Financial Performance of Bulgaria's Agricultural Sector – National and Regional Dimensions

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Abstract

With the accession of Bulgaria to the European Union, restructuring and transformation processes have started in agriculture, which have affected the financial performance of agricultural holdings. This paper analyses the financial performance of Bulgarian agricultural enterprises in the period 2007-2020, based on data from the Farm Accountancy Data Network (FADN). A regional analysis is performed to identify territorial disparities in the development of agricultural holdings. Liquidity, asset turnover, indebtedness and profitability indicators are used for the assessment. The assessment of financial performance is based on balance sheet dependency models. The financial performance of the Bulgarian agribusiness sector is stable, but the dynamics of external processes and crises can have a significant impact in the long term.

Keywords: financial situation; financial sustainability; farms; liquidity; asset turnover; indebtedness; profitability.

JEL Code: Q12; Q14.

Introduction

For fifteen years now, Bulgarian agriculture has been functioning in the conditions of a single European market and the Common Agricultural Policy of the European Union. During this period, a number of transformations have taken place in Bulgarian agriculture, linked to a reduction in the number of farms from 493,1 thousand in 2007 to 132,4 thousand in 2020 and an increase in the average size of the agricultural area used from 6 ha in 2007 to 33 ha in 2020 (MZHG, 2021). The level of specialisation and concentration of production has increased, with a higher share of specialised farms (Ivanov, et al., 2021). The farms with the highest economic potential were those producing cereals and oilseeds, and those using the most land in the country. Livestock has lost a significant part of its production position. These changes have also had an impact on regional processes, the most dynamic being in the North-West, followed by the North-Central, where farms have specialised in intensive crop production. In the South-Central and South-Western regions, the degree of concentration is lower, with a considerably greater diversity in the products produced - livestock, horticulture, fruit growing, vineyards, etc. (Doichinova, 2021). Despite the ongoing restructuring processes, the irrational structure of Bulgarian agriculture has remained, dominated by small and marginal farms and a small number of large farms. Agricultural policy and changes in resource use approaches have led to a number of changes in farming and rural development patterns and systems (Doychinova, et al., 2022). The transition to sustainable agriculture in the EU has also affected Bulgarian farms and set new conditions for the development of rural areas (Nikolova, Linkova, Pavlov, & Krasteva, 2022).

Of interest for this study is to assess how structural changes in agriculture with the country and by region have affected the financial performance of farms in Bulgaria. The Bulgarian literature on the financial performance of farms in Bulgaria is relatively poorly researched. More in-depth is the study by Koteva (Koteva, 2015), which examines the level and trends of change of key indicators characterising the economic and financial situation of agricultural holdings. An in-depth study of the economic context in which agricultural holdings function in Bulgaria is a study by Ivanov et al. (Ivanov, et al., 2021), aimed at assessing the state of agriculture ahead of the new programming period 2021-2027. Individual indicators providing insight into the financial situation of agricultural holdings in Bulgaria are studied by Lyubenova (Lyubenova, 2012). Insufficient research on the issue makes it challenging to assess the financial performance of agricultural holdings in Bulgaria in comparative

terms with the EU and to track the dynamics of changes in the indicators of financial performance of agricultural holdings in territorial terms. The regional dimensions are a prerequisite to study the transformation processes in the agricultural territories in Bulgaria and their impact on the financial performance of the agricultural business. This is the aim of the paper, to analyze the main financial indicators revealing the state of the enterprises of the agricultural sector, in order to reveal potential weaknesses in the financial economic development and establish the financial sustainability of the sector. At the same time to analyze the regional dimensions of changes with the structure of agricultural production and their impact on the financial performance of the sector.

1. Thesis statement

The financial performance of companies is directly related to their financial position. Financial position is defined as the ratio of available to required financial resources at a given point in time or over a given period of time. Considered in this way, financial position is referred to as the equivalent of the solvency of the enterprise. Through financial practice, financial situation appears in the form of a firm's ability to create cash and cash equivalents to be presented as a guarantee for the repayment of financial obligations.

Financial situation can be seen as a quantified degree of the enterprise's financial resources at a certain time or for a certain period of time, ensuring its stability and prosperity. The financial position is that economic situation of the company at a given time which reveals the possibilities for the realisation and development of the activity, through the set of cash equivalents flowing in and out of it. Its timely identification and analysis are essential in order to prevent errors and problems in making key management decisions for the operation and development of the enterprise.

The analysis of the financial situation should also provide an assessment of the changes that have occurred in it under the influence of internal and external factors. Based on the results of the analysis, optimal decisions can be made about the future state of the organisation. For the purposes of the analysis, financial data for the agricultural enterprises in Bulgaria and the EU from the Farm Accounting Data Network (FADN) are used.

The models of balance sheet dependencies and the financial positions of companies characterized on their basis are distinguished by three main criteria, treated as absolute and relative accounting indicators:

✓ *Availability of free equity sources* in relation to its ability to acquire new assets. It is established as the difference:

$$Equity - Fixed\ Assets \tag{1}$$

or

$$Current\ Assets - Liabilities \tag{2}$$

✓ *Availability of net working capital* in relation to the normal operation of the business of the enterprise. It is established as the difference:

$$Current\ Assets - Current\ Liabilities \tag{3}$$

✓ *Ratio of equity to capital resources employed* (sum of long-term and short-term liabilities). It is established as the ratio:

$$\frac{Total\ Liabilities}{Total\ Equity} \tag{4}$$

On the basis of these criteria and dependencies, a general assessment of the financial situation, also relevant to its financial sustainability, can be given in four main varieties:

1) Very good financial performance (absolute of financial sustainability).

Balance sheet dependencies			Indicators
Fixed Assets	*<*	*Equity*	There are available resources to acquire new assets
Current Assets	*>*	*Current Liabilities*	Having working capital
Equity	*>*	*Liabilities*	Covers indebtedness from own sources

2) Good financial performance (normal financial sustainability).

Balance sheet dependencies			Indicators
Fixed Assets	*=*	*Equity*	No resources available for new assets
Current Assets	*>*	*Current Liabilities*	Having working capital
Equity	*>*	*Liabilities*	Covers indebtedness from own sources

3) Stressed, pre-crisis financial performance (unsustainable financial position).

Balance sheet dependencies			Indicators
Fixed Assets	*>*	*Equity*	Shortage of available resources for new assets
Current Assets	*>*	*Current Liabilities*	Working capital available but from leveraged resources
Equity	*=*	*Liabilities*	Balanced indebtedness

4) Poor, crisis financial performance (lack of sustainability). Enterprises are on the verge of bankruptcy.

Balance sheet dependencies			Indicators
Fixed Assets	*>*	*Equity*	Shortage of available resources for the acquisition of new assets
Current Assets	*=*	*Current Liabilities*	Lack of working capital
Equity	*<*	*Liabilities*	Does not cover its indebtedness with own resources, payments are overdue

The sustainability of the financial situation can be restored mainly at the expense of accelerating the turnover of capital and current assets, with a reasonable and justified reduction of inventories, by replenishing own working capital at the expense of external sources.

2. Methodology and experimental methods
Starting from the importance of the financial situation for the existence of enterprises in the agricultural sector, it is necessary to continuously monitor and analyse it in order to regulate it within normal limits. To this end, a system of indicators is used to analyse financial performance, and for the purposes of this study four groups of indicators are included for analysis:
✓ Liquidity;
✓ Asset Turnover;
✓ Indebtedness;
✓ Profitability.

