

Министерство образования и науки Российской Федерации  
НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ  
ТОМСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ (НИ ТГУ)

Институт Экономики и Менеджмента

ДОПУСТИТЬ К ЗАЩИТЕ В ГЭК  
Руководитель ООП  
д-р. экон. наук, профессор  
Л.С.Гринкевич  
« 06 » июня 20 18 г.

**МАГИСТЕРСКАЯ ДИССЕРТАЦИЯ**

РЕЗЕРВНЫЕ ТРЕБОВАНИЯ ЕВРОПЕЙСКОГО ЦЕНТРАЛЬНОГО БАНКА И  
ЦЕНТРАЛЬНОГО БАНКА РОССИИ - СРАВНЕНИЕ

по основной образовательной программе подготовки магистров  
направление подготовки 08.01.05 – Финансы и кредит

Юрьева Лидия Анатольевна

Научный руководитель ВКР  
к. э. н., доцент  
А.С. Баландина  
подпись  
« 06 » июня 20 18 г.

Автор работы  
студент группы №27617  
Л.А. Юрьева  
подпись

НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ  
ТОМСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ

Институт экономики и менеджмента

**ИНДИВИДУАЛЬНОЕ ЗАДАНИЕ**

**Юрьева Лидия Анатольевна**

Направление подготовки	08.01.05 Финансы и Кредит
Программа подготовки	«Финансы»
Квалификация (степень)	магистр

**Исходные данные к работе:**

цель исследования: проанализировать существующие правила и особенности обязательного резервирования Центрального Банка России и Европейского Центрального Банка  
задачи исследования:

- 1) Изучить нормативную базу обязательного резервирования в России и Европе
- 2) Проанализировать и выделить основные общие и различные черты
- 3) Вычислить избыточные резервы и проанализировать их поведение в зависимости от

экономической ситуации в мире

объект исследования: монетарная политика центральных банков России и Европы

предмет исследования: резервные требования Центрального Банка России и Европейского Центрального Банка

№ п/п	содержание задания (перечень разделов и ожидаемых результатов)	Срок реализации
1.	Введение	Январь 2018
2.	Обзор Литературы	Февраль 2018
3.	Первая глава	Март 2018
4.	Вторая глава	Апрель 2018
5.	Заключение	Май 2018

Дата выдачи индивидуального задания: «20» сентября 2017 г.

Срок защиты ВКР (магистерской диссертации): «05» июня 2018 г.

Научный руководитель

  
(подпись)

Баландина А.С., доцент

## **Аннотация**

к магистерской диссертации  
на тему «Резервные требования Европейского Центрального Банка и Центрального  
Банка России - сравнение» («The Reserve Requirements Policy of the European Central  
Bank and the Central Bank of Russia - a comparison»)  
магистранта Института Экономики и Менеджмента НИИ ТГУ  
Юрьевой Лидии Анатольевны

Объем магистерской диссертации 40 страниц, включая 3 рисунка и 8 таблиц. При написании диссертации использовалось 14 источников. Исследование изложено на английском языке.

**Ключевые слова:** резервные требования, обязательные резервные, избыточные резервы, Европейский Центральный Банк, Центральный Банк России.

Данное исследование направлено на изучение особенностей политики Центрального Банка России (ЦБР) и Европейского Центрального Банка (ЕЦБ) в сфере резервных требований. Изучаются основные характеристики и понятия, применяемые в каждой банковской системе.

Освещаются фундаментальные характеристики резервных требований в каждом из случаев, а также проводится их сравнение. Выделяются основные схожие и отличительные черты, и формулируется соответствующий вывод. Также в этой работе проводится исследование избыточных резервных кредитных организаций Европы и России. Исследуемый период 2005-2017 делится на 3 условные части: до кризиса, во время кризиса и после кризиса. Данное разделение вводится для лучшего понимания поведения кредитных учреждений и центрального банка в условиях экономической напряженности. Основная причина отдельного изучения избыточных резервов состоит в том, что именно они отражают реальные ресурсы банков, свободные для создания кредитов для организаций и физических лиц. Избыточные резервы показывают реальные кредитные возможности банков и отражают состояние их свободной ликвидности. В Европе избыточные резервы – один из основных параметров анализа банковской системы, в российской же реальности избыточные резервы не являются важным направлением для изучения.

Актуальность магистерской диссертации отражена в фундаментальном значении политики резервных требований для банковской системы любой страны. Резервные требования являются одним из основных инструментов монетарной

политики. С помощью резервных требований корректируется предложение денег в стране и его кругооборот. За счет изменения ставки резервов и резервной базы изымается излишняя ликвидность из оборота, и наоборот, добавляется, в случае нехватки. Даже небольшое изменение в этих основных значений может привести к радикальному изменению количества свободной ликвидности банков.

Теоретико-методологической базой диссертации стали научные труды зарубежных и отечественных ученых по теории и практике применения резервных требований в политике центральных банков. Информационная база работы представлена данными Центрального Банка России и Европейского Центрального Банка.

В ходе исследования использовались научные методы наблюдения, сравнения, группировки, статистические методы, графический метод предоставления информации, методы анализа и синтеза, методы индукции и дедукции.

Научная новизна исследования состоит в предложенном способе расчета избыточных резервов на основе статистических данных, представленных ЦБР. ЦБР не осуществляет отдельного учета и мониторинга избыточных резервов кредитных учреждений, поэтому для целей работы был предложен возможный вариант их расчета и анализа.

Магистерская диссертация включает в себя введение, две главы, заключение, список литературы и приложения. В первой главе описываются основные характеристики резервных требований, существующие в банковской системе Европы и России. Во второй части проводится расчет и сравнение поведения избыточных резервных в разрезе 3-х временных промежутков (до, во время и после кризиса), а также рассчитываются основные статистические показатели, необходимые для анализа.

## **Table of contents**

1 Introduction.....	1
2 Literature review.....	3
3 Description of Reserve requirements system in Euro Zone and Russia.....	6
3.1 The Reserve Requirements of ECB.....	6
3.2 The Reserve Requirements of the Central Bank of Russia.....	10
4 How European and Russian Central Banks hold their reserves 2005-2017 – a comparison.....	14
5 Conclusion.....	24
Bibliographic References.....	26
Appendices	

## **Index**

### **List of tables:**

Table 1 – The average, standard deviation and coefficient of variation of excess reserves in Russia before, during and after crisis

Table 2 – The average, standard deviation and coefficient of variation of excess reserves in EU before, during and after crisis

#### **Appendices 1**

Table 1.1 – Historical data on the reserve requirement ratio from 2004 to 2009.

Table 1.2 – Historical data on the reserve requirement ratio from 2009 to 2016.

Table 1.3 – Historical data on the reserve requirement ratio during 2017.

Table 1.4 – Historical data on the coefficient of averaging.

#### **Appendices 2**

Table 2.1 – Required and excess reserves of credit institutions in Russia in 01.2005 – 12.2017.

Table 2.2 – Required and excess reserves of credit institutions in Europe in 01.2005 – 12.2017.

### **List of figures:**

Figure 1 – Required and Excess reserves in Russia 2005-2017, bil rub

Figure 2– Required and Excess reserves in Europe 2005-2017, mil euro

Figure 3– Excess reserves in Europe 2005-2011, mil euro

### **List of abbreviations and symbols:**

RR – reserve requirements

RRR – required reserve ratio

ECB – the European Central Bank

CBR – the Central Bank of Russia

OMO – open market operations

EMU – European Economic and Monetary Union

Bil – billion

Mil – million

## **1 Introduction**

A very weighty role in the economic relations of each country is played by the Central Bank. Central banks have significant power of influencing the country's economy via monetary policies. They have a great responsibility in choosing the strategy to reach the goals of monetary policy and also in the choice of the procedures of this policy. The main aim of this paper is to focus on one of such procedure or instruments. Reserve requirements are considered to be one of the traditional monetary policy instruments along with the refinancing rate and open market operations. Reserve requirements represent a percentage of liabilities of a commercial bank that they are obliged to maintain in central bank accounts.

In modern practice, minimum reserve requirements are used primarily as monetary instruments to solve long-term problems of stabilizing the amount of money in circulation and to fight inflation or deflation. Reserve requirements are also used to limit the growth of the money supply and regulate the demand for bank reserves. This tool of monetary policy is powerful, but rather rough, because it affects the fundamentals of the entire banking system. Even a slight change in the norms of reserve requirements may cause significant changes in the amount of bank reserves and lead to a modification of the credit policy of commercial banks.

The main objectives of this research project are:

- 1) To characterize the rules and particular features of reserve requirements implemented by the Bank of Russia and European Central Bank;
- 2) To study the procedures of the implementation of mandatory reserves on the basis of legislative and instructive material of the Bank of Russia and European Central Bank;
- 3) To investigate how banks maintain their required and excess reserves before, during and after the worldwide financial crisis;
- 4) To highlight similarities and differences in the behaviour of the CBR and the ECB.

The data necessary for this project is provided by European Central Bank and Central Bank of Russia in open access on the official web-sites of such authorities.

Therefore, by studying legal basis of such activities of central bank and relevant publications on the topic, as well as the data provided by the two central banks, we expect to gather necessary information to compare the reserve requirements policy of both central banks, as well as to compare how the credit institutions in Russia and Euro Zone hold their reserves.

The paper is organized as follows: section 2 presents literature review, section 3 presents a description of Reserve requirements system in Euro Zone and Russia, section 4 presents a comparison of how European and Russian Central Banks hold their reserves in 2006-2018 and finally, section 5 presents the conclusions of the paper.



## 2 Literature review

The need to maintain reserves in case of an unforeseen cash outflow was taken into account even long time ago by the predecessors of modern credit institutions: money changers, moneylenders, bankers' houses, etc. Later, when classical commercial banks appeared, but state regulation was in its infancy, the features of banking production (for example, the need for liquidity insurance of credit institutions) required the banker to have a certain amount of reserves, primarily cash. The size of such reserves was determined by the intuition of the banker, and reserves were kept directly at the cash desk of the credit institution.

