CRITICAL THRESHOLD FOR THE USE OF WORKING CAPITAL IN AGRICULTURE

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Abstract

In an era of declining economic growth, the dominant owners of capital are seeking to regain their expected return on investment by extracting a larger share of national income from the vast majority of citizens through an austerity fiscal policy. Agricultural producers are the disadvantaged part of this equation. They need to find the easiest ways to increase performance using the little capital they have. The aim of the research is to determine the critical threshold for the use of operating capital in agriculture. This was achieved through a case study of an agricultural cooperative structured in two components: preliminary interview and technical-economic questionnaire. The results indicate the influence of increasing the number of hours of capital use which reduces average depreciation. On the other hand, repair costs, with an average value of 394.8 lei/ha, implicitly increase with the degree of use of fixed assets and their age. The costs of maintenance of fixed assets, wage costs and financial costs are relatively indifferent to the degree of use of fixed assets, with average values of 50.9 lei/ha, 432.2 lei/ha and 45.1 lei/ha respectively. The critical economic threshold for the use of fixed assets was set at approx. 10 thousand hours of operation of the fixed means of transport with variations depending on the type of fixed means of transport, brand and mode of use. This approach could become a functional tool for increasing capital efficiency and ultimately improving the performance of economic units.

Key words: working capital, agriculture, cooperative, critical use threshold

There is no doubt that our environment is still changing. All businesses have more or less experience of change. But it hits the smallest businesses the hardest as they face market challenges with insufficient money. SMEs are largely businesses involving people with great passion, enthusiasm and inspiration. Self-motivation has allowed them to generate many projects, but lack of capital stops them from starting their own business. Modern businesses rely heavily on debt and co-partnership. Loans and credit have existed since ancient times. Entrepreneurs in search of finance look for many ways and combinations to obtain funds. But nowadays we can see that very often "capital" is looking for entrepreneurs (Wilk G., 2016).

There are a number of critical debates on capital borrowing, debt/debt by advancing three main arguments (DiMuzio T., Robbins R., 2020). First, largely due to the tendency to describe such debates, there is no convincing critical theory of its formation in the economic literature on capital (money) and debt. For this reason, the theory of capital as power and how it can help us theorize the consequences of the actual creation of money is discussed. Second, it discusses how the capitalization of money creation by a minority of investors not only leads to the political rush for unsustainable economic growth, but also that there is a differential upward distribution of interest that helps generate greater economic inequality. Third, it is argued that in an era of declining economic growth, the dominant owners of capital seek to regain their expected return on investment by extracting a larger share of national income from the vast majority of citizens through an austerity fiscal policy.

The ongoing question "What is" capital has attracted attention recently. Although the distinction between the term viewed as a financial construct and as a collection of physical productive assets is well known, it is argued that the former concept is unappreciated. The two concepts are often confused in practice and the relationship between them is rarely well understood (Lewin P., Cachanosky N., 2018).

The financial concept underlines its importance as an indispensable calculation and accounting tool. Some views consider the terms human capital, social capital and others and how they differ. Reasons are given for rejecting the notion of aggregate production function in standard

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growth theory (which uses the notion of aggregate stock of physical pissants) (Lewin P., Cachanosky N., 2018) and as recently used by Thomas Piketty in his well-known paper (Piketty T., 2014).

The purpose of the research is to determine the critical threshold of working capital utilization in agriculture. This objective is intended to provide farm managers with a model for calculating when the use of a particular fixed asset leads to losses. The research hypothesis was that any expenditure involved in owning and using an item of capital is considered as capital consumption. In other words, any consumption that would not occur if the farm did not own and use the means of production in question is an operating capital expense.

Romania's South-East development region is one of the eight administrative regions of the country with an area of 35,762 km² (representing 15% of the country's surface area). The majority of the employed population in the South-East Development Region is engaged in agriculture, forestry and fisheries, manufacturing and trade. Fishing and aquaculture, together with trade in fish and fish products, are specific traditional activities. Another characteristic of the region is the high tourism potential given by the presence of the Danube Delta and the Black Sea coastline which gives the region a special status (Pop R.E., 2019).