Liquidity research. The liquidity test is the ability of the firm to meet its short-term obligations as they fall due. Two concepts are known in relation to liquidity: a concept looking at the structure of assets at a given point in time (stock concept); a concept looking at the location of cash inflows and outflows over time (flow concept). In practice, the first concept is usually adopted because it is quick and easy to apply and relies on a certain stability in the asset structure. Liquidity has a direct bearing

on the solvency of firms and is a summary assessment of financial performance. For the purposes of the assessment, three indicators are applied:

1) *Net Working Capital.* Net working capital is an indicator for assessing the short-term position of the firm. Positive net working capital means that firms can finance their current liabilities. High working capital is not always a good indicator. It may indicate that firms have too much inventory, are not investing their excess cash, and are not capitalizing on low-cost debt opportunities. The measurement of net working capital is made using the formula:

$$Net\ Working\ Capital = Current\ Assets - Current\ Liabilities \tag{5}$$

2) *Current Liquidity Ratio*. Measures the ability of firms to repay short-term liabilities payable within one year. It shows how firms can increase their current assets to meet current debts or other obligations. For the needs of the agricultural sector, it is desirable to have a current ratio in the range 1,00-1,50. A ratio below 1,00 is a signal of concern for the stability of firms. A high ratio above 3,00 indicates that firms are not using their current assets efficiently and are not managing their working capital properly. The measurement of the current liquidity ratio was carried out using the formula:

$$Current\ Liquidity\ Ratio = \frac{Current\ assets}{Current\ Liabilities} \tag{6}$$

3) *Quick Liquidity Ratio*. It measures the firm's ability to meet its short-term obligations with its most liquid assets. Indicates the firm's ability to immediately use its assets to cover its current liabilities and borrowings. The higher the quick liquidity ratio, the better the firm's liquidity. The measurement of the quick liquidity ratio is carried out using the formula:

$$Quick\ Liquidity\ Ratio = \frac{"Quick\ Assets"}{Current\ Liabilities} = \frac{Current\ Assets - Inventories}{Current\ Liabilities} \tag{3}$$

Asset Turnover research. Asset turnover measures the value of a firm's sales or earnings (output) relative to the value of its assets. Asset turnover can be used as an indicator of the efficiency with which firms use their assets to generate revenue. The higher the asset turnover ratio, the more efficiently firms generate revenue from their assets, Conversely, if the asset turnover ratio is low, it indicates that the firm is not effectively using its assets to generate sales. For the purposes of the assessment, three indicators are included:

1) *Assets Turnover Ratio*. Measures the ability of assets to create revenue (output). The asset turnover ratio is measured using the formula:

$$Assets\ Turnover\ Ratio = \frac{Total\ Output}{Total\ Assets} \tag{7}$$

2) *Fixed Assets Turnover Ratio*. Measures the ability of fixed assets to generate income (output). The measurement of the turnover ratio of fixed assets is made according to the formula:

$$Fixed\ Assets\ Turnover\ Ratio = \frac{Total\ Output}{Total\ Fixed\ Assets} \tag{8}$$

3) *Current Assets Turnover Ratio*. Measures the ability of current assets to create income (output). The measurement of the turnover ratio of current assets is carried out using the formula:

$$Current\ Asset\ Turnover\ Ratio = \frac{Total\ Output}{Total\ Current\ Assets} \tag{9}$$

Indebtedness (Leverage) and Financial Autonomy research. The indebtedness position of firms is expressed by the amount of borrowed funds directed towards profit generation. The study of indebtedness makes it possible to establish the place of creditors in financing firms. High levels of indebtedness can lead to difficulties in repaying debts to creditors, especially long-term debts.

However, if firms' operations can generate higher returns than the interest rate on loans, debt can help stimulate growth (leverage). There are various ratios that can be categorised as leverage ratios, but the main factors considered are debt, equity, assets and interest expense. In assessing leverage, it is desirable to have it within the range of 0,30-0,50 of long-term capital raised from equity and creditors. For the purposes of assessing leverage, two indicators are used:

1) *Debt to Equity Ratio*. Measures how much of the debt is covered by equity. The leverage ratio is measured using the formula:

$$Debt\ to\ Equity\ Ratio = \frac{Total\ Liabilities}{Total\ Equity} \tag{10}$$

2) *Financial Autonomy*. It expresses how much of the liabilities are covered by equity. It is desirable that the indicator is above 1,00, but the higher the indicator, the more independent firms are from creditors. The measurement of the financial autonomy ratio is carried out using the formula:

$$Finansial\ Autonomy\ Ratio = \frac{Total\ Equity}{Total\ Liabilities} \tag{11}$$

Profitability research. Profitability ratios are a class of financial metrics that are used to assess the ability of firms to generate profits (net income) relative to revenues, operating expenses, balance sheet assets, or equity over time using data from a specific point in time. Profitability ratios indicate how efficiently firms generate profit (net income) and value for their owners. Higher ratio results are often more favourable, but these ratios provide much more information when compared to the results of similar firms, to the company's own historical results, to industry averages, or to performance in other countries. For the purposes of the assessment, four types of profitability were measured:

1) *Net Profitability on Capital*. Expresses the net income generated per unit of equity. The measurement of net return on equity is carried out using the formula:

$$Net\ Profitability\ on\ Capital = \frac{Net\ Income}{Total\ Equity} \tag{12}$$

2) *Net Profitability on Assets*. Expresses the net income generated per unit of assets. The measurement of the net return on assets is made according to the formula:

$$Net\ Profitability\ on\ Assets = \frac{Net\ Income}{Total\ Assets} \tag{13}$$

3) *Net Profitability on Output*. Expresses the net income generated per unit of gross output. The measurement of net profitability of production is carried out according to the formula:

$$Net\ Profitability\ on\ Output = \frac{Net\ Income}{Total\ Outputs} \tag{14}$$

4) *Net Profitability on Inputs*. Expresses the net income generated per unit of inputs. The measurement of the net cost-effectiveness is made according to the formula:

$$Net\ Profitability\ on\ Inputs = \frac{Net\ Income}{Total\ Inputs} \tag{15}$$

The source of information for the analysis is Farm Accountancy Data Network (FADN) data for the period 2007-2020. According to FADN, the evaluation on the indicators follows the trend of decreasing the number of monitored farms - from 146,7 thousand in 2007 to 60,9 thousand in 2020, as their average size grows. In the different statistical regions of the country, the monitored farms are as follows: North-West (from 38,6 thousand in 2007 to 8,6 thousand in 2020); North-Central (from 15,6 thousand in 2007 to 8,3 thousand in 2020); North-East (from 22,3 thousand in 2007 to 8,9 thousand in 2020); South-East (from 30,4 thousand in 2007 to 10,3 thousand in 2020); South-Central

(15,2 thousand in 2007 to 2020); South-West (from 24,4 thousand in 2007 to 9,3 thousand in 2020), with between 200 and 500 farms observed in the survey sample.

3. Results and discussion

Of interest for the purposes of the study are changes in gross output. Since 2007, the Bulgarian agricultural sector has experienced a significant upturn in gross output production, but the process has been accompanied by a significant increase in the costs of production. In the post-2007 period, gross output (gross income) on farms increases annually from €18 159 in 2007 to €72 487 on average per farm in 2020, with the level of gross output in 2020 being 2,99 times that of 2007. Gross expenditure increases at a faster rate, from €15 274/farm in 2007 to €75 981/farm in 2020, an increase of 3,97 times. The excess in the growth rate of expenditures over that of revenues can be explained by the increased investment activity in connection with the restructuring of production after the country's accession to the EU. For the same period, the EU farm data show a much more even development, with more gradual growth rates. Gross production increases from 57 067 €/farm in 2007 to 92 603 €/farm in 2020, with an increase in 2020 compared to 2007 of only 0,62 times. Gross expenditure rises from €48 103/farm in 2007 to €82 711/farm in 2020, or 0,72 times. The changes show the rapid pace at which Bulgarian farms are catching up with EU average farm productivity. Unfortunately, there are significant differences in the ratio of gross output (gross income)/gross expenditure (to create it) across farms (Figure 1). For the whole period analysed, EU farms have an excess of gross output over costs, i.e. there is an ability of the agricultural sector to generate positive profitability. Bulgarian agricultural holdings realise an excess of gross output over the gross costs of creating it only in the period up to 2012 (excluding 2009), and from 2013 to 2020 the index is below unity - at a level of around 0,95. This shows the inability of Bulgarian farms over the last decade to cover their costs and their heavy dependence on public support. A number of studies have demonstrated the dependence of the net income of Bulgarian farms on subsidies. (Ivanov, et al., 2021), (Kirechev, 2021) (Kirechev, 2021). This poses a serious challenge for the Bulgarian agricultural sector to increase its outputs and inputs efficiency.
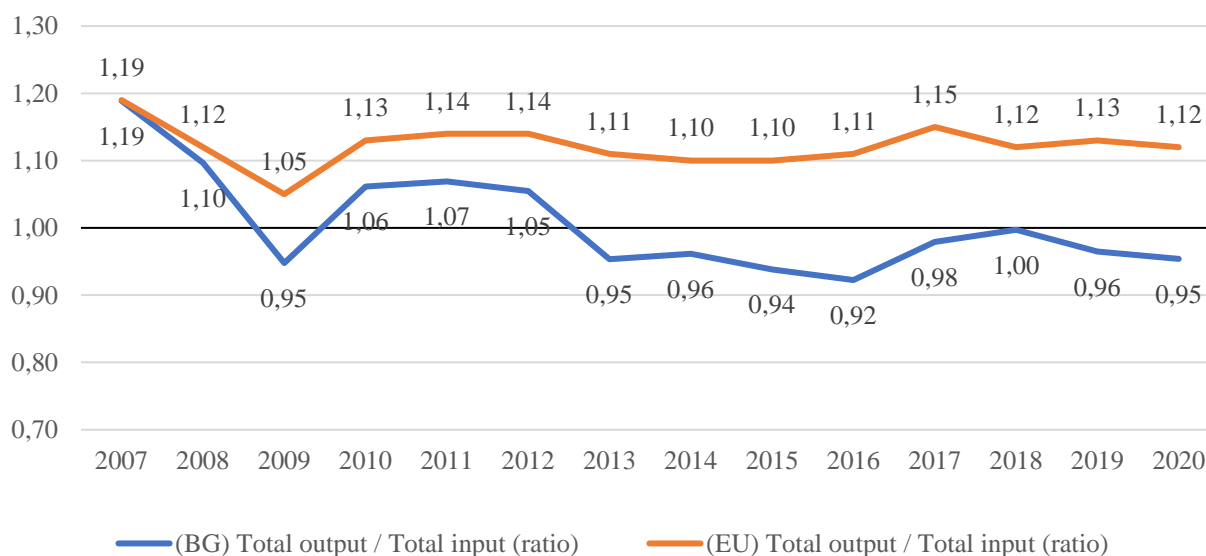

