



Is Economic Decision-Making Possible Without Mathematics?

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ABSTRACT

This study examines whether economic decision-making can occur without the use of mathematics by employing a qualitative library research approach. The research draws on a wide range of primary and secondary sources, including classical and contemporary works in economics, decision theory, and behavioral economics, to explore the relationship between mathematical reasoning and economic behavior. The findings indicate that basic economic decisions can indeed be made intuitively, relying on experience, habits, and simple judgment without the application of formal mathematical tools. Such decisions are commonly observed in everyday life, particularly in low-risk and routine situations. However, the study also reveals that mathematics plays a crucial role in enhancing the quality of decision-making, especially in more complex and uncertain economic environments. The use of mathematical models allows for systematic analysis, improved accuracy, and greater efficiency in evaluating alternatives. Moreover, mathematical approaches facilitate prediction, optimization, and risk assessment, which are essential components in modern economic systems and policy-making processes. Without these tools, decisions tend to be more subjective and potentially less reliable. Therefore, although economic decision-making without mathematics is theoretically possible at a fundamental level, its effectiveness becomes increasingly limited as the complexity of the decision context grows.

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1. INTRODUCTION

Economic decision-making is a fundamental activity in human life that is inseparable from everyday life ¹. Every individual, whether consciously or not, is constantly involved in the process of choosing among various available alternatives. This activity encompasses various aspects, from consumption and production to the distribution of limited resources. At the individual level, economic decisions are manifested in simple actions such as selecting goods to purchase, prioritizing needs, and managing income ². Meanwhile, at the group and institutional levels, economic decisions become more complex because they involve various interests, information, and strategic considerations. Thus, economic decision-making plays a crucial role in determining the well-being of individuals and society at large ³.

In academic contexts, economics is often associated with the use of mathematics as a primary analytical tool. Mathematics is used to construct models, measure relationships between variables, and provide a logical basis for decision-making ⁴. This approach makes economics a discipline that is not only descriptive, but also analytical and predictive. With the development of modern economics, the use of mathematics has become increasingly dominant. This is evident in branches such as microeconomics, macroeconomics, and quantitative economics, which rely heavily on mathematical models. These models allow economists to simplify complex realities into more structured and easily analyzed forms ⁵.

Furthermore, mathematics plays a role in assisting forecasting and rational decision-making ⁶. By using a mathematical approach, various possibilities can be systematically calculated and compared,

¹ Budi Alamsyah Siregar, *Teori Pengambilan Keputusan* (CV. Azka Pustaka, 2024); S E Febrianty et al., *Manajemen Pengambilan Keputusan* (Perkumpulan Rumah Cemerlang Indonesia, 2023); Fadrijah Hapsari, Mirna Herawati, and Siti Wahyuni, "Peran Literasi Ekonomi Dalam Mempengaruhi Aktivitas Ekonomi Dari Sudut Pandang Produsen Dan Konsumen," *Jurnal Ekonomi, Manajemen Dan Akuntansi (JEKMA)* 2, no. 1 (2023): 1–7, <https://journal.binainternusa.org/index.php/ecomas>.

² David A Aaker and Christine Moorman, *Strategic Market Management* (John Wiley & Sons, 2023); João M M Lopes, Sofia Gomes, and Tiago Trancoso, "Navigating The Green Maze: Insights For Businesses on Consumer Decision-Making and the Mediating Role of Their Environmental Concerns," *Sustainability Accounting, Management and Policy Journal* 15, no. 4 (2024): 861–83, <https://doi.org/https://doi.org/10.1108/SAMPJ-07-2023-0492>.

³ Bambang Kustiawan et al., *Perilaku Konsumen: Pendekatan Strategis* (PT. Sonpedia Publishing Indonesia, 2025); Naura Ilgalia Putri et al., *Pengantar Ekonomi Mikro* (Penerbit Widina, 2023).

⁴ Mykel J Kochenderfer, Tim A Wheeler, and Kyle H Wray, *Algorithms for Decision Making* (MIT press, 2022); Hamed Taherdoost and Mitra Madanchian, "Decision Making: Models, Processes, Techniques," *Cloud Computing and Data Science* 5, no. 1 (2024): 1–14, <https://doi.org/https://doi.org/10.37256/ccds.5120243284>; Nisha Nisha and Mahmoud Abouagwa, "Mathematics: The Backbone of Smart Business Decisions," in *Marketing Strategies for Total Quality Management in Hospitality Excellence* (IGI Global Scientific Publishing, 2026), 187–210, <https://doi.org/10.4018/979-8-3693-8608-8.ch009>.