In the early 19th century, the attention of central banks was concentrated on the policy of interest rates (short-term bank rate). Reserve Position Doctrine (RPD) came to replace this model. The RPD appeared in the USA in 20<sup>th</sup> century and according to it a central bank should use open market operation (OMO) to steer reserve concept, which would impact via the money multiplier on monetary aggregates and ultimate goals. For the purposes of monetary policy the RPD moved the role of short-term interest rates to the background and began to concentrate more on excess reserves. Thus, it was assumed that banks are more active in issuing loans when their reserves are high, and slowing down the activity when the level of reserves is low. Open market operations were conducted with the primary purpose of controlling the level of excess reserves (Ulrich, 2004).

Feinman (1993) names two ways of keeping reserves. The first way of keeping reserves is by having reserves directly in cash (known as vault cash) and the other one is in the balances of the Federal Reserve. The author claims that commonly depository institutions are able to satisfy all of their reserve requirements only with vault cash. Those who are not, they need to maintain deposits, called required reserve balances, at the Federal Reserve which are a percentage of the total amount of deposits. The reserves are held in the form of vault cash and deposits at the central bank.

Zhilan (2010) claims that for the first time, reserve requirements were submitted in the United States in 1913 when the Federal Reserve was created. Initially, the minimum requirements were used to achieve narrower goals, in particular, to maintain the proportions between the borrowed funds and own funds. In some cases - in the *Federal Republic of Germany* and Japan since the beginning of the 1970s, in Spain since the late 1970s - reserve requirements were considered primarily as a method of influencing the liquidity of the banking system. At the present time, there is a growing tendency to use reserve requirements

as a method oriented toward global domestic economic goals, creating favorable conditions for using finer instruments for regulating monetary circulation.

Gray S. (2011) focuses on the three main purposes for reserve requirements – prudential, monetary control and liquidity management. Prudential purpose taking us back to the gold standard where commercial banks were limited directly by reserve balances or by another bank that was holding gold reserves. Monetary control defines how reserve requirements can restrict the growth of balance sheet and the ability of central bank to vary the level of reserve requirements for the purpose of managing inflation. Liquidity management includes passive form, which can be applied if reserve requirements can make average over one period, and active form, where central bank involve reserve requirements rates to manage reserve surplus and demand and supply of reserves.

According to Sokolova (2010) the RR in the Russian current banking system are recognized as the mandatory reserve standard that establishes the amount of the guarantee fund of a commercial bank that ensures the reliable performance of its obligations to customers. Also, the reserve ratio depends on the different factors, for example the size of the bank itself: the larger it is, the higher the norm. She mentions that the change in the amount of mandatory reserves affects the volume of the money supply not only by regulating the credit possibilities of commercial banks, but also by means of a bank multiplier. The bank multiplier allows determine the amount of money that can be created by the bank.

Novashina (2016) claims that for the point of view of a bank the reserve requirement it is an abstract, inactive, not efficient resource. For creditors it is a form of guarantee of return of a part of the resources invested in the bank. Finally, for the central bank reserve requirements is a tool to ensure the liquidity of the banking system and the source of repayment of the bank's obligations to depositors when revoking a license.

Frolova and Kardamonova (2015) in their work mention that essentially, reserve requirements are established on the liabilities of credit institutions and serve as a mechanism for regulating the liquidity of the banking sector, and can also be established to monitor monetary aggregates, which helps maintain the money supply in the country at a certain level. Central banks influence the change in the money supply and the liquidity level of the banking sector by modifying reserve requirements based on liabilities.

Nowadays, according to information on the Official web-site of European Central Bank, the minimum reserve requirements for credit institutions are applied almost in all countries with market economies, with the exception of Australia, Canada, Sweden, the UK, New Zealand and Hong Kong. These countries don't have required reserve ratios (or RRRs)

or we may say that RRR equal to zero. However, this does not mean that the banks of these countries can create money indefinitely. They are limited by the requirements for the level of capital. Central Banks of those countries believe that they are much more effective than reserve liabilities.

In the global economy, there is a general tendency to move away from the active use of reserve requirements by the Central Banks as a regulatory tool. This refusal is caused by the presence of such specific properties as inflexibility and inability to operatively influence the credit market. We can name some of disadvantages:

- The RR's "inflexibility" means that frequent changes in the norms of mandatory reservation destabilize the activities of credit institutions. Even small adjustments to reserve norms have a significant impact on the levels of bank reserves, which are important variables in the financial planning of credit institutions
- The mechanism is not adapted for short-term liquidity regulation
- A significant obstacle in the way to lending of enterprises and organizations is the high cost of credit resources. One of the reasons that affect the cost of credit resources are reserve requirements. The mechanism for fulfilling reserve requirements is not very effective in a way that it causes banks to keep additional funds without use. Thus, it reduces the effectiveness of the banking business.

### **3. Description of minimum reserves in Euro Zone and Russia**

In the majority of countries with a market economy central banks use the system of reserve requirements in the process of monetary regulation. Reserve requirements represent a certain part of the second order bank's money, which they are obliged to keep as reserves deposits in the central bank accounts. These reserves are mandatory. At the same time, commercial banks may also have voluntary or excess reserves that are commonly stored on the same account with mandatory reserves and represent an amount of funds exceeding them. Therefore, the required reserves were called the minimum reserves.

For the work to be considered valid have been studied a lot of the law literature, legal and regulatory press publications. Such documents are extremely important because they determine the current basis on which the further policy of banks is built. They are officially provided by the main economic and financial authorities or by the state. For the case of Europe were observed Treaty on European Union (TEU), Protocol (№4) on the statute of the European system of central banks and of the European central bank which is annexed to the TEU, European Council Regulation №2531/98, ECB Regulation №2818/98 on the application of the reserve system (ECB/1998/15) with amendments, The Implementation of Monetary Policy in the euro Area (2011), General Documentation on Eurosystem monetary policy instruments and procedures. For the Russian Federation the main references are an Article 75 of the Constitution of the Russian Federation establishes a special constitutional and legal status of the Central Bank of the Russian Federation, Federal Law No. 86-FZ of July 10, 2002 "On the Central Bank of the Russian Federation (Bank of Russia)", Bulletin of the Bank of Russia which published by Central Bank and determine the amount of required reserves. These documents define the legal framework which is used in the Euro area and in Russia concerning central banking and reserve requirements features in particular.

In this paper we analyze the RR policy of European Central Bank (ECB) and the Central Bank of Russia (CBR).

#### **3.1 The Reserve Requirements of ECB.**

Since January the 1<sup>st</sup>, 1999 the ECB has been conducting a unified monetary policy in the Euro Zone. The countries of the euro area transferred to the European Central Bank all the powers in the field of monetary policy, including the decisions on the amount of issuance

of bank notes and the level of the key interest rate. The legal basis for a unified monetary policy is the Treaty on European Union (TEU) (as amended).

The expression "Euro system" means the ECB and the national central banks (NCB) of those member countries that have euro into circulation. The expression "Euro zone" means a space consisting of EU member states that have already introduced the euro into circulation.

The members of EU that have euro as official currency are Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.

The European Union countries that do not use the euro are Bulgaria, Hungary, Denmark, Poland, Romania, Croatia, Czech Republic and Sweden.

The national central banks of those EU member states that have not yet introduced the euro into circulation do not participate in monetary policy decisions for the Euro Zone, and such national central banks do not participate in the practical implementation of such decisions.

Protocol (№4) on the statute of the European system of central banks and of the European central bank which is annexed to the TEU applied that since June the 1<sup>st</sup> of 1998, the establishment of ECB and the European System of Central Banks (ESCB). The ESCB is composed of the ECB and the national central banks (NCB) of all EU member states. Under the Treaty on the European Union, the Eurosystem is entrusted with the main task of maintaining price stability.

In accordance with the Protocol (№4) the ECB may require credit institutions established in Member States to hold minimum reserve on accounts with the national central banks in pursuance of monetary policy objectives. Regulations concerning the calculation and determination of the required reserves may be established by the Governing Council. In cases of noncompliance, the ECB shall be entitled to levy penalty interest and to impose other sanctions with comparable effect.

The main elements present in the system of RR described next in accordance with ECB:

(1) Reserve base

The reserve base of a credit institution is defined in accordance with the elements of its balance sheet. The balance sheet data is reported to the NCB through the general framework of the ECB's money and banking statistics. Banks and institutions that have full reporting requirements use balance sheet data that refers to the last calendar month to calculate reserve base for reserve requirements in the period starting two month after. For

example, if the reserve base is calculated from the data of the end of March, this information would be used to constitute the reserve requirements in the maintenance period beginning in May.

For the small institutions there is a special condition – they might not present full information of their balance sheet. They only need to quarterly report a limited set of balance sheet (as end-of-quarter data). Also their reporting deadline is longer than for the larger institutions. In this case they use the balance sheet data of the specific quarter to calculate the reserve base for the three following maintenance periods, after two months lag. For instance, the balance sheet of the end of the second quarter (June) would be used for the reserve base calculation in the maintenance periods beginning in September, October and November.

Reserve base in EU includes:

Liabilities included in the reserve base and to which the positive reserve ratio is applied (Overnight deposits, Deposits with an agreed maturity of up to and including two years, Deposits redeemable at notice of up to and including two years and Debt securities with an original maturity of up to and including two years)

Liabilities included in the reserve base and to which a zero reserve ratio is applied (Deposits with an agreed maturity of over two years, Deposits redeemable at notice of over two years, Repos and Debt securities with an original maturity of over two years)

Source: The Implementation of Monetary Policy in the euro Area (2011).

#### (2) Reserve ratio

To calculate the amount of required reserves of a credit institution, the value of the reserve base is multiplied by the reserve ratio. The ECB applies a single standard in relation to most of the indicators that are included in the base for calculating reserves. The reserve ratio was set at 2% at the Stage Three of European Economic and Monetary Union (EMU) but from the 18<sup>th</sup> of January 2012 it is decreased to 1%.

#### (3) The one-time deduction

Institutions have a right to make a one-time deduction due to a decrease in the amount of required reserves for a strictly defined and uniform for all credit institutions amount. Since the introduction of the euro, the one-time allowance is equal to 100,000 € from their reserve requirement. It is intended to cover administrative expenses that arise in connection with the management of required reserves and constitute very small amounts of requirements.

#### (4) Averaging Positions

In order to meet the reserve requirements, credit institutions are required to maintain a positive balance of their current accounts in the NCB. In this regard, the system of minimum reserves allows counterparties to resort to averaging positions. This means that fulfillment of requirements for mandatory reserves are determined on the basis of the averaging daily balance of counterparty reserve accounts during the reporting period of approximately one month.

