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Agricultural Higher Education in Moldova: Some Economic and Financial Aspects of Management

Liliana Cimpoies[a] & Rodica Resitca[b]

[a]*Associate Prof. , Department of Economic Theory and Policies, Academy of Economic Studies of Moldova, Moldova*
E-mail: lcimpoies@ase.md
[b] *Ph. D candidate, Technical University of Moldova, Moldova*
E-mail: rodica.resitca@doctorat.utm.md

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Abstract

Moldova's agricultural education and research system is confronted with many issues due to the aging of the teaching and research staff, the decline in enrollment below the critical level and the unattractiveness of science and education to the younger generation. Another factor that affects the efficiency of the agricultural higher education is the lack of a collaboration network between education, science, and production. The aim of this paper is to analyze the current economic and financial situation of the agricultural higher education system in Moldova. The research is based on data collected from the State Agrarian University of Moldova. Incomes, expenditures, revenues, profits, and other economic and financial management indicators are analyzed. The examined period is 2017-2021.

Over the last years the institution registered losses, mainly because the number of students that apply for agricultural study programs decreased significantly, fact which contributed to lower revenues. Currently higher education has the largest share in revenues, while research and innovations represent less than ten percent of total incomes. To increase revenues, must be identified new sources for research financing, mostly international, and additional sources for modernization of infrastructure, capitalization of institutional patrimony. For a more efficient management in agricultural higher education, is required the modernization of the whole system, focused on education, science, and production network.

Keywords: agriculture, economic performance, higher education, university, research.
Jel codes: I20, M10

1. Introduction

The educational system has a fundamental role in sustainable development and building a society based on knowledge. One of the priority objectives of the higher education system is the formation of the skills and abilities required on the labor market and the achievement of a professional career. Keeping a steady flow of prospective students is one of the biggest obstacles local universities must overcome to fulfill their missions in terms of research, teaching, and knowledge transfer. Over the last decade, both the total number students enrolled in higher education institutions have constantly decreased. Some studies, Lipcean and Turcan (2020), mention that the decline almost doubled within 2014-2019, and turned out to be much sharper than anticipated.

The agricultural education and research are facing different issues. A major problem is related to the aging of the academic and research staff, which generates a problem in ensuring agricultural learning for future generations and innovations for agricultural development. Another issue is related to the decline in students enrollment for agricultural degree programs below the critical level and he unattractiveness of science and education to the younger generation, which generates a severe lack of workforce in agricultural sector. At the same time, there is a lack of collaboration network between academia, research and production system, important components for agricultural development and efficiency of higher education. The aim of this paper is to analyze the current economic and financial situation of the agricultural higher education system in Moldova. This research was realized within State Project 20.8009.0807.44 "Adaptation of the agricultural education-research system in the Republic of Moldova to the conditions of the contemporary society".

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2. Literature Review

Higher education is an essential tool for socioeconomic growth on an individual level and a key promoter of nation's economic development. A skilled workforce is also essential for the continued economic expansion of any country. Different range of people and organizations participate in the complex public-private sector that provides higher education.

Different economists examine the economics of higher education from different aspects, including cost-benefit analysis, revenues and expenditures, profitability of investment in education (Brown (1997), Hinrichs (2017), Psacharopoulos (1994), Robst (2001), Toutkoushian (2001))

Cost benefit analysis is one of the most efficient tools in economics to examine the investment decision. Cost benefit analysis is applied in higher education, where both individuals (students and their families) and the public invest significant resources in the creation and acquisition of education, with the private and public benefits accruing for a very long time after the costs have been paid (Toutkoushian et al. 2016). From 1960s, economists started estimating the return on investment for different stages of education, using the cost-benefit method (Hansen (1963) and Becker (1964)). Another issues, is to clarify what types of costs and benefits matters in the analysis of higher education efficiency. Some of non-financial costs and benefits are difficult to estimate, and particularly important for a nation growth and development.

In examining organizational behavior, several factors must be considered as: what are the sources of its funding? How does the company use its funds? What is the purpose or aim for the firm/organization to accomplish? How does the company compete with other businesses for resources and customers? These factors are important for all type of organizations (both profit and non-profit), including higher education institutions. Profit maximization goal is essential in microeconomics, describing firm behavior.

For public higher education institutions, is often required an economic analysis to justify the impact of allocated funds from government. This includes revenues analysis and main its sources, expenditures, and profitability. There are fewer options for higher education organizations to obtain labor substitutes because education is a very labor-intensive service. Costs associated with higher education should therefore increase more quickly than those associated with other sectors of the economy (Toutkoushian, et al, 2016).