⁵ Veniamin Mokhov et al., "A Review of Mathematical Models of Macroeconomics, Microeconomics, and Government Regulation of The Economy," *Mathematics* 11, no. 14 (2023): 3246, <https://doi.org/https://doi.org/10.3390/math11143246>; Etty Sri Wahyuni et al., *Pengantar Ekonomi* (CV Get Press Indonesia, 2025); Artur Czerwinski, "Mathematics Serving Economics: A Historical Review of Mathematical Methods in Economics," *Symmetry* 16, no. 10 (2024): 1271, <https://doi.org/https://doi.org/10.3390/sym16101271>.

⁶ Ahmad Syamil et al., *Matematika Ekonomi Dan Bisnis* (PT. Sonpedia Publishing Indonesia, 2026); Cut Nova Rianda Cut Nova Rianda, "Mengaplikasikan Konsep Dan Teknik Matematika Untuk

thus ensuring more optimal decisions. This approach is widely used in business, public policy, and economic planning. Key figures in the development of mathematical economics, such as Paul Samuelson, emphasize that the use of mathematics can enhance the scientific level of economics. He believes that mathematics provides a clear, consistent, and empirically testable framework, thus strengthening economics' position as a science ⁷.

However, a fundamental question arises regarding the extent to which mathematics is truly necessary for economic decision-making. Should every economic decision be based on mathematical calculations, or are there other methods individuals can use to make their economic choices? In everyday life, many individuals make economic decisions without using formal mathematical calculations. Decisions are often based on intuition, experience, habit, or even emotional factors. This suggests that the economic decision-making process is not always rational and mathematically measurable.

This view is reinforced by developments in behavioral economics, which highlight the limitations of human rationality. Experts such as Daniel Kahneman have shown that individuals tend to use heuristics or shortcuts in their thinking, which in many cases can deviate from the principles of mathematical rationality ⁸. Based on this background, this study aims to examine the possibility of economic decision-making without mathematics and to analyze the role of mathematics in improving the quality of these decisions. This study is expected to provide a more comprehensive understanding of the relationship between mathematics and economics, both theoretically and practically, particularly in the fields of education and economic policymaking.

2. METHODS

This study uses a qualitative approach with library research. A qualitative approach was chosen because this study focuses on an in-depth understanding of concepts, theories, and ideas related to economic decision-making and the role of mathematics in it ⁹. Through this approach, researchers can examine phenomena interpretively and comprehensively based on relevant written sources ¹⁰. This type of library research was used because all data analyzed comes from literature, not from field research. This study relies on various academic references to explore, compare, and synthesize ideas

Menganalisis Masalah Ekonomi Dan Bisnis," *Al-Buyu: Jurnal Hukum Ekonomi Syari'ah* 2, no. 1 (2025): 46–58, <https://doi.org/https://doi.org/10.55721/8ffm4f24>.

⁷ Mauro Boianovsky, "Reacting to Samuelson: Early Development Economics and The Factor-Price Equalization Theorem," *Review of Political Economy* 33, no. 4 (2021): 631–55, <https://doi.org/https://doi.org/10.1080/09538259.2020.1815969>; Fikra Muljani, *The 20 Great Economists: Belajar Serius Soal Ekonomi Sehari-Hari, Cara Investasi Yang Baik, Dan Pengelolaan Keuangan Rumah Tangga Yang Sehat* (Anak Hebat Indonesia, 2024); Achmad Nur Hidayat and Fachru Nofrian Bakarudin, *Buku Ajar Sejarah Pemikiran Ekonomi* (PT. Sonpedia Publishing Indonesia, 2024).

⁸ Gerd Gigerenzer, "The Legacy of Daniel Kahneman: A Personal View," *Erasmus Journal for Philosophy and Economics* 18, no. 1 (2025): 28–61, <https://doi.org/https://doi.org/10.23941/ejpe.v18i1.1075>.

