Bulgarian Journal of Agricultural Science, 27 (No 5) 2021, 819–828

Economic performance of agricultural enterprises in Bulgaria

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Abstract

Yalamov, T., Vutsova, A. & Arabajieva, M. (2021). Economic performance of agricultural enterprises in Bulgaria. *Bulg. J. Agri. Sci., 27 (5)*, 819–828

The paper provides new empirical evidence on entrepreneurship in agriculture, its early performance (in the second year of establishment), labor productivity, operating revenues, and assets on firm-level data of all companies in the sector. The firm level economic performance is analyzed against a more general background of the sector (production, exports and subsidies) in a longer time frame. Gini coefficients are calculated on various indicators (operating revenues and assets in 2010 to 2018, agricultural subsidies for 2017/2018 and 2018/2019) and units of analysis and they all suggest extremely high inequality in the sector, which is in contrast with previous studies suggesting improving of the situation. The new agricultural entrepreneurs are more effective (relative to the years after the start) as they have prior relevant management experience, easier access to finance and enter the market as value chain entrepreneurs. The paper has important policy implications that the government should redesign its policies, which facilitate the inequality in the sector.

Keywords: labor productivity; entrepreneurship; agriculture; concentration; Gini

Introduction

Bulgarian as other Central and Eastern European (CEE) countries' agriculture experienced deep transformation of its production structure, ownership, factor markets and value chains in the last 30 years, compared to the 30 years before the start of institutional changes in 1989. Agriculture was the first sector to be reformed through the *Law on Ownership and Use of Agricultural Land*, adopted by the Great National Assembly on February 22, 1991. The law envisaged restitution in real borders at the time of nationalization, the approach used also by Romania. Privatization of manufacturing and services formally started with the *Law on Restructuring and Privatization of State and Municipal Enterprises* adopted a year later on May 8, 1992. By 1993 around 20% of land was already in private hands.

However, it was only in 1994-1996 when the mass privatization was held. By 1999 95% of land subject to restitution was handed back to the citizens, yet with problems in titling (Csaki, 2000). The next big industrial privatization wave after the mass privatization came in 2002 when the stock exchange was utilized for competitive privatization bids. By end of 2004 87% of state assets subject to privatization have been transferred to private owners. At the end of 2018 the industrial privatization was over, some 20 years later than the agricultural privatization. The delay of industrial privatization could be explained with the political battles for control of state-owned enterprises. The socialist party initially was reluctant to privatize, and the Union of democratic forces (part of the ruling governments between 1990 to 1994) wanted to provide its believed constituents with enough cash through the restitution process (not only the land, but also residential and industrial estate and vouchers) in order to compete with the *nomenklatura* for the enterprises. Also, there was considerably large amount of former land owners in 1990s who vividly remembered the collectivization/nationalization of agricultural land, cattle and machinery in the period 1944-1959. The assumption was that those people

and their heirs will form the base for the middle class and will support the liberal political parties. Land restitution was largely perceived as restoration of justice even by the socialist party's supporters. Ironically, the liberal motivation for quick restitution of land was following the Marxist concept of base and superstructure (Marx, 1904) serving as the initial accumulation of capital.

The lengthy land restitution process (10 years) was badly sourced and coordinated, was separated from the quick unstructured and untransparent privatization of assets of former socialist agricultural farms, which largely benefited either their former managers or politically tied entrepreneurs not necessarily owning large plots of land. Other countries in CEE like Hungary, Czech Republic, Slovakia and Poland were able to complete de-collectivization quicker as they had considerable share of private owners (be it individual or in cooperatives) during socialism. In Bulgaria private farmlands accounted to 10% of area in 1989 (Bachev, 2008). Despite the fact that some land owners in Bulgaria decided to form cooperatives for joint cultivation, land was generally fragmented (every second citizen became land owner in 1990s and the average plot was smaller than the average plot in 1939) and deserted in the first decade of transition. Owners did not have means to invest, which lead to decrease of production and exports compared to pre-transition years.

Bulgaria, along with Albania (since 1966), Hungary and partially Romania (all years before 1980 and five years between 1980 and 1989) were net exporters prior to 1989. The initial shock transformed Albania in net importer with significant trade deficit and its export still has not reached the maximum of the pre-transition era. Similarly, Romania continued as net importer, despite the fact, that it hosts a third of all farms in the European Union (Eurostat, 2018). Bulgaria and Hungary remained net exporters. While starting at similar levels in 1989, Hungarian agricultural exports grew steadily and faster and currently surpass Bulgarian exports twofold. Czechoslovakia and Poland were net importers before the changes. Slovakia and Czech Republic remain net importers after the splitting, however Poland was able to transform its agriculture and since 2003 is a net exporter (Figure1).

Several studies suggest persistent diverging trajectories of agricultural sectors in CEE countries (Lerman, 2000; 2001; Fertő, 2016; Csaki & Jambor, 2019). Differences appeared in the way land was privatized (restitution in real boundaries, vouchers and market bids, distribution to workers without payments) and used (own-and-use individually, lease-and-use aggregated small plots or cooperative use), land concentration, structure of grown crops, labor relocation (cross-sector and rural-urban migration) and labor productivity, logistics, food processing industry and fast moving

