



The Hidden Mathematics of Entrepreneurship: Rethinking Business Decision-Making

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ABSTRACT

This study explores the often-overlooked role of mathematics in entrepreneurial decision-making and challenges the common perception that business success is primarily driven by intuition and experience. Using a qualitative library research approach, this study examines a wide range of primary and secondary sources in entrepreneurship, financial management, and decision theory to better understand the relationship between intuitive judgment and quantitative reasoning in business practices. The findings reveal that mathematical reasoning is implicitly embedded in many entrepreneurial activities, including pricing strategies, cost management, investment planning, and risk evaluation. Although entrepreneurs may not always use formal mathematical models, their decisions frequently reflect underlying quantitative logic shaped by practical experience and situational awareness. However, the study also highlights that the absence of explicit mathematical understanding can lead to inefficiencies, cognitive biases, and suboptimal decision outcomes, particularly in complex and competitive business environments. Without a structured analytical framework, entrepreneurs may struggle to evaluate alternatives accurately and manage financial uncertainty effectively. Therefore, this study argues that recognizing and strengthening the role of mathematics in entrepreneurship is essential. Integrating mathematical thinking with intuitive insights can significantly improve the quality, consistency, and sustainability of business decision-making processes.

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1. INTRODUCTION

Entrepreneurship has often been understood as an activity heavily influenced by intuition, creativity, and practical experience ¹. Much popular literature and inspirational stories portray entrepreneurs as individuals capable of making quick decisions based on sharp instincts. This perception has led to the widespread understanding that business success is determined more by the courage to take risks and the ability to spontaneously identify opportunities, rather than by systematic analysis. This view is not without merit, as in practice, many entrepreneurs are faced with situations that require quick decisions amidst uncertainty. Dynamic market conditions often do not allow sufficient time for in-depth analysis. In such situations, intuition becomes a valuable tool for responding quickly to change. However, this dominant narrative also has the potential to lead to misunderstandings about the importance of rationality in entrepreneurship.

Narratives about the success of global business figures reinforce this view. Figures like Elon Musk are often portrayed as visionary entrepreneurs who boldly make major decisions based on conviction and intuition. Stories like these foster the perception that business success can be achieved without significant reliance on mathematical analysis². However, behind these major decisions lies a complex process of calculation and analysis. In reality, entrepreneurial activity is inextricably linked to a strong quantitative aspect. Various crucial business decisions, such as product pricing, production cost calculations, profit analysis, and cash flow management, all require a mathematical approach. While not always explicitly recognized, mathematics is an integral part of this decision-making process.

The role of mathematics in entrepreneurship is often implicit or hidden. Many entrepreneurs use mathematical principles intuitively without realizing they are engaging in quantitative analysis ³. For example, when estimating profits or assessing the feasibility of a business opportunity, they are actually performing simple calculations based on mathematical logic⁴. As modern business evolves, the complexity of decision-making increases. Increasing competition, changing consumer preferences, and technological advancements require entrepreneurs to rely more than just on intuition. Decisions must be supported by accurate data and analysis to minimize the risk of error.

In this context, overreliance on intuition can be a weakness. Decisions not based on mathematical analysis can potentially lead to errors that significantly impact business continuity⁵. For example, errors

¹ Scherly Hansopaheluwakan et al., *Kewirausahaan: Berpikir Kreatif Untuk Menciptakan Peluang Bisnis Yang Inovatif* (PT. Green Pustaka Indonesia, 2025); Suprpto Estede et al., *Kewirausahaan Kreatif: Inovasi Dan Strategi Dalam Bisnis Modern* (PT. Star Digital Publishing, Yogyakarta-Indonesia, 2025).

² Asep Amaludin et al., *Leadership (Kekuatan Kepemimpinan: Mengubah Visi Menjadi Tindakan)* 14 Dilihat (Detak Pustaka, 2025); Alam Bachtiar, *The Magic Of Influencer Bagaimana Memberi Nilai Pada Diri Sendiri Dan Memikat Orang Lain*, vol. 159 (Araska Publisher, 2022).