Figure 1. Ratio Total output/total input in agricultural holdings in Bulgaria and EU, 2007-2020

A study of liquidity in agricultural holdings in Bulgaria and the EU in the period 2007-2020.

Liquidity is a fundamental indicator in the study of farm financial performance. In the post-2007 period, the composition of net working capital of Bulgarian farms has increased significantly from €7,751/farm in 2007 to €18,343/farm in 2020 (an increase of almost 2,4 times) (Figure 2). Over

the same period, net working capital on European farms increased from 13 304 €/farm to 19 020 €/farm (a 1,4-fold increase). In practice, in 2020 Bulgarian farms are catching up with European farms on this indicator, despite the different start. In 2007, the level of current assets of Bulgarian farms was 13,0 thousand €/farm and increased to 59,3 thousand €/farm in 2020 (increase 4,5 times).

For the same period, liabilities have increased 7,7 times - from €5,3 thousand/farm in 2007 to €41 thousand/farm in 2020. The increase in assets is mainly a consequence of the increase in material stocks of goods. The increase in liabilities is mainly due to the increase of about 10 times in short-term loans for working capital. In comparison, in EU farms, the level of current assets increased from €49,7 thousand/farm in 2007 to €85,8 thousand/farm in 2020 (a 1,7-fold increase), and current indebtedness increased at almost the same rate from 36,4 thousand €/farm to 66,8 thousand €/farm. The increase in current assets is mainly on account of inventories, while the increase in liabilities is due to the increase in repayments of long-term loans.

The availability of working capital is evidence of the short-term ability of farms to maintain a sound financial position and meet their payments. In the assessment of the net working capital of agricultural holdings, it is noticeable that there are two periods in the dynamics of the indicator related to the programming periods 2007-2013 and 2014-2020, which allows to conclude that the financial support under the CAP has an impact on the financial performance of agricultural holdings. Whereas until 2015 Bulgarian farms did not have any support under direct payments and relied mainly on investment schemes financed by own resources and bank lending, since 2015 the availability of direct income support has positively affected credit and access to finance for the Bulgarian agricultural sector (Kirechev, 2021).
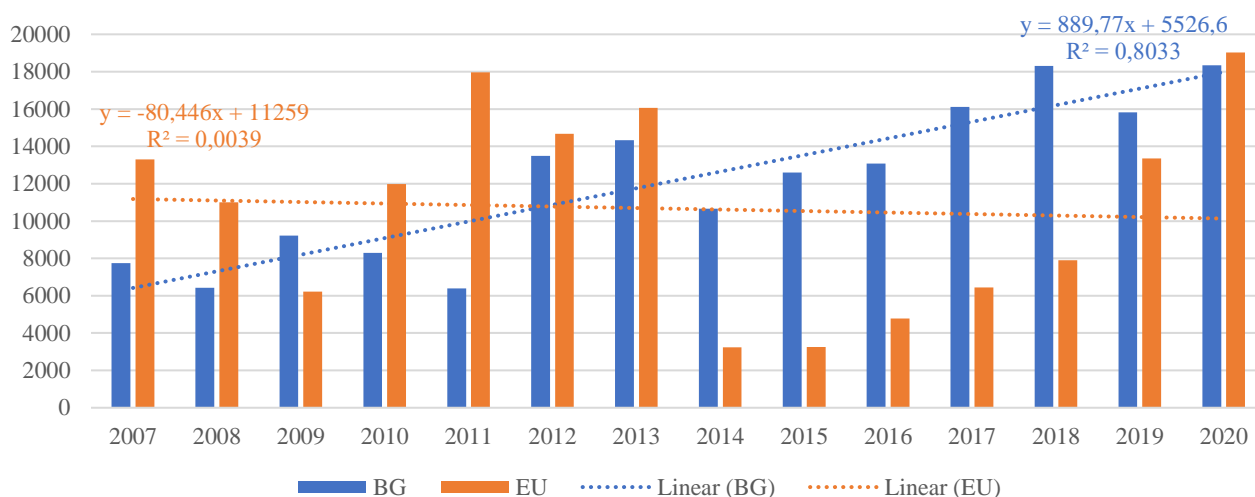

Figure 2. Net working capital in agricultural holdings in BG and EU, €/farm

Changes in farm liquidity in Bulgaria and the EU in the period 2007-2020 have followed relatively similar dynamics (Figure3). The current liquidity ratio of Bulgarian farms decreases from 2,46 in 2007 to 1,45 in 2020 and that of European farms from 1,37 in 2007 to 1,28 in 2020. On both Bulgarian and European farms, current liquidity is within the norm and shows that farms are effectively managing their short-term indebtedness and have no problems meeting their payments. Income support policies are likely to be crucial to maintaining the current solvency of farms. The quick liquidity ratio follows a similar dynamic (unfortunately FADN does not provide data on inventories in the period 2007-2013. The quick liquidity ratio of farms in Bulgaria after 2014 until 2020 is in the range of 1,10 to 1,04. The quick liquidity ratio for European farms increases after 2014 from 0,84 to 1,03. In both cases, a good solvency is shown, where stocks do not need to be released to meet current payments.
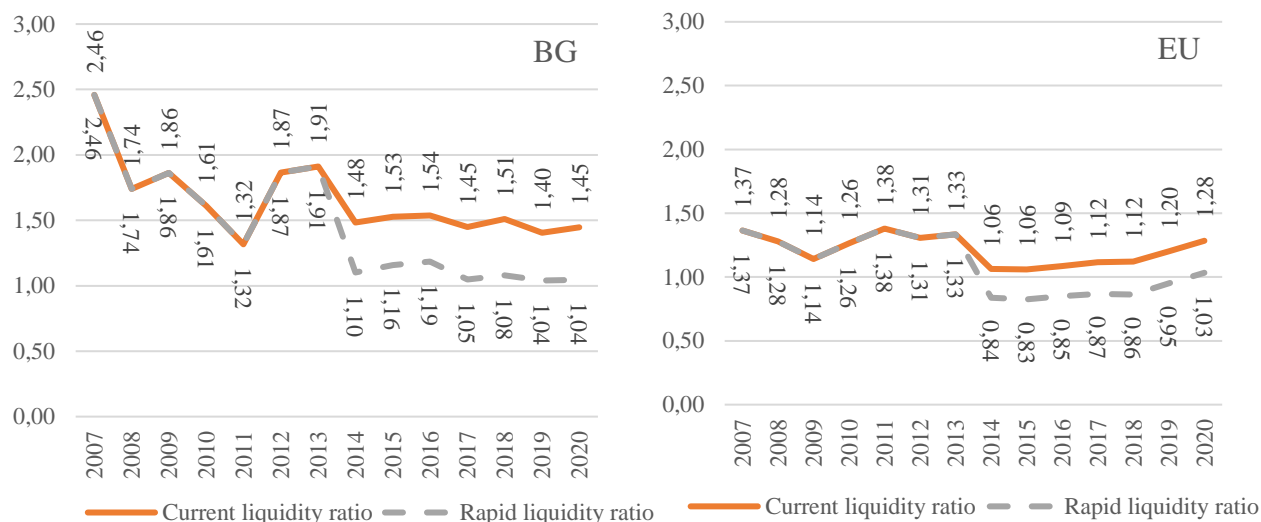
Figure 3. Liquidity in agricultural holdings in Bulgaria (left) and EU (right), 2007-2020

A study on the asset turnover of agricultural holdings in Bulgaria and the EU in the period 2007-2020.

