M12	5,79	5,75	1998M12	4,69	5,22
1996M01	5,73	5,55	1999M01	4,73	5,01
1996M02	5,89	5,28	1999M02	4,99	5,00
1996M03	6,37	5,39	1999M03	5,23	5,01
1996M04	6,62	5,49	1999M04	5,18	5,00
1996M05	6,85	5,50	1999M05	5,54	5,02
1996M06	7,03	5,57	1999M06	5,90	5,18
1996M07	6,99	5,64	1999M07	5,80	5,31
1996M08	6,62	5,53	1999M08	5,94	5,45
1996M09	6,95	5,62	1999M09	5,91	5,57
1996M10	6,64	5,54	1999M10	6,10	6,18
1996M11	6,30	5,50	1999M11	6,03	6,10
1996M12	6,40	5,55	1999M12	6,26	6,13

Database					
EuroStat	ECB	BofE	OECD	DBB	
US **Monthly Data**				**PART 02**	
1994-2008 **Extracted on 04.02.2009**					
geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)	geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
2000M01	6,66	6,04	2003M01	4,02	1,37
2000M02	6,52	6,10	2003M02	3,90	1,34
2000M03	6,26	6,20	2003M03	3,79	1,29
2000M04	6,00	6,31	2003M04	3,94	1,30
2000M05	6,42	6,75	2003M05	3,56	1,28
2000M06	6,10	6,79	2003M06	3,32	1,12
2000M07	6,04	6,73	2003M07	3,93	1,11
2000M08	5,83	6,69	2003M08	4,44	1,14
2000M09	5,80	6,67	2003M09	4,29	1,14
2000M10	5,74	6,78	2003M10	4,27	1,16
2000M11	5,72	6,75	2003M11	4,29	1,17
2000M12	5,23	6,54	2003M12	4,26	1,17
2001M01	5,14	5,73	2004M01	4,13	1,13
2001M02	5,10	5,35	2004M02	4,06	1,12
2001M03	4,89	4,96	2004M03	3,81	1,11
2001M04	5,13	4,63	2004M04	4,32	1,15
2001M05	5,37	4,11	2004M05	4,70	1,25
2001M06	5,26	3,83	2004M06	4,73	1,50
2001M07	5,23	3,75	2004M07	4,48	1,63
2001M08	4,97	3,56	2004M08	4,27	1,73
2001M09	4,76	3,03	2004M09	4,13	1,90
2001M10	4,55	2,40	2004M10	4,08	2,08
2001M11	4,61	2,10	2004M11	4,19	2,31
2001M12	5,07	1,92	2004M12	4,23	2,50
2002M01	5,00	1,82	2005M01	4,21	2,66
2002M02	4,90	1,90	2005M02	4,16	2,82
2002M03	5,28	1,99	2005M03	4,49	3,03
2002M04	5,21	1,97	2005M04	4,34	3,15
2002M05	5,15	1,91	2005M05	4,14	3,27
2002M06	4,90	1,88	2005M06	4,00	3,43
2002M07	4,62	1,85	2005M07	4,16	3,61
2002M08	4,24	1,78	2005M08	4,26	3,80
2002M09	3,88	1,80	2005M09	4,19	3,91
2002M10	3,91	1,78	2005M10	4,45	4,17
2002M11	4,04	1,46	2005M11	4,53	4,35
2002M12	4,03	1,41	2005M12	4,46	4,49

Database				
EuroStat	ECB	BofE	OECD	DBB
US **Monthly Data** **1994-2008** **Extracted on 04.02.2009**				**PART 03**

geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
2006M01	4,41	4,60
2006M02	4,56	4,76
2006M03	4,72	4,92
2006M04	4,99	5,07
2006M05	5,10	5,18
2006M06	5,10	5,38
2006M07	5,10	5,50
2006M08	4,88	5,42
2006M09	4,72	5,38
2006M10	4,73	5,37
2006M11	4,60	5,37
2006M12	4,57	5,36
2007M01	4,76	5,36
2007M02	4,73	5,36
2007M03	4,56	5,35
2007M04	4,69	5,35
2007M05	4,75	5,36
2007M06	5,11	5,36
2007M07	5,01	5,36
2007M08	4,68	5,48
2007M09	4,51	5,49
2007M10	4,52	5,15
2007M11	4,16	4,96
2007M12	4,10	4,97
2008M01	3,73	3,92
2008M02	3,73	3,09
2008M03	3,49	2,78
2008M04	3,65	2,79
2008M05	3,87	2,69
2008M06	4,09	2,77
2008M07	3,98	2,79
2008M08	3,89	2,81
2008M09	3,68	3,12
2008M10	3,79	4,06
2008M11	3,52	2,28
2008M12	2,42	1,80

Datasets 1979 – 2008 (Annual Data)