⁹ Hendrik Poltak and Robert Rianto Widjaja, "Pendekatan Metode Studi Kasus Dalam Riset Kualitatif," *Local Engineering* 2, no. 1 (2024): 31–34, <https://doi.org/https://doi.org/10.59810/lejlace.v2i1.89>; Yvonna S Lincoln, "Insights Into Library Services and Users From Qualitative Research," *Library & Information Science Research* 24, no. 1 (2002): 3–16, [https://doi.org/https://doi.org/10.1016/S0740-8188\(01\)00107-4](https://doi.org/https://doi.org/10.1016/S0740-8188(01)00107-4); Abdul Rahim Abdul Rahman and Suhana Mohezar, "Ensuring Continued Use of A Digital Library: A Qualitative Approach," *The Electronic Library* 38, no. 3 (2020): 513–30, <https://doi.org/https://doi.org/10.1108/EL-12-2019-0294>.

¹⁰ Adelika Adelika and Hendra Hendra, "Peran Lingkungan Politik Pada Bisnis Internasional: Pendekatan Kualitatif Studi Pustaka," *Jurnal Minfo Polgan* 12, no. 2 (2023): 2401–5, <https://doi.org/https://doi.org/10.33395/jmp.v12i2.13282>.

from experts in the fields of economics, decision theory, and behavioral economics. Thus, the results are expected to provide in-depth conceptual understanding. Data sources in this study are divided into two: primary sources and secondary sources. Primary sources include classical and modern works that directly discuss the concept of economic decision-making and the use of mathematics in economics. Meanwhile, secondary sources include scientific journal articles, textbooks, and various other relevant academic publications that support the research analysis.

The data collection technique was conducted through documentation studies. In this case, the researcher identified various literature relevant to the research topic and then classified it based on theme and relevance. Next, the literature was reviewed in depth to identify concepts, theories, and arguments that could be used to answer the research problem formulation. The data analysis technique used was content analysis. This analysis was conducted through several stages: data reduction, data presentation, and conclusion drawing. Data reduction was carried out by selecting and simplifying relevant information, data presentation was carried out in the form of systematic descriptions, while conclusions were drawn by interpreting the findings based on the theoretical framework used. This approach was chosen because it allowed the researcher to conduct an in-depth analysis of various concepts and theories related to the role of mathematics in economic decision-making. Furthermore, this method also provides flexibility in integrating various scientific perspectives, resulting in a more comprehensive and critical understanding.

3. FINDINGS AND DISCUSSION

FINDINGS

This section presents the main research findings obtained through an analysis of various literature relevant to the topic of economic decision-making and the role of mathematics in it. Based on the results of the literature review, it was found that the relationship between mathematics and economic decision-making is not absolute, but rather contextual. This means that the use of mathematics in the decision-making process is highly dependent on the level of problem complexity, the availability of information, and the individual's capacity to process data. These findings indicate a spectrum in economic decision-making practices, ranging from the intuitive to the highly analytical and mathematically model-based.

Economic Decisions Without Mathematics Are Possible

The research results show that economic decision-making without the use of formal mathematics is essentially possible, especially in simple and routine contexts. In everyday life, individuals are faced with a variety of economic choices that do not always require numerical analysis or complex calculations. This confirms that economic activity does not rely entirely on mathematical abilities. In practice, many economic decisions are made spontaneously and practically. For example, when someone chooses necessities at the market, determines a menu, or manages daily expenses, these decisions are often made without involving specific mathematical formulas or models. Individuals rely more on direct judgments that are deemed sufficient to meet current needs ¹¹.

These types of decisions are generally based on simple considerations, such as a perceived affordable price, perceived good quality, or satisfactory previous experience. In these situations, individuals don't feel the need for detailed calculations because the situation they face is relatively uncomplicated and doesn't involve significant risk. This phenomenon demonstrates humans' adaptive capacity to deal with various economic situations. Individuals are able to adapt their decision-making

¹¹ Adelika and Hendra; Thomas Ola Langoday, Christiana Wahyuningrum, and Agustina Sadri Yathy Lay, *Teori Pengambilan Keputusan Bisnis: Pengantar Untuk Calon Manajer Hebat Di Era Global* (PT. Sonpedia Publishing Indonesia, 2023).

methods to the complexity of the problem at hand. When the situation is simple, the approach used tends to be simple and practical, without the need for mathematical tools ¹².