#### (5) Reporting period (maintenance period)

The reporting periods begin on the day of settlements for the first refinancing operations made after the meeting of the Board of Governors, on which, according to the schedule, it is planned to consider the issue of the current position within the monetary policy. The maintenance periods end on the day preceding the corresponding settlement day in the following month.

In order for credit institutions to better manage their reserves, a three-month period before the beginning of the year ECB publishes schedule of maintenance periods (together with a preliminary schedule for the main refinancing operations for a calendar year). These calendars are available at the official web-site of ECB. The schedule may be amended depending on special circumstances (for example, changes in the schedule of Governing Council meetings).

#### (6) Compensation for the deduction of required reserves (remuneration)

The Eurosystem tries to ensure that the system of minimum reserves does not become a "heavy burden" for the banking system and does not interfere with the efficient allocation of resources. For this reason, credit institutions' holdings of required reserves are remunerated. Compensation corresponds to the average marginal rate of the main refinancing operations for the maintenance period, weighted taking into account the number of calendar days. Since the marginal ratios tend to approach the short-term interest rates of the money market, compensation is made at a rate close to the market rate. The excess reserves are not remunerated.

The functions of the system of minimum reserves in Euro Zone is described in ECB (2004)

One of the main functions of the minimum reserve system is to ensure the stability of interest rates of the money market. This function is carried out using the averaging mechanism. The averaging mechanism allows credit institutions to equalize daily fluctuations in liquidity (caused, for example, by fluctuations in demand for banknotes). This is possible

because a temporary deficit in the balance of reserves can be compensated by a surplus of reserves that arise within the same maintenance period.

The second important function of the minimum reserve system is to increase the structural liquidity deficit in the banking system. The fact that credit institutions should keep their reserves in the NCB's accounts stimulates the increase in demand for funding provided by the central bank. Which, in turn, helps the ECB to manage market rates by conducting regular operations to saturate the market with liquidity.

So, the key functions of the minimum reserve system are to stabilize money market interest rates and to increase the structural liquidity shortage of the banking system

### **3.2 The Reserve Requirements of the Central Bank of Russia.**

The monetary policy in Russian Federation is defined and conducted by the CBR is that also referred as "Mega regulator". Since 1995 The CBR began to use reserve requirements more actively as an instrument of monetary policy.

Article 75 of the Constitution of the Russian Federation establishes a special constitutional and legal status of the Central Bank of the Russian Federation, defines its exclusive right to exercise monetary emission and as the main function - to protect and ensure the stability of the ruble (the only currency in Russia). The status, objectives, functions and powers of the Central Bank of the Russian Federation are also determined by the Federal Law "On the Central Bank of the Russian Federation (Bank of Russia)" applied by the Federal Assembly in April 1995 and other federal laws.

The main elements of the system of RR of CBR are:

#### **(1) Reserve base**

The liabilities that are subject to reservation are the liabilities of bank to non-residents organizations (in rubles and foreign currency), the liabilities of bank to individuals (in rubles and foreign currency) and some other liabilities of credit institutions (in rubles and foreign currency). The full list of those is defined in Chapter 2 of Regulation No. 342.

#### **(2) Reporting period**

Usually the separating period is one month of the calendar. In the event of an extraordinary regulation of the amount of mandatory reserves, the reporting period is set by the Bank of Russia.

#### **(3) Maintenance period**

The period from the 10th day of the month following the reporting month to the 10th day of the 2nd month following the reporting one, inclusive.



#### (4) Adjustment coefficient

The coefficient that is needed to exclude the debt of the credit institution's separate divisions. An adjustment (correction) coefficient reduces the amount of the reserve for debt securities issued by a credit institution. It is a numerical factor, the value of which is in the range from 0 to 1.

#### (5) Coefficient of averaging

It is a numerical factor, the value of which is in the range from 0 to 1, established by the Board of Directors of the Bank of Russia to calculate the averaged value of required reserves. The use of this tool is only available for financially stable credit institutions that meet certain requirements of the Bank of Russia. These banks were given the right to leave on their correspondent accounts only a part of the normative amount of mandatory reserves for use for current payments. As a result, such credit institutions can deposit on the special account in CBR not the normative but the calculated amount of mandatory reserves (the difference between the normative and the average amount). (Historical data on the coefficient of averaging in the Appendices, Table 1.1)

Any credit institution for current liquidity regulatory purposes can exercise the right to average required reserves during the averaging period if it meets the following criteria:

- does not have a underpayment, unpaid fine;
- fulfilled the obligation to average required reserves in the previous period
- it has no overdue liabilities to the Bank of Russia (including the Bank of Russia loans)

#### (6) Maintenance period

Maintenance period is 1 calendar month. On the 10<sup>th</sup> working day after the maintenance period credit institutions provide the Central Bank with a calculation sheet where they calculate the following values: the size of reserve liabilities, normative value of required reserves, the averaged amount of required reserves, estimated amount of required reserves, and finally the actual balances on the accounts for the accounting of required reserves and the account for the accounting of required reserves in case of non-performance of duty of averaging. They calculate these values separately in calculating sheets depending on the currency (rubles or foreign currency) and after that summing in the one number. (*Vestnik of the Bank of Russia*, 2015)

#### (7) Reserve ratio

In Russia the ratio differs depending on from what kind of subject the funds were attracted – it may be deposit of individuals or of an organisation. Another distinctive feature

is currency – funds might have been attracted in rubles or in foreign currency. Also ratio may differ depending on type of residence - resident of Russia or non-resident. We can follow all that changes in the Appendices, tables from 1.2 to 1.4.

From the 1<sup>st</sup> of December 2017, the required reserves ratios established by the Central Bank of the Russian Federation are:

- for liabilities of bank to non-residents organizations in rubles - 5%;
- for liabilities of bank to non-residents organizations in foreign currency - 7%;
- for liabilities of bank to individuals in rubles - 1%;
- for liabilities of bank to individuals in foreign currency - 6%;
- for other liabilities of credit institutions in rubles - 1%;
- for other liabilities of credit institutions in foreign currency - 7%.

(8) Other information on RR of CBR

It works like in any other country - when an individual or an organisation contributes with funds to a bank, a certain percentage of this amount must be transferred to a special account with the Central Bank as a reserve and kept there until the money is withdrawn from the bank.

The obligation to deposit funds arises for all credit institutions from the date of obtaining the license. Contributions are made in non-cash rubles, interest on mandatory reserves is not paid. In case of bank liquidation, the reserved funds are transferred to the liquidation commission.

The obligatory reserve fund was created in order to ensure, if necessary, the ability of the commercial bank to timely fulfill its obligations to customers to return previously attracted funds, these funds are deposited and not used by the commercial bank to make loans.

**The common aspects of RR policy in central banking of EU and Russia and the main differences.**

The central bank can decide whether to low or raise the required reserve ratio for commercial banks. Theoretically, the amount of money available for issuance in the form of loans is defined as the sum of all bank deposits minus required reserves. Therefore, an increase in the ratio of mandatory reserves entails a decrease in the lending activity of commercial banks due to a reduction in the liquidity that they can use. Such decision can be made by the Central Bank in order to reduce the supply of money and thereby restrain the

development of inflationary processes. The higher the reserves on the accounts of the Central Bank, the greater the profitability loss of commercial banks.

A change in the norm of mandatory reserves is used by the Central Bank rather rarely, because it is a very powerful tool: even a slight change in the rate leads to a significant change in the supply of money.

The level of the mandatory reserve is also affected by the level of development of the banking system and the state of the economy as a whole. In countries with a developed banking system operating in a stable economy, reserve requirements are set for a relatively long time. As was earlier mentioned the reserve ratio of ECB was changed only once in the last 2 decades (from 2% to 1%), while CBR changed it quite several times. This characterizes Russian central banking as not so developed and stable.

Further, in 1998 the European Central Bank, as a monetary policy tool, introduced a system of mandatory minimum reserves, with payment of interest on them. In Russia, unlike EU and some other countries, interest is not paid on mandatory reserves deposited by credit institutions with the CBR. That's why reserve requirements often treated as some kind of "tax" on banks - they lose some of the funds available for obtain a profit if invested. Thus, for a Russian bank reserve requirements - it is an abstract, inactive, not efficient resource, while CBR makes an effort to present RR as not a heavy burden on credit institutions.

ECB does not imposes a different ratio depending on what kind of origin deposits have (individuals or organizations, residents or non-residents) while CBR has various ratios for each case. This shows that the ECB system is simplified and more unified. In the Russian banking system it is quite pronounced, that CBR, using the RR, aims to stimulate banks to obtain resources by attracting funds in the national currency. It establishes the reserve ratio for funds in ruble rather lower than for funds in foreign currency. By differentiating the required reserve ratios by types of currencies, the CBR persistently gives a signal to the banking community about its target priorities. We could not see such ratio differentiation in ECB policy.

Similarity is present in the fundamental sense - the reason for existence of reserve requirement in the monetary policy of the country. They serve as collateral for the obligations of commercial banks on the deposits of their depositor and they are a tool used by the central bank to regulate the amount of money supply in the country. A similar feature is the maintenance period – one month for both Russia and EU reserve requirements policy.

#### **4. How European and Russian Central Banks hold their reserves 2005-2017 – a comparison**

The policy of reserve requirements is a potentially extremely powerful mean of monetary regulation. Even small changes in the norm of reserves lead to significant changes in the volumes of credit of commercial banks and significantly affect the money supply. Thus, here in this paper we are going to look at the maintenance of required reserves in EU and Russia before, during and after the crisis of 2008 trying to find out if the behaviour of banks changes during these periods.

For the analysis we are going to use the official data provided by ECB and CBR at their official web-sites. The minimum frequency of the data provided by the CBR is one month, so I will use monthly information both for ECB and CBR for comparison. Monthly data of CBR starts from 01.09.2004 and continue till present, it expressed in billions of rubles. For ECB data starts from 02.1999 and continues till present, it expressed in millions of euro. Therefore, we are going to analyse the time period starting from the 2005 (the first full data year at CBR web-site) to the 2017 (the last year with full data by now).

We will divide this period in 3 parts:

(1) Before crisis 2005-2007. We consider the pre-crisis period starting from the year of 2005 due to the fact that CBR does not have data at any further past.

