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CREDIT SUPPORT FOR THE AGRICULTURAL SECTOR IN BULGARIA: STRUCTURAL ANALYSIS AND ECONOMIC DIMENSIONS

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Abstract

This paper examines the dynamics and significance of lending in the agricultural sector of the Republic of Bulgaria and its connection with the sector's economic contribution. Using data from the Bulgarian National Bank and FAO for 2000-2023, the analysis focuses on the structure of loans by size and term and a comparative analysis of Bulgaria with EU-27 countries. The study includes the calculation of the Agricultural Orientation Index (AOI), which normalises credit support against the economic contribution of agriculture. The results show that Bulgarian agriculture faces more limited access to credit, which restricts its investment potential compared to other EU countries. The regression analysis reveals a positive correlation between lending and the gross value added of the agricultural sector, with lending explaining approximately 52% of the variation in the sector's economic contribution. The study emphasises the need to develop a more targeted credit policy that meets the specific needs of agricultural producers in Bulgaria and supports their competitiveness and sustainability.

Key words**:** *agricultural sector, agricultural credit, economic contribution, Agricultural Orientation Index, Bulgaria*

INTRODUCTION

The enhancement of agriculture is becoming more vital problem in modern times as there is a growing urgency to ensure food security and stable pricing of farm products. Achieving these targets requires the establishment of effective credit policies and better access to long-term loans, facilitating the agricultural firms in their investment in modern and sustainable technological solutions. This is essential for increasing the competitiveness and sustainability of the agricultural industry globally and locally, including in the Republic of Bulgaria.

Agricultural credit plays a fundamental role in mobilising resources at all levels, aimed at increasing productivity and production capacity in agriculture. This type of credit is provided with various forms of security - trust-based, pledged, or guaranteed- creating conditions for sustainable agribusiness financing [16]. In the short run borrowing from the banks to secure working capital is a fundamental source of funding for the ongoing production process. At the same time, long-term loans play a critical role in investments in long-term assets and support of projects related to agriculture, livestock farming and processing of agricultural products. The shortage of long-term financing is a critical factor that can limit the efficiency of farms and slow the development of agriculture as a whole [7].

Agricultural loans are also considered a primary factor for stimulating growth in the agricultural sector, which can improve economic welfare and social stability in rural areas [1, 22]. Financial capital is vital for production and economic growth, as providing credits for agriculture strengthens the sector's development and helps develop rural areas. Capital is not simply another resource similar to labour and land but is a key instrument for transforming the agricultural sector's potential into actual production and added value [25]. However, compared to other economic sectors, productivity in agriculture is typically lower, which leads to higher financing requirements and specific conditions for agricultural loans, especially in developed countries [3]. Encouraging investment and increasing the agricultural's sector influence on the economy and employment requires the implementation of sound macroeconomic policies and the

provision of institutional financial support. Numerous investigations have been dedicated to exploring the difficulties of securing loans in the agricultural field. [9, 17, 4, 8]. Research shows that access to credit is a crucial stimulus for improving productivity in the agricultural industry in Central and Eastern Europe. However, the relationship between credit constraints and farm behaviour, including the choice of agricultural resources and productivity, often remains less studied. This lack of research may be due to insufficient data and the complexity of credit markets for the agricultural sector, which require adaptation to the specific needs of farms.

Access to credit is closely linked to the production capacity of agricultural producers [22]. Farmers lacking adequate financial means for investment frequently face challenges in boosting their output and adopting innovative technologies. This limitation affect resource distribution in the sector and results in decreased productivity overall. Conversely, those with access to credit can improve their production capacity and expand their market positions, leading to increased cash flows and improved future access to credit. Investments in new technologies and better production practices, supported by credit, play a fundamental role in the sustainable development of the agricultural sector.

The functioning of financial markets in agriculture is accompanied by a high degree of uncertainty due to information asymmetry and limitations in access to capital [13]. Smaller farms often have no obligations for public disclosure of their financial condition, which makes it difficult for banks to assess their creditworthiness. The borrower's credit history is of decisive importance, but there are also moral risks arising from the sole proprietorship nature of farms. All this contributes to increasing the risk in agricultural lending compared to other sectors, which requires commercial banks to take specific measures for risk assessment.

