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ORCID: <https://orcid.org/0000-0001-8060-1970>**ECONOMIC SECURITY SYSTEMS OF AGRICULTURAL HOLDINGS IN UKRAINE IN CONDITIONS OF SUSTAINABLE DEVELOPMENT**

**Abstract.** Agricultural holdings have a great influence on economic and food security at national and global levels. Thus, it is necessary to study their own systems of enterprise-wide risk management. The article aims to determine the characteristics of the economic security systems at agroholdings in Ukraine and to reveal the development state of these systems by functional components. The study uses the following methods: semantic-structural, comparative and statistical analysis (in research of the components of the economic security of agricultural holdings); description, diagnostics of components of the economic security system; tabular and graphical (diagrams) - for visualization of research results and statistics systematization. The analysis of existing systems of economic security in agroholdings with assets in Ukraine is carried out. For further analysis, the 5 largest agroholdings of Ukraine were selected - with different financial status, scale of production, presence on international stock exchanges, that met the criterion of geographical representation (activity covers several regions of Ukraine) and availability of consolidated (including financial) information: Avangard, Agroton, IMC, Kernel and MHP. The general description of the companies and the history of activity are given. The information on the companies' status by the components of the economic security system is summarized: personnel, political and legal, information, production, physical, market, interface security. The main characteristics of risk management systems of the five largest agricultural holdings of Ukraine are revealed, activity indicators are presented and their strategies are summarized. It is found out that the activity of agroholdings in the aspect of the enterprise economic security is fragmented and in fact, an integrated system is not yet formed. It is recommended to consider economic security as a comprehensive concept, to introduce appropriate units, or to involve specialists for the formation and development of holistic independent self-sufficient economic security systems in each agricultural company.

**Keywords:** agroholdings, agrocompanies, agrocorporations, economic security system, strategy, component, risk management

Formulas: 0; fig.: 1; tabl.: 8; bibl.: 45

**JEL Classification:** M21, Q13, G3

**Introduction.** Large agro-industrial formations, agrarian holdings are the largest and most influential representatives of modern agribusiness both in the world and in Ukraine. These market operators play a significant role in shaping activity conditions, influencing food security and agricultural policy. In Ukraine, they are the largest exporters in almost all product categories, but are generally not the largest taxpayers.

**Literature review and the problem statement.** Agricultural holdings of Ukraine, Kazakhstan, Russia, Brazil, USA, Argentina, etc. in some way were covered in scientific publications [Babenko, Sidorov, Savin 2018; Czyżewski, Matuszczak, Miśkiewicz 2019; Drozd et al. 2019; Drozd et al. 2020; Dzwigol 2019; Dzwigol 2020; Dzwigol et al. 2020; Dzwigol, Dźwigoł-Barosz, Kwilinski 2020; Dzwigol, Dzwigol-Barosz 2020; Fairbairn 2014; Hermans, Chaddad, Gagalyuk, Senesi, Balmann 2017; Kravchuk, Neboha, Reyes; Ren et al. 2019; Miśkiewicz 2019a; Miśkiewicz 2019b; Miśkiewicz 2019c; Miśkiewicz, Wolniak 2020; Saługa et al. 2020; Sumner 2014]. However, as a new object of study, they are insufficiently studied, and the aspect of economic security is usually not considered.

In view of the above, the purpose of the article is to provide a description of economic security systems of agricultural holdings and the state of their development.

Consideration of agricultural holdings' system of economic security in general should be carried out according to functional components (parts) given in [Dub 2016, p.14]. First, we analyze the state of existing systems of economic security (ES) of agricultural holdings by the following parameters: characteristics of companies, history of agricultural holding; description of the ES system; personnel, political and legal, information, production, physical, market, and interface components; strategy.

The financial component (financial condition and economic indicators) has already been considered in more detail in [Dub 2019] article, as most troubled agricultural holdings have financial problems, and all bankruptcies began with insolvency.

First, we have to define terminology used in this study. We consider concept of enterprise (-wide / total / integrated) risk management (ERM) framework as equivalent to enterprise economic security system. Further in this paper these terms are used as synonyms.

Methods of collecting data on the existence of enterprise economic security system (EESS) are surveys or analysis of public sources. Large agricultural companies are extremely closed, almost all information is considered confidential, the disclosure of which can cause certain losses – material or reputational. Even consolidated financial statements are often submitted late, as companies received warnings from the Warsaw Stock Exchange about the temporary suspension of shares trading in the companies that submitted reports late (exactly until all the information has been provided).

Methods for calculating the economic effect of the corporate risk management system introduction are aimed at determining the savings of capital and time by the results of this system, i.e. ex-post-facto. Agricultural companies of chosen sample do not have EESS (in MHP in March 2017, the office confirmed that there is not even a department, the system is reportedly created in late 2018 – early 2019); the rest of the agroholdings, which have the position of risk management director (on public websites this is mentioned in only three of 115 – Kernel, Agroprosperis and IMC, Table 1) and it is assumed that a certain system operates, do not disclose to external users the information required for analysis (year of system creation, etc.)

