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INVESTMENT IN MORTGAGE BONDS

Abstract of a dissertation

for awarding the educational and scientific degree "Doctor"
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Doctoral advisor:
Associate professor Valentin Milinov, PhD

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The dissertation consists of 176 pages, of which: title; content - 2 pages; introduction - 7 pages; main text - 140 pages; conclusion - 5 pages; bibliography - 11 pages (146 literature, 10 normative and 9 internet sources); appendices - 11 pages. Structurally, the development includes an introduction, a three-chapter exposition and a conclusion. In support of the exposition 12 figures and 9 tables and 24 formulas are presented

The dissertation was discussed and directed for defense under the Law on the Development of Academic Staff of the Department of Finance and Credit at the Academy of Economics "D. A. Tsenov ”at a meeting held on November 19, 2021.

The open meeting of the scientific jury for the defense of the dissertation will take place on 11.02.2022 at 09.30 am in the Conference Hall "Rectorate" of the Academy of Economics "Dimitar A. Tsenov" - Svishtov.

The materials on the defense are available to those interested in the Department of Doctoral Studies and Academic Development of the Dimitar A. Tsenov Academy of Economics - Svishtov.

I. GENERAL CHARACTERISTICS OF THE DISSERTATION

1. Relevance of the researched topic

The topicality of the study is related to the analysis of mortgage lending, which performs an important economic and social function, both for consumers, credit institutions and investors in mortgage bonds, and for the stable development of the economy. With the latest financial crisis of 2009, it can be added that lending also carries a serious financial risk for all these economic agents. This necessitated new changes in the European regulatory framework to ensure balanced growth in the real estate market, the mortgage market and investments in mortgage / covered bonds, through prudent lending by European credit institutions. The harmonization of the new European credit regulations should ensure financial stability in the banking sector with issues of double-secured mortgage / covered bonds, with better protection of investors and consumers of mortgage loans.

2. **Object and subject of the research**

The **object** of the present study are mortgage bonds and the effects of modern international regulatory standards, leading to the transformation of the mortgage bond market into a covered bond market.

The **subject** of the study is the retrospective, diagnostic and prognostic analysis of the mortgage market for the period 2010-2020 in the context of its transformation into a covered bond market, i.e a market for a new well-advertised, risk-free and popular financial instrument.

3. Research thesis, goal and tasks of the dissertation

In the dissertation the author examines the **thesis** that achieving an optimal balance in the development of the real estate market, mortgage loans, regulations and investments in mortgage / covered bonds is an important factor in achieving long-term financial stability. credit institutions, financial markets and the

economy. Therefore, this process should be the focus of attention of international regulators and financial managers when making important investment decisions for global investments in mortgage or covered bonds.

The **main goal** of the study is to conduct a systematic study of investments in mortgage and covered bonds in the period 2010-2020 through analysis on the evolution in the international regulatory standards responsible for this process.

The realization of the current pre-set goal predetermines the performance of the following specific research **tasks**:

1. Characteristics of the possibility of concepts such as "low-risk or risk-free financial assets" - as mortgage / covered bonds are considered, highlighting their features and their role in the global financial crisis after 2008.

2. Study of the opportunities in the medium and long term for balanced development and the impact of modern international regulatory standards on the dynamically developing mortgage market, real estate prices and investments in mortgage / covered bonds - during the global financial period and the economic crisis of 2009 and beyond.

3. Carrying out a forecasting and identification analysis of risks and benefits for credit institutions following the adoption of the new European legal framework for covered bonds, which aims to create for banks in Europe "an alternative and stable instrument for financing in the dynamic development of the mortgage market with opportunities to reduce costs for both creditors and customers'.

4. Preparation of recommendations and conclusions on possible effects and risks for institutional investors in global investments in "risk-free assets" packages, with "good returns" for which the "new" mortgage / covered bonds are presented. This process will require effective supervision by credit institutions over credit institutions, in an effort to transfer credit risk, through mass sales of bonds issued - to ensure long-term financial stability in the capital markets and the economy.

4. Research methodology

The research uses traditional research methods such as: the historical method, the comparative method, the inductive and deductive method, the method of analysis and synthesis, statistical method, the method of observation, and other methods. The study used public data from the BNB, NSI, other publicly available data, as well as analyzes and research of leading economists in the field of this specific issue.

The data in the dissertation are processed and presented in the form of tables and diagrams using MS Office Excel 2016.

5. Limitations of the study

Outside the scope of the study remained issues related to the activities of investors in housing construction, the organization of activities and risk management in their investment activities, as well as specific problems in lending to construction companies in the housing sector.

6. Approbation of the dissertation

The dissertation was discussed at a meeting of the Department of Finance and Credit at the Academy of Economics "D. A. Tsenov ”- Svishtov. One study, one article and four reports have been published on the topic of the dissertation in specialized scientific journals.

II. STRUCTURE AND CONTENT OF THE DISSERTATION

The dissertation is developed in compliance with the requirements of Art. 27, para. 2 of the Regulations for implementation of the Law for the development of the academic staff in the Republic of Bulgaria. It consists of an introduction, a three-chapter presentation, a conclusion, a bibliography and appendices. The dissertation was developed in a volume of 176 standard pages, of which 162 pages

are body text and 11 pages are appendices. The main text of the study presents 9 tables, figures 12 and 24 formulas. At the end of the paper 7 applications are presented. The bibliographic reference contains 146 sources, incl. 19 from the scientific school of the financial department, a total of 76 sources in Bulgarian, 50 - in a foreign language, 10 regulations and 10 electronic sources.

In specific terms, the dissertation is structured as follows:

INTRODUCTION

CHAPTER ONE

ANALYSIS OF THE MODERN FINANCIAL PRACTICES FOR MORTGAGE SECURITY

1. Characteristics and features of mortgage lending and mortgage bonds
2. Systematic analysis of mortgage loans and interest rates on mortgage lending
3. Main indicators of the real estate market

CHAPTER TWO

INTERNATIONAL REGULATORY STANDARDS AND THEIR IMPACT ON MORTGAGE LENDING AND INVESTMENT IN MORTGAGE AND COVERED OBLIGATIONS

1. Evolution of commercial and investment banking in the context of new international regulations
2. Changes in international banking regulations for a financially stable banking sector
3. Possibilities for maintaining the dominant role of the banking sector in the mortgage market in the new restrictive conditions for institutional investors

CHAPTER THREE

CREDIT AND INVESTMENT RISK MANAGEMENT IN MORTGAGE AND COVERED BONDS

1. Methodology for diversification of investment risk when investing in mortgage or covered bonds
2. The process of mortgage securitization and its relationship with the crisis in the banking sector

III. SUMMARY OF THE DISSERTATION

INTRODUCTION

The introduction of the dissertation outlines the topicality of the topic, the object and the subject of the dissertation, the main goal and the tasks. The research thesis has been formulated. The limitations of the study are indicated.

CHAPTER ONE

ANALYSIS OF THE MODERN FINANCIAL PRACTICES ON MORTGAGE SECURITY

The creation of mortgage banks began in Germany in the 18th century and mortgage loans were provided mainly in cash and in the form of bonds. The mortgage market is becoming the largest debt market in the United States, with outstanding and outstanding housing loan amounts rapidly exceeding three to four times the outstanding amounts for commercial and farm mortgages. The creation of an active secondary market for mortgages radically changes the market for residential mortgages. The idea itself originated in Denmark, although the fastest development in the mortgage-backed securities market is in the United States. For the period before the crisis in Denmark, sales of mortgage securities amounted to over USD 150 billion. (Kirov, 2019)

Because mortgages have different maturities and interest rates, they do not have enough liquidity to be traded on secondary markets as securities. To stimulate mortgage lending, in 1970 the State National Mortgage Association (GNMA called Ginny May) introduced fully transferable mortgage-backed securities, launching a program to guarantee interest and package payments. from standardized mortgages.

Under this program, private non-financial institutions, such as savings and loan companies and commercial banks, could now package a group of GNMA-guaranteed mortgages worth e.g., $ 1 million and then sell it as a security to a third party (usually a large institutional investor such as investment, pension and other funds). When citizens pay off a financial institution with GNMA-

guaranteed mortgages, it transfers the payments entirely to the owner of the security, sending him a check for their total value. Because GNMA guarantees payments, these fully transferable mortgage-backed securities have a very low risk of insolvency and are very popular, valued at more than $ 400 billion. Mortgage-backed securities are issued not only by government agencies but also by government agencies. private financial institutions. In the 1970s, more than 80% of housing mortgages were held directly by savings and loan companies, mutual savings banks and commercial banks. Currently, only one third is held directly by these institutions, and two thirds are held as mortgage-backed securities. (Mishkin, 1995, p. 24)

This policy has stimulated the secondary mortgage market, which has been experiencing a "real boom" since the 1970s, when global volumes multiplied. Of nearly $ 18 billion in 1970, it exceeded $ 150 billion in 1983. Ten years later, mortgage-backed bonds were worth $ 1,627.2 billion. (IME, 2001, p. 4)

After 1989 - the mortgage loan in our country is regulated by the Mortgage Credit Act, which regulates "granting loans against registered mortgages on real estate, based on the issuance of bonds and the bank must finance the issuance of mortgage loans by issuing mortgage bonds." [1] (IME, 2001, p.4) In Bulgaria, such bonds are issued only by banks under the Mortgage Bonds Act. (Mortgage Bond Act, 2020). According to the Mortgage Credit Act, a mortgage is defined as a limited real right over a certain real estate, which is established in order to secure a certain claim and acquire a right from the creditor to satisfy the price of the mortgaged property. The mortgage follows the property and is not repaid when it is transferred. The mortgage right is indivisible - it is established for the whole

[1] Mortgage bonds are securities issued by a banking institution secured by a portfolio of mortgage loans granted by the bank.. According to Bulgarian law, mortgage bonds can only be issued by banks, so they should not be confused with bonds issued by a special investment purpose company investing in real estate. In order to repay the funds given to individuals and legal entities for the purchase of real estate for the purpose of new investments, the bank on the basis of the right of legal mortgage on the purchased property issues mortgage bonds. Upon their sale, it practically receives amounts almost equal to those given on the loans. Each issue corresponds to certain groups of mortgaged properties, which circumstance is subject to entry. In case of impossibility of the borrower to pay the installments on the loan, and hence - of the bank to pay on the debenture loan, in case of forced execution in the sale of the mortgaged properties the holders of mortgage bonds secured by the respective properties shall have priority.

property or for a part of the property, which meets the requirements for a separate property and is lifted after the whole debt has been repaid. In case of partial repayment, the mortgage continues to weigh on the whole property. It is defined in two types - legal and contractual.