In Bulgaria, the agricultural sector is particularly vulnerable to financial constraints due to the risky nature of production, underdeveloped secondary financial markets and frequent seasonal fluctuations in resource demand [7, 18, 24]. Agricultural financial markets in the country are poorly developed and are characterised by insufficient capitalisation, which limits access to credit for agricultural producers. The lack of securitisation, increased transaction costs, and low profitability of the sector lead to greater caution from banks when serving farmers. The low profitability in the agricultural sector, combined with high risks, creates specific challenges for creditors, which necessitates the development of innovative financial products and policies to support agribusiness.

Credits and subsidies are essential for Bulgarian agricultural producers' ability to invest in innovations and long-term assets. Common Agricultural Policy (CAP) subsidies guarantee credits, reducing risk for banks and stimulating farmer lending [20, 26, 2, 23, 12, 14, 15, 5]. Production-decoupled subsidies have an effect similar to long-term credits, while production-coupled subsidies are aimed more at short-term borrowing [8]. This shows that subsidies can play a decisive role in improving the investment potential of Bulgarian farms and strengthening financial stability in the sector.

The agricultural financial market in Bulgaria continues to develop but faces numerous challenges. Insufficient capitalisation, high transaction costs, and a lack of reliable financial infrastructure limit the possibility of attracting capital to the agricultural sector.

The existing literature emphasises the importance of lending for agricultural sector development but also indicates limited access to credit, especially for small farms, which challenges their growth and competitiveness [10]. The present study complements the existing literature by focusing on the specific case of Bulgaria and providing a comparative analysis with EU-27 countries. Using the Agricultural Orientation Index (AOI), the significance of credits in the agricultural sector is analysed, with the index normalising the share of credits relative to agriculture's economic contribution to GDP. This makes it possible to establish to what extent credit support is adequate relative to the sector's

needs and contribution in Bulgaria compared to other European countries.

The article aims to examine the dynamics and structure of lending in the agricultural sector of the Republic of Bulgaria for the period 2009-2023, looking at trends in the number and size of loans granted and their distribution by term and type. The analysis focuses on different categories of loans by size and term, which allows for identifying changes in agricultural producers' preferences and the impact of investment activity on lending structure.

Additionally, the article examines the relationship between lending and agriculture's economic contribution through regression analysis, which assesses the impact of credits on the sector's gross value added. Through the presented results, the study aims to provide an empirical basis for formulating a more effective credit policy that is better modified to meet the requirements of Bulgaria's farm industry and aids in the sustainability and competitiveness on both national and European scales.

MATERIALS AND METHODS

The current study focuses on credit dynamics in the agricultural sector in Bulgaria and EU-27 countries, with the primary aim of establishing the relationship between credit activity and the sector's economic contribution. The analysis uses data from FAO [11] and the Bulgarian National Bank (BNB) [6], covering the period 2000–2022 for international context and 2009–2023 for Bulgaria. Also used are dates from National Statistical Institute [21], and Agricultural Report from Ministry of Agriculture [19]. The duration of these periods allows detailed tracking of long-term trends in agricultural sector lending and assessment of farm financial resource access.

The analysis includes a macroeconomic perspective examining agricultural credit share against total credit activity in Bulgaria and EU-27 and specific factors influencing agricultural credit structure in Bulgaria. This approach enables investigation of how credit policy differences affect the agricultural industry in Bulgaria in relation to other EU nations.

By comparing Bulgaria and the EU-27, a better understanding of Bulgaria's international position and the agricultural sector's significance for the national economy is achieved.

The Agricultural Orientation Index (AOI) assesses banking finance's significance in agriculture, normalising agricultural credit share against the sector's GDP contribution. The index reflects relative banking sector support, with values below 1 indicating financing shortages relative to the sector's economic contribution, while values above 1 indicate more significant support. The AOI analysis seeks to determine how much credit policies in Bulgaria align with the agricultural sector's economic potential compared to the EU-27.