Therefore, for empirical studies of EESS, calculation of their effectiveness or the degree of impact on the market value of agricultural holdings there is lack of necessary data. In view of this, it was decided to follow an alternative approach – the analysis should not be based on survey results, but on processing data available to public access – sites of agricultural companies themselves (hereinafter, unless otherwise indicated), reports for shareholders, information from stock market screeners, knowledge panel

Google Business Listings and Yahoo Finance, databases of Bloomberg, Reuters, financial reports from the website of Stock market infrastructure development agency of Ukraine (SMIDA), etc.

**Table 1** - Positions in the organizational structure of agricultural holdings, the responsibility of which includes guaranteeing economic security / risk management

Kernel	Agroprosperis	IMC
The Director of Security is responsible for the information, economic and general security of assets and representative offices	Director of the Economics and Risk Management Group. Responsibilities "include the identification, analysis, assessment and minimization of risks arising on the way to the Group's commercial objectives"	Deputy Director General for Internal Control and Risk Management

**Source:** author's design using data about management from corporate sites [Kernel 2020, Agroprosperis 2020, IMC 2020]

Search of data for qualitative assessment of the ES system of agricultural holdings was carried out by key terms "economic security", "risk management", "risks", "enterprise risk management", "ERM" in Ukrainian, English, Russian; the financial statements for quantitative analysis contained a balance sheet, income statement and cash flow statement.

**Research results.** For further analysis, five corporations were selected: Avangard, Agroton, IMC, Kernel, and MHP (Table 2). The criteria for selecting companies were geographical representation (activities in different regions of Ukraine) and information accessibility (including financial statements, reports for investors, data on risk management systems).

Three agroholdings of the sample by the land bank size are simultaneously included in the ranking of the top 35 largest landowners in the world in 2017: Uklandfarming (Avangard is part of it), Kernel, Myronivskyi Khiboproduct. In addition, according to various ratings of management quality, reputation, etc. these companies are usually leaders.

Comparing the largest foreign and domestic agricultural holdings, we must state: foreign agricultural companies act similarly to domestic in terms of coverage of EESS information - information is very rarely covered, available only in public companies and is usually general and descriptive.

**Table 2** - General characteristics of agricultural holdings in sample

Company name	MHP / Group of companies PJSC "Myronivskyi Khiboproduct" / MHP S.A./S.E.	Agroton Public Ltd.	Avangard/ Avangardco	Kernel / Kernel Group	IMC (previously - Industrial milk company) / IMCompany
Established	1998	1992	2003	1995	1998
Specialty	agro-industrial holding	agro-industrial holding	agro-industrial holding	agrotreader	agro-industrial holding

Land bank, thousands of ha (September 2019)	370	110	*Ukrlandfarming total - 500	550	123,9
Owner	Y. Kosiuk	Y. Zhuravliov	O. Bakhmatiuk	A. Verevskyi	O. Petrov
Regions (oblasts)	Crimea, Kyiv, Cherkasy, Sumy, Dnipropetrovsk, Vinnytsia, Donetsk, Poltava, Kherson, Ivano-Frankivsk	Luhansk, Kharkiv	14 regions	Ternopil, Odesa, Mykolaiv, Kirovohrad, Cherkasy, Poltava, Sumy, Chernihiv, Kharkiv, Dnipropetrovsk, Khmelnytsky	Poltava, Chernihiv, Sumy
Managing company, non-resident	MHP S.E	Agroton Public Limited	AVANGARDCO IPL as part of Uklandfarming PLC	Kernel Holding S.A.	IMCompany
Companies in the group / Subsidiaries	25	14	28	51	5
Own brands	Chicken meat "Nasha Riaba" Frozen meat products "Lehko!" Meat products: "Bashchinskyi" Foie Gras "Certified Angus" "Druzhiba narodov"	food products under its own brand	Eggs: "Kvochka", "Kvochka domestic", Organic Eggs Dry egg products: Imperovo Foods	bottled sunflower oil TM "Shchedryi Dar", "Stozhar", "Chumak Gold"	n/a
Own brands	"Europroduct", Qualiko, Ukrainian Chicken, HoReCa Select, Sytnyi riad, Aro, Ashan, Kozhen den, Assilah, Sultanah, Chateau Galicia, fast food chains "Kryla"				

**Source:** author's design using data from official websites of companies; [Latifundist 2020, Simplywal 2020; Infographics guide "Agribusiness in Ukraine" 2014-2018]

According to foreign companies, traditional risk management (RM) practices are applied at Olam International Ltd. (at least since 2013), El Tejar have the position of risk



analyst; as of 2019, CPC Consolidated Pastoral Company PTY Ltd had a risk management system that included a risk management policy and plan, as well as registers of strategic and tactical risks. The RM plan defines procedures and requirements for monitoring and reporting. In February 2019, AACo published a risk management policy containing provisions on acceptable risk size (Risk Appetite Statement), description of the RM system, compliance, risk register, Board philosophy of the RM, roles definition and responsibilities division between the Board, Audit Committee and RM, management, risk and compliance managers. Cresud has been practicing General Risk Management (ERM) since 2019. Business description and history, activities, production component.