The events of 2008-2009 showed that any crisis in the globalized banking sector could lead to a global financial and economic crisis with mass bankruptcies and the need to introduce new changes in the legal framework for regulation of credit institutions.

We are witnessing a dynamic change after 2014 from the European regulations to the activity of credit institutions and the issuance of mortgage / covered bonds - so that investors can feel more secure, through their better collateral and from the possibility of a double claim regarding of collateral assets such as the issuing bank provides them with a "double guarantee". *The author shares the view that recent regulatory changes concerning mortgage bonds represent the desire of European regulations to "build them a new, better image" - already as "covered bonds" and "new" debt instrument with low risk and good yield.* [2]

In order for investors to gain a relatively accurate picture of the financial condition and financial performance of a credit institution that issues mortgage bonds, they must have detailed information to analyze its balance sheet. The balance sheet provides a wealth of information and is the basis for compiling a comprehensive description of the quality of bank assets and liabilities, as well as a major source of information for assessing banking performance. (B. Bozhinov., Vatev, J. 2013, p. 31)

Central bank policy since the last global financial crisis of 2008-2009 shows that they are taking steps to significantly lower interest rates, which

[2] Despite the fact that the new EU member states do not have a stable market for covered bonds during the introduction of the legal framework of European Directive (EU) 2019/2162, a significant part of them, including Bulgaria - in drafting the new bills, will build on of the existing national legislation - therefore in the study, the author considers the terms "mortgage" and "covered" bonds as synonyms. The Mortgage Bonds Act (ZIO) has been in force in Bulgaria since 2000, which regulates the issuance of one of the most typical types of covered bonds - those issued on the basis of a bank portfolio of mortgage loans - on this legal framework, a Law will be created. for covered bonds.

strongly stimulates lending and investment intentions of economic agents. The European Central Bank (ECB) is no exception and in the short period after the crisis, cut interest rates and they have already reached levels below zero - to help the European economy, which after the financial crisis has a new challenge - to develop in the conditions of the debt crisis, as many countries in the European Union have gone too far in borrowing money from credit institutions. This policy is maintained in some countries such as Denmark, Germany and Portugal, which further increases customer interest in mortgages and other long-term and medium-term corporate loans.

In Bulgaria - interest rates on mortgage loans did not change during the pandemic and economic recession, maintaining levels around 2.6 - 3.2%, and consumer - between 4.5 and 6.6%. Georgi Chukalev analyzes the factors that influence household consumption in the long run. The author analyzes the change in disposable income, wealth, changes in credit conditions and consumption. The verification of the impact of loans on consumption was done in two ways - by using the real interest rate on loans and by examining the direct impact of loans. The calculations made by the author with the types of interest rates show that the long-term interest rates on loans (total) and the long-term interest rates on consumer loans are significant and have an impact on household consumption. An increase in these interest rates has a negative effect on long-term consumption.

The increase in the real interest rate on long-term consumer loans by 1% caused a decrease in household consumption by 0.68% in the long run. The other variables included in this model are labor income and seasonal fictitious variables. The real interest rate on loans indirectly proves the impact of loans on consumption. The calculated inversely proportional relationship between real interest rates on loans and consumption is expected. From this connection it can be assumed that loans have a positive impact on consumption in the long run.

This is confirmed by the inclusion of retail loans in the consumption model. On the other hand, as part of the net financial assets of households, loans represent the liabilities of households. Positive net financial assets contribute to the long-

term financing of consumption. The inclusion of credit, along with other variables such as income (from labor) and financial assets, suggests the existence of more than one cointegration vector. The test performed by the author is related to the inclusion of the change in credits (first difference of the data taken as a level). They participate in the model with vector error correction as an exogenous variable. The results of this model are given in the presented appendix. (Chukalev, 2007, pp. 26-28).

There are several periods in world history of major changes in real estate prices. Between 1929 and 1933, during the Great Depression, when prices in the United States fell by 24%. The next period was during the boom of the oil business in the 70s of the twentieth century, when in the oil-rich states, there was a sharp rise in real estate prices and vice versa with a subsequent decline in oil prices - in the early 80- In those years there was a decline in property prices in the same states. Such sharp fluctuations in prices were observed during the recession in the United States - in the early 90's. Following the economic upswing and government support for home-based mortgage policies, real estate prices and real estate prices began to rise sharply until the 2008 mortgage crisis and secondary mortgage bonds, which escalated into a global financial and economic crisis. This is followed by the period 2010-2020, where worldwide, already in the conditions of unprecedentedly low interest rates and aggressive lending to the market, there is a new, stable growth in real estate prices in major cities, regional centers and capitals. In some places, this growth is in the range of 20-30% and is the basis for important research in the entry into force of new international regulations for credit institutions.

European statistics for the last five years before the crisis of 2009 show a significant increase in mortgage lending and real estate prices in CEE countries, with the highest levels in the Baltic countries, Romania and Bulgaria of 25 % to 40%, and Poland, Croatia, Slovakia, the Czech Republic and Russia, for the same period 2004-2007 - from 6% to 22%. The growth is higher in the big cities and the capital as the prices in Bulgaria, in 2008 were four times higher than the prices

in 2000. With the onset of the global financial crisis in 2009 there was a change in monetary conditions in the US and EU countries, which led to the expected decline in real estate prices and an increase in the level of rental income. In the United Kingdom, banking transactions fell by 42% in 2008 compared to the same period in 2007. The escalation of the global financial crisis into an economic one led to a sharp deterioration in global economic conditions and a significant decline in production. the ration of housing. In Bulgaria, mortgage lending continues to grow almost until the end of 2009, due to the high profits it provides to creditor banks, and in 2008 interest rates on housing loans were around 7-8% per year, while in the countries of EU they are between 4.5 and 6%.

High competition in the banking market, aggressive lending are pushing the "price bubble", and mass sales of homes are leading to a collapse in property prices in the United States. They began to fall in late 2008 and had a negative effect on mortgage bond prices, forcing credit institutions to apply stricter measures when granting mortgage loans. The housing market crisis initially began in the United States in mid-2007, gradually spreading to Europe, particularly to Bulgaria, where real estate prices fell sharply between 2008 and 2012. (See Figure 1)

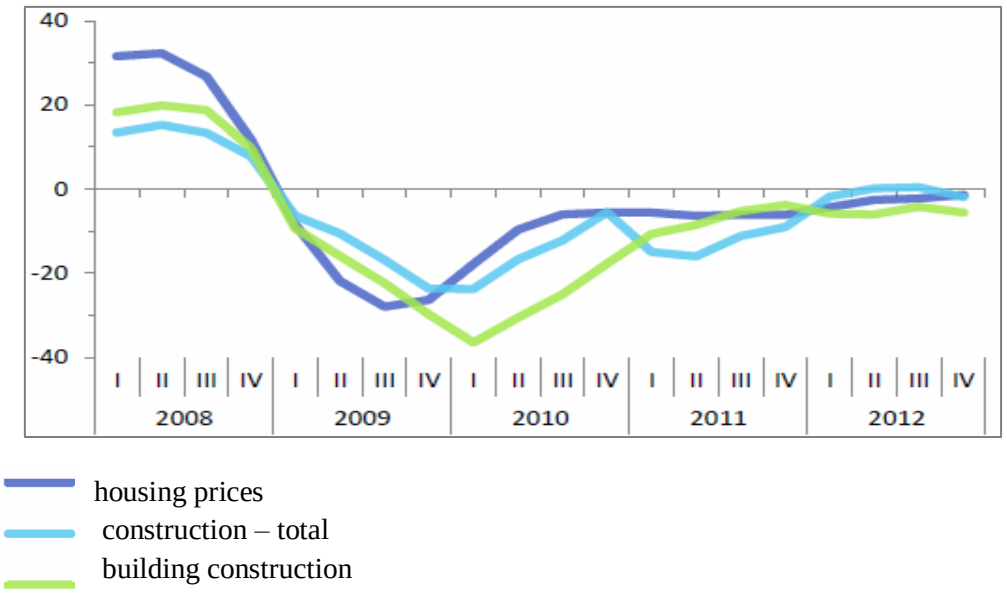

Figure 1. Rate of change in average market prices of housing and the index of construction output (change on an annual basis,%, 2008–2012) (Bozhinov, B., Uzun, N. 2017)