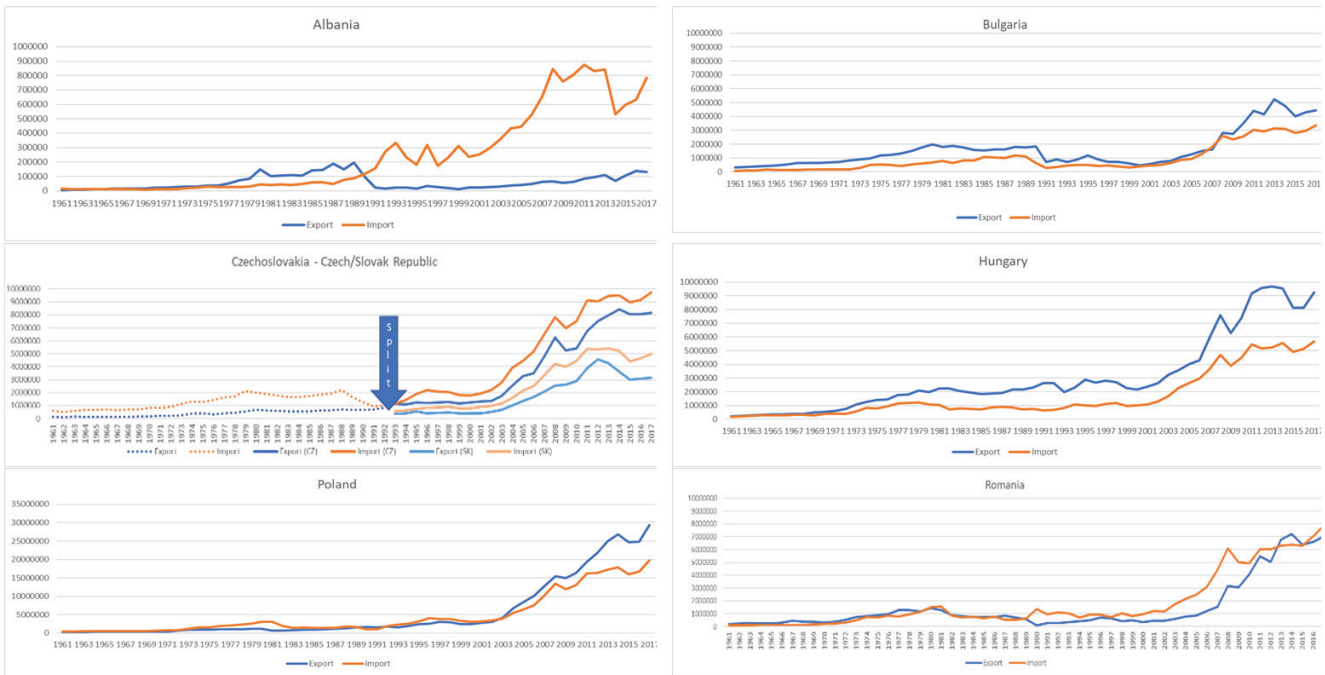

Fig. 1. Export and import of agricultural products of selected CEE countries (1961-2017) in 1000s USD
Source: Food and Agriculture Organization of the United Nations, 2020

consumer goods (FMCG) infrastructure, policy measures and negotiated terms for agricultural quotas and subsidies in the accession process, overall public sector governance and rule of law. A major difference between Bulgaria and the rest CEE countries was the increase of share of agriculture in total employment in the first decade of transition, yet it was lower than Poland and Romania. The labor productivity in Bulgaria grew substantially (more than three times) in the last 10 years and Bulgaria is already ahead many CEE countries like Hungary, Poland, Romania, Latvia, Croatia and Slovenia, reached 71% of labor productivity of Greece and Portugal, but is still half of average EU27 labor productivity for 2019.

Undoubtfully, part of the increased labor productivity is due to the increase of direct payments to farms following the Common Agricultural Policy (CAP) after the accession to the European Union in 2007. Available subsidies (through SAPARD programme) prior to the accession were marginal, accounting to less than 3% of total revenues of farms in 2006, while in 2017 they reached 26.99% of total revenues of farms, according to the System of agricultural accounting information.

Despite the wide-spread national belief that CAP is favoring other EU countries but Bulgaria, in 2018 it attracts the largest EU expenditure as a share of GDP (2.1%). Then follows Lithuania with 1.6%, Greece and Romania with 1.5% and Hungary with 1.4% (European Commission, 2019). In absolute amount (1.155 billion euro), Bulgaria ranked 14 in EU28 in terms of CAP expenditures, like Czech Republic (1.196 billion euro) and Austria (1.282 billion euro). The distribution of CAP (cumulative expenditure for 2015-2017) in Bulgaria follows the EU28 and Visegrad Four's pattern, significantly diverging from Romania (Figure 2).

The second pillar of CAP or the rural development policy in Bulgaria is underperforming Romania and other countries (i.e. Greece), partially because Romania provides larger national co-financing than Bulgaria for rural development and has a sizeable (14.8% of all direct payments compared to 0.5% for Bulgaria) small farmers scheme (Figure 3).

Ivanov (2020) argues that the direct payments increased the speed of land and farm consolation (especially those with less than 1, 2 and 10 ha), which contributed both to the increased farm efficiency and also lack of stable middle class. 5% of farms employ 20% of people in the sector and cultivate 85% of used agricultural land (Ivanov, 2020). Policy makers try to support new farms and (clusters of) young entrepreneurs, who could invest simultaneously in a value chain to the end consumer, not just in agricultural production. Such examples are warm farms, bio-farms, bio-shops and home delivery logistics; spelt fields and bakeries; lavender and cosmetics production; etc. During the previous programing period a very popular targeted scheme has been accessible – SKILSS, with a special category – entrepreneurs. The share of the allocated budget for these measures is, unfortunately, relatively low but they have a place in the overall program portfolio every year.