In the period after 2007, farms in Bulgaria and the EU show certain differences in terms of the ability of their assets to generate gross output, which is related to their resource and technological endowment (Figure 4). Changes in asset turnover are in direct proportion to the output created on farms and in inverse proportion to assets.

In Bulgarian agricultural holdings, the gross production grew 4 times during the period - from €18,1 thousand/farm to €72,4 thousand/farm, with assets growing at a faster pace as a result of the increased investment activity resulting from the CAP. Total assets increased 4,8 times – from €34,0 thousand/farm in 2007 to €165,0 thousand/farm. This changes asset turnover from 0,53 in 2007 to 0,44 in 2020. That is, €1 of funds in assets creates in 2020 €0,44 of output. The level of fixed assets for the period increased 5 times - from 21,2 thousand €/farm in 2007 to 105,6 thousand €/farm in 2020. The large increase is a consequence of the intensive restructuring of farms in the period after joining EU. This naturally reflects on the turnover of fixed assets, which changes from 0,85 in 2007 to 0,68 in 2020. That is, €1 of funds in fixed assets creates in 2020 €0,68 of output. It should be noted that the share of long-term assets in total assets increased from 61,8% in 2007 to 64% in 2020. At similar rates, the composition of short-term assets also changed, growing from 13,0 thousand €/farm in 2007 to €59,3 thousand per farm in 2020, resulting in relatively small changes in the current asset turnover ratio from 1,39 in 2007 to 1,22 in 2020. That is, 1 € of funds in current assets creates in 2020 1,22 € of gross output.

Bulgarian farms use more assets to create 1€ of output than the average European farm. Relatively equal proportions of changes in gross output and input assets exist in European farms. Gross production increased by 1,6 times – from 57,0 thousand €/farm in 2007 to 92,6 thousand €/farm. For the same period, funds in assets grew at the same rate of 1,6 times – from €259,4 thousand/farm in 2007 to €414,5 thousand/farm in 2020. The asset turnover ratio is constant – 0,22 or €1 invested asset provides 0,22 gross output. The situation is similar with fixed assets, which increased from €209,7 thousand/farm in 2007 to €328,6 thousand/farm in 2020. The share of fixed assets in the total assets of European farms is very high – 80,8% in 2007 and falling to 79,2% in 2020. This allows for a fixed asset turnover ratio of 0,27-0,28 – or €1 invested in fixed assets creates 0,27-0,28 € gross production. The low level of the indicator indicates the high concentration of fixed assets in EU farms, which is a consequence of the significant investment support they receive from the CAP.

As regards the use of current assets, they are changing at a slightly faster rate than gross output, increasing from 49,7 thousand in 2006 to 49,7 thousand in 2010. In 2007, the production of current assets increased from 49,7 €/farm to 85,8 €/farm. €/farm in 2020. Thus, the current assets turnover ratio changes from 1,15 in 2007 to 1,08 in 2020, which is close to the values realized by farms in Bulgaria.

Figure 4. Assets Turnover Ratio in agricultural holdings in Bulgaria (up) and EU (down), 2007-2020

Maintaining a high concentration of fixed assets allows modern and innovative technical assets to be invested in agricultural production, but in the long term, if CAP funding for agriculture is reduced, it may create certain risks in relation to maintaining the technical base, increase the use of loans for renovation and worsen the financial situation of farms.

Study on the indebtedness of agricultural holdings in Bulgaria and the EU in the period 2007-2020.

he indebtedness of agricultural holdings is mainly formed by the use of short-term and long-term funds to finance investments and current operations. The study of indebtedness provides insight into the extent of farm dependence on creditors. The level of indebtedness is a consequence of the demand for finance and access to credit in countries for the purposes of the financial performance study, indebtedness includes the ratio of total liabilities (including long-term and short-term) to equity. Additional calculations can identify how indebtedness creates gross output, assets or other.

After 2007, the level of indebtedness in Bulgarian agricultural holdings increased intensively - from €5 314/farm in 2007 to €41 052/farm in 2020 (7,7 times), with long-term loan liabilities

growing from €3,1 thousand/farm in 2007 to €19,7 thousand /farm in 2020 (6,3 times), and short-term loan liabilities increased from €2,2 thousand/farm in 2007 to 21,3 thousand €/farm in 2020. In structural terms, the share of long-term loans decreased from 58% in 2007 to 48% in 2020. This is a consequence of the more active demand for loans for working capital than funds for investment in fixed assets (fi-compass, 2020), (Kirechev, 2021). Simultaneously with the increase in indebtedness, the level of equity also grows. Bulgarian farms have a low degree of capitalization at the beginning of the period, which is why a significant growth of equity is observed - from €28 993/farm in 2007 to €123 997/farm before 2020. Therefore, although the ratio debt / equity to grow, it is at a low level - from 0.18 in 2007 it will grow to 0,33 in 2020. This proves that Bulgarian farms have a good level of capitalization with a low level of indebtedness (Figure 5) and can afford to use the credit to generate profit.
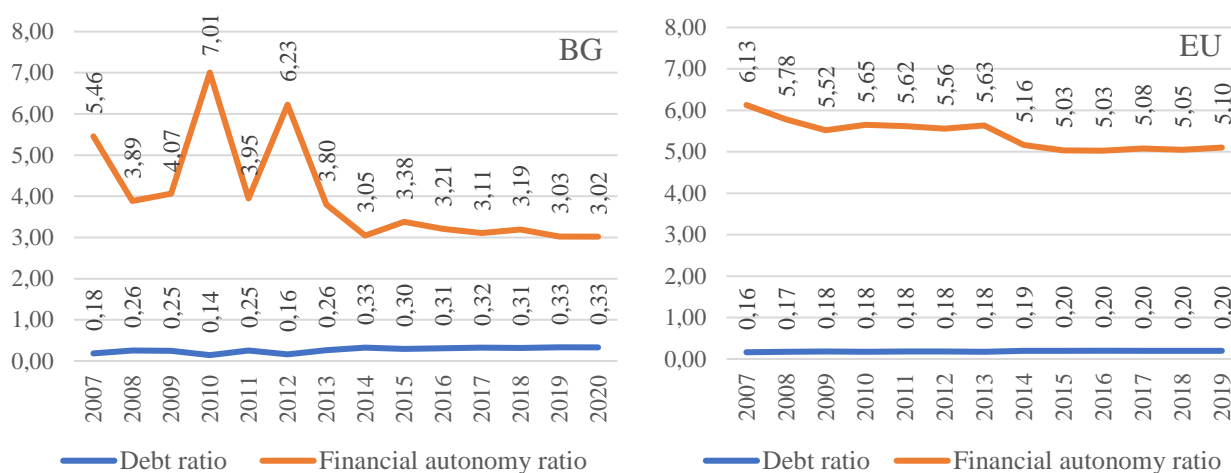

Figure 5. Indebtedness and financial autonomy in agricultural holdings in Bulgaria (left) and EU (right), 2007-2020

The low indebtedness score explains the high financial autonomy of Bulgarian farms, which, although decreasing from 5,46 in 2007 to 3,02 in 2020, is high and allows farms to take advantage of their good capital structure and finance their activities with their own funds.

In additions to the analysis of indebtedness, it can be added how indebtedness creates output and forms assets. The share of indebtedness to gross output was 29,3% in 2007 and rises to 56,6% in 2020. That is, in 2020, €1 of debt creates €0,56 of gross output. Although not to the same extent, but the importance of indebtedness for asset creation is evident. If in 2007 the share of debt to assets was 15,5%, in 2020 it increases to 24,9%, i.e. the importance of credit for asset creation.

In agricultural holdings in the EU countries, indebtedness is growing at a low rate (1.8 times) from 36 402 €/farm in 2007 to 66 848 €/farm in 2020. At similar rates, long-term indebtedness is also changing (from 27, 2 thousand €/farm in 2007 to 51,1 thousand €/farm in 2020), as well as short-term indebtedness from 9,2 thousand €/farm in 2007 to 15,7 thousand €/ farm in 2020). Long-term indebtedness relative to total indebtedness in European households rose from 74,7% to 76,5%. For the same period, the level of equity is very high – €223 090/farm in 2007, rising to €347 663/farm. This determines the low debt/equity ratio – 0,16 in 2007 to 0,20 in 2020 and the high level of financial autonomy – 6,13 in 2007 and 5,10 in 2020. Measured against gross output, indebtedness grows from 63,8% in 2007 to 72,2% in 2020. At the same time, changes in indebtedness have relatively little bearing on asset creation. Measured relative to assets, indebtedness was only 14,0% in 2007 and will increase to 16,1% in 2020. European agriculture is highly capitalized and, thanks to public support, has relatively lower needs for borrowed capital.

