

Jolita Greblikaite

Vytautas Magnus University
Faculty of Bioeconomy Development, Institute of Bioeconomy Research, Lithuania
E-mail: jolita.greblikaite@vdu.lt

Rolandas Rakstys

Vytautas Magnus University
Faculty of Bioeconomy Development, Lithuania
E-mail: rolandas.rakstys@vdu.lt

Agne Dapkuvienė

Vytautas Magnus University
Faculty of Bioeconomy Development, Lithuania
E-mail: agne.dapkuviene@vdu.lt

Mantas Svazas

Vytautas Magnus University
Institute of Bioeconomy Development, Lithuania
E-mail: mantas.svazas@vdu.lt

COMPETITIVENESS EVALUATION OF DIFFERENT TYPES OF FARMS

Preliminary communication

UDK: 631.1:339.137

JEL classification: O13, Q12, Q18, Q56, R50

<https://doi.org/10.17818/DIEM/2026/1.7>

Paper received: March 26, 2025

Paper accepted: June 9, 2025

Abstract

The competitiveness of farms of different sizes is a complex issue, depending in particular on both the type of farm and its capacity to expand. The drive for competitiveness is further boosted by the prevailing environmental change, where rising environmental levels are reorienting farms towards sustainability. In the long term, this will benefit the segment, as sustainable farms will have more opportunities both to sell their products and to create additional value from the agricultural waste they generate. This paper presents solutions to assess the level of competitiveness and potential of farms. The assessment models are versatile, thus allowing their use in different countries or regions. The paper presents relevant indicators for assessing the competitiveness of farms from economic, social and environmental perspectives, in line with the principles of sustainable development. Particular attention is paid to dairy farms, as they present the greatest existential and sustainability challenges.

Keywords: farm competitiveness, sustainable development, dairy farms

1. INTRODUCTION

The concept of competitiveness has multiple definitions in the scientific literature due to its complex and dynamic nature, which can vary across different industries. Authors choose the definitions they use based on their areas of interest and the availability of data on which to calculate competitiveness indicators.



This work is licensed under a Creative Commons Attribution 4.0 International License.

The Organization for Economic Co-operation and Development (OECD) is a key public sector body that has focused on enhancing the understanding of the factors that influence relative competitiveness. The OECD has defined competitiveness as the ability of firms, industries, regions, nations and supranational regions to sustainably generate relatively high levels of factor income and employment while competing in the international marketplace (Hatzichronoglou, 1996).

The competitiveness of an economy is defined by its ability to produce homogeneous goods and provide them to the open market at a lower cost, or at least the exact cost as its competitors, thereby generating more or the same added value (Francis, 2023; Latruffe, 2014) defines farm competitiveness as "the ability of a farm to compete and be successful". The competitive success of farms is determined by the competitive capacity they possess. They depend on the following factors: resources, production structure, national market and related and ancillary outputs.

The 2020 Global Competitiveness Report (World Economic Forum, 2020) highlighted the following areas of action as key:

1. To revive and change the competent environment,
2. Revival and change human capital,
3. Revival and change markets,
4. Innovation revival and change the ecosystem.

All of these areas are closely linked to business competitiveness. The paper's relevance stems from the intense changes in the competitive environment, the growing need for sustainability, and the rapidly evolving macro-environmental conditions. This paper aims to provide solutions for assessing the competitiveness level of farms, thereby predicting their prospects and comparing them with one another, such as in the allocation of investment and other support.

2. GENERAL SOLUTIONS TO MEASURE COMPETITIVENESS

Competitiveness is a relative concept and should be measured against a benchmark, which means that businesses must be compared with one another (Krishnamoorthy and D'Lima, 2014). There are many definitions of competitiveness. However, there is a consensus on what indicators could be used to measure competitiveness.

Measurement can be done within two disciplines: (i) neoclassical economics, which focuses on trade success and measures competitiveness in terms of actual exchange rates, comparative advantage indices and export/import indices; and (ii) the strategic management school, which focuses on the structure of the business entity and its strategy. The latter defines competitiveness as cost leadership rather than price leadership and measures cost competitiveness through a range of cost indicators, as well as productivity and efficiency (Latruffe, 2010) (Fig. 1). This article focuses on the indicators and measurement methods associated with the second discipline, targeting micro-level measurements.