Database				
EuroStat	ECB	BofE	OECD	DBB

Long-Term Interest Rates
10 Year Gov.Bond
Annual Data
1979-1993
Extracted on 24.02.2009

geo/time	DE	UK	US
1979A00	7,57	12,95	9,44
1980A00	8,43	13,91	11,46
1981A00	10,13	14,88	13,91
1982A00	8,91	13,09	13,00
1983A00	8,08	11,27	11,11
1984A00	7,96	11,13	12,44
1985A00	7,04	10,97	10,62
1986A00	6,16	10,14	7,68
1987A00	6,25	9,57	8,38
1988A00	6,49	9,68	8,85
1989A00	7,03	10,19	8,50
1990A00	8,71	11,80	8,55
1991A00	8,46	10,11	7,86
1992A00	7,85	9,06	7,01
1993A00	6,52	7,48	5,87

Database				
EuroStat	ECB	BofE	OECD	DBB

Short-Term Interest Rates
3 Month Rate (Money Market)
Annual Data
1979-1993
Extracted on 24.02.2009

geo/time	DE	UK	US
1979A00	6,69	13,69	11,23
1980A00	9,54	16,62	13,07
1981A00	12,11	13,91	15,91
1982A00	8,88	12,29	12,27
1983A00	5,78	10,13	9,07
1984A00	5,99	9,94	10,37
1985A00	5,44	12,24	8,05
1986A00	4,60	10,94	6,52
1987A00	3,99	9,70	6,86
1988A00	4,28	10,33	7,73
1989A00	7,07	13,88	9,09
1990A00	8,43	14,77	8,15
1991A00	9,18	11,52	5,84
1992A00	9,46	9,62	3,68
1993A00	7,24	5,94	3,17

Database				
EuroStat	ECB	BofE	OECD	DBB

DE
Annual Data
1979-1993
Extracted on 24.02.2009

geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
1979A00	7,57	6,69
1980A00	8,43	9,54
1981A00	10,13	12,11
1982A00	8,91	8,88
1983A00	8,08	5,78
1984A00	7,96	5,99
1985A00	7,04	5,44
1986A00	6,16	4,60
1987A00	6,25	3,99
1988A00	6,49	4,28
1989A00	7,03	7,07
1990A00	8,71	8,43
1991A00	8,46	9,18
1992A00	7,85	9,46
1993A00	6,52	7,24

Database				
EuroStat	ECB	BofE	OECD	DBB

UK
Annual Data
1979-1993
Extracted on 24.02.2009

geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
1979A00	12,95	13,69
1980A00	13,91	16,62
1981A00	14,88	13,91
1982A00	13,09	12,29
1983A00	11,27	10,13
1984A00	11,13	9,94
1985A00	10,97	12,24
1986A00	10,14	10,94
1987A00	9,57	9,70
1988A00	9,68	10,33
1989A00	10,19	13,88
1990A00	11,80	14,77
1991A00	10,11	11,52
1992A00	9,06	9,62
1993A00	7,48	5,94

Database				
EuroStat	ECB	BofE	OECD	DBB

US
Annual Data
1979-1993
Extracted on 24.02.2009

geo/time	**Long-Term** 10 Year Gov.Bond	**Short-Term** 3 Month Rate (Money Market)
1979A00	9,44	11,23
1980A00	11,46	13,07
1981A00	13,91	15,91
1982A00	13,00	12,27
1983A00	11,11	9,07
1984A00	12,44	10,37
1985A00	10,62	8,05
1986A00	7,68	6,52
1987A00	8,38	6,86
1988A00	8,85	7,73
1989A00	8,50	9,09
1990A00	8,55	8,15
1991A00	7,86	5,84
1992A00	7,01	3,68
1993A00	5,87	3,17

Appendix B

Summary in German / Deutsche Zusammenfassung

Die Hauptaufgabe der vorliegenden Arbeit liegt einerseits darin den Überblick über die Geldmarktpolitik zu schaffen und andererseits eine Unterscheidung zwischen kurz- und langfristigen Zinssätzen zu ermöglichen.

Geldmarktpolitik repräsentiert die Summe aller finanzwirtschaftlichen Instrumente, welche von bestimmten Entscheidungsträgern zur Verfolgung und letztendlichen Erlangung monetärer Ziele eingesetzt werden. Diese Entscheidungsträger sind keine Geringeren als die Zentralbanken der jeweiligen Staaten, in derer Macht es steht durch bestimmte politische Interventionen die Geschicke einer gesamten Volkswirtschaft zu lenken und zu beeinflussen. Anhand der, in der Arbeit dargestellten empirischen Studie welche den Zeitraum der letzten drei Dekaden und die drei geographischen Gebiete der Vereinigten Staaten von Amerika, Großbritannien und der Euro Zone umfasst, werden verschiedene Ansätze und Zielsetzungen von Geldmarktpolitik besprochen und bildlich dargestellt.

Die in der Arbeit besprochenen, kurzfristigen Zinssätze sind jene mit der größten Bedeutung im Hinblick auf die Politik der Zentralbanken, da sie im direkten Zusammenhang mit den angestrebten Zielsetzungen stehen und darüber hinaus als direktes Steuerungselement dienen. Durch ihre Anpassung reagieren Zentralbanken auf bestimmte Ereignisse und können somit die Volkswirtschaft einer gesamten Nation effizient und produktiv halten. Durch die Analyse der Daten werden somit bestimmte Trends der jeweiligen Zeitperioden und geographischen Gebiete dargestellt.