(2) During crisis 2008-2011. The worldwide financial crisis started in the 2008 for both EU and Russia. Nevertheless, the end of it didn't come simultaneously for both. Researchers name different times as the last year of crisis depends on how broad they look to the economic situation. We are not going to go too deep to the analyses of how crisis went in Europe and Russia, how it started and when it ended, because it is a huge topic for another research. Here we can admit that a lot of researchers claim that the main economic tensions in Russia started at 2008 and ended in 2009 because of strong anti-inflationary actions made by government, although it had consequences till 2010 and 2011. For Europe the economic crisis started in 2008 and had, as commonly agreed, even deeper consequences and longer difficulties from 2010 to 2012 (for example debt difficulties in Portugal, Greece). So, here for the purpose of comparison we will take average year of 2011 as the only year where economic and financial tensions presented both in EU in Russia because it's better to have the same time limits even though it's not completely correct.

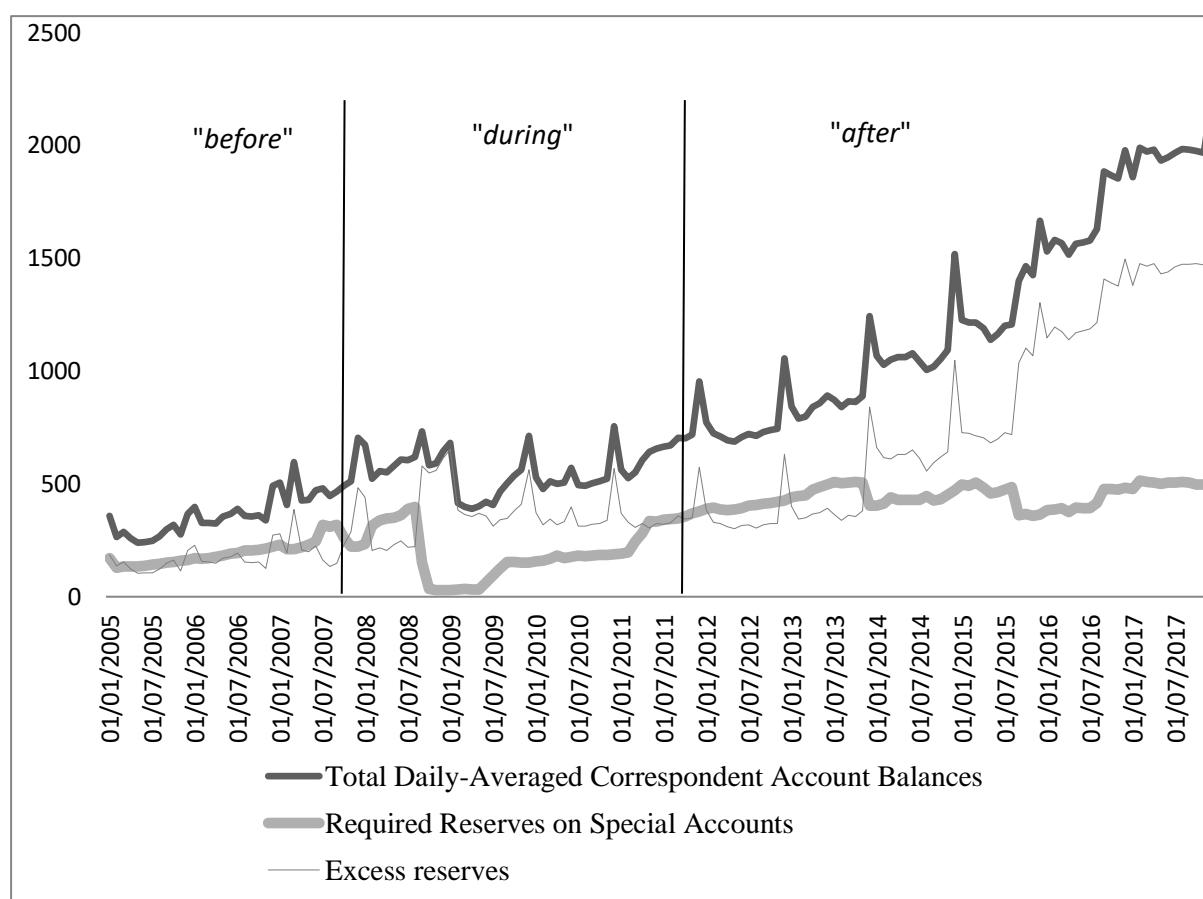
(3) After crisis 2012-2017. We consider the after crisis times from 2012 to the end of 2017 because the 2012 is not treated as crisis year in Russia and the year of 2018 is not fully represented by now.

For better understanding the behaviour of commercial banks we will take a closer look to their excess reserves. These reserves are amounts of funds that banks have in excess of mandatory reserves with central bank. These are the actual means that they can use in their credit activity.

Let us first consider the maintenance of mandatory reserves and excess reserves in the 3 periods in **Russia**.

All the necessary monthly data on required reserves was provided by the Central Bank Russia and available in the Appendices, Table 2.1. Below we can consider the diagram that is based on the found data (Figure 1). Here we can follow all the changes during the whole period from 01.2005 to 12.2017.

Figure 1 –Required and Excess reserves in Russia 2005-2017, bil rub



Source: The figure is built with respect to the data provided by official web-site of CBR.

Thick gray line is a Required Reserves on Special Accounts, the thick black line (above others) is the Total Daily-Averaged Correspondent Account Balances and as the result of them is thin grey line represents Excess Reserves.

The situation with excess reserves in Russia is not clearly represented in the CBR and other legal sources. The authorized bodies do not conduct assess of the excess reserves of commercial banks and do not fulfill monitoring of reserves' conditions. The only certain thing, which is common for worldwide RR practice and can be applied to Russian practice is that excess reserves are the amount of money that commercial banks have at their balances after they provide CB with the required reserves. Applying this methodology to Russian central banking we assume that the excess reserves are the differences between Total Daily-Averaged Correspondent Account Balances and the Required Reserves on Special Accounts. That follows from the fact the Total Daily-Averaged Correspondent Account Balances are what banks have at account balances at total and some of that amount is mandatory reserves that they are obliged to keep with CBR. Hence, the difference between those, provides us with excess reserves that Russian banks have for efficient use in their banking activity. Since the CBR does not conduct calculations of excess reserves of credit institution it was not easy to find any recommendations on how to properly do it with the data that CBR gathers. The offered calculations are made based on our assumption and with the data provided by CBR. In the process of writing this paper we did not found any other offers of calculations of excess reserves.

In the Russian Federation, the regulation of the reserve requirements is one of the most effective instruments of monetary policy, especially during crisis times.

(1) Before crisis.

In the beginning of the researching period there is a trend towards a gradual increase of required reserves on special accounts. However it has some fluctuations during 2007. It has a smoother trend than the total balances of banks, although they are also gradually increasing during 2005-2007 time period. Excess reserves vary around the trend of required reserves on special accounts that shows that the amounts of these two are comparable in this period.

(2) During crisis

Initially, the Bank of Russia planned an increase in the reserve ratio in 2008 as part of the fight against inflation. However, due to negative trends in the economy in the second half of the year, it was decided to reduce the required reserves ratio to 0.5% from mid-October 2008. This was done in 2 steps – in September and October of 2008. As a result the

reserve requirements were reduced to 0,5% and unified for all types of bank liabilities. Even visually it is noticeable that during the crisis serious measures were taken to significantly decrease the required reserves. In Figure 1 we can follow significant fall of required reserves on special accounts with simultaneous rise of excess reserves after 07.2008.

Thus, at the peak of the crisis, the Bank of Russia had to use one of the most powerful tools in the CBR arsenal - reducing the minimum reserve requirements. However, this tool was not used alone but in conjunction with other monetary instruments, such as interest rates on Bank of Russia operations, loans with collateral and loans without collateral, direct repos, currency swaps and a number of other instruments.

### (3) After crisis

In this time period the Bank of Russia was forced to review and improve its methods of implementing monetary policy and methods of economic analysis as well.

In the 3<sup>rd</sup> of June 2010, the Bank of Russia announced the approval of the Bank of Russia Directive No. 2459-U of 03.06.2010, "On the Specifics of Evaluating Credit Risk for Selected Issued Loans, Loan Debts and Equivalent Debts." In accordance with this Directive, the Bank of Russia is gradually returning to pre-crisis requirements in assessing credit risk. The softened reserve requirements for loans during the crisis were aimed to support Russian banks and to allow them to form a smaller reserve funds in such negative economic conditions. In later years, the situation in the banking sector has improved, and that allowed the regulator to tighten the requirements for assessing credit risk, bringing it in line with commonly accepted standards.

On the graph above it is visually notable how after the crisis period CBR have chosen the policy of gradually increasing reserve requirements. They risen from 390,1 bil rubles in the beginning of the period in 01.2012 to 506,4 bil rubles accordingly with the latest data (02.2018). The CBR did not repeat those measures that it had to apply earlier, in 2008. Some fluctuations still have place, but they are not that significant and within the limits of monetary strategy.

Now let us consider the average, standard deviation and coefficient of variation ( $CV = \text{Standard deviation} / \text{Average}$ ) of excess reserves to assess the main changes at behaviour of commercial banks concerning their "free" resources during the 3 time periods.

Table 1 – The average, standard deviation and coefficient of variation of excess reserves in Russia before, during and after crisis.

Period	Average	Standard deviation	Coefficient of variation
01.01.2005 - 01.12.2007	185,7	78,3	0.42
01.01.2008 - 01.12.2011	371,5	121,5	0.33
01.01.2012 - 01.12.2017	763,3	440,2	0.58

Source: Calculations made with the data provided by official web-site of CBR.

According to this data we can conclude that excess reserves are increasing during the researching period from 2005 to 2017. The average at the after crisis period is 2 times higher than in the period before crisis period. As was already mentioned the required reserves ratio decreased due to great financial recession to provide banks with more liquidity. Indeed, commercial banks had more excess for their banking activity than in previous period. After the crisis period, the excess reserves are also 2 times higher than in previous, crisis period.