Farms' and agricultural markets' sustainability, competitiveness and their economic performance are usually assessed by aggregated proxies on national level (Bachev et al., 2017), responses of surveys (Vladimirov et al., 2003; Kaneva, 2016;

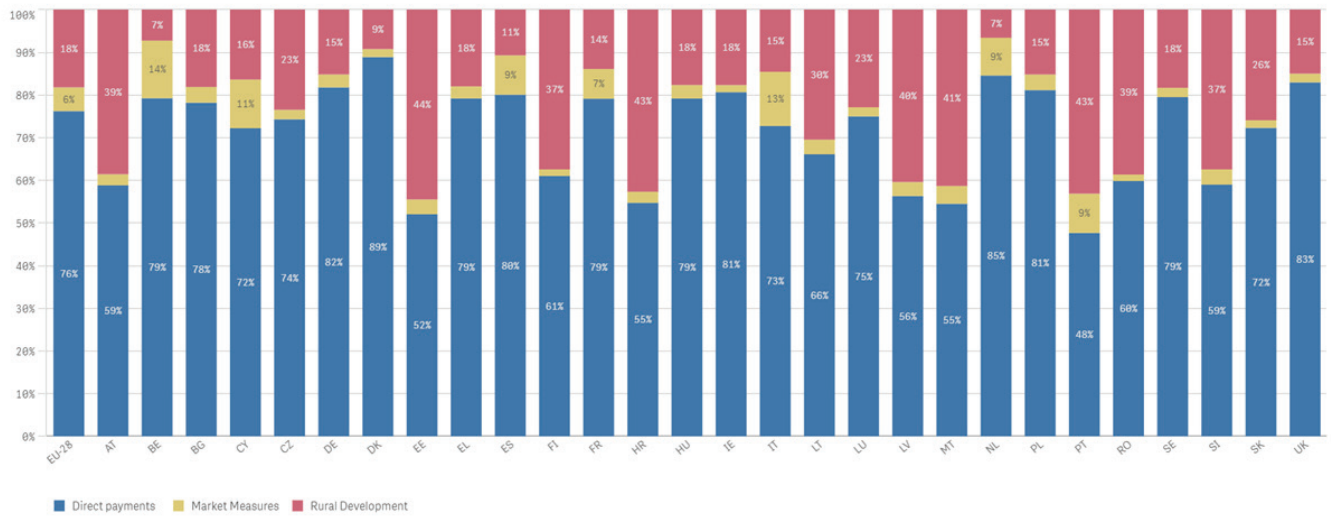

Fig. 2. Distributuion of CAP expenditure by member state (cumulative 2015-2017)
Source: Agri-Food Data Portal, Financing the Common Agricultural Policy – European Union

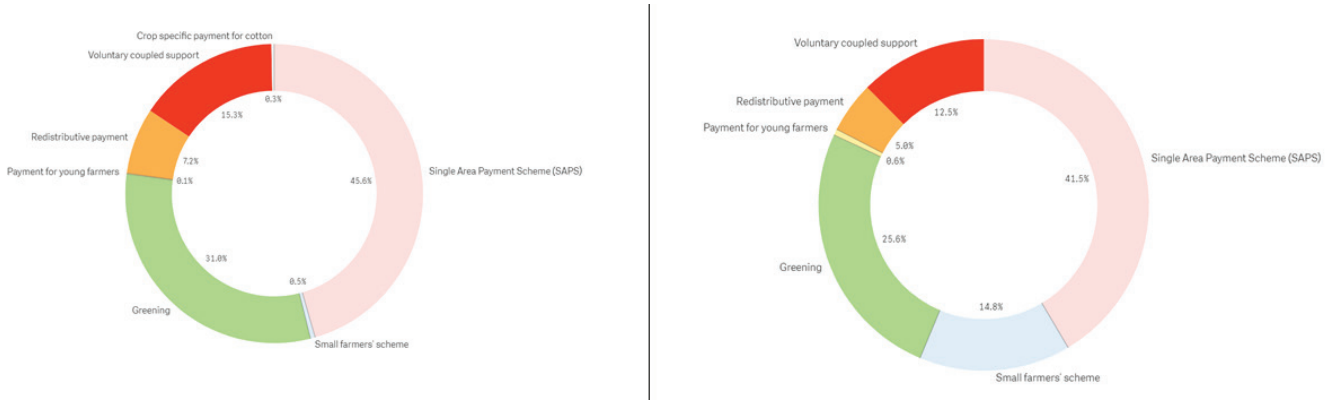

Fig. 3. Distribution of direct payment expenditure (cumulative 2015-107) by scheme in Bulgaria (left) and Romania (right)
Source: Agri-Food Data Portal, Financing the Common Agricultural Policy – European Union

Bachev, 2017), Lorenz inequality curves (Lerman, 2001), etc. This paper aims to fill a gap in studying the above domain through analyzing economic performance of new (established between 2016 and 2018) and all firms in the agriculture, forests and fisheries sector in the period 2010 – 2018. Studying agrarian entrepreneurship is particularly important as the current fashion in academic research is focused on high-tech and ICT entrepreneurship and also we observe declining number of farms in Bulgaria (20% between 2013 and 2016) and the European Union (3% in the same period), as reported by the Eurostat. The paper also aims to provide in-depth descriptive statistics for agricultural entrepreneurship and performance, which are generally not available from the reports by the National Statistical Institute.

Material and Methods

The paper builds on several databases: *Bureau van Dijk's Orbis* database as of November 30, 2019, *APIS web services* as of February 29, 2020 and the register of direct payments of the State Fund Agriculture for 2017/2018 and 2018/2019 seasons downloaded on March 24th, 2020. Orbis sources the data from the National Statistical Institute or the National Revenue Agency, as it contains data on entities (including self-insured farmers), which are not publicly available in the commercial registry and is pretty reliable. We work with 181 345 by entries (22 203 organizations and 159 150 self-employed, all active in 2018). For companies we have financial data (total operating revenues, total assets, profit/loss before tax and number of employed) for 2010-2018, 4-digit NACE code for the sector of economic activity, as well as the year of incorporation of business and location of business registration (not necessarily the place of agricultural operation). Rigorous data cleaning was applied as there were entries of self-employed as corporate as well as trade representations or branches. A total of 786 entries or 3.5% were removed. There are missing financial data for 4 690 firms for the whole period and there are 11 489 data-points for 2018. For the self-employed, we have data for operating revenue for 2018 for 5 823 persons.

At the same time Apis Web services suggests only 5 879 firms in the same sectors, 89% of which were active in March 2020. The explanation is that Apis uses sectors of registration and Orbis uses sectors of reporting to the National Statistical Institute, which might be more accurate as there is a lot of cross-sector migration after registration.