Considering that higher education institutions are not essentially profit-oriented (Ferro, 2020), nevertheless lowering costs and raising revenues is an important objective for an efficient management policy.

3. Data & Methodology

The efficiency of higher education organizations can be assessed through four main areas of activities: educational services; research and innovations, internationalization, economic and financial management. In this paper, we will focus on the last aspect related to economic and financial activity of agricultural higher education institutions in Moldova.

The research is based on data collected from the State Agrarian University of Moldova. The examined period is 2017-2021. The analysis will be based on examining the revenues and expenditures, and its main sources in agricultural higher education in Moldova. As main source for analyzed indicators are the financial and annual reports of State Agrarian University of Moldova.

4. Results

In Moldova, universities benefit from university autonomy (Education Code, 2014), which covers the fields of management, structuring and functioning of the institution, teaching and scientific research, administration and financing and is achieved, mainly, through: organization, development and improvement of the educational and scientific research process; offering study programs; development of study plans and curriculum in accordance with governmental educational standards; organizing the admission process, according to the specific criteria and profile of the higher education institution; selection and promotion of teaching and research staff, as well as other categories of personnel in the educational institution; establishing the evaluation criteria of the teaching activity and scientific research; awarding scientific and didactic titles (associate professor, professor); establishing collaborative relationships with various educational and scientific institutions, centers and organizations in the country and abroad et al (Education Code, 2014).

The university autonomy in financial terms, assumes the administration of financial resources through bank accounts, including the means allocated from the government budget; the use of available resources for carrying

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out the statutory activity, according to their own decisions; the accumulation of own revenues from tuition fees, services provided, etc; administration of the institution's property and ensuring optimal conditions for the development of the institution's material base; the use of the assets owned by the institution and related rights to achieve the statutory goals of the higher education institution (Education Code 2014).

Financing of public higher education institutions in Moldova is carried out on the account of two categories, basic means (budgetary expenses) and special means (extrabudgetary expenses).

One of main sources of revenue for public universities in Moldova is from budgetary allocations. There is high variance in the amount of planned revenues (Table 1). The lowest level of the approved incomes is registered in 2020, and the highest in 2019. The revenue difference in these years was of 33312,6 thousand MDL (higher by 1.49 more in 2020 compared to 2019).
The amount of total executed revenues also differs over the examined time series. The highest and lowest gap in executed revenues between 2017-2019 is much smaller (33312.6 thousands MDL) compared to the difference between the total approved revenues between 2019 – 2020 (11310.5 thousands MDL).

Table 1. Total planned and executed revenues in agricultural higher education, 2017-2021

		2017	2018	2019	2020	2021
Budgetary funds	planned	60,514.1	67,989.0	74,644.3	37,653.5	58,784.5
	executed	62,952.8	67,976.4	60,814.0	67,148.8	57,600.7
Own resources	planned	21,390.7	20,840.9	21,587.1	21,968.3	19,755.3
	executed	20,274.3	22,074.6	23,225.8	19,823.8	23,768.7

Source: based on data from State Agricultural University of Moldova

Both planned and executed total revenues include budgetary funding, own resources, resources from research and innovation and from rural extension services (Table 1).
The largest share in the total planned and executed revenues is held by the budgetary funding, with a share of 68.8-75,6 percent over the examined period.
Budget revenues include the funds allocated for the study period under the execution of the State Order for the training of specialized personnel signed between the Ministry of Agriculture and Food Industry of the Republic of Moldova and the State Agrarian University of Moldova.

According to the schedule of educational services provision during 2017-2021 and the reports on the execution of the operational expenditure estimate, budgetary funds have been allocated for the educational services provided by State Agrarian University of Moldova in the amount from 37,653.5 to 74,644.3 thousand MDL.
The amount of allocated budgetary funds from the Ministry of Agriculture and Food Industry(MAFI) highly fluctuates over the analyzed period, with lowest level in 2020 and the highest level in 2019.
In 2020, MAFI allocated 37,653.5 thousand MDL, while in 2019, almost twice as high (4,644.3 thousand MDL).

Executed budget revenues fluctuate less in this period. The lowest executed budget revenues were registered in 2021 (57,600.7 thousand MDL), while the highest level is observed 2018 (67,976.4 thousand MDL). The largest gap within the examined period was 10,375.7 thousand MDL or 15.3% (1.98 times higher in the case of planned budget revenues)

Planned and executed budget revenues differ significantly in 2020, with a difference of 29,495.3 thousand MDL. Thus, were executed with an amount of 29,495,3 thousand MDL more than planned. This difference is explained by the Government Decision no.50 of 03.02.2020 for the extension of the transition period related to the situation of higher education institutions, under conditions of financial autonomy, the budgetary funds for higher education were allocated for 6 months according to the approved agreement by Ministry of Agriculture, Rural Development and Environment in the amount of 50% of the amount granted annually according to the State Budget Law for 2020. Due to the fact, that in the second half of the year were allocated with 25,145.5 thousand MDL more for undergraduate level in higher education, in addition to the planned amount, the amount of executed revenues is similar with previous years.