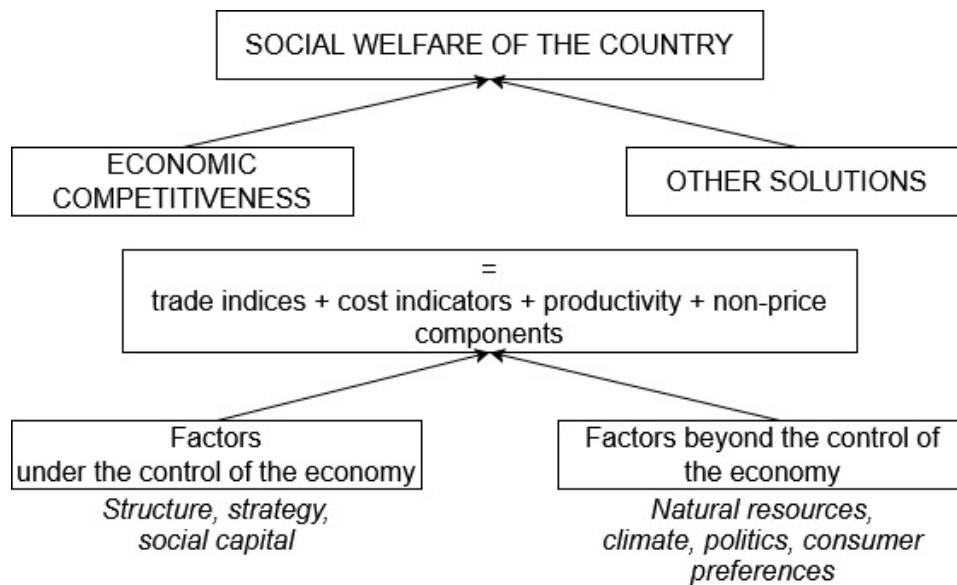


Figure 1 Competitiveness effects, indicators and drivers

Source: Latruffe, 2010

Measures of competitiveness tend to be static, but the operating conditions of farms are constantly changing. Thus, it is to be expected that their competitiveness will also change. Moreover, competitiveness is typically defined as the ability to sustain a profitable business in the long term or a sustainable manner. Therefore, measuring changes in competitiveness may be preferable to annual measurements (Latruffe, 2014).

Going deeper into the competitiveness of a business entity, Peneder and Rammer (2018) define it by identifying three dimensions: competitive performance, competitive advantage, and competitive capabilities of the business entity. Competitive performance refers to the past and present performance of a business entity in the market. Competitive potential, on the other hand, refers to the internal factors that determine a business entity's current and future competitive performance. Business capability, finally, refers to the conditions that translate competitive potential into actual competitive performance.

Competitiveness performance is influenced not only by factors internal to the farm or agricultural enterprise but also by external factors, including the institutional and regulatory environment, infrastructure, education, monetary environment, markets for productive resources, and the structure of the market in which the enterprise operates. That the market structure not only influences the competitive performance, but over time, the competitive performance of the business entity may adjust the market structure (Peneder and Rammer, 2018).

As this research focuses on the competitive performance of farms, competitiveness factors, both external and internal, although identified in Figure 2, are not analyzed in detail as they are irrelevant to the research task.