It can be summarised that the low level of indebtedness allows farms to use credit as a profit-making tool and in the future (in a relatively good external environment), credit may be increasingly important for financing. Supporting farmers' incomes enhances their image with credit institutions, making them desirable, lower-risk customers. It should not be overlooked that the low level of debt prevents farms from making the most of the opportunities provided by financial leverage.

Study on the profitability of agricultural holdings in Bulgaria and the EU in the period 2007-2020.

Profitability research focuses on assessing the ability of equity, assets, revenues and expenses to generate net income (Figure 6). The net income of farms in Bulgaria has been thoroughly studied in previous research (Kirechev, 2021), (Ivanov, et al., 2021) and is formed by the profit from the sale of production and the income from subsidies and assigned taxes.
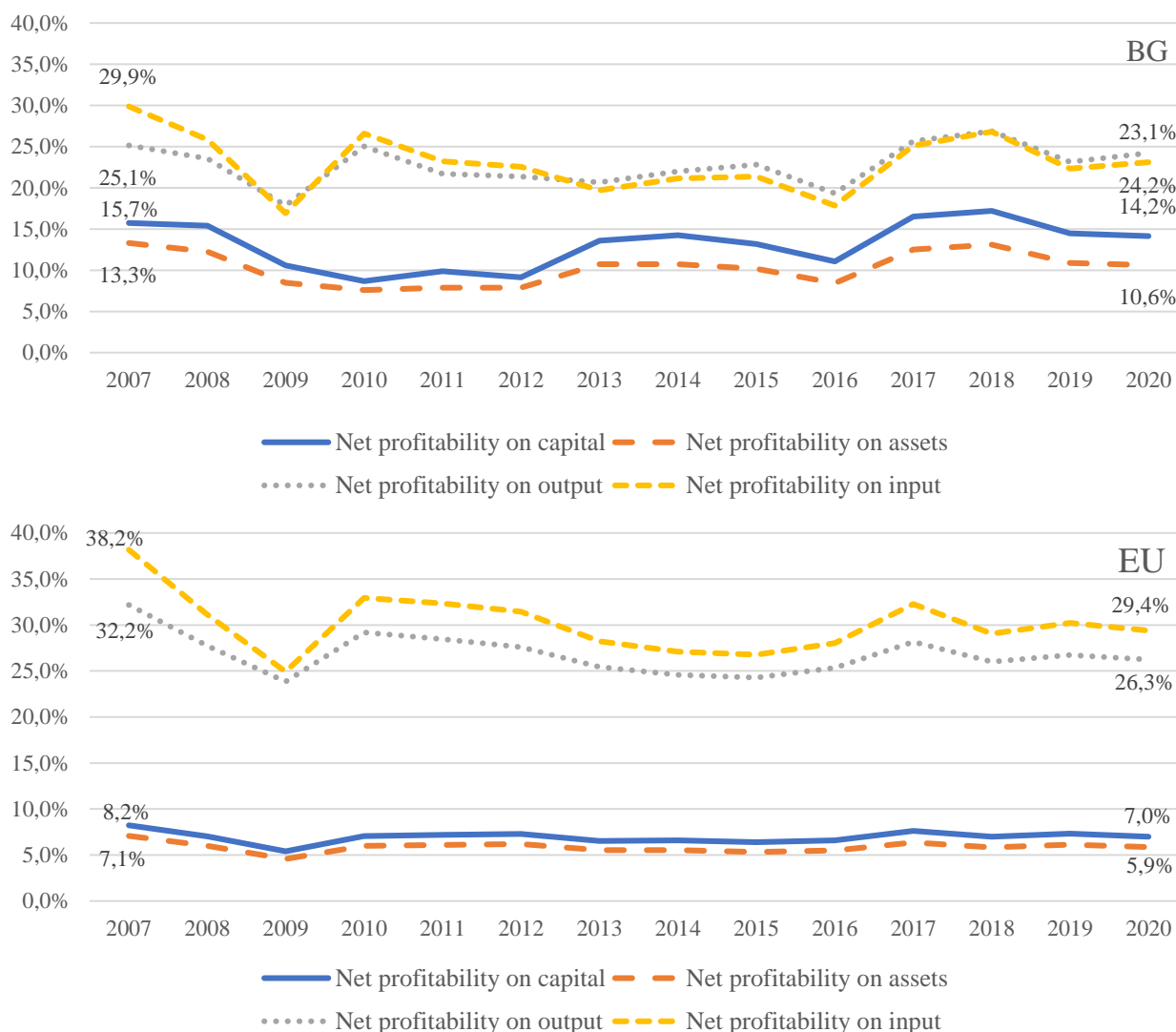

Figure 6. Net profitability in agricultural holdings in Bulgaria (up) and EU (down), 2007-2020

The net income realized by farms in Bulgaria in 2007 was 4,563 €/farm and increased to 17 552 €/farm in 2020 (3,8 times), and that of the European countries increased from 18 362 €/farm in 2007 to €24 310/farm in 2020 (1,3 times). The net income of Bulgarian farms is growing progressively, but unfortunately it is mainly at the expense of subsidies. Current subsidies and taxes on agricultural holdings in Bulgaria increased 12,9 times - from €1 610/farm in 2007 to €20 791/farm

in 2020, while those on European farms increased only 1,5 times - from 9 383 €/farm in 2007 to €14 183/farm in 2020. While for the EU farms for all years of analysis the net income exceeds the average subsidies, for the Bulgarian farms, after 2013, the average subsidies exceed the net income. That is, Bulgarian farms would have a negative income if they were not subsidised, which is a serious challenge to their ability to generate profits. This is also evident from the excess of gross input costs over gross output, as shown in Figure 1.

The dynamics of farm profitability in Bulgaria and the EU for the period since 2007 have been relatively similar. Profitability on an equity basis for Bulgarian farms exceeds that of EU farms. The return on equity for Bulgarian farms ranges from 15,7% in 2007 to 14,2% in 2020, while the same indicator for European farms ranges from 8,2% in 2007 to 7,0% in 2020. The lower return on equity of European farms can be explained by the high degree of capitalisation of European agriculture.

The profitability of assets changes in the same dynamics. For Bulgarian farms, return on assets changes in the range from 13,3% in 2007 to 10,6% in 2020. The average European farm reports a lower level of return on assets - from 7,1% in 2007 to 5,9% in 2020. This can be explained by the high level of technical endowment European agriculture has reached as a result of periods of prolonged subsidisation. If, in the long term, investment support policies are rethought, this could create major risks for farms where a significant amount of assets generate low returns.

Profitability of outputs measured by gross output changes with relatively the same dynamics - from 25,1% in 2007 to 24,2% in 2020 (for Bulgarian farms) and from 32,2% in 2007 to 26,3% in 2020 (for European farms). The indicator shows that 1 € of production generates a net income of 0,23 € for Bulgarian farms and 0,26 € for European farms. However, it should not be overlooked that Bulgarian farms are very dependent on subsidies.

Profitability on a gross cost basis (including cost of living, factor costs, depreciation and taxes) is the highest. The dynamics of profitability on a cost basis shows a decrease from 29,9% in 2007 to 23,1% in 2020 for Bulgarian farms. The decrease in cost-based profitability is higher for European farms - from 38,2% in 2007 to 29,4% in 2020. The indicator is good in terms of the financial performance of both types of farms, given the input of less costs to obtain a unit of net income, indicating an increase in productivity.

Summary assessment of the financial performance of agricultural holdings in Bulgaria and the EU in the period 2007-2020.

In an attempt to assess the overall financial performance of agricultural holdings in Bulgaria according to the proposed balance sheet dependency models, an assessment is made in the following areas: to what extent equity exceeds the level of fixed assets; to what extent current assets exceed current liabilities; to what extent equity covers indebtedness. The results of the assessment are presented in Figure 7.