The largest such example is *Agro Svetlozar Dichevski Sole Proprietor (ranked 10 according to operative revenues in 2018)*, who is registered with NACE code, rev. 1.1. of 5121 Wholesale trade of grain, seeds and animal feed but later turned out to be a major tenant producer of wheat, maize, sunflower and barley and as such having a NACE code rev. 2 of 0150 Mixed farming. Similarly *Troya Avto, part of Dichevski group* started as a transport company but later started agricultural production. Firms registered before the accession to the European Union or without the intention to use structural funds did not mind what code of economic activity they subscribe to, but later codes became very important and are part of the eligibility requirements to apply for funding. However, the documents certifying the main economic activity come from NSI, thus not increasing much the impetus to update the code in the commercial registry. As the four-digit codes could easily change over the years (i.e. when farms are expanding and from pure crop production they engage with livestock breeding as well) there is no requirement to change it in the commercial registry. We believe that working with

Orbis database is better than Apis web services for sector studies as it provides more accurate information also because Apis has only 1025 firms from agriculture, forests and fisheries with financial data digitalized. For all the rest it should be manual reading of scanned financial reports, which makes practically impossible to work with financial data. The positive side for Apis web services is that it provides monthly employment data with just a month delay, as well as full history of ownership information. The register for subsidies for 2017/2018 contains 362 574 entries for 102 958 recipients of direct payments. After careful coding there are 9532 juridical persons (firms, cooperatives, NGOs, municipalities, churches, etc.) and the rest are individual persons.

We provide descriptive statistics for the economic performance of agricultural firms as well as Gini and Herfindahl-Hirsh coefficients for direct payments, operative turnover and assets of firms in agriculture, forests and fisheries for different years. A value added of the paper is using different (and more recent) datasets than the usual suspect Farm Accountancy Data Network (FADN) database. Orbis has around 28% more entries with financial information for 2017 than FADN, as reported through a recent study (Ivanov, 2020).

Results and Discussion

There are about 21 417 organizations (firms, cooperatives and NGOs) in agriculture, forestry and fisheries industry in 2019 according to data from Orbis. 54% of them have submitted financial reports and 51% have at least one socially insured in 2018. 34% of them have VAT registrations (turnover larger than 25 565 EUR).

Despite the available subsidies (including for young agricultural entrepreneurs) the level of entrepreneurship is declining since the peak in 2011 and is lower than most of the other sectors of the economy. In the last three years (2016-2018) there are around only 730 new firms registered, a decrease by 30% than the average in the period 2013-2015 (Figure 4). Key factors contributing to this trend is that the arable land is more or less taken (bought or leased) and young people are either migrating to the urbanized territories or abroad.

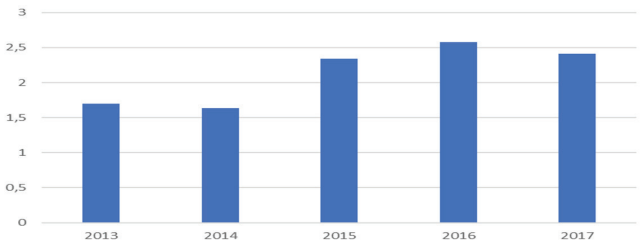

Fig. 5. Growth of sales in second year of establishment[2]
Source: BvD Orbis, 2019

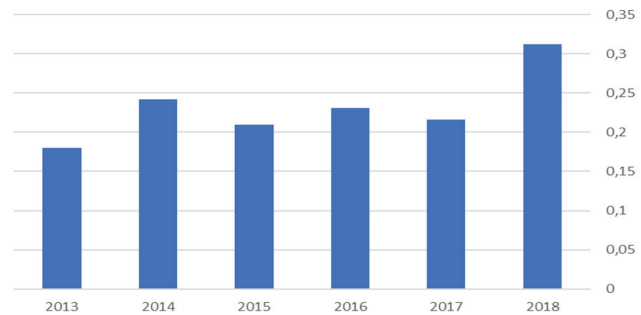

Fig. 6. Sales of second year of existence as a share of the average turnover for the sector (%)
Source: BvD Orbis, 2019

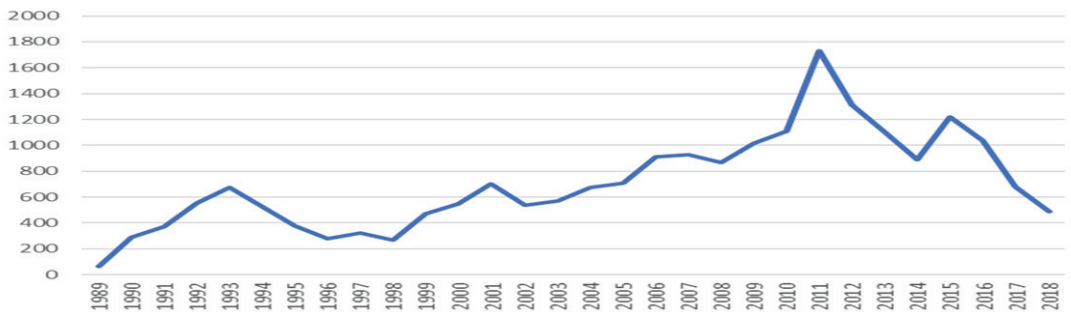

Fig. 4. Year of establishment of firms in 2019[1]
Source: BvD Orbis, November 2019

[1]Data for 1989 include all previous years as well. The oldest firm is established in 1901.

[2]Years represent the year or foundation of the firm.

Yet, newly established firms tend to be more successful than previously established, measured by the growth in total turnover in second year of existence compared to the first year of existence (Figure 5) and by the relative increase of the turnover of the same second year of existence as a share of the average turnover in the sector (Figure 6).