AVANGARDCO IPL is one of the largest agro-industrial companies in Ukraine, specializing in the production of eggs and dried egg products. It is part of the UkrLand-Farming Group of companies. It is the largest exporter of eggs and dried egg products from Ukraine. The company exports its products to more than 40 countries, mainly to the Middle East, Africa, Asia, the CIS and the EU. In the domestic market, the company supplies products to supermarkets and retail stores, wholesale buyers and industrial customers throughout Ukraine. The number of laying hens is in the TOP-20 in the world. A unique feature of the vertically integrated business model is the processing of animal waste into valuable raw materials - biogas, thermal energy and electricity. In 2014, the activities of 7 poultry farms were closed and depreciated, in the following years they agreed to restructure the debt and extend the circulation of eurobonds (in October 2015 in the amount of 200 million US dollars and change the circulation from October 2015 to October 2018). In 2016, the Avis poultry complex was certified according to the ISO 22000: 2005 standard (Food Safety Management System).

In 2017 the company began comprehensive negotiations on the restructuring of credit obligations with most Ukrainian and foreign creditors. 2017-2018 - UkrLand-Farming company has engaged independent reputable financial experts to analyze the possibility of servicing credit obligations. The analysis showed the need to discount foreign currency debt at 50% with the payment of other liabilities over the next 10 years.

AVANGARDCO Group of companies has been certified according to the international standard ISO 9001: 2015, which sets requirements for quality management systems in the organization. Company operates with land bank for almost 500 thousand hectares, 18 meat processing plants, 2 tanneries, 6 seed plants, 6 sugar factories, 3 elevators for 645 thousand tons, 4 granaries, 110 horizontal storages, a herd of cattle 65 thousand heads, 24 million chickens, 19 poultry farms, 3 breeders, 9 young breeding areas, 6 feed mills, 3 long-term egg storage warehouses, Imperovo Foods egg processing plant, Avis poultry farms, and the biogas plant that has been operating since 2017.

**Table 3** - Production component

Course	Kernel	Ukrlandfarming	MHP
Production	405 K ha	650 K ha, 12 clusters 125 livestock farms Eggs Avangardco IPL Meat Ukrmiaso	320 K ha 5 poultry farms 4 pig farms 2 livestock farms 2 hatching farms
Storage: Capacity, million tons	2,6	2,6	1,5

Logistics	40 elevators, 2.8 million tons 1 oil terminal in Mykolaiv 2 grain terminals Oil terminals: "Oiltransterminal" (Mykolaiv) "Grain terminal complex Taman" (Russia) Grain terminal "Transbalkterminal" (Illichivsk)	17 elevators 1.6 million tons capacity 500 trucks Logistics operator: "Rise"	9 elevators 1.1 million tons capacity 450 trucks-refrigerators
Trade	Trading Operator: "Kernel Trade"	Trade operator: ULF Trade AG 25 distribution centers 53 warehouses	11 distribution centers 2600 franchise shops
Processing (production capacity)	Oil extraction factories: 7 in Ukraine, 3 in Russia	6 sugar factories 19 meat processing plants 19 poultry farms 6 feed mills 5 seed plants 2 tanneries	3 meat-packing plants 4 feed mills 2 poultry farms 1 biogas station

**Source:** author's design using data from [Infographics guide "Agribusiness in Ukraine", 2015-2017]

Agroton is a large diversified vertically integrated agricultural producer. Company operates in crop production: growing, processing, storage and sale of grain, oil fodder crops (sunflower, wheat; rapeseed, barley, corn, rye, sorghum, triticale, oats, peas, millet, coriander, soybeans, flax), stockbreeding (poultry, dairy, pig breeding, beef production), food production (bakery, pasta and confectionery, fodder, flour, cheese, butter, honey). Agroton has 5 elevators, 2 mills, oil production plant, feed mill, pasta factory, bakery, 2 poultry farms, 1 livestock farm, 6 pig farms, 2 cheese factories.

IMC was founded in 2007, production activity was started at the same time, but the current shareholders have been developing the business since 1998.

Kernel Group is a vertically integrated group of companies operating in the agro-industrial sector. One of the largest exporters of agro-industrial products and the largest exporter of sunflower oil in Ukraine. In 2017, the assets of Ukrainian Agrarian Investments and Agro Invest Ukraine were acquired.

MHP is the united vertically integrated complex: 20 enterprises, which are combined in production capacities of whole technological chain of poultry farming. The group includes 6 poultry farms and a plant for feed production.

Three main areas of activity include: crop production (growing corn, wheat, sunflower, rapeseed), production of feed and sunflower oil; poultry and related industries (production of chilled chicken, instant products); other agricultural operations (production of fresh premium beef, foie gras, sausages and smoked products, fruit) [Stockworld 2018].

Myronivskiy Khlіboprodukt unites enterprises that specialize in the production of chicken, hatching eggs, feed, cattle breeding and the production of finished products.

Company controls the full production cycle of commercial chicken meat. They grow grain for compound feed production; manufactures feed for its poultry farms for raising parent livestock and poultry meat factories. Due to its own fleet of refrigerated trucks, MHP delivers its products to distribution centers and franchise points in Ukraine.

Let's consider the system of integrated risk management and internal control in the IMC. The risk management process includes the stages of identification, assessment, response, mitigation and monitoring. Information on stocks and production costs, internal control procedures, documentation to ensure acceptable accounting and compliance with legislation are taken into account. An automated accounting system is used and databases are formed to provide the fullest possible protection against human error. In the first half of 2017, the Department of Internal Control and Risk Management was established in the corporate governance structure, which reports to top management and the Audit Committee [IMC S.A. 2018, p.8, 9].