Furthermore, decision-making without mathematics is also influenced by habit. In repeated situations, individuals tend to develop certain decision-making patterns that are considered effective. These patterns then become references for subsequent decision-making, resulting in faster and more efficient thinking without the need for in-depth reanalysis. This ability is also related to the use of an individual's implicit knowledge. This knowledge is gained from everyday experiences and stored in memory as a practical reference. When faced with similar situations, individuals can quickly make decisions based on these experiences without the need for mathematical calculations.

Furthermore, this situation demonstrates that rationality in decision-making is not always synonymous with the use of mathematics. In this context, rationality can be understood as an individual's ability to choose the alternative deemed most appropriate to their needs and the situation at hand, even without undergoing a formal analysis process. Thus, it can be concluded that economic decision-making without mathematics is a real and common phenomenon in everyday life. However, the success of this approach depends heavily on the complexity of the problem at hand, making its use more relevant in simple contexts that do not require in-depth analysis ¹³.

The Role of Intuition and Experience

Research findings indicate that intuition and experience play a significant role in the economic decision-making process. In many situations, individuals do not always rely on systematic mathematical calculations, but instead utilize practical knowledge developed from previous experience. This suggests that the economic decision-making process is also influenced by informal cognitive aspects. Intuition, in this context, can be understood as an individual's ability to make decisions quickly without undergoing a lengthy and structured analysis process. Intuition often emerges as a spontaneous response to a situation, especially when an individual has sufficient experience in dealing with similar conditions. Thus, intuition is not simply a guess, but rather the result of repeated internalization of experience ¹⁴.

Empirical experience is a primary source of this intuition. Individuals who frequently engage in specific economic activities, such as trading or financial management, tend to have greater sensitivity in decision-making. They can recognize certain patterns and use them as a basis for consideration without the need for explicit mathematical analysis. In practice, economic decisions based on intuition are often considered "reasonable" by the individuals involved. Rationality, in this case, is not measured by the accuracy of mathematical calculations, but rather by the decision's appropriateness to the experience and circumstances at hand. This approach demonstrates that rationality can be contextual and not always synonymous with quantitative approaches ¹⁵.

¹² Antyo Pracoyo et al., *Perilaku Keuangan: Teori Dan Praktik* (PT. Green Pustaka Indonesia, 2025); Puja Lestari, "Pengaruh Harga Dan Lokasi Terhadap Keputusan Pembelian Konsumen Kaki Lima Di Pasar Batahan" (UIN Syekh Ali Hasan Ahmad Addary Padangsidempuan, 2025), <http://etd.uinsyahada.ac.id/id/eprint/13477>.

¹³ Muhammad Syarif Hidayatullah et al., "Mengukur Dan Memahami Penalaran" (Komojoyo Press, 2024).

¹⁴ Gilang Sekar Tadjie and Mohamad Abduh Alfahlepi, "Dinamika Pengambilan Keputusan Dalam Menentukan Arah Perusahaan Di Tengah Persaingan Global Pada Perusahaan Di Subang," *Jurnal Ekonomi Utama* 4, no. 3 (2025): 826–34, <https://doi.org/https://doi.org/10.55903/juria.v4i3.340>; Bambang Septiawan and Aris Sunandes, "Implementasi Intuisi Dalam Manajemen Bisnis (Sebuah Studi Literatur)," *Jurnal Penelitian Manajemen Terapan (Penataran)* 9, no. 2 (2024): 199–209, <https://journal.stieken.ac.id/index.php/penataran/article/view/906>.

¹⁵ Dewi Melinda Hutabarat and Pipit Irawati, "Peran Pengambilan Keputusan Intuitif Pada Pengembangan Strategi Bisnis Wisata Kuliner Di Tanjungpinang," *Socius: Jurnal Penelitian Ilmu-Ilmu*

An intuition- and experience-based approach is highly effective in simple, uncomplicated situations. When there are relatively few variables involved and the risks involved are low, individuals can quickly make decisions without requiring in-depth analysis. Furthermore, under time constraints, intuition can be a helpful tool in expediting the decision-making process. However, the use of intuition also has limitations. Decisions based on intuition are highly dependent on the quality and relevance of an individual's experience. If that experience is limited or inappropriate to the situation at hand, the decision is potentially less accurate. Therefore, intuition does not always guarantee high accuracy.