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The allocated budgetary funding was to finance the studies at undergraduate, graduate and post graduate level, and the service and maintenance of university campus. Between 360 and 414 thousand MDL were allocated for social insurance and support.

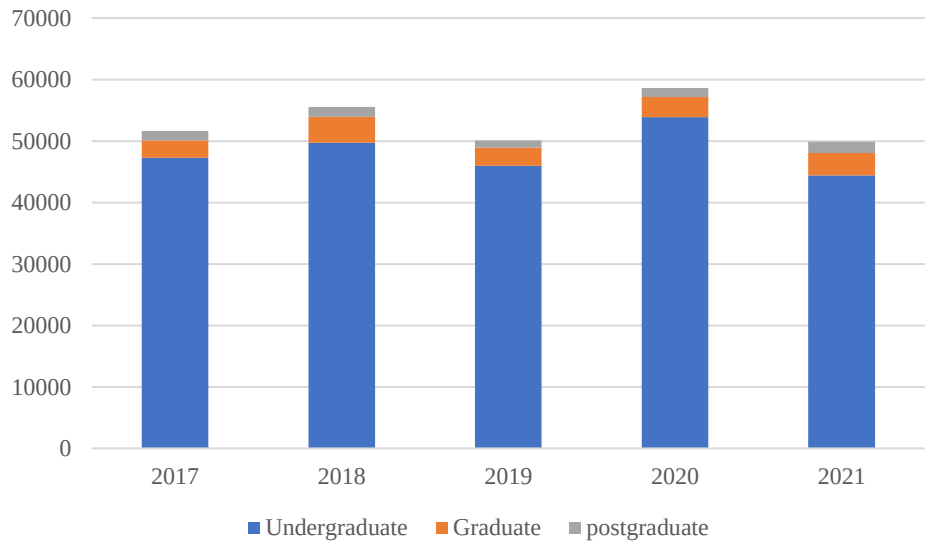

Figure 1. Total revenues allocated from budgetary funds in agricultural higher education, by study cycles 2017-2021
Source: based on data from State Agricultural University of Moldova

The largest share in planned and executed revenues is maintained by higher education, and particularly undergraduate level (Figure 1). The amount allocated to undergraduate studies fluctuates between, 44,429,3 to 67,976.4 thousand MDL within 2017-2021. This represents a share between 73 to 80 percent from total revenues, with the largest share registered in 2020 (80.2 percent). After graduate level revenues, a large share represents scholarships (6,362.9 thousand MDL) and students residences (from 7,704.4 to 12,069.6 thousand MDL).
For graduated studies (master degree) were allocated from 1,723.2 thousand MDL in 2020 to 4,933.2 thousand MDL in 2021. The fewest budgetary funds were allocated for post graduate studies. The approved budget revenues were from 1,210.8 thousand MDL in 2020 to 2,413.2 thousand MDL in 2021.

Table 2. Planned and executed revenues from own sources, thousands MDL

		2017	2018	2019	2020	2021
tuition fees	planned	8,742.8	9,299.4	10,099.6	11,014.7	10,518.0
	executed	9,305.4	10,099.6	11,772.2	10,518.0	13,330.3
other fees	planned	2,939.9	1,689.5	2,049.3	3,257.6	2,505,.9
	executed	2,137.5	2,536.8	3,257.6	2,574.4	2,406.0
lodging fee	planned	7,001.5	7,243.2	7,003.2	6,253.2	5,864.4
	executed	6,224.8	7,003.2	6,253.2	5,864.4	6,365.9
rent income	planned	2,706.5	2,608.8	2,435.0	1,442.8	867.0
	executed	2,606.6	2,435.0	1,942.8	867.0	1,666.3
total	planned	21,390.7	20,840.9	21,587.1	21,968.3	19,755.3
	executed	20,274.3	22,074.6	23,225.8	19,823.8	23,768.7

Source: based on data from State Agricultural University of Moldova

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An important share in total revenue, besides budget allocations, are own resources. It includes revenues from received tuition fees (at all study levels), other fees, lodging fees and rent income (Table 2). Both planned and executed revenues originated from own sources does not vary significantly within the examined period. Planned revenues from own sources have a share between 28.9% in 2019 to 35.3% in 2017 in total revenues. Their share in 2020 is not relevant, because based on Government Decision no.50 of 03.02.2020 for the extension of the transition period regarding the state of governmental higher education institutions under conditions of financial autonomy, the budgetary funds for higher education were allocated for 6 months according to the agreement approved by Ministry of resort, in the amount of 50% of annually granted according to the State Budget Law for 2020.