The second stage of analysis examines credit structure in Bulgaria's agricultural sector by size and term. Issued credit data are categorised by size (e.g., up to 12,500 EUR, 12,500–25,000 EUR, etc.), allowing tracking of farm preferences for different credit sizes. The analysis shows increasing interest in more extensive credits, potentially linked to expanding farm scales and enhanced investment activity.

Credits are also examined regarding terms and types, primarily focusing on overdrafts, which are crucial in supporting smaller farms' current needs. Area subsidies serving as guarantees for these credit types provide additional sector financial stability. Data on credits with different terms (up to 1 year, 1–5 years, and over 5 years) provide insight into farms' long-term and short-term needs and the transformation of short-term credits into long-term, reflecting sustainable financing requirements.

The final research stage applies regression analysis to establish the relationship between lending and agricultural gross added value (GAV) in Bulgaria. The regression model's independent variable represents agriculture, forestry, and fishing credit values (in millions of euros), with the dependent variable being agricultural GAV (in millions of euros). Results demonstrate a positive relationship

between lending and the sector's economic contribution, with the regression model confirming credit support's significance for Bulgaria's agricultural sector development.

RESULTS AND DISCUSSIONS

Dynamics of Agricultural Credits Relative to Sector Economic Contribution in Bulgaria and EU-27

The data in Figure 1 demonstrate the increasing share of agricultural credits against total commercial credit values for Bulgaria and EU-27 countries. When these values are compared with the gross added value (GAV) generated by the sector, differences in dynamics emerge between Bulgaria and other European states.

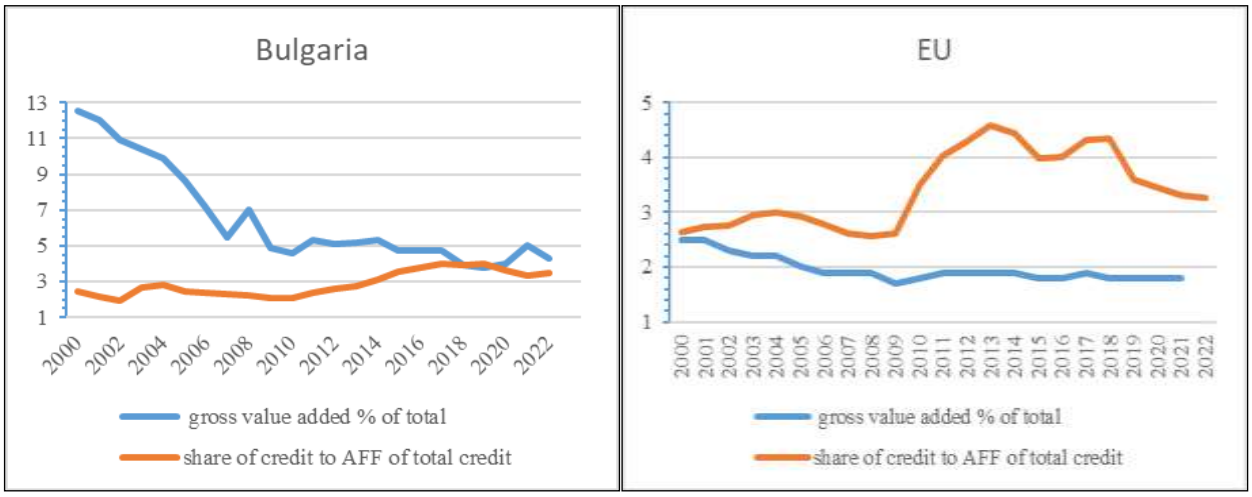

Fig. 1. Share of Agricultural Loans and Gross Added Value in Bulgaria and the EU-27 for the period 2000–2022 (%)
Source: FAO data.

In EU-27 countries, the gross added value from agriculture remains below the credit value for this sector, indicating greater readiness to provide credits compared to agricultural activity's economic contribution. In Bulgaria, however, the industry demonstrates a higher GAV contribution than credit volume, except for 2017-2018, when both values almost equalise.

This difference suggests that Bulgarian agricultural producers face more difficulties accessing credits, with credit policies not always matching the sector's specific needs and characteristics.