We are witnessing a drastic decline in real estate prices, the introduction of new, stricter regulations for credit institutions and several very difficult years for the construction sector, which is an indicator and measure of the state of the modern economy. It is an integral part and prerequisite for the construction of the material base of the economy - production facilities, infrastructure, residential and public buildings, while significantly contributing to the positive development of the labor market. (MF, 2013, p. 14)

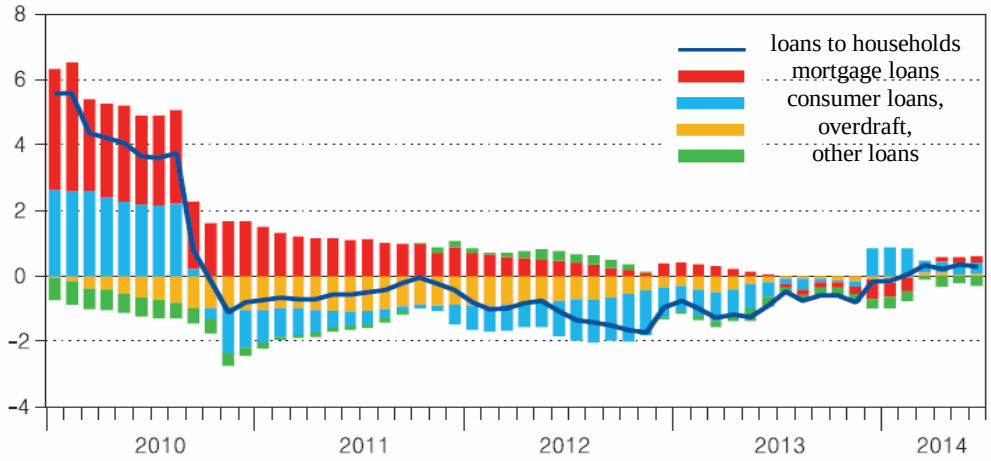

Figure 2. Annual growth of household credit and contribution by type of loan (in percentage points, 2010-2014) (BNB, Economic Review No. 2, 2014, p. 36)

According to BNB data for the period 2010-2014, the average annual bank financing - in the form of direct loans to construction companies and housing loans to households - is in the range of BGN 12.7 - 14 billion, as a share of housing loans in its total volume is between 60 to 70%. During this period, according to industry experts, there is a decrease in the percentage of financing the purchase with a bank loan (by about 20% to levels of about 70%), bank lending remains one of the safest sources for acquiring housing property. . This is evidenced by the positive growth of this type of loan after 2010, which, although declining, remains the only type of loan for households, which in the

period has a positive contribution to the growth of total credit to individuals (See Fig.2). (BNB, Economic Review, No. 2, 2014, p. 36)

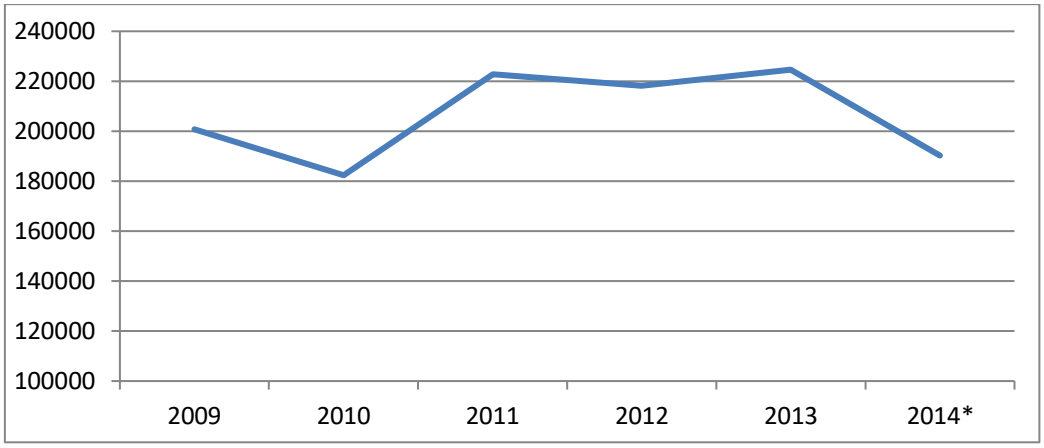

Figure 3. Number of registered home sales (annual basis, 2009-2014)

We can note a specific feature for the period after the crisis 2008-2014, which was observed in the housing market in Bulgaria, namely: despite the registered serious decline in house prices by 36% on average for the country and falling interest rates on mortgage loans, the demand for such properties and the finalization of transactions with them, shows stability rather than growth. (see Fig. 3 and Fig. 4).

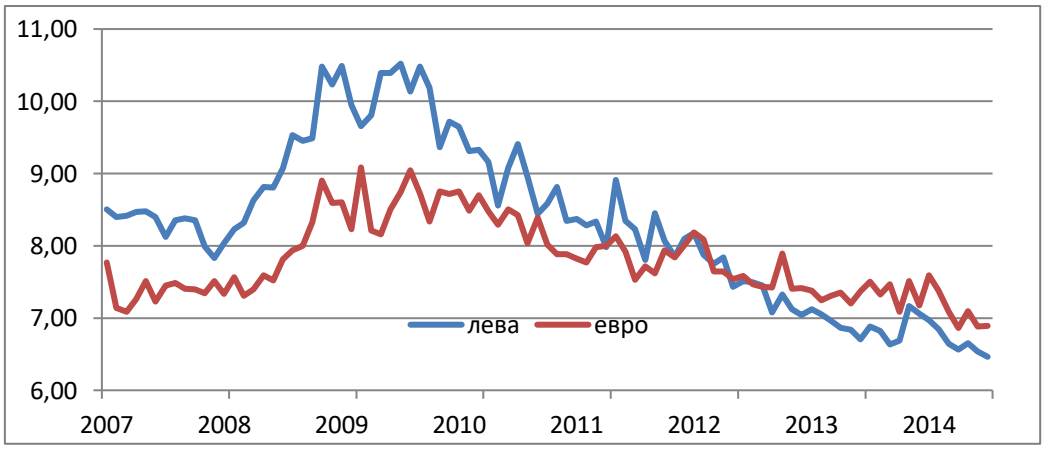

Figure 4. Interest rates on housing loans to non-financial corporations (average interest rate, 2010–2014) [3]

[3] Source: http://www.bnb.bg Newsletter, 2007-2014.

From the analysis of the evolution of mortgage lending before and after the financial and economic crisis of 2008-2009, with the bursting of the price bubble in the US and Europe, the introduction of a new international regulatory legal framework for credit institutions has been mandatory. The European changes started with the adoption of Directive 2014/17 / EU of the European Parliament and of the Council of 04.02.14. The Directive introduces: "new criteria for the protection of the rights of consumers of financial services and the protection of financial and the banking stability of the Member States of the European Union, with the harmonization of regulations at national level '. The new European legal framework must ensure the success of measures to ensure greater transparency, security and confidence in the mortgage market.

The harmonization of the legal framework in our country, with the amendments to the Consumer Credit Act (CPA) in 2014 and with the adoption of the Consumer Real Estate Loans Act (CPRA) in 2016: the normatively defined: "credit opportunities for real estate of consumers, the conditions and procedure for registration of credit intermediaries and control over them, as well as the granting of two categories of mortgage loans: for the purchase of real estate and loans for acquisition or retention of real property rights." The increase in property prices in Bulgaria is also related to the change in their demand due to the increased capacity for debt service and the possibility to use credit from households. The first factor depends on the reduction of key interest rates due to low inflation after the introduction of the currency board. The revitalization of credit institutions is based on the privatization of the banking sector, the liberalization of capital movements and financial innovation. (Yotov, 2008, p. 55).

Globally, we are seeing a rapid activation of credit institutions in mortgage lending after the period 2014-2015, despite the introduction of new international banking regulations. Banks are striving to maintain a leading position in mortgage lending and are becoming more aggressive, which has made the real estate market very dynamic. This trend persists in our country during the pandemic, when over-

lending for the purchase of housing in 2020-2021 was registered. Demand for real estate does not decrease even in the conditions of economic recession, according to BNB data - in July 2021 alone in Bulgaria new BGN 180 million mortgage loans were withdrawn from credit institutions and the total amount has already reached BGN 13.125 billion. and the annual increase is already 15.1%. This intensifies the development of the real estate market in all regional cities, but mostly in the ten largest cities in Bulgaria as a leader in this process is the capital. The change in this behavior of lowering the criteria for mortgage lending by credit institutions in our country - with their good liquidity and high competition - may change with increasing control by the BNB.

Large household deposits and low interest rates make households seek real estate investments. Therefore, from the beginning of 2021 to September alone, more than BGN 6 billion have been invested and the mortgage loans issued amount to BGN 1 billion. This active investment policy in the purchase of housing is expressed in the following statistics - only in the capital, the number of purchased, empty apartments reaches 200,000.

There are clear global trends in long-term lending in real estate, with easy access to cheap financing and active policies of anti-crisis government incentives for pandemic economies observed in the US, Canada, UK, EU countries, Australia, New Zealand.