Diese Ergebnisse, beruhend auf der Auswertung der kurzfristigen Daten, werden nun, unter Berücksichtigung von theoretischen Ansätzen, den langfristigen Zinssätzen gegenübergestellt. Durch die Zuhilfenahme von Diagrammen können letztendlich Aussagen getroffen werden, inwieweit langfristige Zinssätze von kurzfristigen und somit direkt von der Geldmarktpolitik der Zentralbanken beeinflusst werden.

Abschließend muss noch erläutert werden, dass alle, in der Arbeit dargestellten und verwendeten Daten-Tabellen und Diagramme vom Verfasser selbiger erstellt und

ausgewertet wurden. Als Grundlage zur Datenerfassung dienten lediglich die im *Appendix A* und in der *Bibliography* angeführten *Internet-Databases* der jeweiligen Institutionen.

Appendix C

Christian Dolenz

Lebenslauf

Persönliche Daten

- Geburtsdatum: 05.03.1980
- Geburtsort: Villach
- Nationalität: Österreich
- Familienstand: ledig

Studium

- 04/2010: **SPONSION: „Magister"**, Internationale Betriebswirtschaft
- 11/2008 - 04/2010: **Diplomarbeit**: Finance / Macroeconomics, *Prof. Dr. Erich W.Streissler*, "Long-term vs. Short-term Interest Rates; An Empirical Study"
- 11/2007: **Case Study**: **erster Platz**, Asset Management, *Gutmann Bank*
- 08/2006 - 07/2007: **ERASMUS-Auslandsaufenthalt**: „Universidad de Valancia", Spanien
- 10/2000 - 04/2010: Studium: Internationale Betriebswirtschaft, Betriebswirtschaftszentrum der Universität Wien (BWZ)
  Spezialisierungen: **Finanzdienstleistung**, **Banking**

Ausbildung und Schule

- 09/2007: Titel-Verleihung: **„Ingenieur"**, Bautechnik – Hochbau
- 06/1999: **Matura**: Bautechnik – Hochbau, **guter Erfolg**
- 05/1999: **Planungswettbewerb**: **erster Platz**, Wohnbau, *Eternit*
- 09/1994 - 06/1999: Höhere Technische Bundeslehr- und Versuchsanstalt Villach, Hochbau
- 09/1990 - 06/1994: Gymnasium Peraustraße, Villach

Wehrpflicht

- 10/1999 - 05/2000: abgeleistet, **Heeres-Sportzentrum (HSZ)**, Rudern, Blattgasse Wien

Berufstätigkeit und Praktika

- 09/2008 - 10/2008: **Auto Magic KFZ – Sevice GmbH**, Wien: projetbezogener Angestellter
  - Organisation und Logistik
- 01/2001 - heute: **Planungsbüro Dolenz**, Villach: Finanzwirtschaftler / Bautechniker
  - Unternehmensrechnung, Kostenrechnung und Buchhaltung
  - Steuer- und finanzwirtschaftliche Tätigkeiten

- Organisation und Logistik
- Kalkulation, Preis- und Angebotsanalyse
- Ausschreibung (AUER Success)
- CAD - Planung (Auto CAD)
- Bauleitung
- Aufmass und Massenermittlung
- EDV, Software- und Netzwerkadministration

- 07/1998 - 08/1998: **Eatrich Zettinig GmbH**, Villach: Praktikant im technischen Baubüro
  - Kalkulation
  - Ausschreibung
  - Aufmass und Massenermittlung
- 07/1997 - 08/1997: **Eatrich Zettinig GmbH**, Villach: Praktikant im technischen Baubüro
  - Ausschreibung
  - Aufmass und Massenermittlung
- 07/1995 - 08/1995: **Stadtbaumeister Josef Willroider GmbH**, Villach: Praktikant auf Baustelle
  - Gewerk: Baumeisterarbeiten

Leistungssport – Rudern

- 2004: FISA X - Games Sevilla
- 2003: Rowing World Cup
- 2002: U-23 WM Genua
- 2001: U-23 WM Ottensheim
- 2000: U-23 WM Kopenhagen, Rowing World Cup
- 1999: U-23 WM Hamburg, Rowing World Cup
- 1990 - heute: Aktiver Leistungssport, Ruderverein Villach, Nationalkader Österreich, vielmaliger Österreichischer Staatsmeister und Kärntner Landesmeister

Zusatzqualifikationen

- EDV, Software- und Netzwerkadministration:
  - MS-Word, MS-Excel, MS-Powerpoint, Auto CAD: sehr gut
  - MS-Works, Adobe Photoshop, AUER Success, MySQL-Datenbank: gut
- Sprachkenntnisse:
  - Deutsch: Muttersprache
  - Englisch: sehr gut, in Wort und Schrift, Wirtschaftsenglisch
  - Spanisch: gut, in Wort und Schrift, Wirtschaftsspanisch
- Führerschein:
  - A, B

Interessen und Hobbies

Rudern, Mountainbiken, Joggen, Langlaufen, Schwimmen, Wandern, Fitness, moderne Architektur, Design, Musik, Gitarrespielen, Reisen

Wien, im April 2010

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