The average credit share for agriculture in Bulgaria during the analysed period is 2.88%, lower than the EU-27 average of 3.42%. These results highlight the need for better-adapted financing mechanisms that address Bulgaria's sector requirements.

FAO measures banking finance significance for agriculture through the Agricultural Orientation Index (AOI), which normalises agricultural credit share against their total value, comparing it with the sector's GDP contribution.

An index value below 1 indicates agriculture receives fewer credits relative to its economic contribution, while a value above 1 means greater financing than its GDP contribution.

The data in Figure 2 shows that the EU-27 index maintains stable values that have not fallen below 1.5 over the years despite some fluctuations.

This reflects consistent banking sector support for agricultural financing. In Bulgaria, AOI crosses 1 value only during 2018-2020, highlighting a lower focus on agricultural financing than EU-27.

This difference again suggests the need to develop a credit policy that provides greater sector support in Bulgaria and aligns it with its economic contribution.

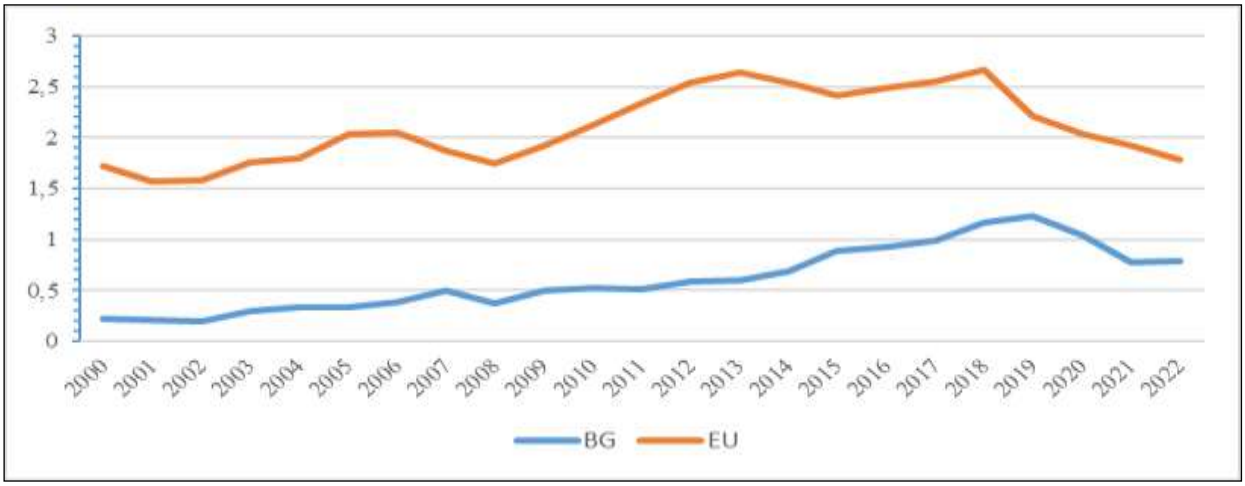

Fig. 2. Agricultural Orientation Index in Bulgaria and the EU-27 for the period 2000–2022
Source: FAO data.

Development of Lending in the Agricultural Industry in Bulgaria

The period from 2009 to 2023 has shown a consistent increase in both the quantity and amount of loans granted to Bulgaria's agricultural industry. Data from the Bulgarian National Bank indicates that the proportion of loans allocated to this sector has risen. In 2023, the agricultural sector comprises 9.49% of total non-financial enterprise credits, rising from 5.26% in 2009.

Additionally, agricultural credits' share of total non-financial enterprise lending increases from 3.38% in 2009 to 6.49% in 2023.

This indicates the growing agricultural sector's significance in economic lending, which occupies an increasingly more significant loan proportion.

Data in Table 1 illustrate steady growth in agricultural sector credit numbers and total financing volume in thousands of EUR.