One of the factors contributing to that is that the founders of newly established firms had previous experience as individual farmers, managers in the sector or had other successful entrepreneurial experience more often than before. Another factor is that new entrepreneurs think more systematically (focus on the value chain and not just on one part of it) and forward looking. Early entrepreneurs in agriculture were either forced to do so (collapse of socialist farms or being unemployed in towns and are getting back to the villages of their childhood) or simply copied existing strategies of people they know. The newer entrepreneurs are more innovative, have other sources of income and hence are more risk-averse, which leads to higher profit. However, still a marginal share (7.4% in 2016) of farm managers in rural areas in Bulgaria were below 35 years old. Whereas the EU-trend decreased between 2010 and 2016, Bulgaria had an increase in the same period in the share of young farmers. Also, the ratio of young managers to elderly increased over time. 34% of the young farmers are women in 2016, which is the highest share in the EU.

Entrepreneurs in agricultural sector have high degree of rationality for decisions regarding purposefulness, analysis and decision-making, autonomy of intent for action, clarity, logic and consistency in actions and relatively less rationality in prediction of consequences and capabilities for implementation of plans of business activities and their adaptation to different circumstances (Taneva et al., 2019). The same study confirms the satisfaction of the entrepreneurs with the profit accrued and that they evaluate their success in the future as highly probable.

Yet, the net entrepreneurial income in Bulgaria is just 1% of the EU28 total (Toteva, 2019). Similar is the situation in Croatia, Latvia, Romania and Slovenia (Figure 7). However, if we look at the agricultural entrepreneurial income per worker from the perspective of average wages in the whole economy (based on EUR/working hour), then the ratio of 83% of the average wage of the economy between 2005 and 2018 is pretty competitive. This share ranges from 116% in 2008 to 68% in 2010 and it is above the EU-average. At EU level, the gap between the agricultural income per worker and the average wage in the economy seems to be closing over time.

New firms emerge in all NUTS III regions in Bulgaria with relatively more new firms in Sofia-city (15% of all new firms in the last three years), Plovdiv region (8%), Dobrich (6%) and Varna (5%). Location decisions for new firms are influenced by various factors – the place of residence of the major entrepreneur, access to transactional services, eligibility requirements for specific schemes (where the entrepreneurs would like to apply) and others.

The bulk of new firms in 2016-2018 represent niche production – snails, bio-fertilizers from California worms, lavender, new construction materials based on mushrooms and straw, etc. Snails have been used to produce bio-medical products in Bulgaria and export to Italy as food. There are lots of Italian investments in small snail farms (more than 20 firms only in 2018). Altogether there are more than 200 snail farms in Bulgaria.

Similar to other sectors, the academic entrepreneurship in the agri- and biotech sectors leads to important innovations. Alex 1977 is a family firm established in late 2011 by a researcher from the Bulgarian Academy of Sciences producing and exporting cosmetics and nutritional products based on snail slime. Alex 1977 (www.goldensnails.com) sells in 11 countries of the European Union and has received numerous prestigious awards among which are the National Innovation Award in 2015 in category Quality of Life of the Applied Research and Communications Fund and Pitagoreus Award of the Ministry of Education and Science and Ministry of Economy for R&D in private business. There are many other firms owned or co-owned by researchers from Bulgarian academia, which would commercialize the research and will sell innovative products for bio-protection, vet medicine

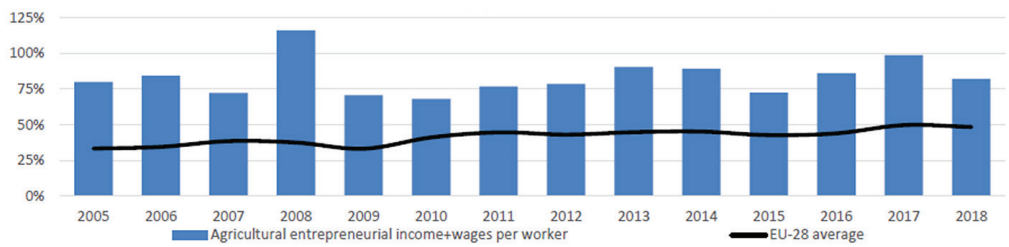

Fig. 7. Agricultural entrepreneurial income per worker compared to average wages in the whole economy
Source: DG Agri – Eurostat, Analytical factsheet for Bulgaria: Nine objectives for a future Common Agricultural Policy, 2019

(i.e. bee veterinary products by Primavet, which received the 2010 National Innovation Award in the category of small firms). Other firms like Bultech 2000 from Stara Zagora (also holding the National Innovation Award for 2015 in category market leader) are leaders in specific niches, like automation and quality control producing apparatus for diagnostics of quality of milk (market leaders in India). Since the EU accession we observe an interesting trend – IT and other high-tech entrepreneurs would become multipreneurs by investing extra effort and finances in agriculture or related services (i.e. drones for agricultural/forestry use).

In the final production in agriculture in 2018, the largest share was of crop production – 68.3%, followed by the livestock with 23.5%, agricultural services – 5.9% and other inseparable non-agricultural secondary activities – 2.3%. The intermediate consumption used to generate the final production in the industry in 2018 amounted to 2 451.2 million euro or 56.7% of the total production value (MAFF, 2019).

Compared to previous year, there was an increase in feed consumption by 23.3 million euro (4.8%), of agricultural services with 18.6 million euro (7.8%) of plant protection products and pesticides by 19.8 million euro (12.9%), of the fertilizers and soil improvers by 28.4 million euro (14.1%), of the costs for maintenance and repair of machinery, small inventory and buildings amounting to 19.4 million euro in total (8.5%), fuels and oils by 46.1 million euro (8.2%) and veterinary expenditure by 6.7 million euro (5.5%). A decrease was observed in the consumption of seeds and seedlings by 7.4 million euro (-7.4%) (MAFF, 2019).

