APPLICATION OF A DEFINITE INTEGRAL CALCULUS IN RENT CALCULATION

Ivan Milojević[1], Dalibor Krstić[2], Ivan Božović[3], Dragan Bataveljić [4]

**Corresponding author E-mail: drimilojevic@gmail.com*

ARTICLE INFO

Review Article

Received: *18 March 2024*

Accepted: *20 April 2024*

doi:10.59267/ekoPolj2402667M

UDC 517.3:332.858.4

Keywords:

definite integral, rent, method of calculation

***JEL**: C60, Q15*

ABSTRACT

For land rent, it is characteristic that it arises as a consequence of capital investment in the purchase of land, which is not a production investment, because capital is not invested for the reason of organizing agricultural production, the main reason of investing capital is to acquire certain ownership of land areas. In this paper, we will present the possibility of solving the problem of rent calculations using the economic application of the definite integral. First, we will show if the integral calcusus is applied in the rent calculation and then in the domain of its calculation.

Introduction

In the economic literature, rent means the economic form of realization of land ownership, (Ilić, B. 2019) i.e. rent is ownership income derived from the ownership (legally established and sanctioned) of certain land areas. (Avakumović, J., at al. 2021) The functions of rent are multiple:

- at the macro level of the national economy, it is not possible to ensure the unity of the economic and market space, among other things, without the economic function of rent;

1 Ivan Milojević, PhD, Full Professor, Principal Research Fellow, Ministry of Defense, Republic of Serbia, Nemanjina Street No. 15, 11000 Belgrade, Serbia, Phone: +381692702697, E-mail: drimilojevic@gmail.com, ORCID ID (https://orcid.org/0000-0003-3653-3477)

2 Dalibor Krstić, PhD, Assistant Professor, School of economics and manadment studies, Kragujevac, Republic of Serbia, Karadjordjeva Street No. 52, 34000 Kragujevac, Phone: +381601619311, E-mail: dal.krstic@gmail.com, ORCID ID (https://orcid.org/0000-0003-2286-112X)

3 Ivan Božović, PhD, Associate Professor, University of Priština - Kosovska Mitrovica, Faculty of Economy, Kolasinska Street 156, 38220 Kosovska Mitrovica, Republic of Serbia, E-mail: ivan.bozovic@pr.ac.rs, ORCID ID (https://orcid.org/0000-0001-6400-7461)

4 Dragan Bataveljić, PhD., Full Professor, Faculty of Law University of Kragujevac, Jovana Cvijića 1, 34000 Kragujevac, Phone: +38134306544, E-mail: bataveljic@jura.kg.ac.rs, ORCID ID (https://orcid.org/0000-0001-7396-0705)

- rents are important in the field of ecological protection of natural and other assets and their preservation for future generations; (Milošević, I., Stankov, B. 2023)
- at the micro level of individual producers, the economic function of rent conditions the movement of production costs within certain frameworks, and breaking through these frameworks means reducing the producer's income (profit); (Milojević, I., & Mihajlović, M. 2019)
- rent is an important element of establishing market balance, because the supply and demand for resources and production oscillates depending on whether the actual sizes of the manifest forms of rent are greater or less than its amount in a state of equilibrium. (Ilić, B., & Krstić, S. 2013)

Capital is invested in order to obtain income (land rent) and in this sense no distinction should be made between land rent and interest on capital invested as interest-bearing capital. (Chen, C., at al., 2023) By investing capital in the purchase of land, the capitalist, in addition to ownership of that land, also acquires a monopoly on the use of the natural conditions associated with that land. (Miteva, A., & Doitchinova, J. 2022) If the land has special natural advantages (special qualities, special microclimatic conditions, etc.), (Hečková, J., 2019) the landowner acquires a monopoly of a special kind and this gives the capitalist the opportunity to, in addition to differential and absolute rent, also appropriate monopoly rent. (Rothschild, M., & Stiglitz, J. E. 1978) Land rent does not appear only in agriculture, but everywhere where land is the main object of work (mining, forestry, construction, etc.). (Jeločnik, M., at al., 2022)