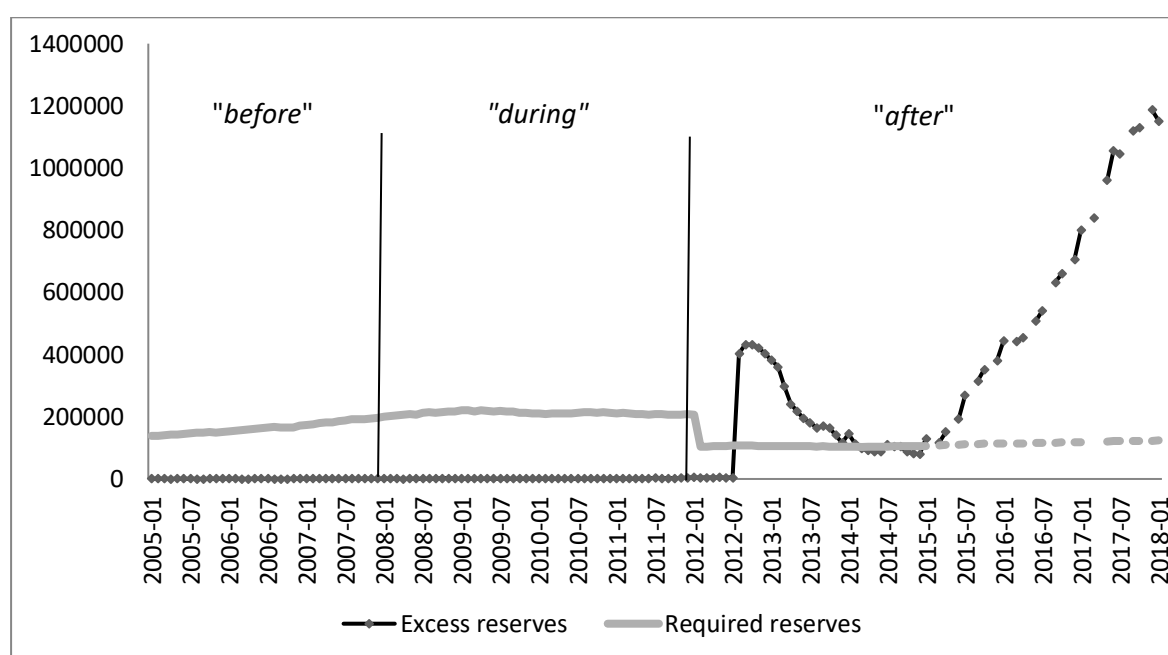
The standard deviation shows how the values are distributed relative to the mean in this sample. Therefore, here we can note significant variability from the average amount of excess reserves, which is becoming even greater from period to period. Concerning the excess reserves of Russian commercial banks during 3 different periods we can note instability in their behavior with the trend of increasing as the time pass. The standard deviation confirms that the values have serious variations around the mean.

Now let us consider the **European Union**.

For the case of European Union we can find a lot more clear and consistent information that is provided by ECB. ECB conducts longer and deeper assessment of excess reserves as well as the required reserves and provide with such data anyone interested in it via their web-site. Compared to Russia, it has longer monitoring data, daily data on required and excess reserves and provides the actual amount of excess reserves (for the case of Russia we made an assumption and calculated them according to given data).



Figure 2 - Required and Excess reserves in Europe 2005-2017, mil euro.



Source: The figure is built with respect to the data provided by official web-site of ECB.

#### (1) Before crisis

The monetary policy of the ECB in pre-crisis period was focused on the aim to keep inflation rates below, but close to, 2% over the medium term. So the main task of ECB in this period was to maintain the price stability in the euro area. According to data provided by ECB the task was in general successfully completed. Indeed, inflation was only slightly above 2% in average, which provided the euro area with relative price stability. Medium and long-term inflation expectations have remained at around 2% as well. This reflects the productive functioning of the ECB's monetary policy and its high degree of credibility, which is based on the principles for sensible central banking (According to the speech by Jürgen Stark, Member of the Executive Board of the ECB, 2009).

The excess and required reserves in this period behave quite stable and do not have any significant changes and that also can be applied to the next time period.

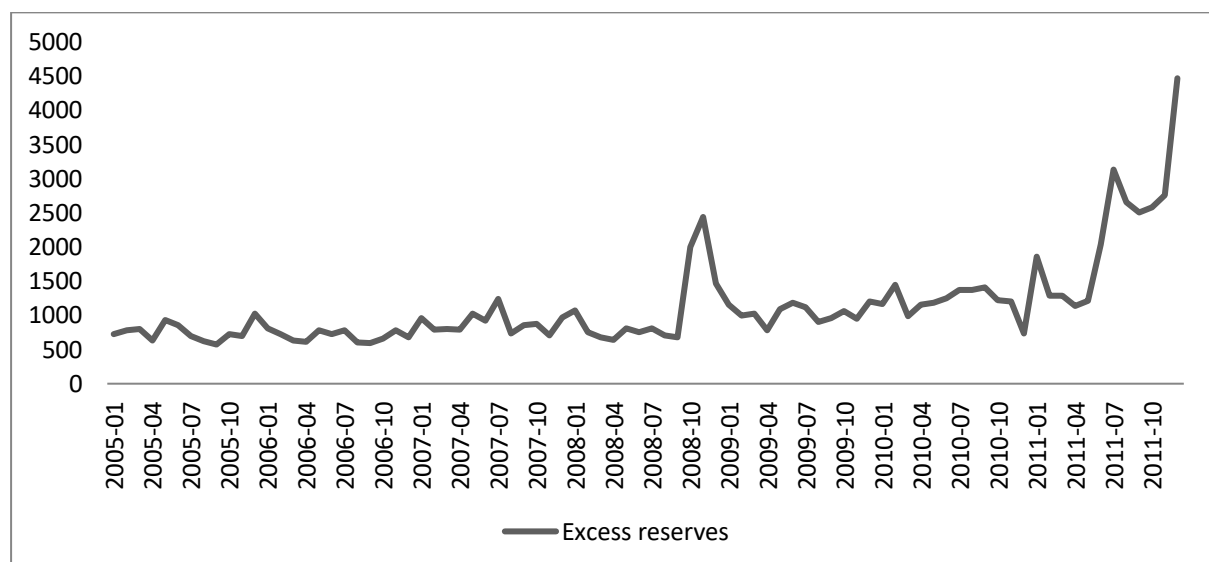
#### (2) During crisis

Visually it can be noted that no significant jumps in the minimum required reserves occurred (Figure 2). Trend reflects a gradual increase with simultaneous growth of excess reserves (at the same chart). According to the table of data in the Appendices, Table 2.2 the growth rate of required reserves was not marked by significant changes in the period of 2006-2012. The trend line looks uniformly increasing till the September of 2008 and after that

point progressive growth stops and continues with smooth fluctuations not higher than 1.5% till the end of chosen period (the end of 2011).

Let us follow changes in excess reserves more closely at the Figure 3 as they are very small comparing to the required reserve of that period, thus fluctuations are not clear from 2005 to the end of 2011.

Figure 3 - Excess reserves in Europe 2005-2011, mil euro.



Source: The graph is build according the data provided by official web-site of ECB.

The first big jump of excess reserves happened in September-October 2008, when the situation in financial market got worse (Figure 3). In the beginning of 2011 starts uneven, upwards movement that continues till the end of chosen period. However, they are still not comparable with the amount of required reserves that are hundreds of times more.

Since the reserve requirements strategy of ECB did not have any significant changes as we can see, the ECB used other measures to fight crisis. A massive campaign of assistance to banking and non-banking institutions helped to reduce the level of stress in the financial markets of European countries and influenced the structure of banking operations and the further strategy of monetary policy.

The reserve requirements system and the monetary policy of the ECB in general proved to be efficient and workable even in crisis periods, and the tools were adopted by other central banks. Required reserves of banks are remunerated at the average marginal rate of the refinancing operations, and excess liquidity is remunerated with the rate of the deposit facility (Stark, 2009).

(3) After crisis

In this period we can note great change in behavior of both required and excess reserves (Figure 2). Concerning the required reserves - they are characterized by a big drop in the very beginning of the period (we can see how thick grey line on the graph drops at that period). That happened because the ECB reduced the minimum reserve ratio from 2% to 1% on 8 December 2011. They fell from 207 024 million euro in 01.2012 to 103 329 next month. By reducing the reserve ratio ECB aimed to free banks' liquidity. After that the required reserves have consistent pattern and not suffer from any other shocks.

The excess reserves have experienced an unprecedented rise in the middle of 2012 (Figure 2). They increased from 4 616 million euro in 07.2012 to 403 239 million euro next month (full data in the Appendices, Table 2.2). After this moment there is a gradual decrease to the level of required reserves in the middle of 2014 that lasted not very long. They started new rise in the beginning of 2015 and after that point there can be observed only uprising trend of excess reserves of the banks in Euro area.

In 2014 the ECB has lowered the refinancing rate in the euro area from 0.25 to 0.15% per annum (historical minimum). In addition, the ECB lowered the overnight deposit rate from zero to minus 0.1% - this is the first time that one of the leading central banks sets a negative interest rate. This is the percentage, under which banks place free reserves on the ECB's accounts for a day. The decision of the ECB actually means that from now on banks will pay for placing their funds in the central bank. In other words, this is a «penalty» for not using liquidity for investment and making profit in the supply of credit or other application. The deposit rate was at the zero level since July 2012, which allowed the ECB to stimulate the credit and investment activity of banks in the euro area. Nevertheless, even at zero percent, banks continued to leave part of the excess reserves on the ECB's risk-free accounts. By lowering rates the ECB tries to push banks to more active lending and increase the turnover of money in the eurozone to prevent the threat of deflation. (Tkachev, 2014).

Nevertheless excess reserves continued to grow and according to the latest data they equal 1 191 791 million euro in 03.2018 with 0% interest rate on minimum reserves.

Let us now have a closer look to the main statistical characteristics of excess reserves in EU during the 3 periods.

Table 2 – The average, standard deviation and coefficient of variation of excess reserves in EU before, during and after crisis.

Period	Average	Standard deviation	Coefficient of variation
01.01.2005 - 01.12.2007	781,3	144,2	0,18
01.01.2008 - 01.12.2011	1104,5	4937,7	4,47
01.01.2012 - 01.12.2017	295530,7	38492,7	0,13

Source: Calculations made with the data provided by official web-site of ECB.