In Bulgarian agricultural holdings, equity exceeds fixed assets, i.e. there are resources available to acquire new assets with own funds. Positive net working capital is realised, which is a prerequisite for short-term financial stability. Equity exceeds the level of short-term and long-term indebtedness, which enables farms to cover their liabilities with own resources (Figure 7, up). This determines the relatively good financial situation of Bulgarian farms, high financial sustainability, but serious attention should be paid to risks arising from the external environment.

As far as European farms are concerned, their equity also exceeds fixed assets, i.e. there are resources available to acquire new assets with own funds. Positive net working capital is realised, which is also a prerequisite for short-term financial stability. Equity exceeds the level of short-term and long-term indebtedness, which enables farms to cover their liabilities with own resources (Figure 7, bottom). This determines the very good financial situation of European farms. The financial sustainability of European agriculture is relatively high.
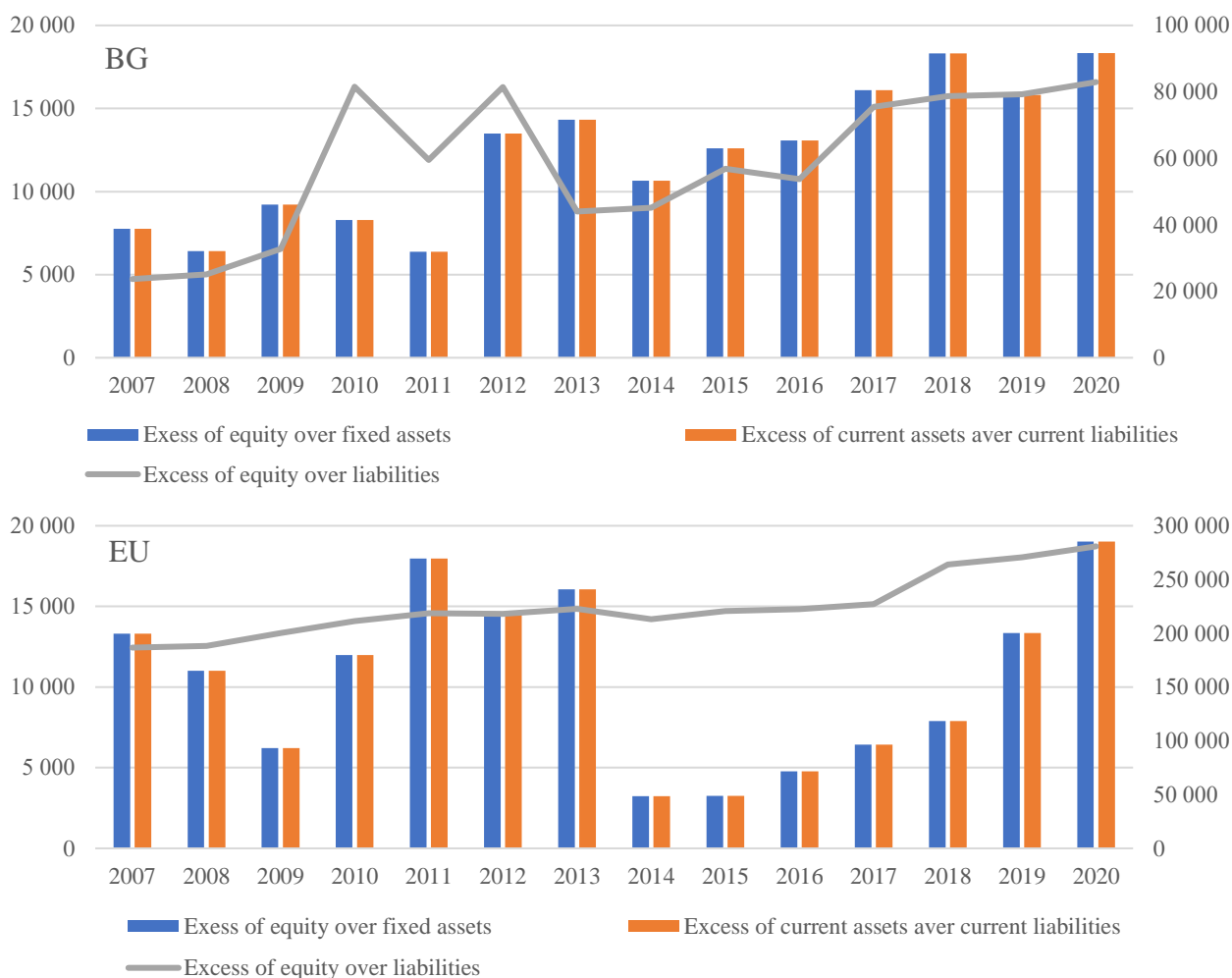
Figure 7. Assessment of the financial performance of Bulgarian (up) and European farms (down) according to the proposed financial dependency models, 2007-2020

Regional dimensions of farm financial performance in Bulgaria, 2007-2020.

The fulfilment of the set research objectives proposes to investigate the financial performance of agricultural holdings in Bulgaria by region in order to reveal some regional dimensions.

Bulgaria is represented by 6 statistical regions monitored by FADN and included in NUT-2: North-West (NW); North-Central (NC); North-East (NE); South-East (SE); South-Central (SC) and South-West (SW). The assessment of financial performance includes measures of liquidity, asset turnover, leverage, and profitability.

An examination of the ratio of gross output to gross inputs by region shows significant dynamics, with gross output exceeding gross expenditure in only two regions in 2020 - the South-West (1,14) and the North-West (1,06). For the remaining regions, the ratio is as follows: South-Central (0,98); North-Central (0,93); North-East (0,89) and South-East (0,87).

The highest gross production was achieved by farms in the North-West region (109,9 thousand €/farm), followed by the North-East region (96,6 thousand €/farm), the North-Central region (91,5 thousand €/farm) and the North-West region (91,5 thousand €/farm). Farms in the South-East (79,6 thousand €/farm), South-Central (44,2 thousand €/farm) and farms in the South-West (35,8 thousand €/farm) produce the least.) In recent years, the North-West region has established itself as the region with the highest added value in agriculture in Bulgaria and has overtaken the North-East region.

In terms of net working capital formation, the North-Central region performed best, followed by the North-East and South-Central regions. While the first two regions are dominated by cereal and

oilseed production, the South-Central. The changes in the composition of net working capital by region is presented in Table 1.

Table. 1. Net Working Capital and Currant Liquidity Ratio in agricultural holdings by regions, 2007-2020

Year	Net working capital, €/farm						Current liquidity ratio					
	NW	NC	NE	SE	SC	SW	NW	NC	NE	SE	SC	SW
2007	5 505	11 522	13 558	7 283	7 716	4 178	2,92	2,50	3,44	2,29	1,87	1,87
2008	5 402	13 669	13 574	4 247	-223	3 959	2,16	2,17	2,70	1,37	0,99	1,81
2009	5 715	13 437	18 358	9 586	6 054	5 389	1,48	1,84	2,35	1,71	1,84	2,01
2010	12 180	9 675	10 054	10 680	6 347	2 864	2,02	1,47	1,53	1,75	1,73	1,23
2011	20 297	20 909	15 582	13 445	-13 750	5 428	2,57	2,11	1,78	1,79	0,54	1,57
2012	20 763	23 234	22 423	13 087	6 989	8 197	1,98	2,07	1,91	1,58	1,74	2,10
2013	16 484	27 675	21 017	15 645	9 568	7 052	1,62	2,21	1,80	1,77	2,27	1,85
2014	22 148	19 133	13 668	10 508	8 605	-210	1,73	1,37	1,38	1,42	1,95	0,98
2015	11 098	18 719	17 570	11 222	16 613	-230	1,23	1,62	1,56	1,41	2,23	0,98
2016	-3 794	24 218	13 608	9 979	23 650	463	0,94	2,01	1,42	1,36	2,80	1,06
2017	-2 277	28 063	24 941	13 987	24 419	2 325	0,97	1,82	1,66	1,38	1,95	1,18
2018	652	28 029	29 753	12 603	29 606	2 477	1,01	1,69	1,74	1,29	2,48	1,22
2019	-3 371	25 914	36 462	-141	28 301	2 544	0,95	1,59	1,96	1,00	2,30	1,21
2020	6 553	31 433	26 560	13 208	24 689	5 003	1,08	1,77	1,57	1,26	1,86	1,47

All regions of farms show a positive total liquidity above 1 unit in 2020, with the highest in the South-Central region (1,86), followed by the North-Central region (1,77), and the lowest in the North-West region (1,08). Changes in liquidity are driven by changes in current assets and liabilities. For the different regions, current liabilities are at the level of 55-75% of current assets, except for the North-West region where this indicator reaches 93% and determines the low liquidity. The increased indebtedness is a consequence of increasing short and long term borrowing for the farms in the region.