Here it is important to explain the relationship between rent and ground rent. (Vladisavljević, V. at al., 2023) In the case of rent, the tenant takes from the owner of the land the right to use it and pays rent for it. (Babajanov, A., at al., 2023) Rent is therefore a market category and an economic expression of the relationship between capitalist tenants and capitalist landowners, (Ryazantsev, I., & Ivolga, A. 2021) i.e. it is the fee paid by the tenant to the capitalist landowner for the use of the given land and is equal to the land rent. (Qiao, X., & Feng, T. 2023) This compensation has the character of interest on the fixed capital invested in the land. (Ilić, B., at al., 2022)

On the other hand, ground rent specifically refers to the payment made by the owner of a leasehold property to the freeholder or landlord who owns the land on which the property is built. In this arrangement, the property owner essentially rents the land from the landlord and pays ground rent as a form of leasehold payment. (Ilić, B., at al., 2022)

In summary, while rent is a broader term that encompasses all payments made for the use of a property, ground rent is a specific type of rent that relates to leasehold properties and represents the payment made for the use of the land on which the property is situated. (Bradfield, T., 2023)

Rent calculation plays a crucial role in the real estate industry, influencing both landlords and tenants in determining the monetary value associated with property usage. The traditional methods of rent calculation often involve complex formulas and considerations,

making it challenging to arrive at a mutually beneficial rental agreement. (Ilić, B. 2019). However, the integration of mathematical concepts, specifically definite integral calculus, can simplify and streamline the rent calculation process. (Wu, W., & Yuan, X. (2023). By understanding how to apply integral calculus techniques, individuals involved in property rental transactions can optimize rent determinations based on objective and logical criteria. (Qiao, X., & Feng, T. 2023)

Materials and methods

Before delving into the application of definite integral calculus in rent calculation, it is essential to understand the fundamental concepts of this mathematical tool. (Ely, R., Jones, S.R., 2023). Definite integral calculus, also known as the calculus of definite integrals, deals with the computation of integrals with specific limits. These limits, often referred to as the limits of integration, provide a means to determine the area between a curve and the x-axis over a specified interval.

The application of definite integral calculus in rent calculation extends beyond simple scenarios involving time-dependent rental rates. (Denčić Mihajlov, K., 2020) Integration can also be employed to analyze spatial configurations and irregular occupancy patterns. (Oehrtman, M., Simmons, C., 2023) For instance, in cases where the rented area varies over time or is non-uniformly distributed within a property, the total rent can be determined by integrating the rental rate function over the corresponding area intervals. (Qiao, X., & Feng, T. 2023)

Furthermore, definite integral calculus enables landlords and tenants to optimize space utilization and allocate rental costs efficiently. (Ilić, B., 2020) By segmenting the property into distinct rent zones with varying rates, integration can be used to compute the total rent for each zone and derive an equitable distribution of expenses based on usage. (Ćirić, I.,2022)

The application of definite integral calculus in rent calculation can be broken down into several steps: (Ely, R., Jones, S.R., 2023)

Step 1: Identify the Relevant Factors

To begin with, it is crucial to identify the factors that significantly influence rent determination. These factors may include property size, location, market conditions, and maintenance costs. Each of these factors can be represented as a function of the rent, allowing for a more comprehensive understanding of their individual contributions.

Step 2: Establish a Functional Relationship

Once the relevant factors have been identified, a functional relationship must be established between these factors and the rent. This relationship can be expressed as a mathematical equation, where the rent is the dependent variable, and the factors are the independent variables.