Table 1. Loans to non-financial enterprises and the agricultural sector (2009–2023)

Year	Total Loans		Non-Financial Enterprises		Agricultural Sector	
	Number	Thousand EUR	Number	Thousand EUR	Number	Thousand EUR
2009	3,004,628	25,605,398	126,479	15,818,219	6,650	534,516
2010	2,763,350	25,918,263	125,227	16,210,338	6,632	541,344
2011	2,655,401	26,757,972	125,939	17,093,451	7,150	629,512
2012	2,734,408	27,511,831	131,485	17,941,822	8,003	713,863
2013	2,786,268	27,518,923	131,944	17,964,487	8,690	750,329
2014	2,822,090	25,302,048	134,289	15,902,708	9,122	793,810
2015	2,750,103	24,928,767	133,773	15,652,984	9,783	893,627
2016	2,741,743	25,143,523	139,231	15,680,077	10,180	941,665
2017	2,746,507	25,988,233	148,555	15,952,165	11,230	1,039,518
2018	3,065,552	27,987,785	147,495	16,826,647	11,427	1,103,743
2019	3,171,576	30,077,541	148,676	17,853,626	12,392	1,171,888
2020	2,913,561	33,680,168	139,926	18,412,172	12,979	1,223,451
2021	2,931,529	36,584,225	141,025	19,242,902	12,757	1,230,412
2022	2,982,449	41,248,650	150,295	21,245,323	13,714	1,438,941
2023	2,966,477	46,357,543	149,651	22,853,752	14,204	1,484,413

Source: Bulgarian National Bank (BNB Statistics).

In 2009, the agricultural sector had a credit number 6,650, with a total value of 534.3 million euros.

By 2023, credit numbers reach 14,204, with total issued funds increasing to over 1.48 billion euros. The more than twofold credit increase demonstrates heightened financial institution interest in sector financing and growing farm capital needs for operational expenses and investments.

Over the years, average agricultural sector credit values also increase, potentially linked to producers' needs for more significant investment and production modernisation funds.

In 2009, average agricultural sector credit value is approximately 80,000 euros, rising slightly above 104,000 euros by 2023.

This loan value growth indicates sector requirements and increased bank confidence in agricultural producers expanding their holdings and investing in new technologies and equipment.

Credit value and number increases form part of a broader financing trend in the agricultural sector, playing a crucial role in its sustainable development.

Lending growth contributes to sector modernisation and overcoming financial barriers for agricultural holdings.

Credit Structure by Size

The analysis of issued agricultural sector credits reveals significant dynamics during the period (Figure 3).