This upward trend in the real estate market is observed in Bulgaria as well, as real estate transactions in the first half of 2021 are 14% more than in the same period of 2019, and the growth of prices in 2020. is over 8-10% per year, mainly due to higher demand from supply and in 2021 in the capital this growth already reaches 20-30%.

We can draw some important conclusions about whether the "price bubble" that credit institutions will create with aggressive lending when buying real estate in major cities and the capital will soon burst. If we analyze a few decades from the end of the 20th and the beginning of the 21st century, we will see that the development of the real estate market maintains a lasting cyclical and predictable

trend in 15-18 years, when it reaches its peak in development , which gives an incentive to the construction sector.

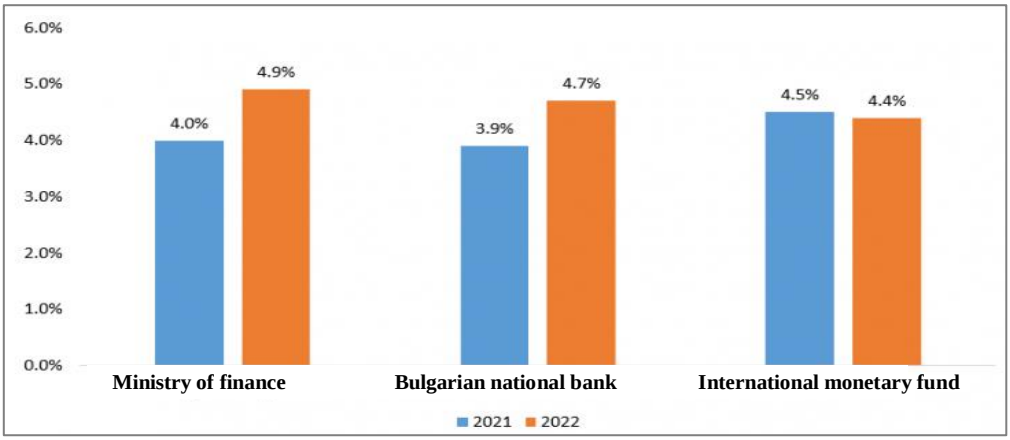

Figure 5. Real GDP growth, 2021 and 2022

A change in this cyclical development can only be brought about by a global economic crisis, which will cause mass bankruptcies of financial and non-financial enterprises, with high unemployment. In 2021, Bulgaria, despite the pandemic and economic recession, is experiencing a recovery / oversupply phase, which means that real estate prices may rise until 2025, although there is already a "price bubble" supported by credit institutions, which will continue with an annual growth of 15-25% in housing lending at consistently low interest rates. Such are the expectations in our country, according to analyzes based on published similar data and macroeconomic forecasts of the Ministry of Finance, the Bulgarian National Bank and the International Monetary Fund for key economic indicators in 2021 and 2022 (See Figure 5).

Analyzes of the recent financial crisis show that the ECB, and the BNB in particular, must master this process by limiting the volume of high-risk mortgages that credit institutions can offer as households take on more and more debt to buy houses and prices. of properties in major European cities and capitals are going up sharply - over 8-10% per year. New ECB regulations leveled at EU central banks are expected to make property markets cool the bubble. Internationally,

such measures are already being taken by the Central Bank of China, where property prices in Shenzhen, for example, rose 16% in 2020. The situation is similar in New Zealand, where mortgage regulations have tightened lending after average house prices hit a new record, rising 23% year-on-year in February 2020. In Australia, the Netherlands and Denmark, real estate prices also hit new highs.

CHAPTER TWO

INTERNATIONAL REGULATORY STANDARDS AND THEIR IMPACT ON MORTGAGE LOANS AND INVESTMENT IN MORTGAGE AND COVERED BONDS

The change in the regulations of mortgage lending in the United States for the purchase of real estate began with the signing by President H. Hoover (1929-1933) of the Federal Law on the provision of bank loans for the purchase of housing and establishing the Bank for Mortgage Lending. The government further stimulated this process with the support of the Home Purchase Program, with the assistance of three government agencies - Fanny May (Federal National Mortgage Association - FNMA, established in the 1930s), Freddy Mack ”(Federal Housing Mortgage Corporation - FHLMC, founded in 1970) and“ Gini May ”(State National Mortgage Association – GNMA). They further stimulate home lending by purchasing and securitizing mortgages, enabling credit institutions that lend mortgages to have a 'new financial resource' at their disposal.

This policy of the US state administration provides an "extraordinary boom in the mortgage market." *The activities of both companies - Fanny May and Freddie Mack can be characterized by classifying mortgages into different risk-free and higher-risk "packages", depending on the rating they have (AAA or A ++, etc.) - yes meet the interests of various investors - those who do not like to take risks and investors who are looking for bigger profits in higher-risk mortgages (such are CDOs - hedge funds and other risky investors invest in them).“*

On this occasion, Alan Greenspan said that it is not uncommon for legislators and regulators to engage in the creation of new laws and regulations

in response to market failures, and the resulting mistakes often can not be eliminated for decades. . The former chairman of the Federal Reserve Board argues that the Glass-Steegel Act, which separated the business of taking over securities from commercial banking in 1933, is based on a false story. It was not until 1999 that the Glass-Steegel Act was replaced by the Gram-Leach-Blyley Act, which restored much-needed flexibility to the financial industries. Awareness of the detrimental effects of over-regulation and the need for economic adaptability has grown significantly in recent years, according to Alan Greenspan. (Greenspan, 2008, pp. 436–437).

In modern regulations, credit institutions have the responsibility to grant mortgage loans with compulsory property insurance on collateral, and in different banks there is a difference in the sums insured required by property insurance. These insurances ensure greater security for credit institutions when granting mortgage loans. The property is usually insured for an amount close to the loan amount. The idea is - in case of insurance risk (insolvency of the borrower) - the insurer to pay compensation to the bank up to the amount of the loan. *Mortgage insurance is becoming a major factor in the development of modern mortgage lending and the real estate market. It reduces the risk for the lender by transferring part of the credit risk outside the banking system. Mortgage insurance facilitates access to credit for customers and allows for better credit conditions for lower-income consumers.*

Government support in the United States for "buying one's own home" and strong competition between banks in mortgage lending in a very liberal environment, as well as the desire for faster financial turnover are the basis for the emergence of securitization of loans (respectively mortgage bonds) . This is a process in which the credit institution that has granted the mortgage loan sells the receivables on it to joint-stock companies with a special investment purpose, realizing a certain profit from the transaction. Thus, they "sell" illiquid assets and with the proceeds, they can re-invest in new loans. . These financial institutions, which are the founders of this transaction, create a portfolio of tangible or

financial assets that are as collateral for the liquid securities (shares or bonds) issued against them. These securities are offered for purchase by investment companies, with the promise of good returns and low risk. This defines securitization as the process of transforming direct ownership of real estate into ownership of shares in a company that directly owns the property. It allows for lower costs of transferring rights to assets and provides good liquidity for these assets. The great interest of institutional investors in the securitization of mortgages by credit institutions provides them with new financial resources for new mortgage loans and strong support for the securitization process and the secondary market of mortgage bonds. This process turns transferable mortgage bonds into a highly sought-after financial asset on secondary markets as securities backed by a package of standardized mortgages that ensures good returns at relatively 'low risk'.

High-risk subprime mortgages are considered to be a very innovative method of lending. Initially, they are granted at higher interest rates to customers with low credit ratings, but over the years this difference in interest rates between primary and secondary mortgages has decreased significantly. Another modern alternative to standard mortgages is the issuance of securities on mortgages (MBS - Mortgage-backed securities) and the return on these securities depends on the return on mortgages. Thus, structured product is offered in different risk rates depending on the desire of investors and the most risk-free product is considered to be the one insured with a third party, which will pay dividends in case of inability of the issuer of securities (CDS - credit default). swaps).

This gives credit agencies a reason to raise the credit ratings of these risky securities to AAA (excellent). This determines the big boom in sales of this product and for the period from 2004 to the crisis of 2008 - 21% of all mortgage loans in the US were high-risk mortgages.

To support credit markets and the global economy since the 2008-2009 crisis, new international banking regulations have been adopted, as well as US Federal Reserve policy, which continues to buy mortgage bonds, and by the end

of 2020 holds such bonds totalling $ 2 trillion. dollars in its balance sheet and this activity must continue to avoid shocks in the financial markets and the economy. The Fed "keeps up the tradition" and buys mortgages every month, with a net figure of about $ 40 billion.

In response to the ongoing processes following the 2009 financial crisis, the Basel Committee on Banking Supervision adopted Basel III on 1 January 2014 as a new, higher international regulatory standard, representing: “a set of more radical rules for the banking system to improve the quality and transparency of the capital base, the liquidity of banks and to create capital buffers for lower risk of bankruptcy '. The purpose of the restrictions for credit institutions and investors is to "more effectively cover the risks arising from the use of complex financial instruments". (Milinov, V. and Collective, 2015, p. 100)

Basel III introduces two new international liquidity standards. These are: Liquidity coverage ratio and net stable financing ratio. The first is aimed at regulating liquidity in the short term, and the second - in the long term. The Liquidity Coverage Ratio (CLR) requires banks to form a “buffer” of highly liquid assets sufficient to cover at all times the net outflow of funds (the difference between inflows and outflows) within short-term interval of up to 30 days in a liquidity crisis scenario. (Vatev, 2015, pp. 127-128).

