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STAGES OF DRAWING UP A MATHEMATICAL MODEL OF THE ECONOMIC ISSUE

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Abstract
The article presents the concept of a mathematical model and the stages of drawing up a mathematical model of an economic issue.

Keywords: Economy, mathematical model, sequence, compound interest, continuous interest.

Introduction

A mathematical model is a approximate description of a reality in the external world, written with the help of mathematical symbols. The analysis of the mathematical model makes it possible to penetrate into the fundamental essence of the studied reality. A mathematical model is a powerful weapon of knowledge of the outside world, which can express an idea in advance and control both the process of mathematical modeling, that is, the study of reality through a mathematical model can be divided into four stages.

The first stage is a clear expression of the laws that connect the main parts of the model, that is, the definition. This stage requires the study of a lot of information on the realities under study and a deep penetration into the connections between them. This stage is completed by writing out the links expressed in the qualities and qualities of quantities studied by this model with the help of mathematical symbols.

The second stage is the study-examination of the mathematical problem generated by the mathematical model. In this, the main question is to solve the generated mathematical problem, that is, to obtain the result data (theoretical results) when analyzing the model and compare them with the results of

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observing the studied reality. At this stage, the formulas, rules used in the analysis of the mathematical model play an important role, while this also depends on the computational techniques used in the formation of the result data, which is proposed as a solution to the complex problem under study. Sometimes the mathematical questions that are formed according to the mathematical model in the study of different realities are the same homogeneous. This necessitates a separate study as an independent matter with an abstraction of such realities under study.

The third stage is to determine whether the theoretical results obtained according to the accepted approximate model correspond to the results obtained from the practical observation of the studied reality. If the model is fully identified (all parameters that determine it are given), the difference in the results of the observation of the theoretical results is carried out by an assessment of the difference in the solution of the main issue. If the difference goes out of the accuracy of the tracking results, this model will not be accepted. Sometimes, when building a model, some of its characteristics become obvious. Model descriptions (parametric,functional) are defined issues are called inverse issues according to the ability to compare the results of observations with the results of observations in the said accuracy. If the conditions under which the descriptions of the mathematical model are not obtained are not met, then such a model will not suit the research of the studied reality. Checking the mathematical model according to the criteria for practice allows you to know if what is based on this model is right or wrong. This method is the only way to study unattainable realities.

The fourth stage is the analysis of the model, according to the data collected about the studied reality, there will be an improvement of the model. The development of Science and technology will continue to clarify the information on the realities under study. And finally there comes such a time that those of us who know about reality do not have a row to our information, which is obtained by means of a mathematical model. Then it becomes necessary to build a new modern mathematical model.

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It is known that the limit of the sequence $\{x_n\}$ with the general limit

$$x_n = (1 + \frac{1}{n})^n$$

gives the number e :

$$e = \lim_{n\to\infty} (1 + \frac{1}{n})^n, \quad e = 2{,}7182818\ldots$$

Let's look at an example of using the number e in the economy.
For example. We know the complex interest formula

$$Q = Q_O(1 + \frac{P}{100})^n \tag{1}$$

where, $Q_O -$ the initial amount of the deposit in the bank,
P $-$ the interest rate for a certain period of time (month, year),
N $-$ the amount of time (number) in which the deposit is stored,
Q $-$ formulas in the form of the amount of the deposit after n times are widely used in demographic calculations and economic forecasting. Assume that the initial deposit Q_O is placed in the bank for the year $P = 100\%$. In this case, the deposit will be made after one year $2Q_O$. After half a year (6 months)
The account is closed with the result

$$Q_1 = Q_0\left(1 + \frac{50}{100}\right) = Q_0\left(1 + \frac{1}{2}\right) = \frac{3}{2}Q_0 = 1{,}5Q_0.$$

It is again deposited in the same bank. At the end of the year

$$Q_2 = Q_O(1 + \frac{1}{2})^2 = Q_0 \cdot \frac{9}{4} = 2{,}25Q_0.$$

If we repeat this work every quarter, the deposit is at the end of the year

$$Q_3 = Q_O(1 + \frac{1}{3})^3 = Q_0 \cdot \frac{64}{27} \approx 2{,}37Q_0.$$

If we withdraw the deposit at any time during the year, at the end of the year

$$Q_{12} = Q_O(1 + \frac{1}{12})^{12} \approx 2{,}61Q_0.$$

If you go to the bank every day,

$$Q_{365} = Q_O(1 + \frac{1}{365})^{365} \approx 2{,}714Q_0,$$

per hour

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$$Q_{8720} = Q_0(1+\frac{1}{8720})^{8720} \approx 2{,}718Q_0$$

and so on.