Companies in the agriculture sector increase their turnover faster than the inflation in the country. For the period 2010 – 2018 the inflation measured at the end of the year is 9.9% and the growth of the average turnover is 41% and the growth of the median turnover is even higher – 76%. There is a high volatility of the maximum turnover in the sector through the years with the peak in 2012 realised by a small firm, which has never made it up to top 100 firms in the sector and with persistent problems with tax authorities and creditors (Figure 8). Among the top companies are the regional state enterprises responsible for the forests and specialized hunting areas and the top four private firms – Zarneni hrani, Milenium 2000 (part of the largest poultry producer Gradus), Zlatia Agro and Ayax 1. Growth of companies follow very different strategies in terms of size. While the average assets grew by 28% from 2011 to 2018, the median assets grew only with 5%, which is lower than the inflation rate for the period (Figure 9). This suggests that smaller firms have been decapitilised while larger firms grew substantially (the growth in the maximum assets is more than three times). Of course, newly established firms as a rule come up with

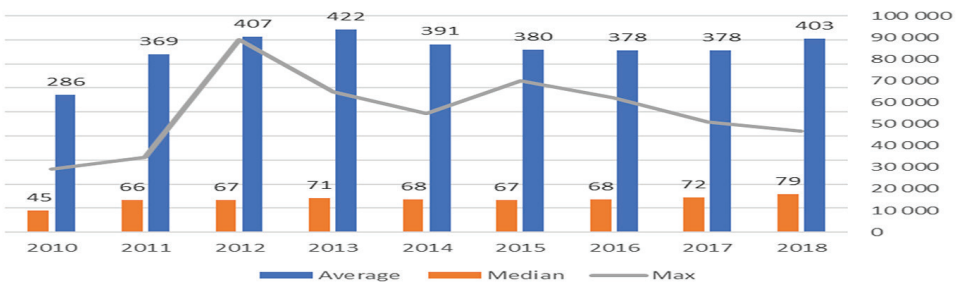

Fig. 8. Total operative revenue for firms in agriculture sector (thousand euro)
Source: BvD Orbis, 2019

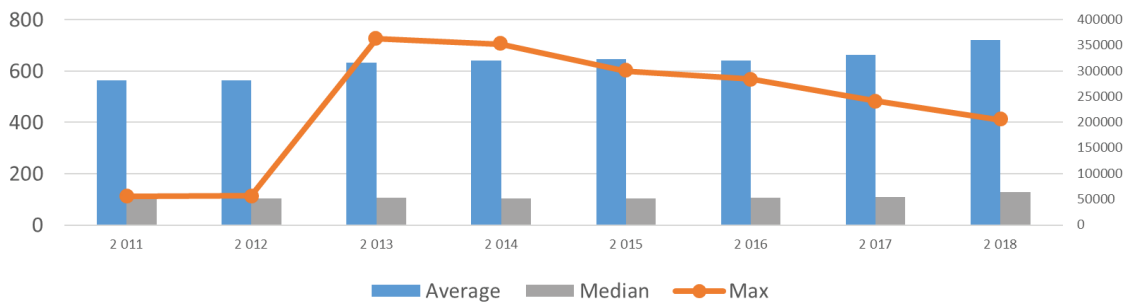

Fig. 9. Total assets in companies in agricultural sector (thousand euro)
Source: BvD Orbis, 2019

less capital (including because of the decrease in minimum required capital for firms), thus holding the medium assets to grow slowly. Other studies find links of the growth of food processing industry with the growth of agriculture production despite the increased imports of resources for the food industry (Vladimirov, 2016).

Similar trends are observed in employment statistics. The average employed in the sector remains almost unchanged through the years, with the only exception of 10 in 2013, and median employed being 3. The largest employers are the state owned enterprises in the sector – the six regional forest companies and the Irrigation system (all of them with more than 700 employed and the maximum being over 2000 by the Southcentral state enterprise).

The top 10 private enterprise employ on average 261 persons with the minimum being 200 and the maximum 373 in 2018. The top 100 private employers have an average 123 employees. There are 791 private companies which employ more than 20 people. On average they employ 43 people. The employment here refers to full-time equivalent reported by companies.

A recent study of firm-level competitiveness (Bachev, 2017) by interviews with managers focused on three pillars of competitiveness – efficiency, adaptability and sustainability. More than half of the farms have a good (on a scale of high, good and low) productivity, profitability and financial availability, which is a significant improvement from the study of competitiveness of farms in 2002 (Vladimirov et al., 2003). The worse situation is observed in sectors grazing livestock and pigs and poultry (100% low productivity, profitability and financial availability), followed by individual farms with between 45% and 62% of cases with different low measures of efficiency. More than a third (36%) of all farms have low levels of profitability (Bachev, 2017). Hard data suggest that 23% of agricultural firms have operated at loss in 2018. And 8% of them operated at loss for two consecutive years (2017 and 2018).

The most productive firms (according to their own self-evaluation) operate field crops and mix crop-livestock. Productivity increases by different measures: physical production per hectare of arable land, physical production per employee, total revenues per arable land (including due to the direct payments and not only because of market prices), total revenues per employee, reducing costs per arable land, etc. The increase of productivity compared to 1990s is also due to improved access to finance for farmers and availability of insurance, which allowed them to invest and modernize their equipment and warehouses in case of vertical integration.

There is a 35% increase of nominal operating revenue (turnover) per employee in the sector in the last nine years. During the same period the cumulative inflation is 9.9%, which suggests a decent improvement in labor productivity in the sector. In the last five years there was a slight increase of 3% in profitability of companies to an average of 47 thousand euro in 2018 (Figure 10).