The agricultural area of the region represents 65% of the total area, involving about 40% of the population (2022, Evolution of economic development in the South-East Region), arable land occupying 78.2% of the agricultural area, the region also has a significant share of the area occupied by vineyards (first place in the country), with internationally renowned vineyards (Rusu Vasile) R.C. *et al*, 2020).

MATERIAL AND METHOD

The research objective was achieved by using a case study of an agricultural cooperative (Pechlaner G., 2010; Zucchella A., 2019) in Galati County in the SE Development Region of Romania.

This entity is an agricultural purchasing cooperative that organizes both purchases of materials and technical means necessary for agricultural production and sales of agricultural products obtained by members. It has a centralized system of accounting, invoicing and quantitative, qualitative and value monitoring of production. It has more than 10 members who produce maize, sunflower, wheat, rapeseed, barley, barley, peas and mustard. These products are produced on a total area of approx. 5,500 ha of which approx. 70.0% is agricultural land for organic production.

Table 1

Techno-economic questionnaire - content and form

Crt. no.	Objective of the question		Form of the question	Answer options / content
Profile of subjects				
1	the economic entity where it operates		selection items (exclusive)	S.C. Name S.R.L.
2	function within the economic unit		selection items	manager / agricultural engineer
Main aspects of capital consumption				
3	depreciation charges		completion items	subjects were asked to estimate the amount of expenditure they had incurred in the previous year in each category specified in column 2 (lei)
4	expenditure on repairs of fixed assets			
5	expenditure on maintenance of fixed assets			
6	expenditure on human resources required forthe use of fixed assets			
7	financial expenditure necessary for the purchase of fixed assets (investment loans)		completion items	average interest rate on investment loans (%)
8	number of persons (full-time) involved in the use of fixed assets		completion items	number of persons
9	expenditure on salaries for persons involved inthe use of fixed assets		completion items	(lei/month)
10	financial expenditure necessary for the use offixed assets (appropriations for current activities)		completion items	average interest rate on loans for current activity (%)
11-14	Critical economic threshold for the use of fixedassets for (tractors, combines, agricultural aggregates, others)		selection and completion items	subjects were asked to estimate themaximum number of operating hoursup to which the use of each category of fixed means is effective (hours)

The identification data of the investigated entity and its members were protected as a consequence of their economic interests. The names provided in this article have been coded and the results show processed values that do not allow primary information to be known.

The research was structured in two components: preliminary interview and techno-economic questionnaire which were conducted in the first part of 2023 at the premises of the researched unit (as appropriate) and online.

The preliminary interview was predominantly qualitative in nature and was conducted face-to-face with managers at the cooperative members' premises. Its purpose was to ascertain farmers' perceptions of capital consumption on their own farm. The interview guide included semi-open and open-ended questions in which subjects were free to express their opinions regardless of the interviewer researchers' assumptions. (D'Amato D., 2020; Masurel E., 2004; Teuber R., 2011) The questions to which answers were requested had the following objectives: (1) subjects' opinion on the share of capital cost in the total cost of own farm products, (2) their perception on the extent to which the capital used is adequate for a successful farming activity, (3) the main problems encountered with regard to the use of fixed assets in the farming activity. The interviewers were agricultural researchers and the duration of the interview ranged from 30 to 60 minutes.

The information obtained was noted in the interview guide, completed in the debriefing stage and centralized in the survey report. The information processing was qualitative and the results were used in the following phases of the research: the drafting of the questionnaires and the organization of the focus group session.