In Avangard's reports also from 2017 there is more consideration of risk in activity; political, operational, market, financial, country risks are considered, risk map is formed. It is stated that the risk management system identifies, measures and responds effectively to most risks within its influence. Most attention is paid to financial risk management: credit, market risks, illiquidity; risks of animal morbidity [AvangardCo 2018, p.84-89].

Kernel has a risk management system with 5 stages: identification, evaluation and prioritization, planning of managers' actions, implementation of actions; measurement, control and monitoring. The principles of the system are as follows:

- take into account the organizational context - the identified risks should correspond to the business, production model, risk management should add value and be an integral part of the organizational process;
- involve stakeholders at all stages of decision-making;
- promote organizational goals - identified risks should reduce uncertainty;
- reporting should provide accurate information and decisions should be made on the basis of the best available information;
- risk management should be a transparent process involving various factors, and stakeholders should be aware of tasks and responsibilities;
- the structure should support the risk management service, and the employees of the service should be dynamic and react to changes in the environment;
- pay attention to indicators of problems early warning, encourage communication and independent solution of challenges at own level of hierarchy;
- the culture of support should be implemented, developed and maintained by asking the right questions, discussions, feedback;
- continuous improvement - to upgrade risk management system on continuous basis.

The Board of Directors reviews and assesses the main risks, and top management team supervises the plans implementation to achieve corporate goals, taking into account this impact. The review takes place at least once a year with audit committee, external independent auditor and top management team. The Board informs stakeholders about results of this review and evaluation in the relevant sections of the annual reports [Kernel Holding S.A. 2019, pp.25-26].

Review of risk management system.

The Board of Directors and management team at MHP view risk management as an integral part of value creation, a process that is consistent with the group's strategy. MHP in 2018-2019 was in the process of implementing COSO and ISO standards. Audit Committee to Board of Directors submits risk reports annually. Until 2016, inclusive, focused activities on integrated risk management were not conducted. Only in 2017 was a separate, specialized department of risks and processes created. Management

is based on algorithm: identification, then assessment of the probability of occurrence and potential financial and non-financial impacts, and for significant risks, response plans are developed and implemented [MHP LSE 2018, p.49].

The Audit Committee monitors the effectiveness of risk management and control systems, using reports, risk appetite, risk maps [MHP Semi 2018, p.77]. Company uses OHSAS 18001 [p.69] and HACCP standards [p.78, health and safety, p.71].

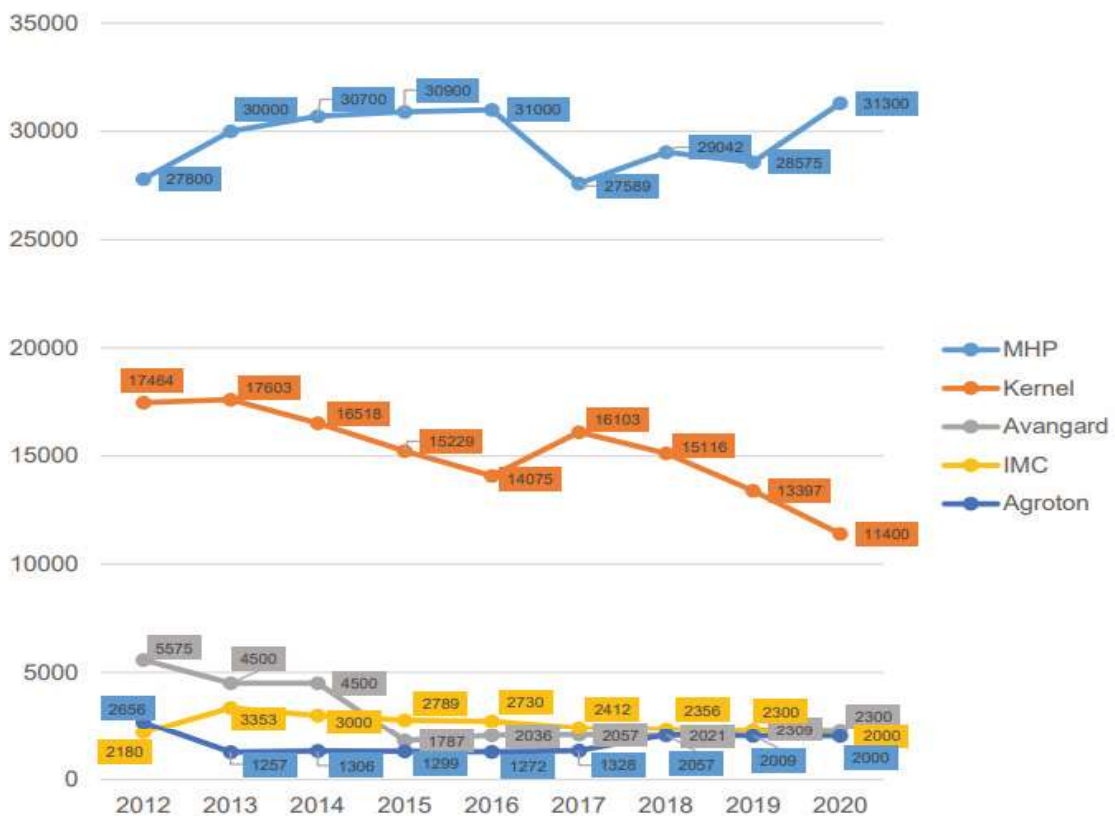
On December 27, 2017, the MHP head office was re-registered from Luxembourg to Cyprus [MHP Corporate Governance Charter 2017, p. 1].