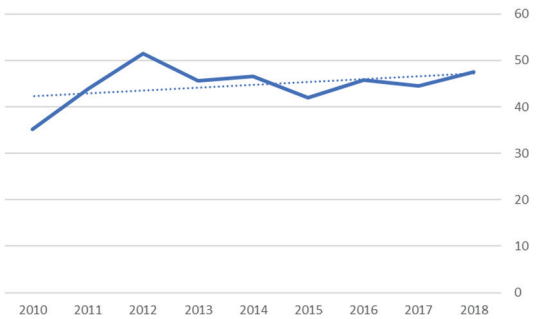

Fig. 10. Operating Revenue per employed in agriculture (thousand euro)
Source: BvD Orbis, 2019

Bachev (2017) suggests that firms (incorporate according the Commercial code) have higher (subjective) productivity than cooperatives and physical persons. Firms generated 45 thousand euro on average per employed in 2018 while cooperatives generated 38 thousand euro. Analysis of variance test for difference suggests that firms' productivity is higher than cooperatives in 90% interval (coefficient of significance 0.071). Yet, there is no significant difference in terms of profit as a share of operative revenue and return on assets. Further analysis suggest that higher productivity of cooperatives might be because bigger companies are more productive.

Unlike Switzerland and Scandinavian countries, Bulgaria was not able to grow successful cooperatives. Out of around 3000 cooperatives established after 1989 (Bachev, 2017) only around 800 survived. The cooperatives as social enterprises could be used for leveling-up against the negative trends of over-concentration of cultivation of land, farms and subsidies.

The overall level of competition in the market is given by the Herfindahl-Hirschman index of concentration of economic activities. Theoretically, the level of competition slightly increases since 2010 as the HHI is low enough and still decreasing to suggest a competitive sector (Figure 11). However, as other studies showed higher real concentration is achieved through complex ownership structures (Stefanov et al., 2015). The sector is characterized with high concentration of receivers of subsidies. In the study by Ivanov (2020) the Gini coefficient of subsidies is estimated between 0.831 (in 2013) and 0.726 (in 2017). Our estimate for Gini for the next year (2017/2018) is 0.831 and for 2018/2019 it is

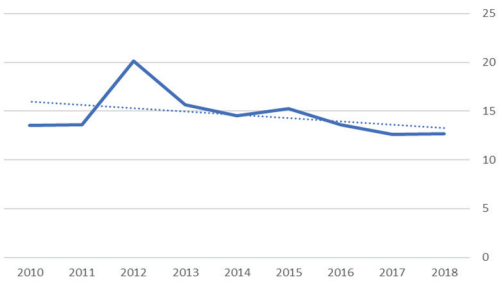

Fig. 11. Herfindahl-Hirschman index of agricultural sector
Source: BvD Orbis, 2019

0.835. We cannot say whether there is a change in the trend or there might be calculation issues due to limitations of the available datasets in different years. For robustness checks we calculated Gini coefficients in several ways: based on all readable entries (totals), based on some aggregations (only for companies or for all persons in a given municipality and region) or even aggregations of companies with the same ultimate beneficial owner/family, with or without the amounts remaining in the State Agricultural Fund, etc. The difference in all Gini coefficients were around 0.01, which is not big enough to reverse the trend. We don't have access to the data used in Ivanov (2020), but if we compute Gini coefficients for 2007 based only on reported size groups, we achieve higher number in 2017. The reported Lorenz curve in Figure 12 is for aggregated subsidies based on ultimate beneficial owner for the top 10 recipients of subsidies and aggregated subsidies based on unique name within each municipality.

Higher concentration (proxied by the share of direct payments received by the top 20% beneficiaries) is observed in Hungary, Estonia, Portugal, Czech Republic and Slovakia (European Commission, 2017).

The Gini coefficients calculated based on operating rev-

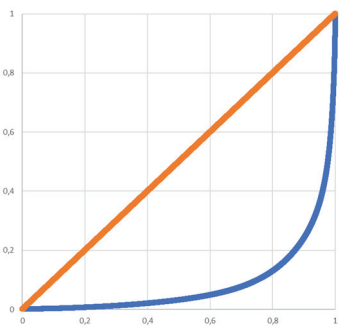

Fig. 12. Lorenz curve for agricultural subsidies for 2017/2018
Source: State Agricultural Fund

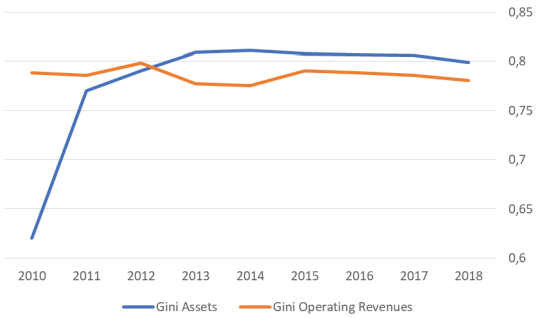

Fig. 13. Dynamics of Gini coefficients of operating revenues and assets
Source: BvD Orbis, 2019

enues between 2010 and 2018 suggest slightly decreasing (improving) linear trend, but with very low coefficient of 0.0006. The maximum is 0.798 in 2012 and the lowest is 0.775 in 2014. Yet, even the minimum value through the period is high enough for the sector. Even more alarming is the fact that Gini on assets is higher (since 2013) than Gini on revenues (Figure 13).

Conclusions

The 30 years of transition to market economy transformed the production structure of Bulgarian agriculture. Bulgaria currently (2014-2018) produces more maize (43% growth), sunflower seed (356% growth), wheat (28% growth) from the top 10 crops in 1985-1989. Rapeseed and pepper (piper spp.) made it to the top 10. The highest decline among the top cultures before the start of transition is observed in growing apples (87% decline) and tomatoes (83% decline). The same trend is observed in most of vegetables and fruits production (declining) while grain production is increasing, mainly due to the way agricultural subsidies are being provided (single area payments). The scheme also contributed to high concentration of subsidies (one of the highest in EU28) and farms (both in terms of cultivated land and in total assets of farms).