According to this data we can conclude that excess reserves are abruptly increasing during the researching period from 2005 to 2017. The average at the after crisis period is 1.4 times higher than in before crisis period, while the deviation from the mean changed at even more amount – it's 34 times higher number than in previous period. At the after crisis period excess reserves are changed unprecedentedly comparing to the during crisis period – they became 267 times bigger. The standard deviation and coefficient of variation behave extremely unstable as well.

So now we can conclude that excess reserves of EU banks are characterized by cardinal jumps towards constant increasing during 2005-2017. The greatest jump happened in after crisis times according to the Table 2.

Comparing behavior of Russian and EU credit institutions with the respect to their excess reserves allow us to highlight some aspects. According to the calculated averages and standard deviations they are both increasing with quite unstable pattern and significant deviations from the correspondent mean. Credit institutions of EU showed here unprecedented growth of excess reserves in after crisis period while Russian banks' growth was not that rapid. Comparing coefficients of variation in pre-crisis we have 0.42 and 0.18 for Russia and EU respectively, 0.33 and 4.47 during crisis and 0.58 and 0.13 after crisis. For the before and after crisis period coefficients of variation in Russia are higher than in EU, in 2-4 times. But during the crisis the behavior of coefficient of variation changes crucially. For the EU the coefficient of variation is 13.5 times higher than in Russia. That shows abnormal rise of excess reserves in EU in the mid-2012.

Reserve ratio in Russia is more complicated that in euro zone. The ratio set by CBR is also higher than in ECB policy and during the period of 2006-2012 had a lot of changes that related with separation and complication of the type of liabilities (Appendices, Tables 1.2-1.4). It has higher ratio for liabilities in foreign currency because of the CBR's policy of supporting national currency. The ECB changed the reserve ratio only once – from 2% to 1% in the end of 2011. In other words ECB policy concerning reserve requirements is more

persistent and consistent. Reserve requirements are not the tool that ECB reaches for at first, it tries to solve financial and economic difficulties via other instruments without significant changes in reserves policy.

The main purpose of both CBR and ECB policies is to provide liquidity to banking system and keep the main monetary targets on the line. This was especially important during the time of economic and financial tensions that led to the crisis.

During crisis ECB used the various monetary tools and avoided to make changes in such powerful instrument as RR while CBR significantly reduced RR to achieve the necessary level of activity in the banking sector.

At this time, the central banks of leading countries were forced to seek measures unusual for their monetary policy. For example, Federal Reserve in USA started to make interest payments for excess reserves because of unprecedented hoarding of those by many banks in US. The Bank of Russia never used such tool neither before nor after the crisis period. The ECB was successfully using this tool since 1999. Although, excess reserves situation in Europe was predictable in 2008-2011. Liquidity hoarding phenomenon is an aftermath of tensions in financial markets. In normal conditions, banks choose to invest excess resource to earn profit, but in case of recession, banks may start to keep more excess to insure self-stability and to show that their ability to pay is not under risk (Mattingly, Abou-Zaid, 2015).

Hence, ECB and CBR had before and have now different policies but seek to one goal - providing liquidity and supporting the national currency. However, while CBR looking for ways to fight inflation and keep it low, ECB more concerned about how to avoid deflation. Such fundamental diversities come from the fact that Russia and EU have different levels of economic development. Russia in economic and financial terms refers to “developing countries” and the leading countries of euro zone are referred to as “developed”. Therefore, the instruments and targets of monetary policies of central banking are also might largely differ even in the comparable situation.

## 5 Conclusion

Reserve requirements play a crucial role in monetary regulation of the country. Being a traditional and quite rough instrument, the norms of mandatory reserves affect the size of the credit possibilities of commercial banks and the money multiplier.

One argument in favor of using reserve requirements is to ensure the stability of the money multiplier. If the reserve requirements are stable, within a certain framework the money multiplier will also be stable, and the Central Bank will be able to exercise greater control over the money supply with the help of other instruments of monetary policy.

Another argument in favor of reserve requirements is that during the bankruptcy procedure, as a rule, mandatory reserves are the only "live" available assets that a bankrupt bank has. It increases the confidence in the bank's activities because these funds can be used to pay off debts to depositaries. For the case of Russia this aspect is especially important in current stage of economic development. Some banks lose their licenses and become a bankrupt. That means that depositors of such banks suffer the most because basically they are the most unprotected layers of the population – they are not professionals in the banking sphere and are not able to anticipate economic tensions, bank's behavior, etc. Therefore, in our opinion, commercial banks should continue keep the mandatory reserves with the CBR, since the mechanism for guaranteeing deposits in the country is not yet developed.

With respect to given disadvantages of mandatory reserves, the central banks of some developed countries have reduced the activity of using the policy of mandatory reserves in recent years. The ECB follows this concept and tries to simplify the reserve requirements policy, while in Russia it becomes more complicated as time passes (various rates, frequent changes).

Moreover, the ECB tries to ensure that the reserve requirements are not seemed as "heavy burden" for banks in euro area by offering 2 ways of smoothing the negative effect of these "tax" on banks: one-time allowance and the compensation that is made at a rate close to the market rate. Such compensation has a rather psychological effect. It reduces the banks' possible desire to avoid part of mandatory reservation by substituting one type of obligation for another, excluded from the reserve base. By now Russian reserve requirements mechanism provides the possibility of returning reserved funds only in the event of a bankruptcy of a credit institution. Further development of the reserve requirements may include the introduction of compensation payments on the reserves allocated on the CBR

accounts. The distortion in allocation of resources will decrease and banks will be able to pay higher interest rates to their customers.

The comparison of the application of the reserve requirements policies in Russia and in the economically developed area of Europe showed great differences in both approaches. In the monetary policy of the CBR, there is an active application of reserve requirements and their constant adaptation to changing economic conditions. While in Europe this tool is used less actively. The level of the European economy allows not resorting to such harsh measures of monetary regulation. Rare adjustments of the norms of minimum requirements in Europe take place as an element of stimulating macroeconomic policy.

The ECB has a long and consistent experience in collecting data on excess reserves. This can only indicate the high importance of research of this aspect for the economic development of the region from the ECB point of view. The ECB provides complete and consistent daily data and other information on excess reserves. Also there is a great amount of research and publications on this topic. On the other hand, the CBR does not pay so much attention to excess reserves whatsoever. It is very difficult to find any reference to this topic not only in the legal documents and reports of the CBR but also in other publications. This suggests that the excess reserves are not the subject of detailed study and assessment in Russia. Earlier in this work we made an assumption concerning the calculations of excess reserves based on information that CBR is actually providing. This made a contribution of the paper because hardly any researcher suggested the way of assessment the excess resources for the case of Russia since even central bank do not interested in it. The reasons of that might include that Russian central banking does not yet recognise the importance of the reserves in assessing the financial situation and activity of the banking sector. The assessing of excess reserves is not the typical measure of credit institutions' investigation in Russia but the made calculations showed that they can be used for further financial and banking studies and for better understanding the profitability of banks.

## Bibliographic references

ECB (2011) The Implementation of Monetary Policy in the euro Area. General Documentation on Eurosystem monetary policy instruments and procedures. Retrieved on March, 11, 2018, from <https://www.ecb.europa.eu/pub/pdf/other/gendoc2011en.pdf?c7c23fd7c60fb4477f32c5c922d60eb3>.

Frolova and Kardamonova (2015). Mandatory reserve requirements of the Bank of Russia: characteristics and mechanism, Peoples' Friendship University of Russia (PFUR), Moscow.

Gray S. (2011). Central Bank Balances and Reserve Requirements, IMF Working Paper No. 11/36. Retrieved on February, 18, 2018, from <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Central-Bank-Balances-and-Reserve-Requirements-24648>

Joshua N. Feinman, (1993). Reserve requirements: history, current practice, and potential reform, Federal Reserve Bulletin, Board of Governors of the Federal Reserve System (U.S.), 569-589. Retrieved on February, 8, 2018, from <https://www.federalreserve.gov/monetarypolicy/0693lead.pdf>.

Mattingly M., Abou-Zaid A. (2015). The High Levels of Excess Reserves 2008-2012: An Investigation into the Determinants of the U.S. Banks' Liquidity Hoarding during the Global Financial Crisis, *Advances in Economics and Business* 3 (4). Retrieved on March, 27, 2018, from <http://www.hrpub.org/download/20150410/AEB4-11803420.pdf>

Normative acts and operational information (2015) Official journal of the Bank of Russia *Vestnik of the Bank of Russia*, Moscow. Retrieved on March, 12, 2018, from <https://www.cbr.ru/Publ/Vestnik/ves151230121.pdf>

Novashina T.S. (2016). Instruments of the monetary policy of the Bank of Russia, Moscow Academy of Entrepreneurship under the Government of Moscow.

Official Journal of the European Union from 26.10.2012, Article 19, Protocol (№4) on the statute of the European system of central banks and of the European central bank.

Sokolova E. (2010). Norms of mandatory reserves, *The financial question*, Moscow: Monetary Pres.



Stark J. (2009). Speech, Member of the Executive Board of the ECB, University Tübingen, Tübingen. Retrieved on March, 22, 2018, from <https://www.ecb.europa.eu/press/key/date/2009/html/sp091109.en.html>

The Monetary Policy of the ECB (2004). European Central Bank, Frankfurt.

Tkachev I. (2014). Below zero: the ECB for the first time made the main rate negative, *Information Agency "RBK"*, Newspaper № 101 (1876) (0606) //1560). Retrieved on March, 23, 2018, from <https://www.rbc.ru/newspaper/2014/06/06/56be87ab9a7947299f72cf79>.

Ulrich B. (2004). The operational target of monetary policy and the rise and fall of reserve position doctrine, European Central Bank, *Working Paper Series 372*.

Zhilan, O.D. (2010). *Obligatory reserves of credit institutions deposited with the Bank of Russia: concept, purpose and meaning*, Moscow: Fund.

## Appendices 1

Table 1.1 - Historical data on the coefficient of averaging of CBR.

Period of time	Coefficient of averaging
from 01.10.2006 to 31.10.2007	0,3
from 01.11.2007 to 29.02.2008	0,4
from 01.03.2008 to 30.06.2008	0,5
from 01.07.2008 to 31.08.2008	0,5
from 01.09.2008 to 30.09.2008	0,6
from 01.10.2008 to 09.12.2013	0,6
from 01.01.2012 to 31.12.2015	1
from 10.12.2013 to 09.09.2015	0,7
from 10.09.2015 to 30.11.2017	0,8
from 10.09.2015 to 31.12.2015	1
from 01.01.2016	1
from 01.12.2017	0,8

Source: The database from the official web-site of the Bank of Russia.