Agroton’s risk management system focuses exclusively on the financial component, considering credit, liquidity, market (including losses from exchange rate differences and interest payments) and operational risks [Agroton 2017, p.77]. Internal auditors analyze the risks of errors or fraud in financial statements [Agroton 2020, p.11].

Personnel component.

In order to understand how large the agroholdings of the sample really are and to determine how they are growing, the number of staff (full-time and part-time, excluding temporary workers) by years was analyzed (Figure 1).

The largest number is in MHP, then in descending order - Kernel, IMC, Avangard and Agroton. The information is given as of the end of the respective financial / marketing year, which coincides with the calendar year in all agricultural holdings, except Kernel. Kernel generates reports by the operating cycle, financial / marketing year lasts from June 30 to June 30. It is worth noting that the data on employees’ number in companies’ annual reports for investors and information of stock market screeners are approximately the same, usually coincide, or differ slightly.



**Figure 1** - Number of employees in selected agroholdings in 2012-2020

**Source:** author's design using data from Bloomberg, Simplywal.st, Smida



At the same time, in official reporting for Ukrainian regulatory authorities (PJSCs are reflected in SMIDA), namely in the balance sheet (statement of financial position) in the column Average annual number of employees there is a huge discrepancy in numbers (Table 4). To clarify it is necessary to unify counting and still keep it for all business units of the group, for all categories of employees (both production and administration), because such differences in data only raise additional questions and doubts among external users of information, including potential and existing investors.

MHP management admits that they have a high turnover of staff, many talented employees leave the company and re-enter the labor market, but already more qualified, with better prospects. The specificity of seasonal work and increasing automation also leaves its mark. In 2017, the number of staff decreased sharply by almost 3.5 thousand persons (by 11%) according to the screeners' data, and in the consolidated reports on SMIDA for some reason this decline was determined by 45%. MHP representatives did not comment on the situation with the data. Nevertheless, even with such indicators, MHP is much higher than the market and sector averages.

**Table 4** - The difference in counting the number of staff according to corporate reports and data published at Smida

Year	MHP in report	MHP at Smida	difference	Avangard in report	Avangard at Smida	difference
2013	27800	27800	-2200	4500	334	-4 166
2014	30000	30200	-500	4500	233	-4 267
2015	30 700	29 923	-977	1787	211	-4 289
2016	30900	30979	-21	2036	799	-988
2017	31000	19100	-8 489	2057	1 077	-959
2018	27 589	19100	-1 042	2057	1 982	-75
2019	29 042	28 000	-575	2300	1 013	-1044
2020	28 575	31 427	127	2300	1 905	-395

**Source:** author's design and calculations using data from official reports, [Smida 2020] and [Market Screener 2020]

Kernel's staff in 2012-2018 did not change quantitatively, there were slight fluctuations. But from 2012 to 2020, the number of employees still decreased by more than 6 thousand people.

IMC hired more employees in 2013 compared to 2012, the company grew. As no further expansion is currently planned, the number of employees in 2019-2020 remained more or less constant.

In 2013, the number of staff at Agroton decreased, in 2014-2016 this number remained almost unchanged, in 2020 the company almost returned to 2012 figures.

The most radical changes in the number of staff took place in Avangard agricultural holding (a decrease of 63% compared to 2012), due to general negative trends within the company - as result of hostilities they lost part of tangible assets, and many workers remained in the occupied territories or annexed Crimea, financial indicators are declining, the company's solvency is also undermined. Although in 2013, before the events of Maidan and war, the number of employees decreased by 1,075 persons (19%), and in 2014, according to the company's employees (texts of public responses), redundancies



and dismissals were carried out. Thus, in 2015 there was a sharp decline in the number of staff by 40% compared to the previous year. This negative indicator confirms unsatisfactory general condition of agricultural holding. In 2016-2018, the number of staff increased slightly, but these figures ranged from 10-11%, the company has not yet recovered in this sense. In 2019-2020, the number remains at one level – 2,300 people.

The number of staff is simple information; it is usually ignored when considering companies. However, this is a good enough indicator to give a brief impression of the company's health, and the personnel policy is in line with the company's plans for the future [Macroaxis 2020].

In 2018, the MHP management published information on the installation of surveillance cameras to monitor the employees' mood. If a person looks unhappy, dissatisfied in the process of work, it leads to further discussions with the line manager. It is said that the unmotivated and dissatisfied are fired. In international practice, any measures to monitor subordinates are considered unethical. If the presence of cameras in warehouses, places of storage of valuables can be explained by a warning against theft, then such measures to monitor the mood seem bizarre.

According to the Korn Ferry ranking of employers in the agro-industrial complex in 2018, Kernel, HarvEast Holding and MHP (among 31 companies) are the top 3 in terms of intangible motivation.

The management and board of directors are described by the indicators of average time spent in office (table 5).

The youngest representatives of Board of Directors (average age 46) are in Avangard and Kernel. At the same time, the Boards in Agroton and Kernel have been operating for the longest time (9.8 and 9.1 years, respectively). Agroton has the oldest board members of the sample, and IMC has the newest Board, which has been operating for less than 5 years. The time spent in the MHP management team corresponds to the industry average. By the way, it was with the gathering of MHP new Board of Directors that the system of integrated risk management began to take shape in 2018, and corporate reports began to focus more on international practices.