The technical-economic questionnaire was predominantly quantitative in nature and was administered online in the Google Forms platform (https://www.google.com) through which it was addressed to the managers and agronomists of the farms within the cooperative (Marousek J., 2013). Its purpose was to determine the cost of capital in terms of its economic dimension. The questionnaire form (Table 1) contained 14 closed questions with values and items of the subjects' choice in which they specified the main aspects of capital consumption on their farm. The questions were structured on obtaining information at farm level: expenditure on depreciation, expenditure on repairs of fixed assets, expenditure on maintenance of fixed assets, expenditure on human resources needed to use fixed assets, financial expenditure needed to purchase and use fixed assets (questions 3 - 10). To these questions were added questions aimed at establishing the minimum profile of the subjects (questions 1 and 2) and requests to assess the economic threshold for the use of fixed assets (questions 11 - 14). The order of the questions was established according to the principle of increasing difficulty (Dantsis T., 2010; Vesala H.T., 2010,).

The analysis of the information obtained led to the determination of the following economic indicators: average cost of depreciation (lei/ha), average cost of repairs (lei/ha), average cost of maintenance of fixed assets (lei/ha), average cost of salaries of staff directly using fixed assets (lei/ha), average financial cost generated by the acquisition of capital (lei/ha), average financial cost generated by the use of fixed assets (lei/ha). These indicators led to the determination of the critical threshold of capital use (operating hours). This was determined as the number of hours of use of fixed assets at the minimum level of the sum of the cost of use of these fixed assets (Lindsay K. et. al., 2018; Zhang Z.X. et. al., 2022).

RESULTS AND DISCUSSIONS

Depreciation charges averaged approx. 383.7 lei/ha with wide variations depending on the level of capitalization of the farm, economic potential and agricultural area used, from a minimum of 32.5 lei/ha to a maximum of 938.6 lei/ha for the units surveyed.
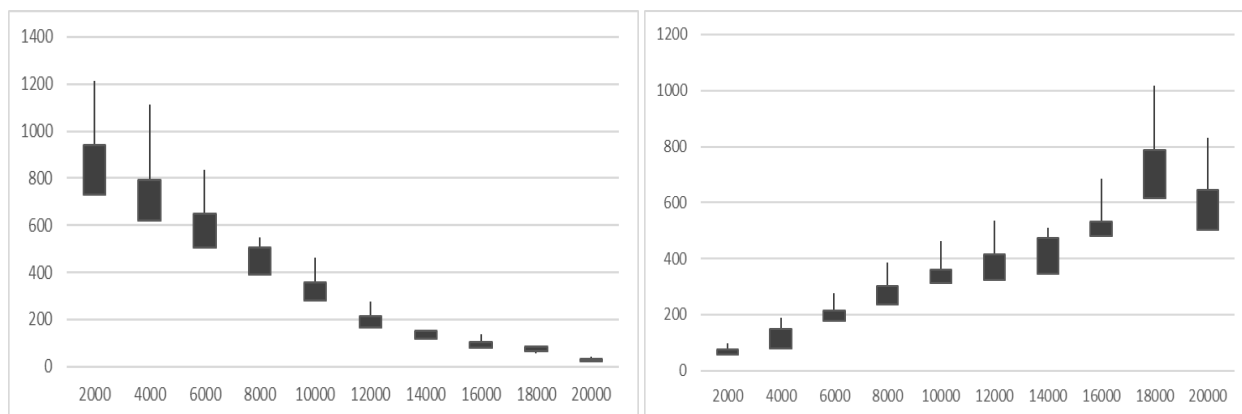

Figure 1 **Average cost of depreciation (a) Average cost of repairs (b) (lei/ha)**

As the number of hours of use of capital increases, the level of average depreciation decreases due to the way it is determined as a direct ratio between the level of input value of fixed assets and the number of hours of use (*Figure 1.a*). The variation from logarithmic decrease is given by the different area of land worked by agricultural machinery, the mode of use and the crop structure.