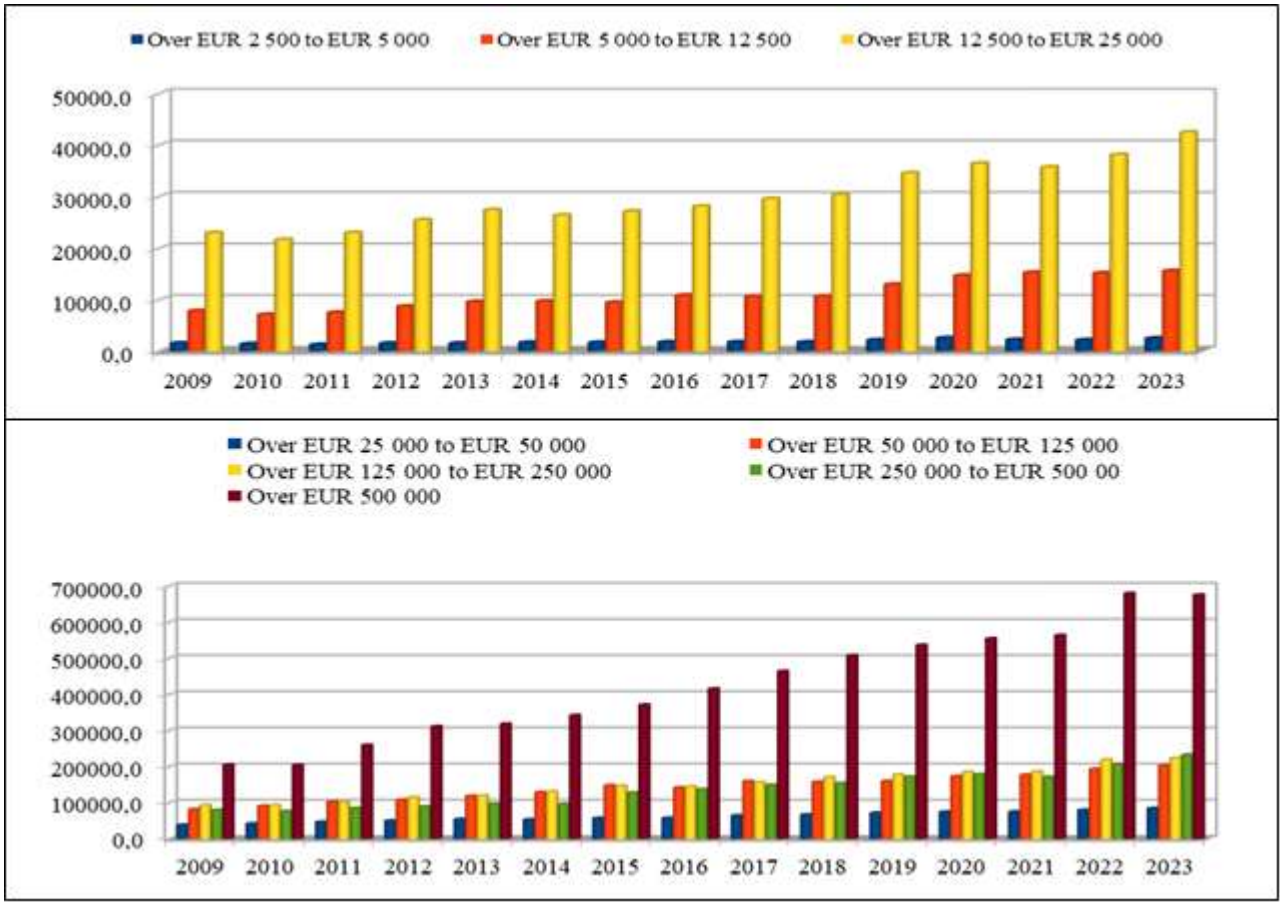

Fig. 3. Distribution of agricultural sector loans by size for the period 2009–2023
Source: Own calculations based on data from the BNB.

Despite overall credit number increases, their size structure remains relatively stable. With credit numbers growing, the most significant increase occurs in credits ranging between 50,000 and 125,000 euros, followed by credits between 25,000 and 50,000 euros, and between 12,500 and 25,000 euros.This suggests agricultural holdings have leveraged more significant investment opportunities corresponding to their growing needs and operational scale.

In 2023, a slight decline occurs in credits up to 12,500 euros, representing 35.24% of total credits, compared to 38.86% in 2009.

Meanwhile, credits from 12,500 to 25,000 euros reduce their share from 17.72% to 15.39%. A similar decline appears in credits between 25,000 and 50,000 euros, standing at 15.85% in 2023 versus 15.35% in 2009.

Conversely, credits between 50,000 and 125,000 euros increase from 14.54% in 2009 to 17.26% in 2023, indicating heightened financial resource demand in this range. The same trend emerges for credits between 125,000 and 250,000 euros, whose share increases from 7.62% to 8.58%, and for those between 250,000 and 500,000 euros, rising from 3.22% to 4.51%.Credits exceeding 500,000 euros also demonstrate growth, with their share increasing from 2.63% in 2009 to 3.16% in 2023. This indicates enhanced investment activity and agricultural holding expansion, which are increasingly oriented towards more significant, long-term investments. The trend towards more extensive credits potentially stems from increased sector investment needs, including purchasing modern machinery, expanding production areas, and implementing new technologies, necessitating higher-value financial resources for these endeavours.

Structure of Credits by Term and Type

The analysis of credit data by term and type reveals an exciting transformation in the agricultural sector's credit structure (Figure 4 and Figure 5). The increase in overdrafts by more than three times - from 2,415 in 2009 to 7,833 in 2023 - shows a clear preference of agricultural producers for this type of lending. Overdraft is a key instrument for securing the necessary funds for operational expenses, particularly for smaller farms that often experience liquidity shortages. This lending plays a vital role in maintaining the financial stability of these enterprises until they realise revenue from crop sales. Moreover, using area-based subsidies as a guarantee contributes to greater security and stability in the sector, providing banks with better protection against default risk.