The adoption of the European Directive 2014/17 / EU of 04.02.14 sets an ambitious goal related to better protection of the rights of consumers of financial services and protection of the financial and banking stability of the member states of the European Union. The harmonization of the legislation after 2014 at the national level with the new European regulatory framework continues with the amendments to the Consumer Credit Act (CPA), related to the abolition of fees for early repayment and utilization, credit management and the possibility of the borrower to meet the amount of the mortgaged property under the general procedure of the CPA as a market risk of collapse in the prices of mortgaged property in local or global crises, will be entirely to credit institutions. The harmonization of national legislation with the new European banking regulations

continued with the Consumer Real Estate Loans Act (LCNPA) adopted in 2016. This law precisely defines “new opportunities for providing real estate loans to consumers, the conditions and procedure for registration of credit intermediaries, control over them and the regulatory legal framework for granting two categories of mortgage loans: 1) for the purchase of real estate as loans secured by a mortgage or other comparable security on real estate and 2) loans aimed at acquiring or retaining a real right over real estate such as the law, will also apply to credit agreements intended for repair in cases where when secured by a mortgage.

On 27 November 2019, the European Parliament adopted Directive (EU) 2019/2162, which regulates the issuance of covered bonds and public oversight of them by amending Directives 2009/65 / EC and 2014/59 / EU. Directive (EU) 2019/2162 aims to harmonize not only the conditions for investment and supervision, but also the conditions for the issuance of covered bonds, which eliminates differences or absences in national regulations for the definition of "covered bonds", the way they are issued and different levels of investor protection, which will ensure the integration of the European covered bond market, with a low risk to financial stability and uniform levels of investor protection. *We must emphasize the fact that the process of creating covered bonds as a debt instrument, which is very close to mortgage bonds, dates back to Prussia 150 years ago, with the possibility of different collateral - not only through mortgages but also from other loans*. They are used in most European countries as the main source of profitable long-term financing for credit institutions, which provides a higher level of security for investors. The possible proceeds from various issues of covered bonds can be used to finance the granting of new housing and commercial mortgage loans related to the activities of companies by pledging their own real estate to finance various of their business projects.

With the adoption of Directive (EC) 2019/2162, which must be transposed into the legislation of the EU countries by 8 July 2021 and implemented from 8 July 2022, it means that a draft Law on covered bonds, with which to oblige credit

institutions in Bulgaria to use covered bonds, according to the new European legislative framework. This will significantly expand the covered bond markets in Europe and the opportunities for institutional investors to invest at low risk in the real European economy. Expanding the circle of investors outside the European Union will further stimulate this process. The expectations are - with the legal harmonization of the main characteristics of covered bonds issued by credit institutions in the EU and the national regulatory frameworks of the member states "to ensure prudential reliability and better protection of institutional investors, which should expand the investment interest beyond investment and central banks'.

With the creation of such a normative project in Bulgaria (the draft Law on Covered Bonds - at the end of 2021) and the entry into force of the Law on Covered Bonds - on July 8, 2022, not only the rules for issuing covered bonds must be harmonized. covered bonds and the powers of the specialized supervisory body, but also rules for exchange of information and cooperation with other competent national and foreign administrative bodies such as control responsibilities, through the BNB or the FSC, according to the European directive imposes additional obligations.

With the expected change in the legislation in our country, after the entry into force of Directive (EU) 2019/2162 of the European Parliament and the Council of 27 November 2019, it is expected to increase interest in investing in covered bonds in our country, which will have an important socio-economic role by stimulating credit institutions and institutional investors to more actively participate in the capital market, although at the beginning of the 21st century we can not boast of great interest of credit institutions in our country to the possibilities for direct financing from the Bulgarian capital market through issues of mortgage bonds. According to the published "list of issues traded on the Bulgarian Stock Exchange - Sofia", at the end of 2007 only 12 issues of mortgage bonds issued by 7 banking institutions with a total face value of just over EUR

137 million were registered for trading on the BSE. , where only indivisible mortgage bonds (Pass through type) are offered.

The policy of CEB and the BNB to keep interest rates low is the basis of a large-scale mortgage credit expansion of banks in Europe and creates an opportunity for an already familiar phenomenon from the crisis of 2009 - the bubbling of house prices, especially in major European countries, cities and capitals. Rising property prices are associated with higher demand, good credit conditions, a consequence of lower mortgage interest rates, stabilization of household incomes and low inflation.

Covered bonds, with these dual collateral characteristics and good yields, like US mortgage bonds in the early 21st century, could easily become a "new hit in the financial markets" - a preferred financial asset among institutional investors because have guaranteed security - against the background of low yields on investments in government securities or deposits. The crisis of 2009 proved that in a given market situation, global investment in such financial assets as "covered" mortgage bonds, even at low risk - may be the wrong decision for investors in the face of difficult financial and economic a crisis that inevitably affects the real estate market and the banking sector, and such a possibility exists - in a pandemic and a prolonged recession with an unclear horizon.

CHAPTER THREE

CREDIT AND INVESTMENT RISK MANAGEMENT IN MORTGAGE AND COVERED BONDS

How is it possible to form an investor's expectation for future profitability and risk? There are many options, but the most commonly used in practice are two approaches with different modifications:

The first approach is based on the view that the movement in asset prices depends on another factor or factors for which an expert assessment can be made. Very often the profitability and its probabilistic distribution is linked, for example, to scenarios regarding the price of assets in different states of the

economy - strong recession, stagnation, normal growth, economic boom. Investors do not know for sure whether the economy will grow fast, slow or in recession - they do not know what return their investments will bring. Therefore, investment decisions are in line with expectations for future economic development.

The second approach is based on the view that the future is a repetition of history with minor changes. If there is enough information about the movement but the return on assets in the past, this can serve to form an expectation for future returns. (Prodanov, St. et al., 2007, pp. 229–231).

In the world financial literature, the problems of investment remain one of the central ones, concerning the areas of investment, the structure of investments, the valuation of capital assets. However, no universal principles can be found to be used in each specific investment case to ensure the highest return, while minimizing the risk. The global financial crisis has shown that what is considered a "risk-free investment" in assets such as secondary mortgage bonds can lead to large investment funds, banks and companies in huge losses and bankruptcies.

The financial world changed radically in a short period of time, with many large companies merging, others being declared bankrupt and sold off to competition. Bankruptcy of debtors to banks has led to large penalties paid by mortgage insurers.

Mortgage bond trading is associated with several specific risks. They are:

- Credit risk - mortgage bonds are controlled by a special law regarding the issuing bank and the collateral on the securities (this includes the type of property, risk classification of loans, unencumbered encumbrances, liquidity of the collateral, etc.), which is the reason for the lower credit risk compared to corporate bonds;
- Interest rate risk - the lower credit risk of mortgage bonds, determines that they carry - lower interest rate risk than corporate and, accordingly, higher risk than government securities (government securities);

- Liquidity risk - compared to the government securities market, the mortgage bond market in the Republic of Bulgaria is poorly liquid. Opportunities for better development in the future is the special regulatory framework and the availability of collateral.
- Market risk - it depends mainly on changes in interest rates.

The management team must perform a comprehensive and systematic risk analysis of the investment activities of investors in mortgage bonds, as well as in relation to the accompanying risks. Theoretical problems in the development will be analyzed in order to formulate the nature of the categories "investment risk" and "return". The applied aspect will be expressed in retrospective-diagnostic and prognostic-identification analysis of the “return on risk” ratio as a main indicator of the investment activity of investment companies and the portfolio performance of investment funds.

In particular, a comprehensive financial analysis of the investment activity of investment companies will be conducted and the portfolio performance of investment funds will be assessed in the conditions of crisis, with an emphasis on risk and return, on the basis of which specific conclusions will be drawn on investment efficiency, the perspectives, the role and the place of the investment activity for increasing the sustainability and competitiveness of the investment funds in our country.

Institutional investors (investment banks, insurance companies, investment, pension funds, etc.) have a leading role in the money and capital markets. The management of their investments is based on the principle of optimizing the risk-return ratio, which means an optimal ratio of high return and low level of investment risk. This should discourage them from investing in risky business areas, and investment risk analysis should play an increasingly important role in a new era of turbulence in the global economy. Risk managers operate in a dynamic environment with many unknown risks, which makes the process of risk management and management decision-making to cover the stages from risk identification to its assessment, treatment and monitoring. The analysis of risk

events and risk identification can be associated with a number of considerations in the management of the investment process. Investment activity is a typical risk process in which potential and often unpredictable risk events occur in the conditions of dynamic technological development and presentation of increasingly sophisticated financial products. Therefore, the study of investment risk should be carried out at each stage of the study - until its completion in order to limit the negative effect of the occurrence of potential risk events. This obliges modern risk management to use the most effective quantitative methods to assess the relationship "risk-return".

Analyzes show that at the end of the 20th and the beginning of the 21st century the interest of institutional investors in bonds is growing and the main reason can be pointed out - entering the era of chaos and the era of turbulence, where economic ups and downs , will be much more common. Government securities and mortgage bonds provide greater security for investment in them, with good yields and low risk[4].