Nevertheless, intuition and experience remain important as alternative mechanisms in economic decision-making. In many cases, they can replace mathematical analysis, especially when conditions preclude detailed calculations. This demonstrates human flexibility in adapting thinking to the situation at hand. Therefore, it can be concluded that intuition and experience are essential components in economic decision-making. Both serve not only as complements but also as effective alternatives under certain circumstances. However, their use must be tailored to the complexity of the problem to ensure optimal decisions are made.

Limitations Without Mathematics

Although economic decision-making without mathematics is possible, this study found significant limitations in practice. These limitations primarily arise when individuals are faced with more complex situations, where decisions are no longer simple or routine. In such circumstances, non-mathematical approaches tend to be unable to produce optimal results. One major limitation lies in the level of decision accuracy. Without the support of mathematical analysis, decisions are often based solely on estimates or subjective judgments. This has the potential to result in inaccurate decisions, especially when the variables involved are numerous and interrelated.

Furthermore, uncertainty poses a significant challenge to decision-making without mathematics. In dynamic economic situations, individuals often face risks and contingencies that cannot be easily predicted. Without mathematical tools such as probability or risk analysis, the ability to estimate the impact of a decision is severely limited¹⁶. Another limitation is the difficulty in systematically evaluating various alternative choices. In many cases, economic decisions involve comparing several options with different consequences. Without a mathematical approach, this evaluation process tends to be unstructured and relies on individual subjective perceptions.

This situation also opens up the possibility of various biases in decision-making. One common bias is *overconfidence*, the tendency for individuals to be overconfident in decisions made without adequate analysis. Furthermore, errors in understanding or perceiving risk often occur when mathematical tools are not used. Furthermore, individuals also have the potential to overlook important information that should be considered in the decision-making process. Without a clear analytical framework, not all variables can be optimally accounted for. This can lead to decisions that are less comprehensive and do not consider all relevant aspects¹⁷.

Sosial 3, no. 5 (2025): 209–12, <https://doi.org/https://doi.org/10.5281/zenodo.17862695>; Philipp Korherr et al., "The Role of Management in Fostering Analytics: The Shift from Intuition to Analytics-Based Decision-Making," *Journal of Decision Systems* 32, no. 3 (2023): 600–616, <https://doi.org/https://doi.org/10.1080/12460125.2022.2062848>.

¹⁶ Arnah Ritongah and Riby Tamara, "Hubungan Antara Peluang Dan Keputusan Manusia," *Algoritma: Jurnal Matematika, Ilmu Pengetahuan Alam, Kebumihan Dan Angkasa* 3, no. 3 (2025): 7–13, <https://doi.org/https://doi.org/10.62383/algoritma.v3i3.472>; Erika Nur Kenzu and Ariantje Dimpudus, "Model Matematika Dalam Pengelolaan Keuangan," *Jurnal Pembelajaran Dan Pengembangan Matematika* 5, no. 2 (2025): 119–31, <https://doi.org/https://doi.org/10.36733/pemantik.v5i2.11544>.

¹⁷ Agasta Amaliya Khususna, "Pengaruh Confirmation Bias, Self-Attribution Bias, Overconfidence Bias, Cognitive Dissonance Bias, Dan Herding Bias Terhadap Pengambilan Keputusan Investor Pemula

From a modern economic perspective, these limitations become increasingly apparent given the ever-evolving complexity of economic systems. Decisions made without a basis in mathematical analysis tend to be unable to keep pace with these dynamics. Consequently, decision quality becomes less competitive, particularly in the context of business and public policy. Therefore, it can be concluded that the absence of mathematics in economic decision-making increases the potential for error and reduces the quality of decision outcomes. While non-mathematical approaches remain relevant in certain contexts, their use has clear limitations, particularly when faced with complex, high-risk situations that require in-depth analysis.