Table 1.2 – Historical data on the reserve requirement ratio of CBR from 2004 to 2009.

Period	Reserve requirements for bank's liabilities of credit institutions to non-resident banks in ruble and in foreign currency	Reserve requirements for bank's liabilities of individual in ruble	Reserve requirements for other bank's liabilities of credit institutions in ruble and in foreign currency
08.07.04-31.07.04	—	3,5	3,5
01.08.04-30.09.06	2	3,5	3,5
01.10.06-30.06.07	3,5	3,5	3,5
01.07.07-10.10.07	4,5	4	4,5
11.10.07-14.01.08	3,5	3	3,5
15.01.08-29.02.08	4,5	4	4,5
01.03.08-30.06.08	5,5	4,5	5
01.07.08-31.08.08	7	5	5,5
01.09.08-17.09.08	8,5	5,5	6
18.09.08-14.10.08	4,5	1,5	2
15.10.08-30.04.09	0,5	0,5	0,5
01.05.09-31.05.09	1	1	1
01.06.09-30.06.09	1,5	1,5	1,5
01.07.09-31.07.09	2	2	2
01.08.09-31.10.09	2,5	2,5	2,5

Source: The database from the official web-site of the Bank of Russia.

The following years in Tables 1.3-1.4.

Table 1.3 – Historical data on the reserve requirement ratio from 2009 to 2016 of CBR.

Period	Reserve requirements on bank's liabilities to non-resident organisation in ruble	Reserve requirements on bank's liabilities to non-resident organisation in foreign currency	Reserve requirements on bank's liabilities to individuals in ruble	Reserve requirements on bank's liabilities to individuals in foreign currency	Other bank's liabilities in ruble	Other bank's liabilities in foreign currency
01.11.09-31.01.11	2,5					
01.02.11-28.02.11	3,5		3		3	
01.03.11-31.03.11	4,5		3,5		3,5	
01.04.11-28.02.13	5,5		4		4	
01.03.13-31.03.16	4,25		4,25		4,25	
01.04.16-30.06.16	4,25	5,25	4,25	4,25	4,25	5,25
01.07.16-31.07.16	4,25	6,25	4,25	5,25	4,25	6,25
01.08.16-31.12.16	5	7	5	6	5	7

Source: The database from the official web-site of the Bank of Russia.

Table 1.4 – Historical data on the reserve requirement ratio during 2017.

Period	Reserve requirements on bank's liabilities on non-resident organizations				Ratio for bank's liabilities to individuals		Ratio for other liabilities			
	short term		long term				short term		long term	
	when in ruble	when in foreign currency	when in ruble	when in foreign currency	when in ruble	when in foreign currency	when in ruble	when in foreign currency	when in ruble	when in foreign currency
01.01.17-30.11.17	5,00	7,00	5,00	7,00	5,00	6,00	5,00	7,00	5,00	7,00
01.12.17	For banks with a universal license, for non-bank credit institutions									
	5,00	7,00	5,00	7,00	5,00	6,00	5,00	7,00	5,00	7,00
	For banks with a basic license									
	5,00	7,00	5,00	7,00	1,00	6,00	1,00	7,00	1,00	7,00

Source: The database from the official web-site of the Bank of Russia.

## Appendices 2

Table 2.1 – Required and excess reserves of credit institutions in Russia in 01.2005 – 12.2017.

<b>Averaging Period Starting on:</b>	<b>Actual Daily-Averaged Correspondent Account Balances, bil rub</b>	<b>Required Reserves on Special Accounts, bil rub</b>
06.12.2017	2172,9	506,2
08.11.2017	1967,7	497,5
11.10.2017	1974,1	497
06.09.2017	1979,9	505,9
09.08.2017	1983	508,9
12.07.2017	1967,1	504,3
07.06.2017	1945,9	506,5
10.05.2017	1931,4	501
12.04.2017	1981	504,9
08.03.2017	1971	507,5
08.02.2017	1989,4	514,6
11.01.2017	1858,2	478,2
08.12.2016	1978,8	481,9
10.11.2016	1852,2	475,2
06.10.2016	1867,9	476,7
08.09.2016	1884,5	477,6
04.08.2016	1628,1	413,8
07.07.2016	1576,6	391,4
09.06.2016	1569,8	391,5
12.05.2016	1562,6	394,1
07.04.2016	1514,8	375,3
10.03.2016	1566,4	391,1
11.02.2016	1581	386,3
10.01.2016	1529,4	382,3
10.12.2015	1665,3	363,4
10.11.2015	1423,3	356,9
10.10.2015	1465,5	365,3
10.09.2015	1398,1	361,2
10.08.2015	1205	486,5
10.07.2015	1201,9	475,4
10.06.2015	1163	463,8

<b>Averaging Period Starting on:</b>	<b>Actual Daily-Averaged Correspondent Account Balances, bil rub</b>	<b>Required Reserves on Special Accounts, bil rub</b>
10.05.2015	1138,9	457,5
10.04.2015	1189	483,5
10.03.2015	1215,9	504,2
10.02.2015	1214,6	491,7
10.01.2015	1224,9	496,7
10.12.2014	1518,7	470,8
10.11.2014	1094,1	451,9
10.10.2014	1052	432,7
10.09.2014	1019,8	427,1
10.08.2014	1003,6	446,6
10.07.2014	1043	428,6
10.06.2014	1078,4	427,8
10.05.2014	1060,5	430,3
10.04.2014	1060,6	430,1
10.03.2014	1050	439,9
10.02.2014	1027,4	412,3
10.01.2014	1067,1	404,8
10.12.2013	1242,1	402,3
10.11.2013	888,1	506,4
10.10.2013	862,2	507,7
10.09.2013	865,7	506,1
10.08.2013	840,6	501,6
10.07.2013	871,4	507,5
10.06.2013	890,7	497,7
10.05.2013	858,7	487
10.04.2013	841,5	473,6
10.03.2013	798,2	449,5
10.02.2013	789,9	446,7
10.01.2013	841,8	441
10.12.2012	1055	425,6
10.11.2012	744,7	419,5

<b>Averaging Period Starting on:</b>	<b>Actual Daily- Averaged Correspondent Account Balances, bil rub</b>	<b>Required Reserves on Special Accounts, bil rub</b>
10.10.2012	738,1	413,9
10.09.2012	729,2	411,5
10.08.2012	712,5	407,1
10.07.2012	720,3	403,2
10.06.2012	707,6	392,8
10.05.2012	688,5	387,7
10.04.2012	692,9	382,7
10.03.2012	710,2	385,2
10.02.2012	724,7	393,9
10.01.2012	773,6	390,1
10.12.2011	953,2	378,4
10.11.2011	719,7	369,6
10.10.2011	699,9	356,6
10.09.2011	704,6	347
10.08.2011	670,8	342,6
10.07.2011	663,7	341,6
10.06.2011	655,5	331,3
10.05.2011	640,7	335,4
10.04.2011	604,6	280,8
10.03.2011	552,3	244,1
10.02.2011	525,2	195,2
10.01.2011	561,4	192
10.12.2010	755,4	188,4
10.11.2010	523,1	185,7
10.10.2010	511,6	186,2
10.09.2010	502,8	182,2
10.08.2010	491	179,3
10.07.2010	494,3	180,8
10.06.2010	572	175,5
10.05.2010	504,3	170,4
10.04.2010	500,6	183,1
10.03.2010	510,7	167,7
10.02.2010	476,2	159,1
10.01.2010	528,7	156,5
10.12.2009	713,2	151,4

<b>Averaging Period Starting on:</b>	<b>Actual Daily- Averaged Correspondent Account Balances, bil rub</b>	<b>Required Reserves on Special Accounts, bil rub</b>
01.11.2009	561,6	151,4
01.10.2009	535,9	154
01.09.2009	501,9	153,9
01.08.2009	465,2	125,3
01.07.2009	406,2	93,2
01.06.2009	419,3	61,8
01.05.2009	400,2	31,5
01.04.2009	388,3	32,5
01.03.2009	397,4	33,3
01.02.2009	413,5	31,1
01.01.2009	681,3	29,4
01.12.2008	644,1	29,8
01.11.2008	590,1	30
01.10.2008	581,1	34,1
01.09.2008	731,9	151,8
01.08.2008	618,6	397,7
01.07.2008	606,1	388
01.06.2008	607,4	360,3
01.05.2008	580,1	350,4
01.04.2008	550,2	345,7
01.03.2008	556,3	339,3
01.02.2008	521,3	316,5
01.01.2008	673,2	234
01.12.2007	704,8	220,7
01.11.2007	510,6	222,8
01.10.2007	491,1	260,5
01.09.2007	466,8	318,8
01.08.2007	445,4	311
01.07.2007	480,5	317,7
01.06.2007	470,7	244,8
01.05.2007	430,2	229,9
01.04.2007	426,6	219,1
01.03.2007	595	209,6
01.02.2007	405	210,5
01.01.2007	506,7	229,4

<b>Averaging Period Starting on:</b>	<b>Actual Daily-Averaged Correspondent Account Balances, bil rub</b>	<b>Required Reserves on Special Accounts, bil rub</b>
01.12.2006	492,7	221,1
01.11.2006	337,6	212,7
01.10.2006	359,7	207,2
01.09.2006	356,3	205,8
01.08.2006	357,3	204,2
01.07.2006	388,4	193,9
01.06.2006	365,7	190,2
01.05.2006	353,9	183,1
01.04.2006	323,4	176,1
01.03.2006	325,8	172,1
01.02.2006	326,3	168,3
01.01.2006	399	171,6

<b>Averaging Period Starting on:</b>	<b>Actual Daily-Averaged Correspondent Account Balances, bil rub</b>	<b>Required Reserves on Special Accounts, bil rub</b>
01.12.2005	366,5	161,3
01.11.2005	274,8	159,8
01.10.2005	317,7	154,6
01.09.2005	297,8	150
01.08.2005	267,3	144,7
01.07.2005	246,9	142
01.06.2005	242,8	137,2
01.05.2005	239	135,1
01.04.2005	258,4	134,4
01.03.2005	286,1	133,2
01.02.2005	265,6	129,1
01.01.2005	356,7	171,6

Source: The database from the official web-site of the Bank of Russia.