Research shows that the total nominal value of bonds issued in the United States and Japan significantly exceeds the market value of all shares traded within these markets. This explains the great importance of debt instruments in the field of corporate life, corporate finance and investment management, which requires the development of modern theories for diversification of investment risk in investing in mortgage bonds, as well as for the development of technology and their evaluation . Like all other assets, the value of bonds in its general case is formed by the sum of the present values of the expected cash flows on them. (Ganchev Al., And team, 2018, pp. 221-222) (See formula 1).

$$(1) \quad V_B = \sum_{t=1}^{T} [\frac{CF_t}{(1+r)^t}],$$

[4] Pl. Patev and N. Kanaryan point out in the book "Portfolio Management" four established strategies for bond selection, namely: immunization, conditional immunization, indexation and combination of cash flows. Immunization minimizes the reinvestment risk for a particular investment horizon. Conditional immunization consists of setting an immunized target return and a minimum secure return to satisfy the investor. The combination of cash flows consists in the construction of a portfolio that covers the payments on the liabilities with the cash flows from the investments, as the value of the portfolio decreases to zero after the payment of all liabilities. Indexing is the construction of a portfolio of bonds that have the characteristics of a pre-selected bond index, which serves as a benchmark.

where:

V_B is the value of a bond;

CF_t is the cash flow on the bond that occurs at time t;

r - the discount percentage.

However, depending on whether the bonds are coupon or non-coupon, their valuation has a different mathematical specification. Coupon bonds pay coupon payments to their holders, and at their maturity, along with the last coupon payment, the nominal value of the bond is paid. Thus, the value of a coupon bond at a certain discount rate would be measured in the equation (Ganchev Al., And collective, 2018, pp. 221-222):

(2) $V_B = \sum_{t=1}^{T-1} [\frac{C_t}{(1+r)^t}] + \frac{C_T+N_T}{(1+r)^T}$,

where:

C_t *is the coupon payment at the moment;*

C_T *the coupon payment at the time of maturity or moment T;*

N_T *the par value of the bond at maturity.*

On the other hand, a coupon-free bond has only one cash flow - that of maturity, when its nominal value is paid. Thus, the value of the bond is reduced only to: (Ganchev Al., And team, 2018, pp. 221-222)

(3) $V_B = \frac{N_T}{(1+r)^T}$.

The direct relationship between the duration and the sensitivity of the value of the bond portfolio to interest rates is important for portfolio managers who are trying to derive additional returns by adjusting the structure of their portfolio to changes in market interest rates. The main problem inherent in bond portfolio management is related to obtaining a return that meets the expectations for the investment horizon. In practice, interest rates are constantly changing, which exposes portfolio managers to interest rate risk. This risk consists of two components - price risk and reinvestment risk, as the price risk is the risk of

deviations of market prices of bonds from expectations due to changes in interest rates on the day of the investment horizon. it is not known at what interest rate, the coupons will be reinvested. If, after the purchase of the bonds, the interest rates fall, the coupons will be reinvested at a lower percentage than expected, which will affect the final value of the portfolio, which will be below expectations. (Patev, Pl., N. Kanaryan, 2008, p. 723).

It is not possible to completely eliminate the risk in any way to diversify the investment portfolio. That is why in 1966 William Sharp, John Lintner and Jan Mosin developed a special Capital AssetPricingModel, which allows the quantification of investment risk and the estimated return on investment. (Sharpe, 1964).

The model is essentially the core of modern portfolio theory. It provides an accurate prediction of the relationship that must be observed between the risk of an asset and its expected return. This dependence performs two important functions:

- Provides a reference rate of return that can be used in valuing investments;
- Gives the opportunity to make a reasonable assumption about the return on assets that are not publicly traded.

This model is based on the idea that there are two types of investment risk: systematic and non-systematic. The postulate of this model is that non-systematic risk can be eliminated by diversifying the investment portfolio, which, however, cannot eliminate the systematic risk, even if the portfolio contains all possible securities traded on the market. In this sense, the capital asset valuation model is a way of measuring only systemic risk.

The basis for the capital asset valuation model is the so-called beta (β)- a coefficient that expresses the dependence of the stock or bond on market changes and is calculated as follows:

(4) $$\beta_i = \frac{Cov(r_i; r_m)}{\sigma^2{}_m},$$

where:

Cov *is the covariance (dependence) between the market portfolio and the asset in question;*

r_m *is the expected return (return) on the market portfolio;*

r_i *- the expected return on the i-th asset;*

$\sigma^2{}_m$ *- the variance (variation) of the market portfolio;*

The relationship between the expected return on a security and - the ratio is expressed by the equality:

(5) $$E(r) = r_f + \beta\lfloor E(r_m) - r_f \rfloor,$$

where: r_f *is the risk-free return.*

In this case, the constituent components of the equation have the following meaning:

$\lfloor E(r_m) - r_f \rfloor$ is the amount of the market risk premium;

$\beta\lfloor E(r_m) - r_f \rfloor$ is the expected risk premium for each specific asset

The market price of the risk, i.e. the additional return to bear the risk of the portfolio is defined as follows:

(6) $$\frac{E(r_m) - r_f}{\sigma^2{}_m}.$$

The marginal cost of risk, ie. the trade-off between the increase in the risk premium and the increase in risk is expressed in the equality:

(7) $$\frac{\Delta E(r)}{\Delta \sigma^2} = \frac{E(r_m) - r_f}{2\sigma^2{}_m}.$$

The difference (+/-) between the actual and expected rate of return of a given type of stock or bond is called alpha (α).

The capital asset valuation model also cannot be described as perfect. It contains shortcomings of the theorem for the transformation of investment decisions into financial ones. In addition, it again includes hypothetical concepts

such as a market portfolio and a risk-free asset. In practice, it links the rate of return on assets with one factor - the market risk premium, and this limits the analysis, because the rate of return is influenced by other factors. (Patev, Pl., Kanaryan, N. 2008, pp. 255-320)

However, the capital market valuation model is useful and is used quite often in the financial field. When investing, investment funds should have information about the beta ratios of the various securities and consider that by including in their portfolio securities with higher bets, they take a higher risk, as the return on these shares will change more. compared to the market as a whole. Conversely, by including securities with lower bets in their portfolio, they should expect less risk and correspondingly lower returns from that portfolio.

In the course of research and analysis of the level of risk and profitability, they must be characterized quantitatively. Apart from the considered beta coefficient, the following algorithms are especially popular among financial managers (Prodanov, St. et al., 2009) (Patev, Pl., Kanaryan, N. 2008).

When an investor makes a certain investment with a time horizon of N years and its initial value is V0 and the final value is V, the profitability (return) for a period of N years, reflected by the symbol r, is calculated as in relation to the value of the investment at the end of the period to its value at the beginning, reduced by one:

(8) $$r = \left(\frac{V}{V_0} \right) - 1.$$

In the case of the components participating in the previous formula, they satisfy the following equality:

(9) $$V_0 \times (1 + r) = V.$$

The value of an investment at the end of the period is determined by the following two factors:

- the selling price of the given investment instrument after N years;

- the amount and conditions for reinvestment of the income received from the given investment during these N years.

Since the final value of V is not known, the return is considered as an expected value and is calculated by the following formula:

(10) $$r = \left(\frac{E(V)}{V_0} \right) - 1,$$

where: $E(V)$ is the mathematical expectation of the random variable V, i.e. the expected value of the investment at the end of its period.

The formula for calculating the expected value of the investment at the end of the period is as follows:

(11) $$E(V) = P_1 V_1 + P_2 V_2 + ... + P_n V_n,$$

where:

$i = 1,2,...,n$ are all possible values of the value of the investment at the end of the period;

P_i - the probability that at the end of the period the value of the investment will be equal to V_i;

When analyzing the return on investment, it should be borne in mind that the expected return takes into account the factor "uncertainty of the final value V" and gives an estimate of the average value of return for the period of N years. The investment risk is contained in the possible deviation of the actual return from the expected return calculated by the previous method. For its quantitative assessment, the most common and accessible indicators are the standard deviation and the variance of profitability. If, for example, the bonds in which an investment company will invest for a period of N years are known to have their yield values, the variance as a measure of statistical dispersion (σ^2) will be calculated by the following formula:

(12) $$\sigma^2 = \frac{\sum_{i=1}^{N}(r_i - \bar{r})^2}{N}.$$

The standard deviation (σ) is the square root of the value of the variance.

(13) $$\sigma = \sqrt{\frac{\sum_{i=1}^{N}(r_i - \bar{r})^2}{N}}.$$

The average level of profitability ($\bar{r}$) is calculated as a weighted arithmetic mean with the following formula:

(14) $$\bar{r} = \frac{\sum_{i=1}^{N} r_i}{N}.$$

Statistical theory claims that the formula for the variance of the return slightly reduces its estimate, because the calculation work does not use the actual average value of profitability, but the representative, which is at the center of the sample and therefore deviations from it and representative data are on average smaller than if calculated from the actual average of the variable. Therefore, it is more correct to use the Bessel formula for data from a small sample (for example, less than 30 cases), in whose denominator the years are reduced by one.

(15) $$\sigma^2 = \frac{\sum_{i=1}^{N}(r_i - \bar{r})^2}{N-1}.$$

The variance of profitability with these formulas is determined on the basis of data from previous periods, but for practical purposes it is necessary to assess investment risk in the future and then use forecast values for future profitability and therefore the variance of profitability is calculated as random (probabilistic) magnitude.