It can be seen that the growth sequence of the initial deposit value

$$\{q_n\} = \left\{\frac{Q_n}{Q_0}\right\} \quad n \to \infty$$

overlaps with the sequence that gives the number e. Thus, the income earned in a year when interest is calculated continuouslydoes not exceed

$$\lim_{n\to\infty} \frac{(Q_n - Q_{0)}}{Q_0} \times 100\% = (e-1) \times 100\% \approx 172\%$$

In general, if the calculated percentage P – is divided into n parts, after t years the deposit will reach

$$Q_n = Q_0(1+\frac{r}{n})^{nt}$$

soums. Here,

$$n = \frac{P}{100}.$$

Let's change the form of this expression:

$$Q_n = Q_0[\left(1+\frac{r}{n}\right)^{\frac{n}{r}}]^{rt}.$$

Now let's add a new variable

$$m = \frac{n}{r}, \qquad (n \to \infty \; m \to \infty).$$

$$\lim_{n\to\infty} Q_n = \lim_{n\to\infty} Q_0 \left[\left(1+\frac{1}{m}\right)^m\right]^{rt} = Q_0 e^{rt}.$$

The calculation performed by this formula is called continuous percentage calculation.

References

1. М.С.Красс, Б.П.Чупрынов. “Основы математики и ее приложения в экономическом оброзовании” Дело. Москва. 2000.
2. Х.Беркинов, А.Беркинова, Б.Султонов, Х.Холдоров “Иқтисодий масалаларда корреляцион-регрессион таҳлил моделлари татбиқи” , “IQTISOD-MOLIYA”.Т.2008. Ўкув қўлланма.

3. Тахиров А. Предельные теоремы для периода занятости системы. G I │M │1│N.-Доклад. АН УзССР,1977, №6,- С. 3-4.
4. Т. Нуруллаев. “Эканомика ва математика” Узбекистан. Т. 1972.
5. Djalilova T., Komolova G. Operatsion hisobni ba`zi bir matematik-fizika tenglamalariga tadbiqi//“O`zbekiston va avtomobil sanoati: fan, ta`lim va ishlab chiqarish integratsiyasi” xalqaro ilmiy-amaliy anjuman materiallari, 386-389 betlar, AndMI.
6. Xalilov Murodiljon, Tillayev Donyorbek Experience in Using the relationship between mathematics and physics in shaping the concept of limit // Analytical journal of education and development 2021 yil, 212-215 b..
7. Djalilova T., Komolova G. Birinchi tartibli differensial tenglamalarni mexanika va fizikaning ba’zi masalalarini yechishga tatbiqlari// Namangan muhandislik texnologiyalari instituti ilmiy-texnika jurnali.
8. Naymanov B., Xalilov M. va boshqalar “Boshlang‘ich ta’limda ona tili, matematika o‘qitishning dolzarb muammolari” Respblika ilmiy-amaliy anjuman materiallari, 41-42 betlar, ADU
9. Sultanmurod E., Bobur K. TO’G’RI CHIZIQNING AMALIY MASALALARGA TATBIQI //Kokand University Research Base. – 2024. – С. 732-734.
10. Murodiljon, K., Gulhayo, K., & Bobur, K. (2022). Ayrim kimyoviy reaksiyalarni tenglamalar yordamida yeching. Biznesni boshlash va ochiq jamiyat Yevropa jurnali , 2 (1), 45-48.
11. Джалилова, Т. А., Комолова, Г. Ш. К., & Халилов, М. Д. У. (2022). О распространении сферической волны в нелинейно-сжимаемой и упругопластической средах. Oriental renaissance: Innovative, educational, natural and social sciences, 2(3), 87-92.
12. Комолова, Г., & Халилов, М. Stages of drawing up a mathematical model of the economic issue. Journal of ethics anddiversity in international communication. Испания-2022, 60, 45-48.
13. Komolova, G., Xalilov, M., & Komiljonov, B. Tenglamalar yordamida ba’zi kimyoviy reaksiyalarni yechish. Yevropa biznes startaplari va ochiq jamiyat jurnali.-2022.-2-jild.-Yo'q, 1(8), 45-48.

14. Xalilov, M. D., Komiljonov, B. K., & Komolova, G. S. (2022). Complex and vector expression of harmonic scaliar vibrations. Miasto Przyszłości, 24, 341-344.
15. Komolova G., Khalilov M., Komiljonov B. Solve Some Chemical Reactions Using Equations //European Journal of Business Startups and Open Society. – 2022. – T. 2. – №. 1.
16. Komolova, G., & Khalilov, M. Stages of drawing up a mathematical model of the economic issue. Journal of Ethics and Diversity in International Communication jurnali, e-ISSN, 2792-4017.
17. Abdujalilovna, DT, Sayibjon, K., Shukirillayevna, KG, & Durbekovich, KM (2023). Qattiq zarrachalar bilan ikki fazali vosita bilan yupqa profil atrofida oqim. Farmatsevtikaning salbiy natijalari jurnali , 3592-3596.
18. Ergashev Sultonmurod, K. B. (2021). Differensial tenglamalarni mehanika va fizikaning bazi masalalarini yechishga tadbiqlari. Наманган муҳандисликтехнология институти илмий-техника журнали, 430-433.
19. Bobur, K. (2024). Application of Operational Calculus and Laplac Exchanges to Electrical Mechanics. Miasto Przyszłości, 55, 459-463.
20. Muradiljon K., Mashxuraxon S. Application of the Theory of Linear Differential Equations to the Study of Some Oscillations //Web of Synergy: International Interdisciplinary Research Journal. – 2023. – T. 2. – №. 1. – C. 60-65.
21. Халилов М. Д., Комилжонов Б. К. Differensial tenglamaga olib keluvchi ba’zi masalalar //Journal of Advanced Research and Stability. – 2022.