³ Mohamad Yusak Anshori and Teguh Herlambang, *Manematik Mengelola Bisnis Dengan Logika Angka Dan Strategi* (Deepublish, 2025); Eny Latifah and Rudi Abdullah, "Pendekatan Metodologik Matematika Dalam Ekonomi Dan Bisnis Islam," *JIEM: Journal Of International Entrepreneurship And Management* 2, no. 2 (2023): 113–21, <https://doi.org/https://doi.org/10.62668/jiem.v2i02.1156>.

⁴ Allan M Williams, Isabel Rodriguez Sanchez, and Vlatka Škokić, "Innovation, Risk, And Uncertainty: A Study Of Tourism Entrepreneurs," *Journal of Travel Research* 60, no. 2 (2021): 293–311, <https://journals.sagepub.com/doi/abs/10.1177/0047287519896012>; Matteo Cristofaro, Pier Luigi Giardino, and Jeffrey Muldoon, "Entrepreneurial Decision-Making In The Age Of AI: Sector Knowledge At The Balance Of Intuition And Analysis," *Technology in Society* 85 (2025): 103200, <https://doi.org/https://doi.org/10.1016/j.techsoc.2025.103200>; Anshori and Herlambang, *Manematik Mengelola Bisnis Dengan Logika Angka Dan Strategi*.

⁵ Dewi Kartika et al., "Menganalisis Faktor Penentu Kegagalan Wirausaha Di Indonesia: Sebuah Pendekatan Kualitatif," *Jurnal Ilmu Pendidikan Dan Sosial* 4, no. 1 (2025): 9–20,

in pricing or estimating market demand can lead to significant financial losses ⁶. Behavioral economics provides additional explanations for the limitations of intuition in decision-making. Daniel Kahneman explains that humans tend to use heuristics, or shortcuts in thinking, which do not always lead to optimal decisions ⁷. These heuristics can lead to cognitive biases that influence how individuals assess information and make decisions.

In the context of entrepreneurship, this cognitive bias can manifest itself in various forms, such as overconfidence, the tendency to be overly confident in one's own judgment. This bias can lead entrepreneurs to ignore data or information that contradicts their beliefs ⁸. As a result, decisions are less rational and potentially carry greater risks. Therefore, it is important to position mathematics as an integral part of entrepreneurship. Mathematics serves not only as a calculation tool but also as a framework for thinking that helps analyze situations, evaluate alternatives, and make rational decisions. Thus, mathematics can be a tool to control and complement intuition.

Based on this background, a need arises to reexamine the role of mathematics in entrepreneurship. Key questions that need to be answered are whether mathematics is truly hidden in business practices, and how it plays a role in improving the quality of decision-making. This study is relevant considering that many entrepreneurs still do not realize the importance of mathematical aspects in their business activities. This research aims to identify forms of mathematics hidden in entrepreneurial activities and analyze how this role can be optimized. By understanding the relationship between intuition and mathematical analysis, this research is expected to provide a new perspective on entrepreneurship, not only as an activity based on creativity and intuition, but also as a process involving rational and structured thinking.

2. METHODS

This study uses a qualitative approach with library research to gain a deep understanding of the relationship between entrepreneurship and mathematics. This approach was chosen because it allows researchers to comprehensively explore concepts, theories, and previous research findings⁹. Therefore,

<https://doi.org/https://doi.org/10.58540/jipsi.v4i1.786>; Ahmad Syamil et al., *Matematika Ekonomi Dan Bisnis* (PT. Sonpedia Publishing Indonesia, 2026).

⁶ Erwin Febriansyah et al., "Pelatihan Penentuan Harga Pokok Produksi Dan Strategi Penetapan Harga," *IJTIMA': Jurnal Pengabdian Masyarakat* 2, no. 1 (2025): 21–30, <https://doi.org/https://doi.org/10.25299/ijtima.2025.21752>; Ichsan Khalis et al., *Pengambilan Keputusan Dalam Diskriminasi Harga, Penentuan Harga Produk Baru, Dan Penetapan Harga Pada Pasar Yang Telah Mapan* (Fahmi Karya, 2024).