(16) $$\sigma^2 = \sum_{i=1}^{n} P_i \times (R_i - E(R))^2,$$

Where: $E(R) = P_1R_1 + P_2R_2 + ... + P_nR_n,$

Where:

R_i, $i = 1,2,...,n$ are all possible values of the return on investment R at the end of the period;

P_i - the probability that at the end of the period the return on investment will be equal to R_i;

$(R = R_i), i = 1,2,...,n;$

Apart from the fact that the variance characterizes the degree of scattering around the average value of the expected return, it has another useful property called "fair inequality of Chebyshev":

(17) $P\{S\}\{|R - E(R)| \geq \varepsilon\} \leq \sigma^2 / \varepsilon^2,$

Where:

$P\{S\}$ is the probability of event S;

R – is return;

$E(R)$ - the expected return, ie the mathematical expectation of profitability;

ε - Random positive number.

The above inequality means that the smaller the variance, respectively the standard deviation (standard) deviation, the less likely it is that the actual yield will deviate from the expected yield by the value of the quantity ε .

In the essence of the formula for calculating the variance, respectively the standard deviation, the rule is to take into account both the negative values of profitability, which are less than expected, and the positive definitions, when the profitability assumes values greater than expected. In general, however, the investor is mostly interested in the negative results, which are in fact the basis of his investment risk. Therefore, in practice, other popular approaches are used in risk assessment, which can be defined as alternatives:

- probability of incomplete return, ie the return of the respective investment is likely to be lower than expected

- average incomplete return, calculated from the deviations of the return on the investment below the expected return;
- semi-variance, for the calculation of which only those possible returns are used, which are lower than the expected return, ie. in which $R_i < E(R)$.
- the coefficient VaR (valueatrisk), showing the maximum amount that an investor can lose in a certain period of time with a given probability.

In Bulgaria, collective investment developed too late - in the late twentieth and early twenty-first century with the processes of mass privatization and the then established privatization funds. In 2002, there were only three active collective investment schemes in Bulgaria. With the growth realized on the Bulgarian Stock Exchange - Sofia and mainly with the amendments to the Public Offering of Securities Act (POSA) from 2005, investments in securities are popularized. According to data from the Bulgarian National Bank (BNB), by the end of 2009 there were already 255 investment funds in Bulgaria. (https://www.bnb.bg/, n.d.)

The classical measures for evaluation of portfolio performance are a product of portfolio theory in its fundamental form, using the achievements and its main formulations. Therefore, the measures included in this group are usually applicable mainly to conventional collective investment schemes and less than hedge funds. (Ganchev, 2012, pp. 126-127) A strong impetus in the development of the theory of valuation of portfolio performance gives the development of the model for valuation of capital assets (CAPM) as its concepts related to the relationship between risk-free asset return, risk premium in the economy, the beta coefficient, etc., are the basis for the development of the Treynor coefficient since 1965. (Treynor, 1965, pp. 63-75)

This is also the first quantitative tool for analyzing the performance of investment funds. The presence of a risk-free asset in the economy forces Treynor to change the traditional return / risk ratio, which can be used to assess an investment portfolio at an initial and very intuitive level. What is important for him is not the absolute return per unit of risk, but whether the assumed risk is

adequately compensated with a return above that of an alternative investment - for example, the risk-free asset:

(18) $$T = \frac{r_p - r_f}{\beta_p},$$

Where:

T - the Treynor ratio;

r_p – the profitability of the portfolio;

r_f – risk-free return;

β_p – the beta ratio of the portfolio.

As can be seen from the risk measure equation, the Treynor ratio beta uses the beta ratio of the portfolio being valued. This is logical in view of the fact that, according to the CAPM, non-systematic risk can be eliminated through diversification, while this is not possible for systematic risk, which shows that by neglecting non-systematic risk, the Treynor ratio becomes objectively unable to assess poorly diversified wallets. (Ganchev, 2012, pp. 126-127)

The brief theories and methods for investment portfolio formation and for return and investment risk assessment can and should be successfully used in investment activities because they have proven their practical effectiveness and can contribute to optimizing the investment portfolios of investment companies, minimizing their investment risk by taking them into account the specific financial and economic situation - inflation, stock exchanges, economic conditions, etc.

The investment portfolio - in times of crisis - needs to be somewhat more conservative and very well diversified. The crisis severely affected those investors whose investment portfolios were not well positioned, did not optimize their costs, had invested in non-performing assets and in CDS (CreditDefaultSwaps) and did not reduce the value of their investment portfolio.

In conclusion, we can conclude that the main challenge for financial managers in times of crisis is to keep companies' own funds. Many financial

instruments disappear or depreciate during a crisis, and the stock market is often opaque and speculative. In the context of a pandemic and an economic depression with an unclear horizon, investment firms must pursue sound and flexible financial policies, including optimal cost management and revision of their investment policies in order to minimize investment risk and increase returns.

Everyone in society is aware of and accepts the objective need for state intervention and regulation of economic life. However, differences come when discussing the scale, direction and instruments of state intervention. They derive from the scientific analyzes and practical observations of politicians, citizens and non-governmental organizations. Therefore, criticism of the effects of state intervention can be divided into:

- fundamental, which reveals genetic defects in the economic intervention of the state, and
- empirical, which is based on observations and assessments of economists, politicians and citizens. (Manliev, 2009, p. 55).

In this regard, we must point out the interest rate policy of the Federal Reserve after 2000, which sharply reduced the federal interest rate (federal funds rate) from 6.5% to 1%. This changes the interest of investors to buy mostly government securities, which no longer have a good return. In mortgage bonds, they find another relatively risk-free investment with a good return. If we have to summarize in a few sentences, what is the reason for the financial crisis in 2008-2009, we can say that this is the effect of active state intervention in the US securitization process, which is rapidly evolving after the active support of the State National Mortgage Association (GNMA), which is the guarantor of payments on investment packages - standard mortgages, as we have witnessed a real boom in the spread of this new type of financial instrument - mortgage-backed securities (mortgage bonds), and then - the active trading of secondary mortgage bonds. Investment and commercial banks play an active role in the securitization process, and competition between credit institutions intensifies this process. AIG-type mortgages, secured by AIG, have been securitized by Wall

Street investment banks and sold to investors around the world under the AAA stamp of prestigious rating agencies such as Standard & Poor's. , Moody's Investors Service, Fitch IBKA.

According to F. Mishkin, "securitization is a process of transforming illiquid financial assets such as housing mortgages into transferable instruments on the capital market", and German economist Michael Liebig identifies structural securitization as one of the causes of the US mortgage crisis. Through the created illusory feeling of risk-free investment - structural securitization introduces a widespread practice of removing mortgage loans from the balance of banks immediately after their issuance. Selling them in the so-called "Securitized" packages, banks avoid credit risk and secure new funds for new loans, then "securitize" them, etc. "This process creates a deceptive sense of the existence of a universal scheme to eliminate risk, which allows for faster financial turnover and good profits for banks. "

Former US Federal Reserve Governor A. Greenspan believes that "the securitization system that created subprime mortgage bonds is the cause and the main cause of the global financial crisis."

With the rapid growth of mortgage lending in the Republic of Bulgaria, there was talk of securitization of loans (respectively of mortgage bonds). The issuance of mortgage bonds by banks became possible with the adoption of the Mortgage Bonds Act in 2000. It protects the interests of bondholders by arranging guarantees for mortgage bonds. The regulations of the general legal framework in the Public Offering of Securities Act (Law on Public Offering of Securities) also apply here. Credit institutions now have the opportunity to directly finance their mortgage programs from the capital market. The management of the mortgage loan portfolio, which is an integral part of the bank's total loan portfolio, is in accordance with the methods and strategies for bank management and credit risk management, with strict application of the Credit Institutions Act and BNB Regulations.

Mortgage bonds are becoming very popular because they bring good returns to investors (they receive interest plus the face value of the security, which is paid by the issuer on the maturity date). They can make a capital gain if they sell them. Mortgage bonds have good collateral (with mortgage receivables from the issuing bank) and are fast becoming a widely used financial instrument in the United States and Europe. Banks issue them to refinance their active operations and increase their loan portfolios. With the new European legal framework for covered / mortgage bonds, the feeling is the same - building a new image of a risk-free financial instrument, with a double guarantee and good returns, which will allow alternative financing of credit institutions directly from capital markets and stimulate financial markets .

According to the Law on Mortgage Bonds in the Republic of Bulgaria - issuers of mortgage bonds are commercial banks, which are covered / secured by receivables from mortgages granted by them, and insurance becomes a mandatory element for additional insurance against possible depreciation of the mortgaged property. Thus, the mortgage becomes a second reliable collateral until the loan is repaid. The legislator additionally determines that the mortgage loans granted by the bank exceed the volume of the mortgage bonds issued by it by at least 10%. *As a third collateral, we can accept the obligation of banks that are debtors of mortgage bonds to strictly comply with the requirements of the Central Bank for capital adequacy and liquidity, which ensures their financial stability.* According to the Credit Institutions Act and the BNB Regulations, the bank's mortgage loan portfolio is an integral part of its total loan portfolio, which means that it is subject to the same credit risk management methods as the entire loan portfolio. All this created the feeling and definition of mortgage bonds as a low-risk financial instrument with all the characteristics of covered bonds.