The Role of Mathematics in Complexity

Mathematics plays a crucial role in complex economic decision-making. In situations involving numerous variables, high uncertainty, and long-term consequences, a mathematical approach becomes an indispensable necessity. This indicates that the more complex an economic problem, the greater the need for systematic and measurable analytical tools. In the modern economic context, complexity is increasing with the development of globalization, market integration, and technological advances. Economic activity is no longer limited to the local scale but involves rapidly evolving cross-border interactions. This situation demands an approach capable of accurately managing large amounts of information, a capability that can only be optimally facilitated through mathematics ¹⁸.

Mathematics enables individuals and institutions to analyze data more systematically. By using a quantitative approach, complex economic data can be transformed into meaningful information. This process includes measuring, grouping, and interpreting data, helping decision-makers understand the situation more objectively. Furthermore, mathematics plays a role in identifying patterns that are not immediately visible. Through specific analytical techniques, the relationships between economic variables can be more clearly mapped. This is crucial for understanding market trends, consumer behavior, and overall economic dynamics ¹⁹.

The ability of mathematics to generate predictions is also a key advantage in economic decision-making. Using mathematical models, various future possibilities can be estimated based on available data. These predictions help plan more effective strategies and anticipate potential risks. Various mathematical models, such as optimization analysis, probability theory, and econometric modeling, provide a robust framework for evaluating decision alternatives. These models enable decision-makers to rationally and systematically compare various options, thus determining the most optimal option based on specific criteria.

In addition to improving accuracy, the use of mathematics also makes the decision-making process more structured and transparent. Each step in the analysis can be explained logically and retested by others. This is crucial in academic, business, and public policy contexts, where accountability is a crucial concern. Therefore, it can be said that in complex situations, mathematics serves not only as a tool but also as a primary foundation for economic decision-making. The presence of mathematics enables more

Dalam Investasi Saham Di Masa Pandemi Covid-19" (Universitas Islam Indonesia, 2023); Shilla Khairani Putri, "Mitigasi Bias Kognitif Dalam Pengambilan Keputusan Finansial: Peran Keterampilan Berpikir Kritis Dan Literasi Keuangan (Tinjauan Literatur Sistematis)," *Jurnal Ilmiah Ekonomi, Manajemen, Bisnis Dan Akuntansi* 3, no. 1 (2026): 191–201.

¹⁸ Syamil et al., *Matematika Ekonomi Dan Bisnis*; Muh Nur and S E Arifin, *Buku Ajar Matematika Ekonomi Dan Bisnis* (Penerbit: Kramantara JS, 2025).

¹⁹ Pelia Elza, "Integrasi Big Data Dengan Model Matematika Untuk Prediksi Tren Ekonomi," *Jurnal Matematika Dan Aplikasi* 1, no. 1 (2025): 1–7, <https://ejournal.samudrailmu.com/index.php/jma>; Mohamad Yusak Anshori and Teguh Herlambang, *Manamatik Mengelola Bisnis Dengan Logika Angka Dan Strategi* (Deepublish, 2025).

rational, accurate, and accountable decisions, thereby improving the quality of results achieved in various economic contexts.

DISCUSSION

The findings of this study demonstrate that economic decision-making without mathematics is indeed possible, especially in simple contexts that do not involve many variables. In everyday life, individuals are often able to make economic choices based on practical considerations that do not require formal mathematical calculations. This suggests that economic activity at a basic level is flexible and does not always rely on quantitative approaches. This phenomenon aligns with the classical economic view that views humans as rational agents, albeit within certain limits ²⁰. The concept of bounded rationality explains that individuals have limited cognitive abilities in processing information, so they do not always use a fully optimal approach. Under these conditions, decisions taken are still considered rational as long as they are in accordance with the information and capabilities available.

Furthermore, in simple contexts, individuals tend to rely on experience, habit, and intuition when making economic decisions. This approach allows for a quick and efficient decision-making process without the need for complex analysis. Therefore, mathematics is not always a prerequisite for every economic activity, especially those that are routine and repetitive. However, as complexity increases, non-mathematical approaches begin to show their limitations. In situations involving many variables, uncertainty, and high risk, intuition and experience alone are insufficient to produce optimal decisions. This is where mathematics begins to play a more significant role. From a modern economic perspective, mathematics has become an irreplaceable tool in the process of economic analysis. The use of mathematical models allows complex economic realities to be simplified into more structured forms ²¹. This helps economists and decision-makers understand the relationships between variables more clearly and systematically.