Step 3: Integrate the Factors

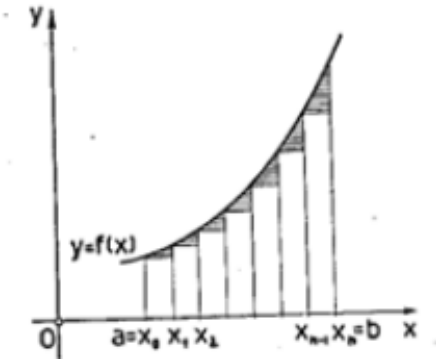
With the functional relationship in place, the next step involves integrating the factors using definite integral calculus. This process enables the computation of the combined effect of these factors on the rent. The definite integral calculus allows for the integration of multiple variables, providing a more accurate and holistic representation of rent determination.

Step 4: Interpret the Results

The final step involves interpreting the results obtained from the integration process. By analyzing the output, one can gain valuable insights into the relative importance of each factor in determining the rent. This information can be used to adjust rent estimates and develop more effective rental strategies.

We will take under consideration function $y = f(x)$ defined on some segment $[a,\ b]$. The interval $[a,\ b]$ is divided into n equal parts $a = x_0 < x_1 < x_2 < \ldots < x_{n-1} < x_n = b$, where $x_1,\ x_2, \ldots,\ x_n$ represents ends of small intervals that belongs to the interval $[a,\ b]$. (Damnjanović, R., at al., 2018) Values of the function $f(x)$ at the ends of those subintervals are: $f(x_1),\ f(x_2),\ f(x_{n-1}),\ f(x_n)$.

Figure 1. Graphic representation of the integral account

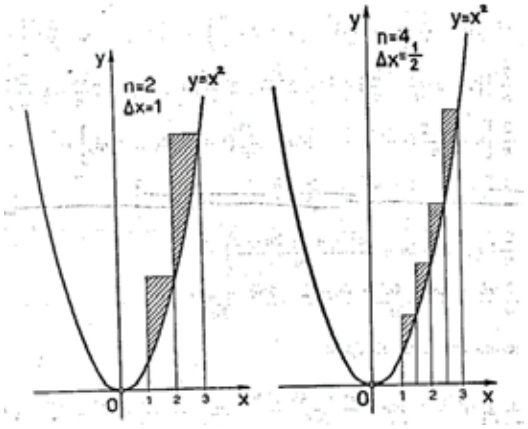


Source: Shekutkovski, N. (2013)

What is the procuct of $f(x_1)(x_1 - x_0) = f(x_1)\Delta x$?

It is the area of the smallest rectangle in the image. In general, the area of an ith rectangle is $f(x_i)\Delta x$, while the area of all those rectangles is $\sum_{i=1}^{n} f(x_i) \cdot \Delta x$. This surface is different from the image surface in Fig. 1 bordered by the curve $y = f(x)$, x axis, and the directions $x = a$ and $x = b$ for the hatched part. (Herceg D., 2009)

Figure 2. Splitting intervals to display partial intervals



Source: Shekutkovski, N. (2013)

When the interval $[a,\ b]$ is divided into an even larger number of partial intervals $x_i - x_{i-1} = \Delta x$, (Fig. 2) the sum of the areas of the rectangles of which these partial intervals are the base will differ even less from the area of that curvilinear picture. (Haq, S., at al., 2022) When is $n \to \infty$, that is $\Delta x \to 0$, the limit value of that sum $\lim_{n\to\infty} f(x_i) \cdot \Delta x$ is completely equal to the area between the curve $y = f(x)$, the line $x = a$ i $x = b$, and the x axis. It is marked with $\int_a^b f(x)\,dx$ i and is called the definite integral of the function $f(x)$ in the limits from a to b. (Huffman Hayes A., 2024) The definite integral is, therefore, the limit value of the sum of the area of the partial rectangles. The sign of the integral, the elongated letter S, is the initial letter of the word "sum". (Sharipova, M. 2024)

Results and Discussions

Let's assume that the land area is R_1, R_2, R_3,…, R_n dinars of rent at the end of the current year, that is, at the end of each of the next $n-1$ years. The present value A of such an annuity is equal to $A = R_1 r^{-1} + R_2 r^{-2} + \ldots + R_n r^{-n} = \sum_{k=1}^{n} R_k r^{-k}$, provided that compound interest is calculated decursively and that the interest rate is constant during that period. If $R_k = const.$, $(k = 1,2,\ldots,n)$, than $A = R \sum_{k=1}^{n} r^{-k} = R \frac{1}{r^n} \frac{r^n - 1}{r - 1} = R\ IV_p^n$.