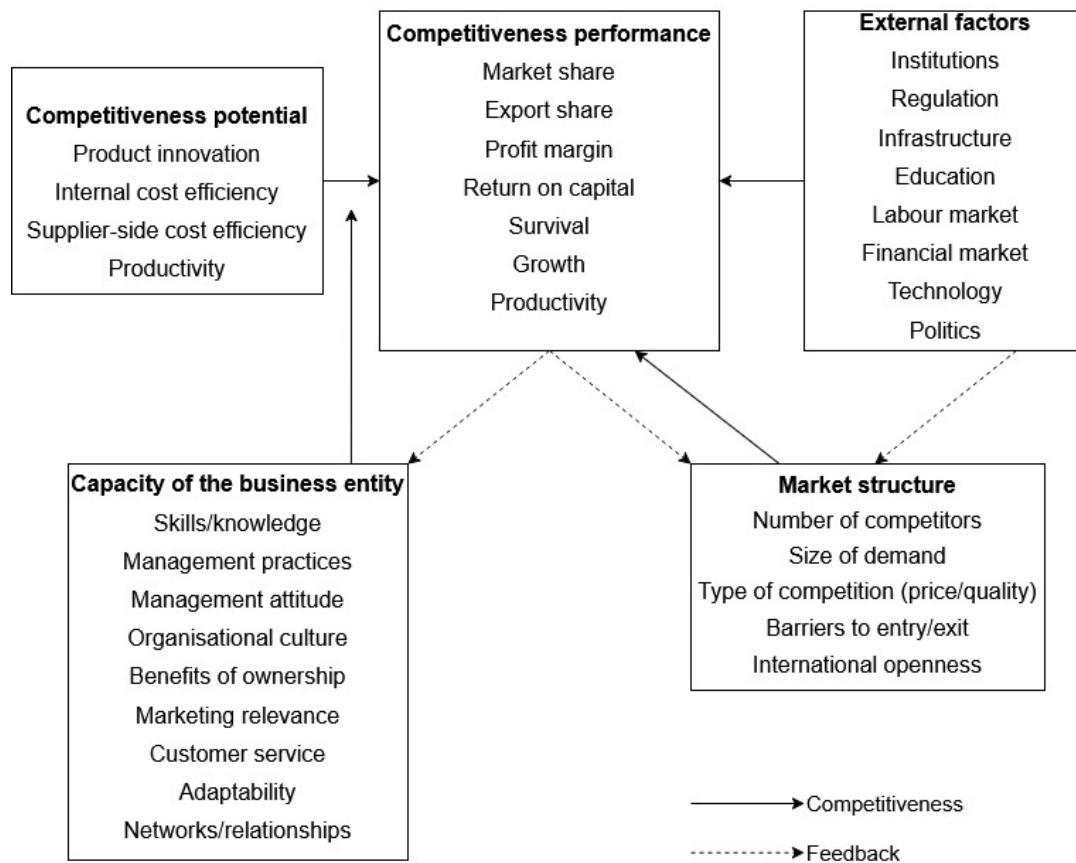


Figure 2 A conceptual model of business competitiveness

Source: Peneder and Rammer, 2018

The elements of the Competitiveness Potential dimension indicate the ability to build future competitiveness and adapt to market changes. Such opportunities are reflected in the innovations introduced by an economy or enterprise. Innovation by competitors may undermine the innovation of the enterprise. Innovation can be of two types: product (new features that differentiate a product from others on the market) and process (more efficient production methods, which change the flexibility, reliability, and speed of production).

Improving competitiveness can go in different directions. In cases where farms face resource constraints, a clear focus on the most efficient solutions is necessary. They must allow both to adapt to the competitive environment and to maintain the necessary flexibility in day-to-day business activities. The methods used to assess farms differ somewhat and are detailed for each current operation. In turn, these vary according to the type and size of the farm.

3. APPLYING COMPETITIVENESS ASSESSMENT METHODOLOGIES TO FARM EVALUATION

The most widely used methodologies for assessing the competitiveness of the meso-level (mainly economic sectors) can be divided into three groups:

- Analysis of the economic performance of macroeconomic and sectoral enterprises, including farms. This methodology assesses the leading macroeconomic and sectoral indicators (Table 1), including the sector's sales volume, value added generated, and the number of employees. It compares these indicators with national or EU average sectoral indicators. Industry is considered competitive if its comparative share and indicator values

are above the average comparative share and indicator values of the corresponding (selected) industry in EU countries. The advantage of this methodology is the possibility to compare the results obtained with those of a larger economic region. To obtain more detailed results from the analysis, the dynamics of the selected indicators should be monitored over a long term.

Table 1 Key performance indicators for determining the competitiveness of enterprises/farm enterprises

| Indicators | Explanation |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of enterprises (farms) in the sector, pcs. | Number of enterprises operating in the sector. An enterprise is considered to be in operation if it has at least one employee and/or has generated revenue during the year. |
| Quality of the workforce in the branch, %. | Value added and labor force in the branch during the reference period price ratio. |
| Branch productivity, EUR/hour | The ratio of value added per hour worked in the reporting period for the branch. |
| Number of workers in the branch, including conditional and contractual personnel. | Employees of enterprises, owners of sole proprietorships, farmers (the number of employees includes part-time workers, short-term absentees, seasonal workers, family members). |
| Turnover of the branch, EUR | Income from the sale of goods and services during the reference period from typical activities (in the case of a sole proprietorship, this income includes all receipts). |
| Turnover per worker EUR/worker | The ratio of the turnover or revenue of the branch for the reference period to the average number of persons employed in the branch |
| Share of GDP generated by the branch, % | The relative share of GDP generated by the branch during the reference period, % of national GDP. The percentage change in GDP generated by the branch is calculated by comparing the data for the current year with the data for the previous period. |
| Value added of the branch, EUR | The value added generated by a branch during the reference period is calculated as the value of output minus the value of intermediate consumption. |
| Value added/employee, EUR/job | The ratio of the value added of the branch in the reference period to the average number of persons employed in it. |
| Foreign direct investment in the branch, EUR | Foreign direct investment includes not only the initial investment of capital but also subsequent economic transactions between the investor and the direct investment enterprise. |
| Tangible investment in the branch, EUR | Expenditure on the acquisition of fixed tangible assets, the construction of new assets, and the repair of existing assets, i.e., to prolong the useful life of an asset and/or to improve its valuable characteristics. |