On the positive side, despite that the agricultural entrepreneurship is at very low levels it is competitive and newer companies are more efficient, partially because they enter as value chain entrepreneurs, not just producers of agricultural goods. Entrepreneurial income and labor productivity are steadily improving, however still important income and productivity gaps exist with the other EU member countries. Policymakers should support academic entrepreneurship in general and in particular in agricultural sector, as it could further increase the value added of start-ups in the sector as well as achieve higher agricultural productivity through

innovative plant biotechnology (Atanassov & Batchvarova, 2002). CAP interventions in Bulgaria should be shaped to provide more sustainable development and not just favor the top 5% recipients of direct payments. National agricultural policies should reverse the tendency of concentration and inequality in the sector. Although the paper did not focus on other transition countries and did not analyze the Common Agricultural Policy of the European Union it seems that intervention on union level is needed to overcome the negative tendencies of inequality.

Acknowledgement

The paper is an outgrowth of a research project "Strategic partnership for AGRI-entrepreneurship and EcoInnovation", agreement n°2019-1-BG01-KA203-062284AGRI-ECO, funded by the European Erasmus Programme, Key Action 2 "Cooperation for innovation and the exchange of good practices, Strategic partnerships in the field of education, training and youth". Earlier version of the paper has been included in the project deliverable Intellectual output I "Country cross-analysis of diversity of needs and characteristics" on behalf the project partner Center for Research and Analysis (www.cra-bg.org).

References

Atanassov, A. & Batchvarova, R. (2002). Challenges in front of the Bulgarian plant biotechnology. *Biotechnology & Biotechnological Equipment*, *16(2),* 21-25.

Bachev, H. (2008). Production and productivity of Bulgarian agriculture in post war years. MPRA Paper, 7787. München.

Bachev, H. (2017). Competitiveness of farming enterprises in Bulgaria. *Annals of Agricultural and Crop Sciences*, *2(2),* 1029.

Bachev, H., Ivanov, B., Toteva, D. & Sokolova, E. (2017). Agrarian sustainability in Bulgaria – economic, social and ecological aspects, *Bulgarian Journal of Agricultural Science*, *23(4),* 519-525.

Csaki, C. (2020) Land reform and agroprocessing privatization in Bulgaria. *Társadalom és gazdaság Közép-és Kelet-Európában/ Society and Economy in Central and Eastern Europe*, 22(1), 87-105.

Csaki, C. & Jambor, A. (2019). Convergence or divergence – Transition in agriculture of Central and Eastern Europe and Commonwealth of Independent States revisited. *Agricultural Economics*, *65(4)*, 160-174.

Csaki, C., Nash, J., Fock, A. & Kray, H. (2000). Food and agriculture in Bulgaria : the challenge of preparing for EU accession (English). World Bank technical paper; *no. WTP 481.* Europe and Central Asia environmentally and socially sustainable development series. Washington, D.C. , The World Bank.

European Commission. (2017). Report on the distribution of direct payments to agricultural producers (financial year 2016).

European Commission. (2019). European Union: Agriculture Statistical Factsheet.

Eurostat. (2018). Farms and farmland in the European Union – statistics. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Farms_and_farmland_in_the_European_Union_-_statistics#Farmland_in_2016

Fertő, I. (2016). Structural transformation in Central and Eastern European countries' agriculture: Convergence or Divergence? *Advances in Economics and Business*, *4(10),* 547-552.

Ivanov, B. ed. (2020). Analysis of the State of Agriculture and Food Industry (Analiz na sastoyanieto na selskoto stopanstvo i hranitelnovkusovata promishlenost). Institute of Agricultural Economics, Agricultural Academy, Sofia. (Bg)

Kaneva, Kr. (2016). Efficiency and productivity of Bulgarian farms. *Bulgarian Journal of Agricultural Science*, *22*, 176-181.

Lerman, Z. (2000). From common heritage to divergence: why the transition countries are drifting apart by measures of agricultural performance. *American Journal of Agricultural Economics*, *82(5),* 1140-1148.

Lerman, Z. (2001). Agriculture in transition economies: from common heritage to divergence. *Agricultural Economics, 26(2),* 95-114.

Marx, K. (1904). A contribution to the critique of political economy. CH Kerr.

Ministry of Agriculture, Food and the Forestry. (2019). Annual Report on the State and Development of Agriculture.

Stefanov, R., Yalamov, T. & Karaboev, S. (2015). The Bulgarian public procurement market: Corruption risks and dynamics in the construction sector, Barbara Budrich Publishers, Opland-en-Berlin-Toronto.

Taneva, T., Naydenova, N. & Genova, P. (2019). Economic rationality of agricultural entrepreneurs in Bulgaria, In: *Trakia Journal of Sciences*, *Volume (17), Suppl. (1)*, 577-585.

Toteva, D. (2019). Assessment of economic sustainability at national level (Otsenka na ikonomicheskata ustoychivost na natsionalno nivo), In: Bachev, H., Koteva, N., Mitova, D., Ivanov, B., Chopeva, M., Panteleeva, D., Sarov, A., Sokolova, E., Todorova, K., Mitov, A. & Vanev, D. *Sustainability of Bulgarian Agriculture (Otsenka na ustoychivostta na balgarskoto selsko stopanstvo),* Institute of Agricultural Economics, Sofia. 14-15. (Bg)

Vladimirov, Zh. (2016). Status and development of Bulgarian food industry after (2006Sastoyanie i razvitie na balgarskata hranitelno-vkusova promishlenost sled 2006 g.). Annual of Sofia University "St. Kliment Ohridski". Faculty of Economics and Business Administration, *Volume 13*, 5-45. (Bg)

Vladimirov, Zh., Katsarski, I., Simova, A., Malamova, N., Rakadjiiska, T., Harizanova, O., Vuteva, S. & Kopeva, D. (2003). Competitiveness of farms in Bulgaria (Konkurentosposobnost na zemedelskite stopanstva v Bulgaria), Sofia University "St. Kliment Ohridski, Sofia. (Bg).

Received: May, 11, 2020; *Accepted:* May, 19, 2020; *Published:* October, 2021