Let's assume that the rent does not arrive discontinuously, in leaps and bounds at the end of each year, but flows continuously throughout the year. (Ely, R., at al., 2023) Let it be received in this way every year at R dinars. Then comes approx. $R \frac{1}{365}$ dinars per

day, $R\frac{1}{365\cdot 24}$ dinars per hour etc., that is $R\cdot\Delta t$ dinars per small interval of time Δt. (Kočović, J., Pavlović, M., 2018)

If the rent $R\cdot\Delta t$ is due after t godina, years, starting from today (when $t=0$), i.e. In interval $t,\ t+\Delta t$, then its present value, with continuous interest, is approximately equal $R\cdot\Delta t e^{-\frac{pt}{100}}$.

What is the present value of the annuity in the entire interval from $t=0$ to $t=x$ years? Obviously, it is approximately equal to the sum: $\sum_{\Delta t\in[0,x]} R\,e^{-\frac{pt}{100}}\cdot\Delta t$.

The mark $\Delta t\in[0,x]$ p indicates that the summation is performed by time intervals Δt from $t=0$ to $t=x$. (J.W.L. Glaisher, 1871)

If $\Delta t\to 0$, the sum converges to the integral $\int_0^x R\,e^{-\frac{pt}{100}}dt$, which represents the exact value of the considered rent at time $t=0$. (Normatov, A. 2023).

In the special case, when the annual interest rate p is fixed, we have

$$\int_0^x R\,e^{-\frac{pt}{100}}dt = R\int_0^x e^{-\frac{pt}{100}}dt = R\left[-\frac{100}{p}e^{-\frac{pt}{100}}\right]_0^x = R\left(-\frac{100}{p}e^{-\frac{pt}{100}}+\frac{100}{p}\right).$$

Therefore, the present value of A annuity of R dinars for the year, which flows continuously for x years with continuous interest $p=const.$, is equal

$$A = R\cdot\frac{100}{p}\left(1-e^{-\frac{px}{100}}\right).$$

Obviously, A is a simple function of time x and interest rate p. It is easy to see that A depends on x. (Wu, W., & Yuan, X. 2023) It is evident that A is larger as x is larger, i.e., that the present value of the rent increases when the time interval is wider. (Oehrtman, M., Simmons, C. 2023) What's more, it follows the above relation that it is $\lim_{x\to\infty} A = R\frac{100}{p}$. This result is interesting, because it shows that the present value of rent in the continuous and discontinuous case is equal. (Shekutkovski, N. 2013) Therefore, the actual or present value of an annuity does not depend on how that annuity flows or how interest is calculated (continuously or discontinuously). (Kočović, J., Pavlović, M., 2018).

It is easy to show that A decreases when p increases (x is fixed), or symbolically

$\lim_{p\to\infty} A = 0$, since it is $\lim_{p\to\infty} A = \lim_{p\to\infty} R\frac{100}{p} \cdot \lim_{p\to\infty}(1 - e^{-\frac{px}{100}}) = 0(1-0) = 0$.