Table 2.2 – Required and excess reserves of credit institutions in Europe in 01.2005 – 12.2017.

<b>Period</b>	<b>Interest rate on excess reserves, %</b>	<b>Excess reserves, mil euro</b>	<b>Required reserves, mil euro</b>
2005-01	2,07	729	138383
2005-02	2,06	781	139255
2005-03	2,05	804	140520
2005-04	2,05	628	142642
2005-05	2,05	932	143088
2005-06	2,05	858	144597
2005-07	2,05	700	147189
2005-08	2,05	626	149164
2005-09	2,05	573	149678
2005-10	2,05	721	150708
2005-11	2,06	694	149549
2005-12	2,07	1025	151973
2006-01	2,29	809	153251
2006-02	2,3	721	154658
2006-03	2,31	628	157664
2006-04	2,56	616	158877

<b>Period</b>	<b>Interest rate on excess reserves, %</b>	<b>Excess reserves, mil euro</b>	<b>Required reserves, mil euro</b>
2006-05	2,58	779	160399
2006-06	2,57	727	162589
2006-07	2,81	777	165577
2006-08	2,8	607	166481
2006-09	3,04	597	165802
2006-10	3,03	664	166310
2006-11	3,3	783	166229
2006-12	3,3	682	172477
2007-01	3,57	961	174304
2007-02	3,55	789	175755
2007-03	3,55	799	179771
2007-04	3,81	791	181840
2007-05	3,82	1023	182221
2007-06	3,8	918	185330
2007-07	4,06	1245	188335
2007-08	4,06	738	191262

<b>Period</b>	<b>Interest rate on excess reserves, %</b>	<b>Excess reserves, mil euro</b>	<b>Required reserves, mil euro</b>
2007-09	4,09	855	191862
2007-10	4,18	877	192502
2007-11	4,12	704	193661
2007-12	4,17	966	195872
2008-01	4,2	1071	199783
2008-02	4,17	754	201626
2008-03	4,1	681	204568
2008-04	4,19	643	206901
2008-05	4,24	810	207829
2008-06	4,17	751	207333
2008-07	4,06	811	211857
2008-08	4,35	705	214062
2008-09	4,38	677	213332
2008-10	4,58	2004	214765
2008-11	3,94	2444	216066
2008-12	3,25	1464	217220
2009-01	2,5	1154	220231
2009-02	2	998	221056
2009-03	2	1027	217569
2009-04	1,5	777	220782
2009-05	1,25	1092	219712
2009-06	1	1189	216682
2009-07	1	1117	218095
2009-08	1	907	215998
2009-09	1	964	215923
2009-10	1	1066	213656
2009-11	1	951	211823
2009-12	1	1207	210228
2010-01	1	1170	210078
2010-02	1	1445	209466
2010-03	1	991	210850
2010-04	1	1153	211375
2010-05	1	1182	211221
2010-06	1	1251	211271
2010-07	1	1376	213002
2010-08	1	1374	214333
2010-09	1	1406	213877

<b>Period</b>	<b>Interest rate on excess reserves, %</b>	<b>Excess reserves, mil euro</b>	<b>Required reserves, mil euro</b>
2010-10	1	1218	211917
2010-11	1	1199	214007
2010-12	1	732	211768
2011-01	1	1863	210546
2011-02	1	1285	212286
2011-03	1	1290	211626
2011-04	1	1140	209323
2011-05	1,25	1211	208263
2011-06	1,25	2035	206931
2011-07	1,25	3135	207740
2011-08	1,5	2659	208794
2011-09	1,5	2509	206981
2011-10	1,5	2578	206097
2011-11	1,5	2754	206177
2011-12	1,25	4469	207748
2012-01	1	5290	207024
2012-02	1	4728	103329
2012-03	1	4570	104294
2012-04	1	4282	105365
2012-05	1	5275	105222
2012-06	1	4206	106581
2012-07	1	4616	106909
2012-08	0,75	403239	106990
2012-09	0,75	432898	107121
2012-10	0,75	431095	107018
2012-11	0,75	422720	106434
2012-12	0,75	403527	106350
2013-01	0,75	382990	106008
2013-02	0,75	360807	105434
2013-03	0,75	297341	105618
2013-04	0,75	241136	104875
2013-05	0,75	217281	104869
2013-06	0,5	195045	105300
2013-07	0,5	181418	105064
2013-08	0,5	165138	104473
2013-09	0,5	169599	104939
2013-10	0,5	164672	103754

<b>Period</b>	<b>Interest rate on excess reserves, %</b>	<b>Excess reserves, mil euro</b>	<b>Required reserves, mil euro</b>
2013-11	0,5	141108	103760
2013-12	0,25	116924	103320
2014-01	0,25	144838	103386
2014-02	0,25	112425	103610
2014-03	0,25	98277	102833
2014-04	0,25	91643	103568
2014-05	0,25	87737	103506
2014-06	0,25	88342	103924
2014-07	0,15	109847	104427
2014-08	0,15	105230	105002
2014-09	0,15	104852	105225
2014-10	0,05	87296	105347
2014-11	0,05	82779	105708
2014-12	0,05	78994	106455
2015-01	0,05	130144	106307
2015-02	n/a	n/a	n/a
2015-03	0,05	117812	107545
2015-04	0,05	151285	110566
2015-05	n/a	n/a	n/a
2015-06	0,05	193067	110339
2015-07	0,05	269073	112288
2015-08	n/a	n/a	n/a
2015-09	0,05	315666	112743
2015-10	0,05	352106	113228
2015-11	n/a	n/a	n/a

<b>Period</b>	<b>Interest rate on excess reserves, %</b>	<b>Excess reserves, mil euro</b>	<b>Required reserves, mil euro</b>
2015-12	0,05	380772	113059
2016-01	0,05	443823	113283
2016-02	n/a	n/a	n/a
2016-03	0,05	442615	113848
2016-04	0	455648	114310
2016-05	n/a	n/a	n/a
2016-06	0	508731	115033
2016-07	0	541622	115839
2016-08	n/a	n/a	n/a
2016-09	0	632130	116686
2016-10	0	659630	117775
2016-11	n/a	n/a	n/a
2016-12	0	706484	117403
2017-01	0	800291	118754
2017-02	n/a	n/a	n/a
2017-03	0	840525	120373
2017-04	n/a	n/a	n/a
2017-05	0	960486	120625
2017-06	0	1056430	122293
2017-07	0	1046671	122553
2017-08	n/a	n/a	n/a
2017-09	0	1120373	122131
2017-10	0	1131016	122264
2017-11	n/a	n/a	n/a
2017-12	0	1186836	122859

Source: The database from the official web-site of the European Central Bank.



## Отчет о проверке на заимствования №1

Автор: [lida.yurieva@gmail.com](mailto:lida.yurieva@gmail.com) / ID: 5771777

Проверяющий: [lida.yurieva@gmail.com](mailto:lida.yurieva@gmail.com) / ID: 5771777



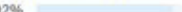
Отчет предоставлен сервисом «Антиплагиат»- <http://www.antiplagiat.ru>

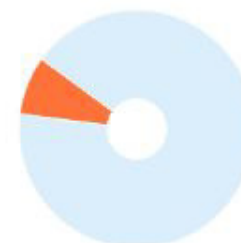
### ИНФОРМАЦИЯ О ДОКУМЕНТЕ

№ документа: 1  
Начало загрузки: 02.06.2018 13:13:42  
Длительность загрузки: 00:00:02  
Имя исходного файла: ilovepdf\_merged (3)  
Размер текста: 2117 кБ  
Символов в тексте: 76854  
Слов в тексте: 10513  
Число предложений: 399

### ИНФОРМАЦИЯ ОБ ОТЧЕТЕ

Последний готовый отчет (ред.)  
Начало проверки: 02.06.2018 13:13:45  
Длительность проверки: 00:00:02  
Комментарии: не указано  
Модули поиска:

ЗАИМСТВОВАНИЯ	ЦИТИРОВАНИЯ	ОРИГИНАЛЬНОСТЬ
8% 	0% 	92% 



Заимствования — доля всех найденных текстовых пересечений, за исключением тех, которые система отнесла к цитированиям, по отношению к общему объему документа.  
Цитирования — доля текстовых пересечений, которые не являются авторскими, но система посчитала их использование корректным, по отношению к общему объему документа. Сюда относятся оформленные по ГОСТу цитаты; общеупотребительные выражения; фрагменты текста, найденные в источниках из коллекций нормативно-правовой документации.  
Текстовое пересечение — фрагмент текста проверяемого документа, совпадающий или почти совпадающий с фрагментом текста источника.  
Источник — документ, проиндексированный в системе и содержащийся в модуле поиска, по которому проводится проверка.  
Оригинальность — доля фрагментов текста проверяемого документа, не обнаруженных ни в одном источнике, по которым шла проверка, по отношению к общему объему документа.  
Заимствования, цитирования и оригинальность являются отдельными показателями и в сумме дают 100%, что соответствует всему тексту проверяемого документа.  
Обращаем Ваше внимание, что система находит текстовые пересечения проверяемого документа с проиндексированными в системе текстовыми источниками. При этом система является вспомогательным инструментом, определение корректности и правомерности заимствований или цитирований, а также авторства текстовых фрагментов проверяемого документа остается в компетенции проверяющего.

№	Доля в отчете	Доля в тексте	Источник	Ссылка	Актуален на	Модуль поиска	Блоков в отчете	Блоков в тексте
[01]	0,86%	3,27%	European Central Bank 2001 the Monetary Policy of the Eur...	<a href="https://documents.tips">https://documents.tips</a>	27 Ноя 2017	Модуль поиска Интернет	20	54
[02]	1,57%	2,9%	Full document (1 MB)	<a href="http://bde.es">http://bde.es</a>	12 Янв 2017	Модуль поиска Интернет	30	52
[03]	0,76%	1,84%	Monetary and Capital Markets Department Central Bank Ba...	<a href="http://imf.org">http://imf.org</a>	28 Апр 2017	Модуль поиска Интернет	8	31

Еще источников: 10

Еще заимствований: 4,8%