Changes in asset turnover are mainly determined by the composition of assets on farms, both overall and by type. The composition and structure of assets is directly related to the specialisation and concentration of production. Areas specialising in the production of grain and oilseeds naturally also have the most developed technological base.

In 2020, the region with the most assets is the North-West (256,9 thousand €/farm, including fixed assets – 170,3 thousand €/farm and current assets - 86.5 thousand €/farm), followed by the North Central region (€208,7 thousand/farm, including fixed assets – €136,5 thousand/farm and current assets – €72,1 thousand/farm), North-East region (204,9 thousand €/farm, including fixed assets – 132,2 thousand €/farm and current assets – 72,7 thousand €/farm), South-East region (186,4 thousand €/farm, including fixed assets – €123,3 thousand/farm and current assets – €63,1 thousand/farm), South-Central Region (€118,0 thousand/farm, including fixed assets – €64,6 thousand/farm and current assets – €53,3 thousand/farm) and South-West region (€55,5 thousand/farm, including fixed assets – €39,8 thousand /farm and current assets – €15,6 thousand/farm).

The highest return on assets is seen on farms in the South-West (which are also the smallest, specialising in fruit and vegetable production). The lowest return on assets is observed on farms in the South-Central region - with the most developed ruminant livestock and vegetable production. Typical regions specialising in grain and oilseed production have relatively uniform returns on assets, which for 2020 range as follows: returns on assets – 0,43-0,47; returns on fixed assets – 0,65-0,73; returns on current assets – 1,26-1.,3 (Figure 8).
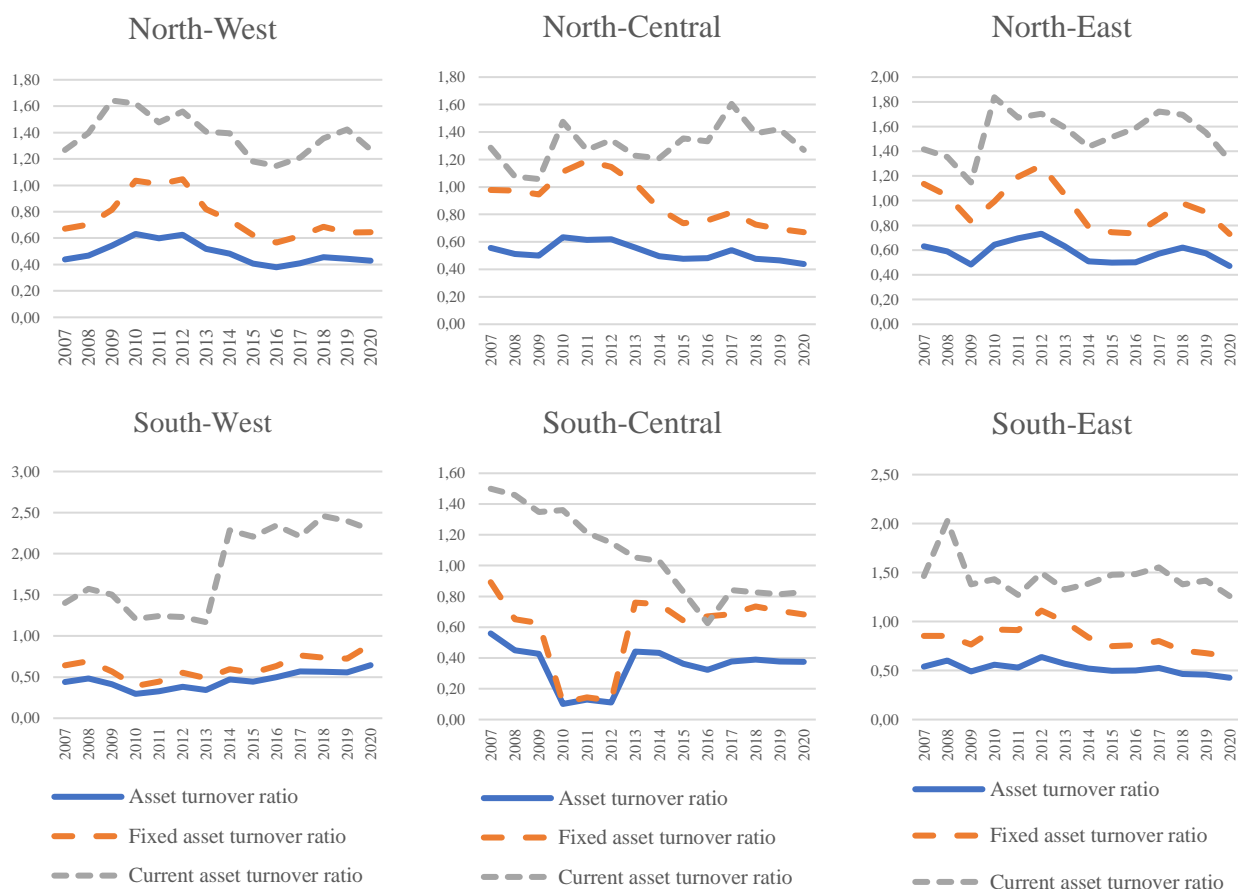
Figure. 8. Assets Turnover Ratio in agricultural holdings by regions, 2007-2020

The examination of indebtedness in a regional plan shows that the region with the highest indebtedness for 2020 is the North-West (€80,0 thousand/farm, including long-term indebtedness €36,0 thousand/farm and short-term indebtedness 44,0 thousand €/farm), followed by the South-East region (€49,9 thousand/farm, including long-term indebtedness €27,3 thousand/farm and short-term indebtedness €22,6 thousand/farm), North-East region (€46,2 thousand/farm, including long-term indebtedness €25,2 thousand/farm and short-term indebtedness €21,0 thousand/farm), North-Central region (40,7 thousand €/farm, including long-term indebtedness €18,4 thousand/farm and short-term indebtedness €22,3 thousand/farm), South Central Region (€28,6 thousand/farm, including long-term indebtedness €12,3 thousand/farm and short-term indebtedness €16,3 thousand/farm) and the South-West region (€10,6 thousand/farm, including long-term indebtedness €4,1 thousand/farm and short-term indebtedness €6,5 thousand/farm).

In the same year, the level of capitalisation of farms with equity was highest in the North-West region (€ 176,9 thousand/farm), followed by the North-Central region (€ 168,0 thousand/farm). The North-East region (158,8 thousand €/farm), the South-East region (136,5 thousand €/farm), the South-Central region (89,3 thousand €/farm) and the South-West region (44,8 thousand €/farm). Based on the data on indebtedness and the level of equity, the debt to equity ratio and the financial autonomy ratio were measured (Table 2).

For the period analysed, there are dynamics in indebtedness which are higher in the periods 2009-2011 and 2015-2017, corresponding to the activity in the periods of operation of the Rural Development Programmes related to investment actions. It should be noted that, in most regions, indebtedness is driven more by short-term borrowing than by long-term borrowing. By 2020, the debt to equity ratio is highest in the North-West region, followed by the North-East region, and the lowest

in the North-Central region and the South-West region. However, for all regions, the leverage ratio is below 0,5, i.e. the liabilities can be covered by equity, which indicates a good capital structure in the farms. Although declining over time (Table 2), the financial autonomy ratio is high, with the highest in the South-West region (4,23) in 2020, followed by the Northeast region, and the lowest in the North-West region, where indebtedness is highest.