At the same time, there is a significant decrease in the number of short-term loans with terms up to 1 year (different from overdrafts), suggesting that more farms prefer the flexibility of overdrafts to traditional short-term loans. This transformation reflects farmers' desire for greater financial flexibility, which is necessary to cope with revenue fluctuations characteristic of the agricultural industry. At the same time this method enables farms to address their monetary requirements more efficiently, reducing the stress of repaying set payments in the near future. The rising significance of overdrafts as a popular funding option highlights the needs within the agricultural field. This lending approach reflects how credit institution are adjusting to the unique demands of the sector, where revenues are highly seasonal, while expenses for crops, machinery, and materials are constant.

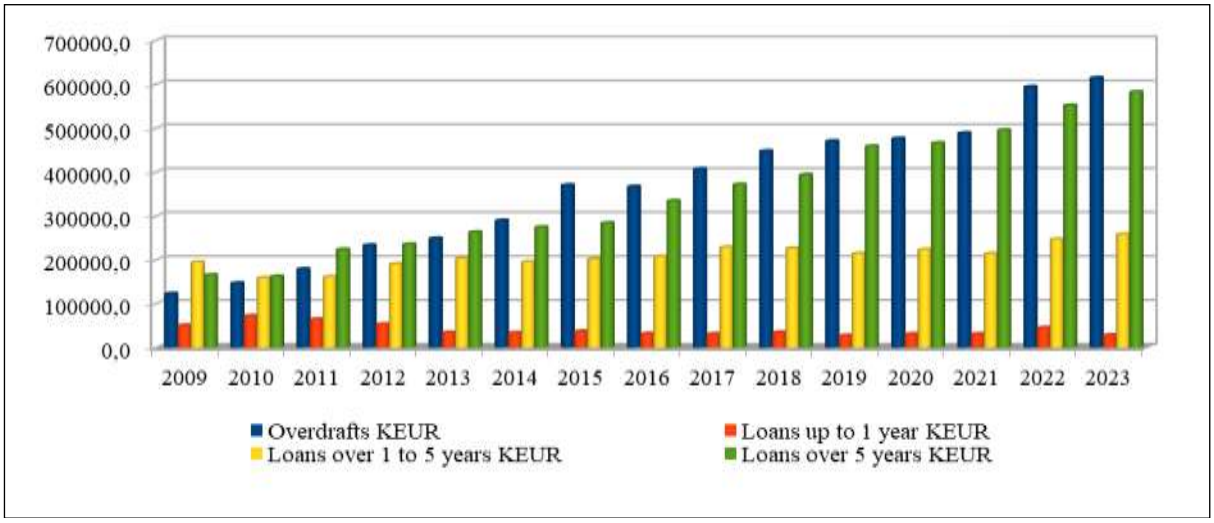

Fig. 4. Distribution of agricultural sector loans by type, size, and loan term for the period 2009-2023
Source: Own calculations based on data from the BNB.