**Table 5** - Average time at position and age of managers (1) and Board Directors (2), years

Indicator	Avangard	Agroton	IMC	Kernel	MHP
Time at position	4,7	10,7	4,3	n/d	6,1
	7,3	9,8	4,5	9,1	6,1
Average age	n/d*	n/d*	n/d*	n/d*	54,5
	46	66		46	63

\*n/d - no data provided

**Source:** [Simplywal 2020]

According to the agricultural holdings official websites, all 5 companies have staff development programs, advanced and internal training, cooperate with students, graduates directly and through higher education institutions network.

Political and legal component.

Jurisdiction / headquarters / country of registration of all analyzed companies is Cyprus. Until December 2017, MHP was registered in Luxembourg, but then also re-registered in Cyprus. This is due to the taxation optimization and the actual avoidance of

paying full taxes at the place of business. In Ukraine, three of them are established in the form of public joint stock companies - MHP, Avangard and Agroton. Out of all Kernel subsidiaries, the organizational-legal form of PJSC has Poltava Oil Plant, the representative of management company in Ukraine - company "Burat-Agro" is registered as a limited liability company. In general, the activity in the form of a limited liability company is the most popular among agricultural holdings - until January 1, 2019, in Ukraine they were not required to disclose reports, unlike financial institutions and public joint stock companies. Therefore, only 5 of Latifundist's agroholdings list of 115 companies (Avangard, Agroton, APK-Invest, Ekoprod, Myronivskyi Khiboproduct) were public, and published their annual financial statements on the Smida website by April of the following year.

In regards to legal issues, one can announce the raider seizure of Agroton granaries [Raider attack on the Agroton group of companies]. The company even appealed to the President of Ukraine, but no updates on this issue were covered. Therefore, risk management, in this case protection against raider capture, was not performed at the proper level. This highlights the importance of developing the economic security system in agricultural holding.

Information and interface components in the ES system will be considered in the context of not only cooperation with contractors, but all stakeholders of companies. Kernel and Avangard minimize the risks of cooperation with suppliers and customers through detailed verification of contractors, work with verified customers, through verified sales channels, etc. [AvangardCo 2018; Kernel 2020].

The presentation of information on sampled agroholdings in public access is provided mainly by data from official websites of companies themselves, and corporate reports. The IMC site is the most convenient, key financial indicators, company history, etc. are clearly indicated for investors. Kernel also has a site with the appropriate modern design requirements, but for example, the story is divided into inconvenient pages, in many places included extra flash elements, and so on. MHP publishes both the organizational structure, indicators, and news. But still for the site of the Cypriot office, the data are newer. The Avangard generally lists the most popular elements for corporate sites and has no significant shortcomings. Agroton does not have a Ukrainian-language site interface at all, which is rather strange for a company that has large land assets in Ukraine and reports in accordance with Ukrainian law. The copyright of the site is exhibited in 2010, the latest news for 2016, the regulations on the audit committee of the company do not even change the names of already unemployed directors, but consolidated reports for 2019 are given.

As for the physical component (power security), all agricultural holdings mention mainly protection against theft or petty theft.

Listings on foreign exchanges.

All agroholdings of the sample use several trading platforms to place their securities. Only Avangard is represented exclusively on the London Stock Exchange (Table 6).

**Table 6** - Representation of selected agricultural holdings on foreign stock exchanges

Ticker symbol	Stock exchange	Country	Currency	Date of placement
MHPC	London Stock Exchange	UK	USD	09 May 2008
MHPS.Y	Pink Sheets LLC	USA	USD	09 May 2008

MPQ	Deutsche Boerse AG	Germany	EUR	09 May 2008
MHPC	PFTS Ukraine Stock Exchange	Ukraine	UAH	09 May 2008
MHPCL	BATS 'Chi-X Europe'	UK	USD	09 May 2008
IMC	Warsaw Stock Exchange	Poland	PLN	04 May 2011
IM4	Boerse-Stuttgart	Germany	EUR	04 May 2011
0Q9Z	London Stock Exchange	UK	PLN	04 May 2011
KER	Warsaw Stock Exchange	Poland	PLN	23 November 2007
0Q9Y	London Stock Exchange	UK	PLN	23 November 2007
AVGR	London Stock Exchange	UK	USD	04 May 2010
AGT	Warsaw Stock Exchange	Poland	PLN	14 July 2011
0QH1	London Stock Exchange	UK	USD	November, 2010
	Frankfurt Stock Exchange	Germany	EUR	2010
	Frankfurt Stock Exchange	Germany	EUR	November, 2009

**Source:** [Simplywal 2020]

The use of stock exchange instruments to raise capital began in 2008 (MHP was the first to go public). On May 4, 2011, the Warsaw Stock Exchange began calculating a separate index WIG Ukraine, the basket of which includes shares of Ukrainian companies with free-float not less than 10%. At the beginning of 2019, it included 5 companies exclusively from agribusiness: Agroton, Astarta, IMC, Kernel and Ovostar. Initially, for agricultural companies, listing was a means of confirming and strengthening financial security. However, the need for payments on bonds and depository receipts for some companies becomes a source of insolvency risks.