In contrast, repair costs show the opposite trend to depreciation costs as they implicitly

increase with the degree of use of fixed assets and their age. This is the most important reason why the minimum level of this cost was 74.2 lei/ha for machinery with a level of use of approx. 2 thousand operating hours and a maximum of 788.3 lei/ha for approx. 18 thousand operating hours (*Figure 1.b*). The maximum values are not very relevant because they relate primarily to fixed assets with long periods of use such as grain stores, but the repair costs relate in total to these as well. However, the average value of repair costs of 394.8 lei/ha indicates a significant burden on farm costs and consequently on the average cost of agricultural products.

The cost of maintenance of fixed assets does not show a statistically assured change according to the number of operating hours. The differences from the average value of 50.9 lei/ha (*Figure 2.a*) are due to the type of fixed assets used and the attitude of farmers towards own capital. New machinery purchased with non-reimbursable funds is monitored by specialized service providers because it is a condition of the financing projects but the others are directly dependent on the decision of the farm management.
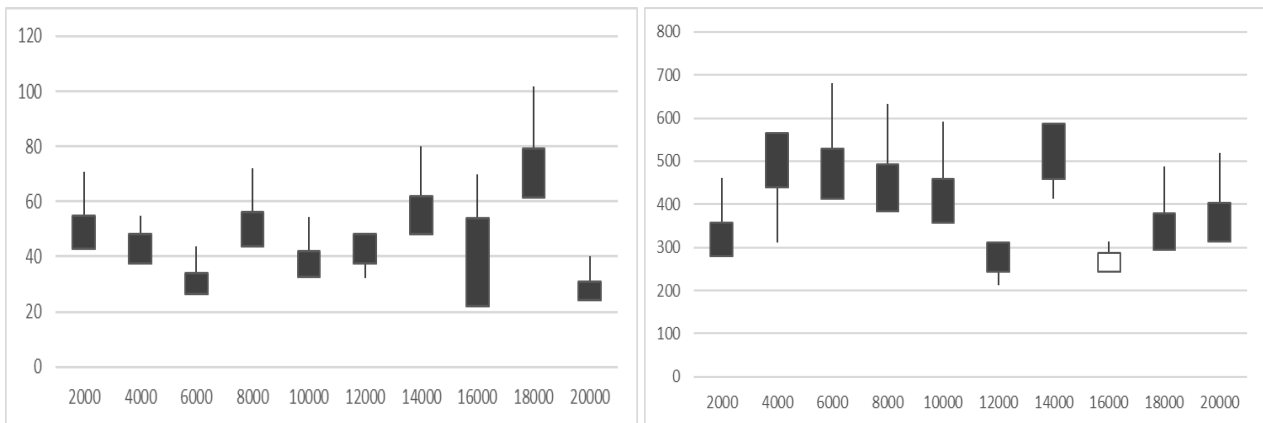

Figure 2 **Average cost of maintenance of fixed assets (a) Average cost of salaries of staff directly using fixed assets (b) (lei/ha)**

Expenditure on human resources required for the use of fixed assets is not conventionally associated with the costs of using operating capital because it is a direct expenditure and is rather considered to be implicit in the production process. However, based on the research assumption that any expenditure involved in owning and using a capital item is considered as capital consumption, wage expenditure becomes an important value for this issue.