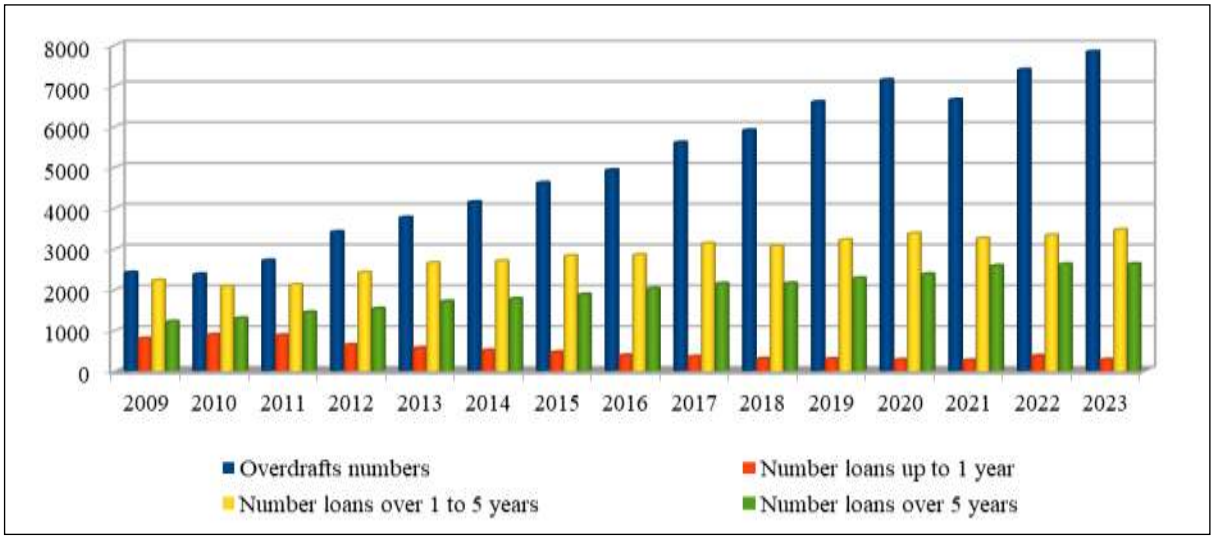

Fig. 5. Distribution of agricultural sector loans by type, number, and loan term for the period 2009-2023
Source: Own calculations based on data from the BNB.

Analysis of the Relationship Between Agricultural Lending and Gross Value Added in Bulgaria

The present study examines the relationship between agricultural lending and its contribution to Bulgaria's national economy. This relationship is explored through regression analysis, where the indicator for credits provided to agriculture, forestry and fishing (in millions of euros) is used as an independent variable, and the gross value added (GVA) of agriculture at current prices (in millions of euros) as a dependent variable. The study period covers 23 years (2000-2022), with data collected from FAO and Eurostat.

The analysis results show a correlation coefficient (Multiple R) of 0.7187, indicating a strong positive relationship between the variables examined. The R square value of 0.5165 indicates that around 52% of the fluctuation in Bulgaria's GVA are attributable to sector lending, while the remaining 48% is due to the influence of other factors. This result emphasises the significance of lending for the economic contribution of agriculture.

The analysis of variance (ANOVA) confirms the adequacy of the regression model, with the value of Significance F being less than 0.05 (F = 22.435, Significance F = 0.0001), which means the model is statistically significant. The parameter estimates are also critical, confirmed by the t-statistics and p-value values (Intercept: t Stat = 11.947, p-value < 0.0001; X Variable 1: t Stat = 4.737, p-value < 0.0001).

The regression equation describing the relationship between agricultural credits and GVA takes the following form: y=0.7466x+2853.61

This result shows that with an increase in agricultural credits by 500 thousand euros, the sector's gross value added increases by an average of 0.382 million euros. This positive relationship between lending and the economic contribution of agriculture emphasises the need to form a more stable credit policy for the sector. The current state of lending in the agricultural industry is not optimal, and there is a need for additional measures to support its sustainable development and increase its contribution to the national economy.

CONCLUSIONS

The study of lending dynamics and significance in Bulgaria's agricultural sector reveals several key aspects that influence the sector's economic contribution. In Bulgaria, agricultural lending, although increasing as a share of total credit activity, continues to lag behind the greater support the industry receives in the EU-27. Credit share indicators and the Agricultural Orientation Index (AOI) show that Bulgarian agriculture has more

limited access to credit resources than its contribution to the economy, limiting its potential for development and modernisation.

The analysis of credit structure in Bulgaria's agricultural sector for the period 2009-2023 shows increasing demand for larger loans, which reflects the growing scale and investment needs of farms. The increased importance of overdrafts, especially among smaller farms, emphasises the importance of short-term financing for securing operational funds. At the same time, the demand for long-term loans shows growing investment activity, supported by national and European subsidies.

The regression analysis confirms a positive relationship between agricultural industry borrowing and its economic contribution. Approximately 52% of the variation in the sector's gross value added can be attributed to its lending, which emphasises the significance of financial support for stimulating production and sustainable development.

The results indicate the need to build a more adapted credit policy that meets the specific needs of agricultural producers in Bulgaria. Better-tailored financing mechanisms and stimulating credit policy would help increase the sector's competitiveness and sustainability. In conclusion, improved lending would contribute to a more significant economic contribution of agriculture and its stable development in the context of the national economy.

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