It follows that in the continuous, as well as in the discontinuous case, the present value of the rent decreases when the interest rate increases. (Bradfield, T., at al., 2023) This statement highlights an important relationship between the present value of rent, continuous or discontinuous, and the interest rate. (Kočović, J., Pavlović, M., 2018) In essence, it suggests that as the interest rate rises, the present value of the rent tends to decrease. This can be understood through the concept of time value of money, which states that a dollar today is worth more than a dollar in the future due to its potential earning capacity in the interim. (Vladisavljević, V., 2023)

In the context of continuous and discontinuous cases, it implies that whether the cash flows from rent are received in a steady stream or in discrete intervals, the effect of interest rate changes remains consistent. Higher interest rates make future cash flows less valuable in present terms, leading to a decrease in the present value of rent. This relationship is crucial for financial decision-making, as it helps in evaluating investment opportunities and making informed choices based on the expected interest rate scenario.

In the case of determining the continuity of the rent calculation, that is, whether it is more favorable to receive the rent continuously during the year, rather than all at once at the end of the year in the case where $R = 50000$ dinars for the year, $x = 28$ years and $p = 5$ per year. That's when

$A = 50000 \cdot \frac{100}{5}(1 - e^{-1,4}) = 1\ 000000(1 - 0{,}246579) \approx 753403$ dinars,

in the event that the rent arrives continuously, assuming that it is working with compound continuous interest. (Popović, G. 2006)

If compounding is discontinuous and decursive (Kočović, J., at al. 2020), and the rent is received at the end of the year, we have

$A = 50000 \cdot IV_5^{28} = 50000 \cdot 14{,}89812726 = \underline{744906}$ dinars, i.e. now less, because it is more favorable to receive rent continuously throughout the year, than all at once at the end of the year. (Vasiljević, Z., at al., 2006)

This arrangement provides a steady cash flow for the landlord, ensuring financial stability, and allows tenants to manage their expenses more effectively, avoiding potential financial burdens. Additionally, this method fosters a more harmonious landlord-tenant relationship, as it reduces the likelihood of disputes and promotes a sense of responsibility and reliability on both sides.

By extending this methodology to more complex rent structures, such as variable rental rates or lease extensions, property owners and tenants can benefit from a systematic and mathematical approach to rent calculations.

Conclusion

The paper deals with the problem of the possibility of calculating rent using the economic application of a definite integral. The application of definite integral calculus in rent calculation offers a powerful tool for real estate professionals and researchers. By integrating the diverse factors that influence rent determination, this mathematical technique allows for a more accurate and comprehensive understanding of the underlying processes. By leveraging the principles of calculus, property owners and tenants can establish equitable and transparent rent agreements that account for various factors influencing rental costs. As technology advances and computational tools become more accessible, the application of mathematical techniques in rent calculation is poised to enhance the accuracy and efficiency of rental transactions.

As a result, the utilization of definite integral calculus in rent calculation can lead to more informed decision-making and improved outcomes in the real estate market. As the real estate industry continues to evolve, the integration of calculus in rent calculation remains a valuable tool for optimizing financial outcomes and enhancing property management practices.

We came to the conclusion that the present value of the rent increases when the time interval is wider, but that the present value of the rent is equal in the continuous and discontinuous case. Therefore, the actual or present value of an annuity does not depend on how that annuity flows or how interest is calculated (continuously or discontinuously). The present value of an annuity is determined by factors such as the number of periods, the interest rate, and the payment amount, rather than the specific timing or mechanics of the payments. This concept allows for a consistent method of evaluating different types of annuities, regardless of their individual characteristics. It follows that in the continuous, as well as in the discontinuous case, the present value of the rent decreases when the interest rate increases. Furthermore, the next conclusion is that it is more favorable to receive rent continuously during the year, than all at once at the end of the year.

Conflict of interests

The authors declare no conflict of interest.

References

1. Amanda Huffman Hayes. (2024). The Story of Definite Integrals: A Calculus Textbook Narrative Analysis. *International Journal of Education in Mathematics, Science and Technology*, *12*(1), 139–177.
2. Avakumović, J., Marjanović, N., Rajković, A. (2021). Menadžmet cene kapitala u svrhu donošenja investicionih odluka preduzeća. Akcionarstvo, 27(1), 89–106. [*in English*: Avakumović, J., Marjanović, N., Rajković, A. (2021). Capital price management for the purpose of making investment decisions of the company. *Akcionarstvo*, 27(1), 89–106].