Table 2. Indebtedness and financial autonomy in agricultural holdings in Bulgaria by regions, 2007-2020

Year	Debt to Equity Ratio						Financial Autonomy Ratio					
	NW	NC	NE	SE	SC	SW	NW	NC	NE	SE	SC	SW
2007	0,13	0,21	0,15	0,19	0,25	0,20	7,46	4,80	6,72	5,21	4,00	4,94
2008	0,18	0,28	0,19	0,28	0,45	0,20	5,45	3,57	5,21	3,62	2,20	4,91
2009	0,29	0,35	0,22	0,26	0,21	0,16	3,48	2,89	4,60	3,79	4,80	6,34
2010	0,24	0,41	0,30	0,29	0,04	0,25	4,17	2,43	3,35	3,48	22,30	4,02
2011	0,19	0,30	0,30	0,30	0,24	0,20	5,32	3,36	3,28	3,28	4,13	4,95
2012	0,25	0,29	0,29	0,37	0,06	0,17	3,94	3,49	3,44	2,71	16,80	5,77
2013	0,29	0,26	0,28	0,32	0,23	0,19	3,40	3,87	3,53	3,11	4,41	5,31
2014	0,25	0,43	0,35	0,36	0,28	0,27	4,00	2,34	2,90	2,79	3,63	3,73
2015	0,39	0,28	0,27	0,31	0,24	0,26	2,55	3,60	3,72	3,18	4,11	3,85
2016	0,54	0,22	0,29	0,33	0,23	0,25	1,85	4,55	3,48	3,02	4,42	3,98
2017	0,53	0,23	0,25	0,33	0,30	0,28	1,87	4,39	4,00	3,05	3,34	3,58
2018	0,50	0,26	0,27	0,35	0,23	0,23	2,00	3,92	3,76	2,83	4,27	4,29
2019	0,49	0,26	0,23	0,48	0,25	0,24	2,06	3,84	4,32	2,09	3,94	4,22
2020	0,45	0,24	0,29	0,37	0,32	0,24	2,21	4,12	3,44	2,73	3,11	4,23

The dynamics in the level of profitability by region is very different, with various trends being observed, which can be traced in Figure 9. The highest net income of an agricultural holding in 2020 was realized by the North-West region – €31,4 thousand/farm, followed by the South-West region – €17,8 thousand/farm, the North-Central region – €17,1 thousand/farm, the South-Central region – €15,4 thousand/farm, the South-East region – €15,1 thousand /farm and the North-East region – €10,5 thousand/farm. The most serious problems with profitability are experienced by the North-East region, and the region in which there is a steady increase in profitability for the entire period after 2007 to 2020 is the South-West region. In the remaining regions, agricultural holdings have relatively constant profitability (Figure 9). Profitability issues are directly related to the specialization of production and are largely influenced by market factors.

Analyzing in more depth the net income and efficiency, it should be noted that in 2020, only two regions realized net income outside of subsidies – the North-West region and the South-West region. In 2020, the level of support in the form of subsidies and assigned taxes is the highest in the South-Central region - €26,7 thousand/farm, followed by the North-West region and the South-East region - €22,3 thousand/farm, the North central region €23,8 thousand/farm, Northeast region – €22,8 thousand/farm and South-West region €13,2 thousand/farm. This is yet another proof that Bulgarian farms and regions can hardly make a net income without the support of CAP subsidies. It turns out that agricultural subsidies support income but have little impact on increasing the profitability of agricultural production, especially in terms of grain and oilseed production and livestock. To the extent that vegetable and fruit production are higher value-added products, specialised areas do better. Territorially, the conclusion emerges that areas with diversification of their agricultural production, although with lower values of the indicators, show greater resilience to generate high financial and economic effects from their activity.
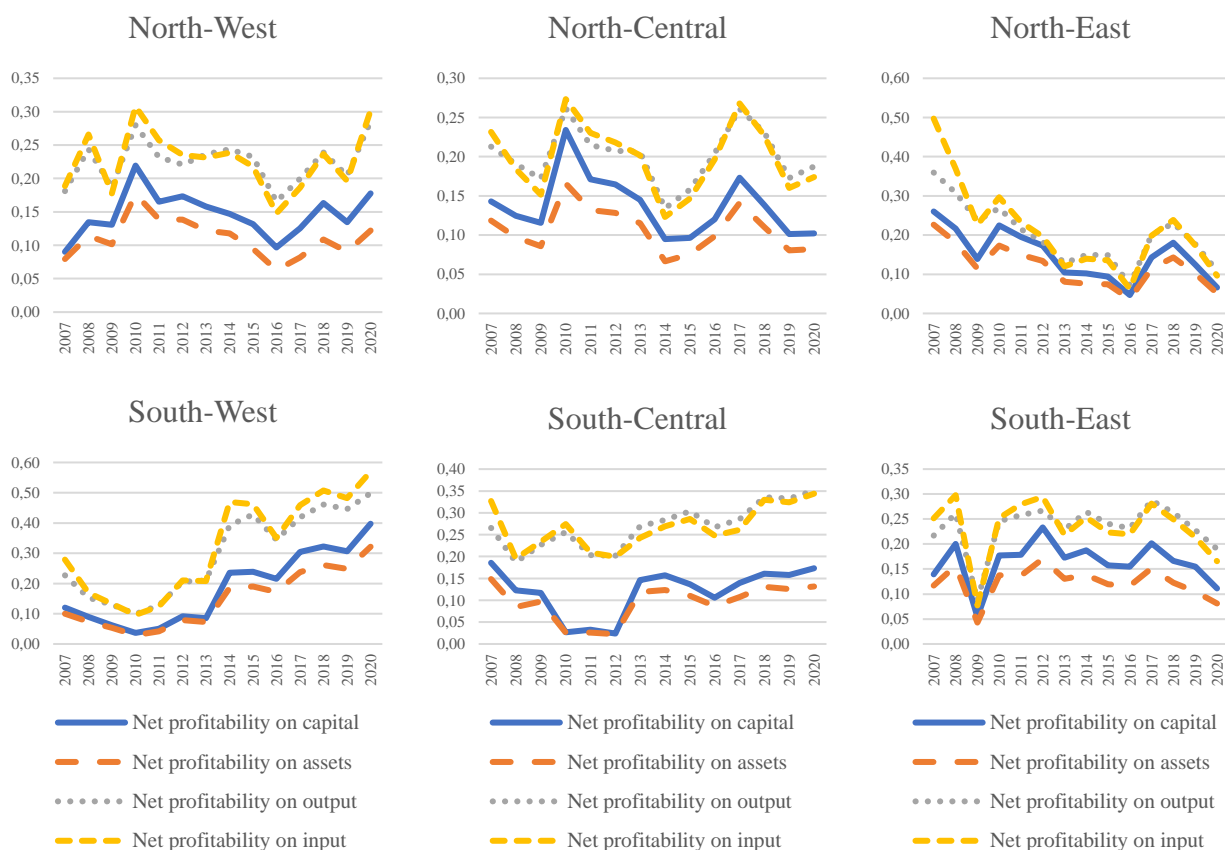
Figure. 9. Net profitability in agricultural holdings in Bulgaria by regions, 2007-2020

It can be summarized that regionally, farms have a relatively stable financial performance, which, although fluctuating, indicate the availability of spare resources for asset acquisition, sufficient working capital and a relatively low level of indebtedness. This does not provide sufficient protection from external influences and crises (inflationary processes, pandemic conditions, military conflicts in the region, etc.) that seriously affect the financial situation of farms, but due to the lack of sufficient up-to-date data it is still difficult to be the object of research. The limited scope of the study cannot provide a more detailed analysis of the financial situation by farm size and by production specialisation.

Conclusion

At the conclusion of the analysis, a number of conclusions and generalizations can be drawn to provide a starting point for on-farm financial and economic decisions and the implementation of policy support:

✓ After 2013, the agricultural sector does not provide enough gross output, showing the dependence of income on the level of support.

✓ Bulgarian farms maintain net working capital and high total and quick liquidity, above the average for European farms, which allows for normal business activity.

✓ Asset turnover (including fixed assets and current assets) is high, above that of European farms. In our farms, 1 €. of gross output is created as a result of more assets (including fixed assets) being invested compared to the EU average.

✓ Farm indebtedness is higher than the EU average, but farms show a good capital structure. It is a consequence of increased investment activity in the sector and increased financing after 2013 with working capital loans and investments.

✓ Bulgarian farms (although below the EU average) have high financial autonomy, which

provides the opportunity to attract new capital resources.

✓ Profitability on the basis of capital, assets, gross output and gross costs has been relatively constant over the period 2007-2020 and is above the EU average, indicating the ability of the sector to generate net income under competitive conditions. However, given the high dependence of income on subsidies and ceded taxes, Bulgarian farmers would find it difficult to cover their costs.

✓ The composition of equity is mainly composed of farmers' fixed capital (in contrast to the EU average for farms), implying limited possibilities to cover future losses and increasing financial risk in the future. This could pose serious problems in an environment of increased inflation or other crises.

✓ In the period 2007-2020, Bulgarian and European agricultural holdings are developing in conditions of very good financial sustainability.

✓ Regionally, the area with the most developed farms is the North-West, but the best financial performance is in the South-West. The specialisation of production regionally has an impact on the financial performance of farms. Regions with a higher degree of diversification of production exhibit higher financial sustainability to generate good financial from their operations.

The analysis approach used can provide a lot of information on the financial performance of Bulgarian farms by type of production or by farm size, which is a favourable opportunity for future research.

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