Wage costs averaged 432.2 lei/ha (*Figure 2.b*) without suggesting a statistically significant variation from the level of operating capital use. It recorded significant variations from 244.3 lei/ha to 587.4 lei/ha but these variations cannot be correlated with the duration of operation but rather, are determined by the management of human resources practiced by farmers and even by the use of their own labor without payment in wages by farmers who prefer to pay their own labor in dividends.
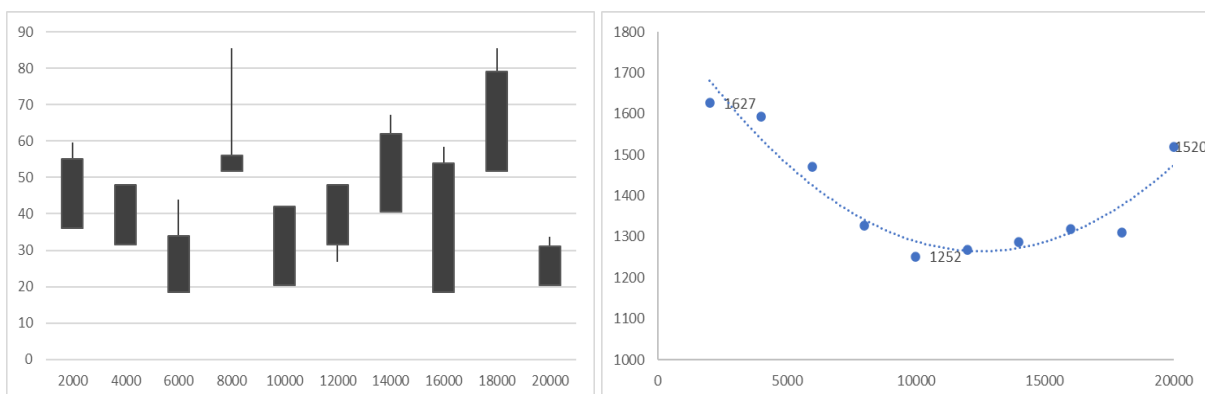

Figure 3 **Average financial cost of capital acquisition and use (a) (lei/ha)**
Critical threshold of capital utilization (b) (operating hours)

Also, the financial expenditure required for the purchase and use of fixed assets does not show a statistically assured change according to the number of operating hours. The differences from the average value of 45.1 lei/ha (*Figure 3.a*) with values ranging from a minimum of 26.3 lei/ha to a maximum of 66.8 lei/ha are due to the self-financing capacity of the farms, the capital available to their owners and other conjunctural aspects but not to the level of use of expatriation capital. The critical economic threshold for the use of fixed assets (*figure 3.b*) was determined at ca. 10 thousand hours of fixed asset operation. This value is indicative because for different fixed assets the specific critical threshold will vary according to the type of asset, make and mode of use. For example, for tractors, the critical threshold may be between 7,500 and 8,500 operating hours and for combines between 5,500 and 6,000 operating hours. Subjects' responses on this indicator differed 12.4-68.1% from these values. Consequently, farm management should take on the management of this information or purchase specific services for the most efficient use of capital (Zhang Z.X. et. al., 2022).

One of the limitations of the present research is that the large amount of information available on fixed assets available in the investigated establishments requires a presentation of the results in a much more detailed framework. Thus, in future research, these models could be presented in the form of a practical guide for farmers (possibly in digital format) presenting the methodology for determining these indicators and tables with values for different fixed assets under different conditions of use.

CONCLUSIONS

The increase in the number of hours of capital use leads to a reduction in average depreciation The average depreciation level is 83.7 lei/ha. On the other hand, repair costs, with an average value of 394.8 lei/ha, show the opposite trend to depreciation costs because they implicitly increase with the degree of use of fixed assets and their age.

Fixed assets maintenance costs, wage costs and financial costs are relatively indifferent to the degree of use of fixed assets, with average values of 50.9 lei/ha, 432.2 lei/ha and 45.1 lei/ha respectively.

Expenditure on human resources required for the use of fixed assets is not conventionally associated with the costs of the use of operating capital because it is direct expenditure and is rather considered implicit in the production process. However, based on the research assumption that any expenditure involved in owning and using a capital item is considered as capital consumption, wage expenditure becomes an important value for this issue.

The critical economic threshold for the use of fixed assets was set at ca. 10 thousand hours of operation of the fixed asset with variations depending on the type of fixed asset, make and mode of use.

This information, and in particular the approach to obtaining it, could become effective functional tools for increasing capital efficiency and ultimately improving the performance of economic units.

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