3. Babajanov, A., Islomov, U., Umarov, S., Abdiramanov, R., & Inoyatova, M. (2023). Organizational and economic mechanisms of regulating land relations in agriculture. In BIO Web of Conferences (Vol. 65, p. 03005). EDP Sciences.
4. Bradfield, T., Butler, R., Dillon, E. J., Hennessy, T., & Loughrey, J. (2023). Attachment to land and its downfalls: Can policy encourage land mobility?. Journal of Rural Studies, 97, 192-201.
5. Chen, C., Restuccia, D., & Santaeulàlia-Llopis, R. (2023). Land misallocation and productivity. American Economic Journal: Macroeconomics, 15(2), 441-465.
6. Ćirić, I., Tešanović, D., Vujasinović, V., & Ćirić, M. (2022). The impact of food and wine harmonization on the experience and future intentions of the guest. *Ekonomika poljoprivrede*, *69*(2), 331-347. https://doi.org/10.5937/ekoPolj2202331C
7. Damnjanović, R., Đurković, V., & Miljković, M. (2018). Specific integral in economic functions. Oditor, 4(3), 71-81. https://doi.org/10.5937/Oditor1803071D
8. Denčić Mihajlov, K. (2020). Does sustainability matter in mergers and acquisitions?: The case of the Serbian food industry. *Ekonomika poljoprivrede*, *67*(1), 25-36. https://doi.org/10.5937/ekoPolj2001025D
9. Ely, R., Jones, S.R. The Teaching and Learning of Definite Integrals: A Special Issue Guest Editorial. Int. J. Res. Undergrad. Math. Ed. (2023). https://doi.org/10.1007/s40753-023-00214-2
10. Haq, S., Aphane, M., Khan, M. S., & Fabiano, N. (2022). Certain integrals involving generalized Mittag-Leffler type functions. Vojnotehnički glasnik, 70(4), 797-817. https://doi.org/10.5937/vojtehg70-40296
11. Hečková, J., Štefko, R., Frankovský, M., Birknerová, Z., Chapčáková, A., Zbihlejová, L. (2019) Cross-border mergers and acquisitions as a challenge for sustainable business. Sustainability, 11(11): 3130-3130
12. Herceg D., Herceg Đ., The definite integral and computer, The teaching of mathematics, 2009, Vol. XII, 1, pp. 33–44
13. Ilić, B. (2019). Cena zemlje kao faktor održivog razvoja. Održivi razvoj, 1(2), 7-16. https://doi.org/10.5937/OdrRaz1902007I [*in English*: Ilic, B. (2019). The price of land as a factor of sustainable development. Odrzivi razvoj, 1(2), 7-16.].
14. Ilić, B., & Krstić, S. (2013). Politička ekonomija. Etnostil. [*in English*: Ilić, B., & Krstić, S. (2013). Political economy*, Etnostil*].
15. Ilić, B., Đukić, G., & Balaban, M. (2020). Sustainable development directions of rural tourism of Timok region. *Ekonomika poljoprivrede*, *67*(1), 157-174. https://doi.org/10.5937/ekoPolj2001157I
16. Ilić, B., Milojević, I., & Miljković, M. (2022). The role of joint stock company in sustainability of capital development. Održivi razvoj, 4(1), 19-28. https://doi.org/10.5937/OdrRaz2201019I
17. J.W.L. Glaisher B.A. F.R.A.S. F.C.P.S. (1871) XXXII. On a class of definite integrals, The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, 42:280, 294-302, DOI: 10.1080/14786447108640568