The executed revenues from own sources also vary in this period, from 19,823.8 thousand MDL in 2020 to 23,768.7 thousand MDL in 2021 (Table 2). Their share in the total executed revenues was from 30.2% in 2017 to 41.3% in 2021.

The largest share in revenues from own sources is held by tuition fees (from 8,742.8 thousand lei in 2017 to 11,014.7 thousand lei in 2020). The executed tuition fees vary for this period from 9,305.4 thousand MDL to 13,330.3 thousand MDL. The fluctuations related to the tuition fees are due to the number of students enrolled on a contract basis. The share of approved tuition fees revenues from own sources changed from 40.9% in 2017 to 53.2% in 2021, and of those executed from 45.9% in 2017 to 56.1% in 2021.

Besides revenues, another important category in an organization financial activity is played by the amount of expenses its activity generates. To increase the efficiency of the use of financial resources, it is necessary to analyze the expenses to reduce those less important in the teaching process or in the scientific activity.

For higher education institutions, expenditures can be classified in different categories. As the main activity of university relies in providing educational services, the largest share of expenses includes wages for teaching staff and other direct costs related to education. Even through instructional services are highly important in institutions of higher education, research activities are also important. According to some researchers (Toutkoushian, 2001) including all faculty wages in instruction will exaggerate the number of resources spent on this activity. Some of the salaries paid to academics are meant to fund their research and public service activities. Nevertheless, there are other costs that are not direct instructional expenditures, as academic support and student services that are not included in this category but are important among the number of resources spent.

Regarding research expenditures, this category usually includes additional resources attracted from grants and other resources from outside funding. In Moldova each four years, the National Agency for Research and Development allocates funding for the selected research projects. An important category of expenses is for operation and maintenance, it includes costs related to the maintenance of buildings and grounds possessed by institution. The costs associated with self-supporting activities of an institution that offer services to faculty and students, including as residence halls, food services, and recreational facilities, are referred to as auxiliary enterprises. The entire amount spent on scholarships and fellowships awarded to students by the university is referred to as scholarship and fellowship expenditures. Expenditures for agricultural higher education during 2017-2021 experienced different fluctuations (Figure 2). The amount of total expenditures include staff expenditures, services, social benefits, other current expenditure, fixed assets, stocks of current assets and rural extension services (Figure 3).

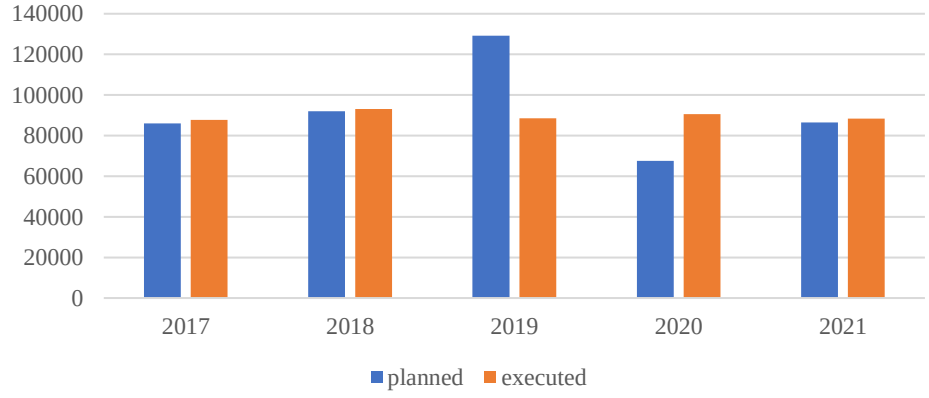

Figure 2. Total expenditures on agricultural higher education, 2017-2021

Source: based on data from State Agricultural University of Moldova

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The largest share in the total expenditures incurred are the personnel expenses. (Figure 3). It amounts fluctuated between 38,300.2 thousand MDL in 2020 to 85,313.0 thousand MDL in 2019.