Source: Žvirblis, 2007; Navickas, Malakauskaitė, 2010

- Benchmarking. This methodology is based on a comparative analysis of the competitiveness indicators of selected objects (farms). The primary concern with the methodology is the reliability of the statistical data. It is challenging to apply this methodology to assess the competitiveness of specific enterprises, such as farms, due to the difficulty in obtaining aggregated, reliable industry data.
- Michael E. Porter's "Diamond" model. The Porter methodology is based on an analysis of the four key elements that determine the competitive advantage of economic sectors and countries. These elements are: factor utilisation, local demand conditions (market), related and supporting industries (clusters, networks and business systems), and corporate strategies and management.

Problems/limitations of competitiveness assessment. When assessing competitiveness, certain limitations are encountered. The problems of competitiveness assessment should be divided into methodological, i.e., related to conceptual and methodological limitations, and applied, which express specific problems in applying competitiveness assessment methodologies.

Methodological (theoretical) problems/limitations of competitiveness evaluation:

- Limitations determined by concepts of competitiveness. An analysis of economic literature suggests that a unified concept of competitiveness has yet to be formulated. There is no unified opinion on the meaning of social competitiveness, specifically whether competitiveness is determined solely by economic advantages or whether social welfare factors should also be considered in assessing competitiveness.
- Limitations determined by competitiveness assessment methodologies. Various concepts and notions based on which competitiveness is perceived accordingly form the diversity of assessment methodologies. Competitiveness assessment methodologies differ in their scope and purpose, even when the object being assessed is the same (e.g., an industry or a farm). This means that by applying different assessment methodologies to the same object, it is possible to obtain completely different or even contradictory assessments of competitiveness.
- Applied (practical) competitiveness assessment problems/limitations:
 - Limitations imposed by time resources. Detailed competitiveness assessment methodologies are time intensive. This reduces the flexibility and efficiency of competitiveness assessment, as it is not always possible to promptly obtain the latest data or quickly respond to changes in them. It should be emphasized that some statistical competitiveness indicators (e.g., macroeconomic) become officially available only after a certain period and sometimes after a complete change in macroeconomic conditions.
 - Limitations determined by financial resources. The more detailed the competitiveness assessment, the more financial resources it is. It should be emphasized that methodologies that require empirical research and surveys to obtain specific competitiveness indicators are more accurate and reveal various nuances and aspects of competitiveness. However, due to higher costs, it is not always possible to apply these methodologies, or their application is not expedient, i.e. the costs exceed the planned benefits.
 - Limitations resulting from the availability and quality of information. To assess competitiveness, it is necessary not only to have a transparent and defined system of evaluation criteria and methodology but also to have the necessary information for assessing competitiveness. Problems with information availability or quality (completeness, accuracy, etc.) are often encountered, especially in cases involving statistical information (e.g., reliable aggregated data related to a specific industry or farms are not always readily available).

The scientific literature distinguishes the main groups of market share, profitability, and efficiency indicators of farm competitiveness. There are many of them. As a separate aspect of assessment, various combinations of indicators from these groups are possible for assessing competitiveness. In summary, competitiveness assessment process is time-consuming, financially intensive, and often resource-intensive in terms of human resources.

4. EVALUATION OF THE COMPETITIVENESS OF DAIRY FARMS IN THE CONTEXT OF SUSTAINABILITY

One methodology for assessing the competitiveness of dairy farms could be presented as an example; however, it is essential to note that this methodology was developed by researchers at Ohio University and applied in the United States. This methodology for assessing the competitiveness of dairy farms is based on 15 measures or assessment criteria, which are divided into 11 broad areas that evaluate the competitiveness of the dairy business. These 11 management areas are listed below. These management areas are also associated with individual indicators:

1. Production rate - the amount of milk in l/ kg per employee,
2. Cost control - costs per l/ kg of milk,
3. Capital efficiency - investments per animal; asset turnover,
4. Profitability - net income per animal; return on capital,
5. Liquidity - liquidity indicator; capital turnover,
6. Repayment schedule – debt repayment indicator,
7. Solvency – debt-to-asset ratio; debt size per animal,
8. Mission – a concise and specific plan of what we are striving for in business; in this case, the farm. This is not an economic indicator, but a managerial one, which allows to set goals and achieve them.
9. Maintain a family standard of living – the ratio of family farm living expenses to farm income; Expenses should make up 5-10 %.
10. Motivated workforce – a qualitative indicator that focuses on leadership and management skills. Owners and farm managers should seek opportunities to enhance their management skills. Various information resources and courses can broaden their horizons and provide the necessary knowledge and competencies.
11. Manure collection – expenses per animal do not exceed \$ 125-\$ 150 per year.

Thus, the listed criteria and indicators are pretty specific, and their scope is small. It is possible to discuss what scope is optimal, under what conditions, and what activities are engaged in on the farm, among other topics. The methodology also guides farm management and suggests suitable tools to enhance farm competitiveness.

When assessing the profitability and sustainability of dairy farms, which are closely tied to competitiveness, US scientists argue that relying on only one or a few measures may not be an accurate assessment and could result in an incomplete understanding. Therefore, all areas reflected by specific measures are important for the long-term viability of the business, and they are interrelated. Therefore, it is essential to consider the assessment of farm viability (Table 2).

Table 2 Farm viability concept interpretations

| Author (-s) | Concept Interpretation | Economic Viability Classification |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| A. Adelaja, K. Sullivan (1998) J. Scott, R. Colman (2008) R. B. Whitaker (1999). | Farm income covers only variable costs Sale of assets does not cover the losses incurred Farms cannot service financial debts due to the seasonality of activity Operating results decreased compared to previous periods due to unfavorable natural conditions | Weak |
| C. Popelier Hosmer (2009) J. Scott (2005) N. Koleda, N. Lace (2010) A. Fedorchenko (2008) I. Solomatina (2025) V. Vitunskienė (2024) | Profitable farm activity, resulting in a positive net income (stable sales, technological processes remain unchanged, etc.) Stable farm activity, during which neither quantitative nor qualitative parameters change almost completely When the gross output of the farm covers all farm costs, the farm is characterized by positive cash flows and return on capital. Positive cash flows, thanks to which farms are liquid and solvent | Average |
| E. J. Dillon et al. (2010) A. Adelaja (2007) N. Koleda, N. Lace (2009) M. Švažas, V. Navickas (2025) | Profitable and promising farm activity Profitable and steadily growing farm activity The ability of the farm to grow and develop due to the optimal allocation of resources and the efficiency of their use | Strong |

Table 2 illustrates that farm viability is evaluated at multiple levels and can be linked to and/or assessed about farm competitiveness. The possibility of integrating sustainability criteria into the farm competitiveness methodology should be considered. After analyzing international experiences in assessing sustainable farming systems in dairy farming, in countries such as the USA, New Zealand, China, and, of course, the various European Union countries, it became clear that both leading dairy farming countries pay considerable attention to sustainability research and implementation. Countries that aim to become more competitive, such as China are already striving to implement sustainability principles, recognizing that traditional approaches are insufficient to strengthen the sector (Zhan, Tan, Ji, Tseng, 2018). EU countries pay great attention to the implementation of sustainability. For this purpose, the legal acts of the EU institutions and the country's strategies are guided, while realizing that sustainable long-term solutions in farms ensure not only the stability of farms, but also growth, innovative solutions related not only to climate change, but also to complex solutions in managing farms.

In summary, measuring the competitiveness of farms and monitoring changes, especially in individual indicators, is partly possible by applying various farm management tools. When assessing competitiveness, it is essential to consider the viability and sustainability of farms. In this way, it is possible to assess the long-term prospects of the farm.

5. CONCLUSIONS

The scientific literature distinguishes between the main groups of farm competitiveness indicators, including market share, profitability, and efficiency. There are many of them. As a separate aspect of assessment, various combinations of indicators from these groups are possible to assess the competitiveness of farms. The scope of indicators may enable a more accurate assessment of the situation, but this depends on the goal and purpose of evaluating farm competitiveness.

In summary, assessing competitiveness is a time-consuming and financially demanding process that often requires significant human resources. Not only the accuracy of the assessment results but also the complexity of the assessment process, the costs of applying the methodology, and its expediency directly depend on the completeness and degree of detail of the methodology. Evaluation of competitiveness methodologies, which differ in their scope and purpose, has an

essential common feature: they enable determining the relative position of the assessed object about other analogous (of the same type) objects, based on a developed system of assessment criteria and indicators.