Overall rating from traders: Avangard securities are overvalued and the balance sheet contains alarming data; Kernel - the stock price is fair, moderate growth potential; IMC - good price, excellent financial condition; MHP - high growth potential, good price, there is a payment of dividends; there is no information about Agroton [Simplywal 2020]. Each sample agricultural company seeks to achieve leadership in its segment, maximize profits and land assets and accordingly forms development goals (Table 7).

Avangard Agroholding's strategy is announced on the company's website: "We strive to become a producer of eggs and egg products number 1 in the world." Implementation of the strategy involves key elements: increase production efficiency (optimize the use of production capacity, increase operational efficiency by increasing the load of new poultry farms, modernization of existing assets, introduction of modern technologies in

production), diversification of sales to increase profits, increase exports of eggs and egg products; maintaining high product quality (continue to comply with relevant Ukrainian and international quality standards, including ISO 9001:2015, ISO 22000:2005, FSSC 22000), adherence to best business practices, attracting highly qualified employees to company and ensuring their continued maintenance”.

**Table 7** - Market positions of agricultural holdings of the sample

Company	MHP	Avangard	Kernel
Market share, %	Since 2015, it covers about 50% of the market for industrial poultry production; in 2020 - 30.4% of the feed market	In 2008, Avangard became the largest producer of eggs and dried egg products in Ukraine. As of the end of 2017, the company occupies 29% of industrial egg market and 63% of dried egg products market in Ukraine. In 2020 company is the third largest by elevator capacity	10 largest exporters of sunflower oil export almost 75% of the total volume. The share of the market leader, Kernel, is 20%. In 2020, Poltava OZHK is one of the top 5 refined oil producers, 10.1%; second place by elevator capacity

**Source:** author's design using data from official websites of companies; [Infographics guide "Agribusiness in Ukraine" 2014-2020]

Agroton's strategy on the public website is defined as "Becoming a leader in the production of agricultural products in Ukraine" by improving financial performance and activity results, increasing the capacity of granaries, expanding the land bank, use of Western standards of corporate governance. IMC also formulates strategies to expand the agricultural business by increasing the land bank in cultivation and storage capacity, focusing on operational efficiency, crop diversification and selection of the most profitable ones; deepening vertical integration to generate additional income from the processing of agricultural raw materials.

Since the second half of 2016, the chairman of Board of directors at Ukrlandfarming PLC (Avangard's parent company) has been negotiating with Chinese and American investors to sell more than 50% of the company's shares, noting that it is not possible to save the company on its own.

Kernel [2020] aims to double its exports in the 2016-2020 financial years through the efficient use of its asset network, investment in technology and innovation, strategic acquisitions, team capacity development and process improvement. The strategic goals of the agricultural holding are: to consolidate the oil business in Ukraine (although the market share is already 20%), to double the volume of grain exports compared to the 2016 financial year, to achieve sustainable cost management in agricultural production. The overall goal is to maximize the company's profits, ensuring its sustainable development. Medium-term goals are detailed by business lines and in general: "Sunflower oil: construction of oilseed processing plant in Western Ukraine with an annual capacity of 1 million tons; significant renovation of plants to increase their efficiency. Grain exports and infrastructure: double grain exports by 2020 marketing year by building a deep-water terminal in Ukraine with a capacity of up to 4 million tons; to optimize the elevator network



to ensure growth of domestic agricultural production and exports. Agribusiness: achieving sustainable agro-production at low cost through investment in technology; integration of the company's new assets to increase their operational efficiency and productivity to the level of Kernel's high standards".

MHP's strategic goal is high growth rates in all business areas. The strategy envisages: control over production costs (the cost of poultry products production in MHP is one of the lowest in the industry), construction of modern enterprises (continue to invest in production capacity and equipment), increase the land bank (the company plans for 2016 to increase the land bank by 50 thousand hectares in Ukraine), increasing market share (expand the range and gain a larger share of meat processing segment, including value-added products, such as fast food and semi-finished products), promotion of brands through targeted advertising, expansion of sales systems (franchise network, as of 2015 – more than 2,000 points, [newer data on the site in 2020 is not specified – author's note], to maintain the balance of retail sales between franchise stores and supermarkets). Dividends were paid to MHP in 2014, 2016, 2017. MHP products are exported to more than 70 countries. Brand recognition among consumers is 97%.

The plans are to purchase 5 plants in Europe and expand markets in Africa, Asia, the Middle East and China. The international strategy is reflected in the fact that in 2016 was opened the first plant in the EU in the Netherlands, in 2017 – the second one, in Slovakia. Since 2016, in the UAE company has had a trading office as part of its export strategy. The biogas station is working, licenses for export to the EU have been obtained, and new trademarks are being added.

In April 2017 (based on the decision of the end of 2016) IMC was rebranded - officially changed the former name "Industrial Milk Company", as milk production in business already occupied less than 4%, and the main focus of operations is crop production. The established abbreviation, which has been used by counterparties and stakeholders for more than 10 years, has received a new interpretation: "principles of our work and priorities. These are: I – innovations, M – management, C – team ['komanda' in Ukrainian – author's note]". In the same year, dividends were paid for the first time.