In Bulgaria there is very little interest in the issues of mortgage bonds and investments in them. After the vote on the Mortgage Bonds Act, only 29 issues of mortgage bonds have been registered in the National Assembly until 2019, amounting to EUR 270 million. The last issue was issued in 2015 and repaid in

2019. This shows that the Bulgarian mortgage / covered bond market is weakly active despite the fact that the housing loan market grew strongly in the pre-crisis period of 2008 and now in the period 2015-2021, although interest rates on loans are not the lowest in Europe - we have a permanent increase in the housing price index because the currency board guarantees the stability of the financial market in our country, and credit institutions are highly liquid and have access to other more accessible and cheaper sources of funding, related to the alternative - with the issuance of mortgage / covered bonds. This shows that in Bulgaria, a working, effective law on covered bonds must be adopted to help develop the market. To expand the opportunities of financial participants to invest in the economy with the introduction of a lasting tendency of credit institutions to issue mortgage / covered bonds. The harmonization of European directives will develop the markets for covered bonds in countries such as Bulgaria, where these markets do not currently exist or operate symbolically, and this process aims to help finance the real economy.

The mortgage bonds of the issue are not offered and have not been requested and / or admitted to trading on another regulated or equivalent securities market, except for the Bulgarian Stock Exchange-Sofia AD (BSE). The distribution of the Prospectus in some jurisdictions outside Bulgaria may be restricted by law and persons in possession of the Prospectus should be informed of and comply with these restrictions. *This shows that commercial banks in Bulgaria are ready to use the opportunities for direct financing from the Bulgarian capital market through issues of mortgage bonds, emphasizing some of the important for research and analysis risks associated with investing in mortgage bonds in Bulgaria.*

As a result of the financial crisis, many US investment banks have been challenged to write off billions of dollars in assets. On September 15, 2008, one of the five largest American credit institutions, the investment bank Lehman Brothers, went bankrupt. Thus, the bank, which has existed for 158 years, ceases to operate and marks the largest bank failure in the United States, as its debts

amount to 613 billion dollars. This was followed by mass bankruptcies of affiliated, smaller credit institutions and a decline in the shares of all financial companies around the world.

Table 1

Return on equity (ROE)

BANK	2007 г. 31.03.	2008 г. 31.03.	2009 г. 31.03.	2010 г. 31.03.
UBB	5,609553	6,541011	2,905438	3,273829
DSK	4,809486	5,677201	3,821713	2,254198
BULBANK	4,772602	6,405419	4,09531	2,262598

In Bulgaria, there was an increase in non-performing loans from 3.2% in 2008 to 6.1% at the end of 2009, which significantly reduced the consolidated profit of the banking system after taxes - by 44% on an annual basis (from 1.387 billion. BGN 2008 - up to BGN 780 million) According to BNB data, at the end of August 2010 bad and restructured loans amounted to BGN 6.4 billion, or 16.5% of the banks' portfolio in the country.

As a negative effect of the global financial crisis is the increase in the share of non-performing loans in all three surveyed credit institutions (Unicredit Bulbank AD, UBB AD and DSK AD) in the period 2009-2010. we have a high amount of specific provisions for mortgage loans, and on the other hand - a low share of mortgage loans for the total loan portfolio. This speaks of problematic decisions of the bank management, which does not take into account the negative effects of local or global crises on mortgage lending. Comparing the growing amount of provisions in the three banks with the return on equity (ROE) and return on assets (ROA), a decrease in the respective indicators is observed, which means that they reduce the chances of covering losses. 1 and 2).

Table 2

Return of assets (ROA)

BANK	2007 г. 31.03.	2008 г. 31.03.	2009 г. 31.03.	2010 г. 31.03.
UBB	0,752519	0,80468	0,371442	0,436964
DSK	0,580573	0,757144	0,572507	0,374697
BULBANK	0,751299	0,944789	0,52915	0,330232

Despite the strict financial discipline imposed by the currency board in our country, the crisis reduces the ability of credit institutions to cover losses, which requires rapid implementation of new regulations and rules for assessing investment risk not only in the short but long term because the banking sector remains one of the important factors for economic convergence. During the period 2015-2019, mortgage lending and the real estate market in Bulgaria recovered rapidly. Despite the pandemic and economic recession in 2020, real estate transactions are stable in the largest cities in Bulgaria and in the third quarter of 2020 are growing compared to the third quarter of 2019. For Sofia, this growth is 1 .4%, in Plovdiv increased by 12.9%, in Varna by 7.1%, Burgas registered real estate transactions increased by 2%, Stara Zagora - growth by 8.7%. The total number of real estate transactions registered in the country for this quarter is 56,675, which is an increase of 2.8% compared to the same period in 2019, in contrast to the registered slight decline in mortgage loans. The pandemic made credit institutions and consumers more cautious, so in the third quarter of 2020. 10,191 legal and contractual mortgages are registered throughout the country, compared to 2019, when 11,083 mortgage loans were registered.

CONCLUSION

In the conclusion the main conclusions and the achieved results from the theoretical and empirical research of the investments in the mortgage bonds made in the dissertation are formulated and summarized.

IV. GUIDELINES FOR FUTURE RESEARCH ON THE TOPIC OF DISSERTATION WORK

The received important results and scientific-applied contributions from the conducted dissertation research give grounds to the author for conducting additional studies related to the adoption of the regulations for covered bonds in Bulgaria in 2022 and the opportunities for achieving positive results and challenges. in stimulating the financial markets, stabilizing the real estate market and mortgage lending in the period 2025-2030. This will enrich the theoretical and empirical research in our country in the field of investment in mortgage / covered bonds.

V. REFERENCE ON THE MAIN CONTRIBUTING POINTS IN THE DIVERSION WORK

Based on the performed analyzes and evaluations, we can summarize several important results and scientific-applied contributions, which are reached in the dissertation research:

1. The wrong approach is shown in the US-approved structural securitization, which is seen as a universal scheme for liquidation of risk, management of financial turnover for faster profits at low risk and proves that structural securitization can not be a positive engine of the investment process related to mass investment in risk-free assets such as real estate, mortgage and covered bonds.

2. It is revealed that after the adoption of the European Directive (EU) 2019/2162 on covered bonds, setting an ambitious goal of stabilizing the banking sector and stimulating financial markets in the EU, the interest in issuing and investing in mortgage and covered bonds in The newly admitted countries in the EU, such as Bulgaria, which are characterized by poorly developed investment policy, will strengthen, and this guarantees new opportunities for alternative financing of credit institutions in the future rising interest rates and stable economic development.

3. Possible problems related to the policy of the European Central Bank and the national central banks to keep interest rates low, which has ensured the growth of mortgage lending in the EU in recent years, but with increasing financial risks due to the economic crisis related to COVID-19 and the existence of high real estate prices, creates preconditions for a new financial crisis of the scale of the period 2008-2009.

4. A recommendation is made to institutional investors that despite the fact that the new European legal framework creates the image of covered bonds as financial instruments with good yields and low risk, they should shape their investment policy taking into account a set of financial, macroeconomic and

investment factors, including on the basis of the possibility of a recurrence of the events of the global financial crisis of 2008-2009.

5. It appears that in the conditions of strong competition between credit institutions and aggressive mortgage lending lead to the development of the real estate market, but its possible collapse due to the supply of multiple real estates has a serious potential to reduce the value of mortgage and covered bonds. central banks to closely monitor and adjust the activities of credit institutions in a timely manner in order to ensure their financial stability, protect the interests of their depositors and the stability of mortgage and covered bond markets.

6. It is revealed that the sustainable development of the financial markets requires a balance between having a stable banking sector, active mortgage lending, stable real estate prices and optimal investment in mortgage or covered bonds, which can be achieved by implementing of counter-cyclical and anti-crisis regulations by EU regulatory institutions and national legislation of the Member States, focused on transparency and guarantees for investors.

V. LIST OF PUBLICATIONS ON THE TOPIC OF DISSERTATION

I. Studies:

Kirov, B. THE EFFECT OF EUROPEAN CREDIT REGULATIONS ON MORTGAGE LENDING AND MORTGAGE INVESTMENT INVESTMENTS // Annual Research Almanac. Book 15, AI Tsenov, Svishtov, 2019.

II. Articles:

Kirov, B. INVESTMENTS OF INSURANCE COMPANIES IN BULGARIAN MORTGAGE BONDS - CHALLENGES AND RISKS // Annual almanac of research of doctoral students. Book 14, AI Tsenov, Svishtov, 2018.

III. Scientific reports:

Kirov, B. MORTGAGE BONDS AND THE OPPORTUNITIES FOR DIRECT FINANCING OF COMMERCIAL BANKS FROM THE BULGARIAN CAPITAL MARKET // MIO, International Scientific Conference6-1 January 21-12 11-12 p.

Kirov, B., Milinov, V. EVOLUTION OF THE MORTGAGE MARKET AND THE HOUSING MARKET // MIO, International Scientific Conference 11-12 MAY 2018 (pp.62-69).

Kirov, B. INVESTMENT BANKS AND MORTGAGE BONDS // Jubilee scientific-practical conference, 75 years since the establishment of the Union of Scientists in Bulgaria, Svishtov, November 22, 2019, pp.196-205.

Kirov, B. CHANGES IN THE EUROPEAN REGULATORY CAPITAL REQUIREMENTS FOR COVERED BONDS IN CRISIS //

International Conference - dedicated to the 85th anniversary of SA "D. A. Tsenov ”- Svishtov, 8-9.11.2021, pp. 386-393.

DECLARATION OF RELIABILITY AND ORIGINALITY OF THE DISSERTATION

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