REFERENCES

- Adelaja, A., & Sullivan, K. (1998). *The viability of agriculture at the urban fringe*. Working paper). New Brunswick, NJ: Rutgers The State University of New Jersey, Department of Agricultural, Food and Resource Economics.
- Adelaja, A. O. (2007). The importance of small and medium scale industries in a developing/underdeveloped economy: Nigeria case study. *Mechanical Engineering Department, University of Lagos, Nigeria*, 1-17.
- Peneder, M., & Rammer, C. (2018). *Measuring competitiveness*. Austrian Institute of Economic Research, Centre for European Economic Research
- Dillon, E. J., Hennessy, T., & Hynes, S. (2010). Assessing the sustainability of Irish agriculture. *International journal of agricultural sustainability*, 8(3), 131-147. <https://doi.org/10.3763/ijas.2009.0044>
- Francis, A., & Tharakan, M. (Eds.). (2023). *The competitiveness of European industry*. Taylor & Francis. <https://doi.org/10.4324/9781003369820>
- Hatzichronoglou, T. (1996). *Globalisation and competitiveness: relevant indicators* (No. 1996/5). OECD Publishing.
- Hosmer, C. P. (2009). *The success of agriculture in Michigan counties: A weak test of sustainability*. Michigan State University.
- Krishnamoorthy, B., & D'Lima, C. (2014). Benchmarking as a measure of competitiveness. *International Journal of Process Management and Benchmarking*, 4(3), 342-359. <https://doi.org/10.1504/IJPMB.2014.063240>
- Koleda, N., & Lace, N. (2010). Dynamic factor analysis of financial viability of Latvian service sector companies. *Economics and Management*, 15(2010), 1822-6515.
- Latruffe, L. (2010). *Competitiveness, Productivity and Efficiency in the Agricultural and Agri-Food Sectors*. OECD Food, Agriculture and Fisheries Papers, No. 30, OECD Publishing, Paris.
- Latruffe, L. (2014). Competitiveness in the agricultural sector: measures and determinants, *Farm Policy Journal*, 11 (3), 9–17.
- Navickas, V., & Malakauskaitė, A. (2010). Konkurencingumo vertinimo metodologinės problemos ir riborumas. *Business: Theory & Practice*, 11(1), 5-11. <https://doi.org/10.3846/btp.2010.01>
- Scott, J. (2005). *Farm and Community Viability*. Canada: GPI Atlantic.
- Scott, J., Colman, R. (2008). *The GPI Soils and Agriculture Accounts: Economic Viability of Farms and Farm Communities in Nova Scotia and Prince Edward Island – an Update*. Canada: GPI Atlantic.
- Solomatina I. (2025). Waste management as an element of reverse logistics in the circular economy. *Vadyba*, 41(1), 19–32. <https://doi.org/10.38104/vadyba.2025.1.02>
- Svazas, M., & Navickas, V. (2025). The Synergy Potential of Energy and Agriculture –The Main Directions of Development. *Energies*, 18(5), 1031. <https://doi.org/10.3390/en18051031>
- Vitunskienė, V. (2024). Government-funded agribusinesses: Empirical evidence on the extent to which farming is supported in Lithuania. *Management Theory and Studies for Rural Business and Infrastructure Development*, 46(4), 463-472. <https://doi.org/10.15544/mts.2024.43>
- Whitaker, R. B. (1999). The early stages of financial distress. *Journal of economics and finance*, 23(2), 123–132. <https://doi.org/10.1007/BF02745946>
- World Economic Forum (2020) Global competitiveness report Source: <https://www.weforum.org/reports/the-global-competitiveness-report-2020/in-full/executive-summary-70fef507ea>
- Zhan, Y., Tan, K. H., Ji, G., & Tseng, M. L. (2018). Sustainable Chinese manufacturing competitiveness in the 21st century: green and lean practices, pressure and performance. *International Journal of Computer Integrated Manufacturing*, 31(6), 523-536. <https://doi.org/10.1080/0951192X.2016.1268721>
- Žvirblis, A. (2007). Paslaugų bendrojo vertingumo ir jų konkurencingumo vertinimo principai. *Verslas: teorija ir praktika*, (2), 82-86. <https://doi.org/10.3846/btp.2007.13>