For example, the use of utility functions and optimization models provides a robust framework for determining the best choice among various alternatives. These models enable rational decision-making, considering various constraints. Thus, mathematics serves as a tool for achieving efficiency and optimality in economic decisions. On the other hand, behavioral economics offers a different perspective on the decision-making process. Figures like Daniel Kahneman have shown that humans often do not act entirely rationally. Individuals tend to use heuristics, or simple rules of thumb, when making decisions, which in some cases can deviate from the principles of mathematical rationality. This concept of heuristics explains that individuals use cognitive shortcuts to simplify the decision-making process. This approach is particularly useful in situations requiring quick decisions or when available information is limited. However, the use of heuristics also has the potential to introduce biases that can affect decision quality.

Thus, it is understandable that in everyday practice, mathematics is not always explicitly used in economic decision-making. Many decisions are made intuitively without formal calculation. This demonstrates the gap between ideal economic theory and actual practice. However, the limitations of non-mathematical approaches become increasingly apparent in more complex contexts. Without mathematical support, the ability to predict future economic conditions is severely limited. Yet, prediction is a crucial aspect of economic planning, both at the individual and institutional levels.

²⁰ Nanda Suryadi, "Rasionalitas Ekonomi Dalam Perspektif Teoritis Dan Praktis: Dari Homo Economicus Hingga Rasionalitas Syari'ah," *Jurnal Masharif Al-Syariah: Jurnal Ekonomi Dan Perbankan Syariah* 10, no. 3 (2025): 1555–65, <https://doi.org/https://doi.org/10.30651/jms.v10i3.26479>.

²¹ QULYASRY FADILA, "Pemodelan Matematika Terhadap Revitalisasi Keuntungan Pasar Tradisional (Studi Kasus Di Pasar Koga)" (UIN Raden Intan Lampung, 2026), <https://repository.radenintan.ac.id/id/eprint/42482>.

Furthermore, risk assessment becomes difficult without mathematical tools. In the world of business and public policy, every decision has consequences that must be carefully considered. Without adequate risk analysis, decisions have the potential to cause significant losses.

The use of mathematics in risk analysis allows decision-makers to quantify the likelihood of an event occurring and its impact. This helps identify the safest and most profitable alternatives. Thus, mathematics contributes to improving the quality and reliability of economic decisions. Furthermore, in the context of public policy, decisions made without a basis in mathematical analysis can have far-reaching impacts on society. Therefore, the use of a quantitative approach is crucial to ensure that the resulting policies are objective, transparent, and accountable. Considering these various aspects, it can be concluded that mathematics plays a strategic role in economic decision-making, especially in the face of modern complexity. However, this role does not negate the importance of intuition and experience as part of the decision-making process. Therefore, mathematics should be viewed as a tool that strengthens the quality of economic decisions, not as the sole approach. The integration of mathematical analysis and intuitive considerations can actually produce decisions that are more comprehensive, adaptive, and relevant to real-world conditions.

4. CONCLUSION

making without mathematics is theoretically possible, especially in simple, everyday contexts. In such situations, individuals tend to rely on intuition, experience, and practical considerations that do not require formal mathematical analysis. This suggests that basic economic activity can still operate effectively even without the support of a quantitative approach. However, when faced with more complex situations, the use of mathematics becomes crucial. Complexity involving numerous variables, uncertainty, and high risk demands more systematic and measurable analytical tools. In this context, mathematics plays a role in increasing the accuracy, efficiency, and rationality of decisions, resulting in more optimal and accountable results.

Furthermore, mathematics serves not only as a tool but also as a fundamental foundation for modern economic analysis. Various mathematical models simplify complex economic realities into more structured and easily analyzed forms. Therefore, although not always explicitly used in everyday practice, mathematics still plays a crucial role in generating quality economic decisions. Based on these findings, further research is recommended to empirically examine how individuals or groups use mathematics in economic decision-making across various contexts, such as education, business, and public policy. Furthermore, research can develop an integrative approach that combines mathematical analysis with behavioral aspects, such as intuition and heuristics, to gain a more comprehensive understanding. Interdisciplinary studies involving economics, psychology, and education are also important to enrich perspectives and increase the relevance of future research findings.

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