The personnel expenses executed also vary for the years taken into study from 51,166.0 thousand lei in 2017 to 62,682.9 thousand lei in 2021. In total expenditures, personnel spending had a share between from 58% in 2017 and 65% in 2021. From the personnel expenses executed, the largest share is for wage retribution, from 45,200.8 thousand MDL in 2017 to 50,580.7 in 2020. Besides wage retribution, into this category, spending related to insurance and social security payments are included.
Services are another category into expenditures. Their amount changed from 12,863.0 thousand MDL in 2020 to 21,108.0 thousand MDL in 2018. Energy resources and natural gas expenses have the largest share in services.

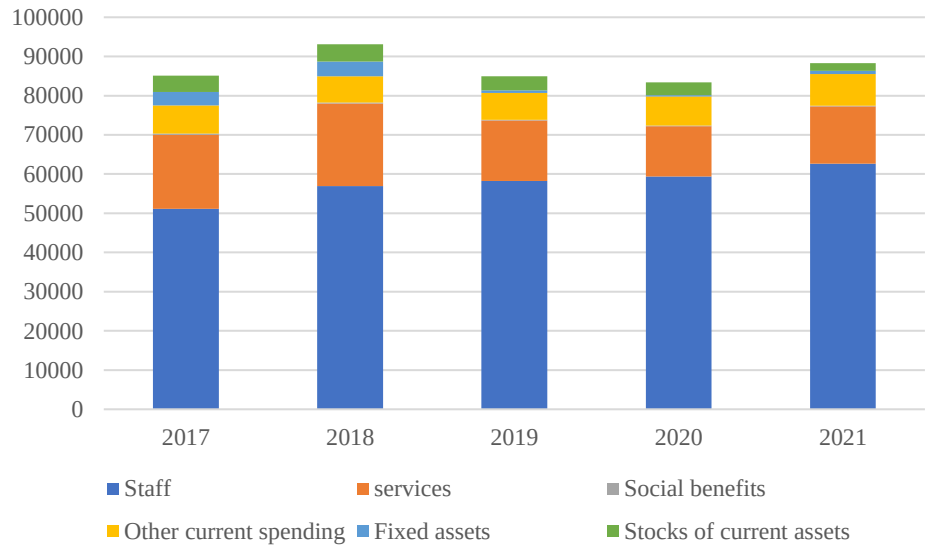

Figure 3. Categories of expenditures in agricultural higher education, 2017-2021

Source: based on data from State Agricultural University of Moldova

The expenditures related to current repairs amounted to about 2 million MDL for the period considered. There is no need to reduce the expenses of this article, as this amount is not enough for all repair works required. Other categories of expenses and social benefits and other current spending have a modest share. Among it, larger spending is for scholarships, the amount of which should be increased rather than decreased.
It is obvious that for any organization, including also agricultural higher education institutions, to increase the efficiency of their activity, it is necessary to grow revenues and reduce expenses. For revenues growth, the activity of the institution should focus on the following priority actions: to identify new sources of funding for the research activity by stimulating academic staff to participate in different project competitions in order to obtain state-funded and international research projects; to close new agreements with private sector for the implementation in production process of scientific achievements; for the academic staff to participate with peers and colleagues from other countries in international scientific research projects; to increase the efficiency of financial management in the institution; to increase the number of students with tuition fees by increasing the visibility and attractiveness of the institution's educational offers, providing training courses for farmers on modern technologies of cultivation of the main agricultural species; the participation of teachers in the implementation of modern technologies for the cultivation of agricultural plants or of some technological links; capitalization of the patrimony of the institution and lease of the space not used for teaching and research activities in order to generate additional sources of revenue; adjustment of the accommodation fee in residence halls for foreigners at current prices; the provision of other paid services, different from the educational and research services.
Expenditures reduction can be achieved through diminishing the costs of utilities, which generate a great amount of expenses. Some actions for this could include thermal insulation of the northern part of the walls of administrative buildings and residence halls; the placement of photovoltaic panels on the buildings used for teaching and research activities; to install light sensors in all buildings, including the residence halls, would significantly reduce the electricity consumption at night and partially during the day.

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5. Conclusions

Both planned and executed total revenues include budgetary funding, own resources, resources from research and innovation and from rural extension services. The allocated budgetary funding is targeted to finance the studies at undergraduate, graduate and post graduate level, the service and maintenance of university campus, social insurance, and support. The largest share in planned and executed revenues is maintained by higher education, and particularly undergraduate level. Expenditures for agricultural higher education during the examined period experienced different fluctuations. The amount of total expenditures include staff expenditures, services, social benefits, other current expenditure, fixed assets, stocks of current assets and rural extension services. Personnel and services are largest categories among expenditures in agricultural higher education. Personnel costs is difficult to decrease, as education is a very labor intensive service. Thus, institution should target in reducing costs related to services and utilities which account and important share in total expense.

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