18. Jeločnik, M., Subić, J., & Zdravković, A. (2022). Economic effects of investment in irrigation systems implementation at the small family farms. Ekonomika poljoprivrede, 69(3), 793-817. https://doi.org/10.5937/ekoPolj2203793J
19. Kočović, J., Mitrašević, M., Rajić, V., (2020). Aktuarska matematika (4. izd.). Univerzitet u Beogradu, Ekonomski fakultet, Centar za izdavačku delatnost. [*in English*: Kocovic, J., Mitrasevic, M., Rajic, V. (2020). Actuarial mathematics, *University of Belgade, Faculty of economy*.
20. Kočović, J., Pavlović, M., (2018). Uvod u finansijsku matematiku (3. izd.). Centar za izdavačku delatnost Ekonomskog fakulteta. [*in English*: Maksimović, G., Sekulić, D., Petrović, A., & Dragičević, D. (2017). Contemporary trends and new competitiveness strategies in hotel industry. *Hotel and Tourism Management, 5*(2), 27-35.].
21. Milojević, I., & Mihajlović, M. (2019). Implementation of the method of assessing investment projects in the public sector. Oditor, 5(1), 19-31. https://doi.org/10.5937/Oditor1901019M
22. Milošević, I., Stankov, B. (2023). Upravljanje prilivima stranih direktnih investicija u Republici Srbiji u kontekstu njihovog uticaja na visinu bruto domaćeg proizvoda. Akcionarstvo, 29(1), 133–149. [*in English*: Milosevic, I., Stankov, B. (2023). Management of inflows of foreign direct investments in the Republic of Serbia in the context of their impact on the gross domestic product, Akcionarstvo, 29(1), 133–149.
23. Miteva, A., & Doitchinova, J. (2022). Agriculture in the Southwestern region of Bulgaria and its impact on rural development. *Ekonomika poljoprivrede*, 69(4), 1003-1016. https://doi.org/10.5937/ekoPolj2204003M
24. Normatov, A. (2023). Some applications of the definite integral. In Proceedings of International Conference on Modern Science and Scientific Studies (Vol. 2, No. 6, pp. 260-263).
25. Oehrtman, M., Simmons, C. Emergent Quantitative Models for Definite Integrals. Int. J. Res. Undergrad. Math. Ed. (2023). https://doi.org/10.1007/s40753-022-00209-5
26. Popović, G. (2006). Macroeconomic efficiency measurement of the invested funds into a rural area or sector with a method of a capital coefficient. *Ekonomika poljoprivrede*, 53(4), 947-961.
27. Qiao, X., & Feng, T. (2023). Land rent theory and rent research of digital platform enterprises. Journal of Digital Economy, 2, 52-63.
28. Rothschild, M., & Stiglitz, J. E. (1978). Increasing risk: I. A definition. In Uncertainty in Economics (pp. 99-121). Academic Press.
29. Ryazantsev, I., & Ivolga, A. (2021). Distribution of agricultural lands and land ownership in Russia. Ekonomika poljoprivrede, 68(4), 961-975. https://doi.org/10.5937/ekoPolj2104961R
30. Sharipova, M. (2024). A is correct of the integral to the economy applications. Solution of social problems in management and economy, 3(1), 116-125.
31. Shekutkovski, N. (2013). Definition of the definite integral. Teaching of Mathematics, 16(1), 29-34.

32. Vasiljević, Z., Sredojević, Z., & Ćejvanović, F. (2006). Model of investments into agricultural land as an element of development program. *Ekonomika poljoprivrede*, 53(2), 403-412.
33. Vladisavljević, V., Mičić, S., Zupur, M. (2023). Analiza kao osnov za donošenje poslovnih odluka. Finansijski savetnik, 28(1), str. 7-35. [*in English*: Vladisavljevic, V., Micic, S., Zupur, M. (2023). Analysis as a basis for making business decisions. *Finansijski savetnik, 28(1), str. 7-35.*].
34. Wu, W., & Yuan, X. (2023). Why Is an Integral an Accurate Value. Applied Mathematics, 14(12), 847-850.