MHP first added to the name S.A. (Société Anonyme, i.e., anonymous / joint stock company, partnership), which is the equivalent in French-speaking countries (including Luxembourg) of corporations in the USA (corporation, incorporated, joint-stock company), public limited company (plc) in the UK and an Aktiengesellschaft (AG) in Germany. From 2018, the company adds the abbreviation SE (Societas Europaeae) to emphasize its status and origin, which formally means "European company" in Latin. Every company established under the European Company Charter must add this abbreviation at the beginning or end to its name.

MHP has increased the company's brand awareness by 48% through an online learning and business creation program.

Reputational risks.

Regarding reputational losses and problems covered in the media, the following became known:

- scandals of Avangard about connection with banks VAB and "Finansova initziatyva" (everywhere owners are the same), when insider loans bankrupted institutions, and the agricultural holding was used as an additional financial guarantee, funds were withdrawn, etc.;



- improper organization of production at Avangard, when the stench spread to the whole settlement, in addition, environment specialists spoke about the threat of manure getting into groundwater
- MHP receiving in 2018 812 million UAH in subsidies from state budget and the organization of corporate events with employees in Courchevel;
- installation of cameras to monitor the emotions of employees at MHP plants, which then affects the assessment of the work quality;
- strikes of peasants and workers against Kernel in Poltava region;
- raider attacks on Agroton, party affiliation of the company's owners.

These events negatively affect the system of economic security of agricultural holdings, and require consideration and elimination of shortcomings.

Auditors' opinions.

In 2014, a high-profile scandal with the bankruptcy of "Mriia" agricultural holding has left its mark on the reputation of its then auditor - an international company from the so-called The Big Four - E&Y (formerly Ernst & Young), which confirmed the financial statements reliability and the absence of fraud. However, in Ukraine this case was simply discussed, while in the United States in a similar situation in the early 2000s with the collapse of Enron and inadequate audit conclusions of its auditor, it led to the collapse of Arthur Andersen audit company (at that time they were still considered "Big Five").

The auditors of the agricultural holdings' consolidated financial statements for stock exchanges are: Deloitte Audit S.A.R. (Kernel), Deloitte Audit (MHP), KPMG Ltd (Avangard and Agroton), BDO Audit (SA) Pty Ltd (IMC).

Let's consider how their auditors ([Smida 2020], according to reports, table 8) assess the condition of selected agricultural holdings.

**Table 8** - Audit opinions of Avangard, Agroton and MHP in Ukraine

Name / Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Avangard	C	x	U	C		U	C		
Agroton	*	n	C			R	P	x	x
MHP	x	C				R			

Note:

R - with restriction, U - unconditionally positive assessment result, P - positive, C - conditionally positive assessment result, x - no data, n - negative, \* - decline

**Source:** author's design using data from [Smida 2020]

In 2012, Agroton's auditors declined to comment on the fact that they could not monitor the inventory and did not obtain adequate and acceptable evidence of receivables and payables due to the Company's limitation of their work. "...also could not determine whether there was a need for any adjustments to the financial investments cost accounted for using the equity method due to the inability to gain access to management and auditors of subsidiaries. Due to the significance of the matters described in the "Reasons for decline to express opinion" section, we have not been able to obtain sufficient appropriate audit evidence to form a basis for auditor's opinion. Accordingly, we do not express

an opinion on the financial statements of the Private Joint-Stock Company "Agricultural Production Company "Agroton" as of 31.12.2012".

In the Avangard's report of the same year, the auditors were of the opinion, "with some professional skepticism, that after the inspection, circumstances may arise that would raise the question of fraud and error". For MHP in 2013, the auditors determined that the financial condition of the company is satisfactory, it has a liquid balance sheet; indicators of solvency and financial stability remain at the level of normative; there is no probability of bankruptcy. In 2014-2015, the conclusion is the same in wording, but already includes "indicators almost at the level of normatives".

Thus, for the first time a comprehensive analysis of the existing economic security systems of 5 agricultural holdings with assets in Ukraine was conducted.

The characteristics of agricultural companies by specialization, organizational structure of subsidiaries and parent companies, business description, production component of the enterprise economic security system are given. An overview of risk management systems is provided.

The analysis of the existing systems of economic security is carried out by functional components: personnel security, political and legal, information, production, physical, market and interface. The historical stages of the companies' activity, current operations and strategy are considered. Problems in the activities of companies in general and in risk management in particular are outlined. Comprehensive economic security in the selected five agricultural companies and total of 115 publicly known agricultural holdings is virtually non-existent, the systems differ in some partiality, limitation, division between different levels of corporate government and departments, and are fragmentary. Further work is needed to improve the enterprise economic security systems within agricultural companies.

**Conclusions.** It is determined that in the vast majority of agricultural companies comprehensive activities to ensure the economic security of the enterprise is not carried out (only 3 agrohholdings out of 115 - Kernel, Agroprosperis and IMC - highlighted on the official website the presence of the manager responsible for economic security or risk management, fourth agrohholding - MHP - in corporate reports for 2018 announced the formation of a specialized department).

The work on economic security ensuring is fragmentary, not coordinated by uniform provisions or regulations, there is no appropriate management structure (committees, managers), risks are considered separately by different services of company (security, product quality, financial management, etc.), but there is no common vision, risk register is not kept, consultations of top management are not carried out. In general, agrohholdings of the sample focus on financial risk management and use tools to insure certain production risks.

Therefore, in the future it is planned to study the economic efficiency of economic security systems of agricultural holdings, to develop comprehensive programs, plans and concepts for the formation and development of these systems.

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