⁷ Aristo Afrianto Budiman, "Pengaruh Heuristic Biases Dan Herding Bias Terhadap Keputusan Investasi Dengan Financial Literacy Sebagai Variabel Pemoderasi (Studi Empiris Perilaku Investor Di Pasar Modal Indonesia)" (Sekolah Tinggi Ilmu Ekonomi YKPN Yogyakarta, 2024), <http://repositorybaru.stieykpn.ac.id/id/eprint/2468>; 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, <https://doi.org/https://doi.org/10.61722/jemba.v3i1.1958>.

⁸ Agasta Amaliya Khusna, "Pengaruh Confirmation Bias, Self-Attribution Bias, Overconfidence Bias, Cognitive Dissonance Bias, Dan Herding Bias Terhadap Pengambilan Keputusan Investor Pemula Dalam Investasi Saham Di Masa Pandemi Covid-19" (Universitas Islam Indonesia, 2023); Putri, "Mitigasi Bias Kognitif Dalam Pengambilan Keputusan Finansial: Peran Keterampilan Berpikir Kritis Dan Literasi Keuangan (Tinjauan Literatur Sistematis)."

⁹ Anggun Eindhana Zulfa et al., "Penerapan Matematika Pada Ilmu Ekonomi: Himpunan," *JIDE: Journal Of International Development Economics* 3, no. 2 (2024): 101–13,

the study focuses not on field data collection but on critical analysis of various relevant literature sources. The qualitative approach emphasizes the meaning and interpretation of the phenomena studied. Researchers seek to understand how mathematics plays a role in entrepreneurial activities, both explicitly and implicitly. Through this approach, researchers can explore various perspectives developed in the literature and connect them to the context of business decision-making. Data sources in this study were obtained from various literature related to the research topic. This literature covers the fields of entrepreneurship, finance, and mathematical concepts relevant to business decision-making. Sources were selected selectively, considering their quality, credibility, and relevance to the research focus.

The primary data sources in this study consist of scholarly works that directly discuss the theory and practice of entrepreneurship and finance. These works serve as the primary reference because they contain basic concepts and theoretical frameworks that serve as the foundation for the analysis. By using primary sources, the research has a strong foundation for examining the phenomena under study. Furthermore, secondary data sources are also used to complement and enrich the analysis. Secondary sources include scientific journal articles, textbooks, and other relevant academic publications. These sources serve to provide additional perspectives, previous research findings, and reinforce the findings obtained from primary sources. Data collection techniques are carried out through documentation studies, namely by identifying, collecting, and reviewing various written documents related to the research topic. This process involves in-depth reading, noting important information, and grouping data based on specific themes. In this way, researchers can organize data systematically and purposefully.

The data analysis in this study used the content analysis method. This method is used to systematically examine the content of various literature sources to identify patterns, themes, and meanings relevant to the research focus. Content analysis allows researchers to interpret data in depth without having to rely on numerical data. The stages of data analysis include data reduction, data presentation, and drawing conclusions. Data reduction is carried out by selecting and simplifying relevant information, thus making the data more focused. Next, the data is presented in a structured narrative form for easy understanding. The final stage is drawing conclusions, where researchers formulate key findings based on the results of the analysis. Through this stage, the research is expected to produce a comprehensive understanding of the role of mathematics in entrepreneurship.

3. FINDINGS AND DISCUSSION

FINDINGS

The results of this study provide a compelling insight into how mathematics is actually present in entrepreneurial practice, though often not explicitly recognized by business actors. In many cases, entrepreneurial activity is perceived as a domain that relies more on intuition and experience, even though it actually includes logical and structured thought processes. This confirms a hidden dimension to entrepreneurship that has received little attention: the role of mathematics as a foundation for decision-making.

Mathematics is implicitly present in various entrepreneurial activities.

<https://doi.org/https://doi.org/10.62668/jide.v3i2.1326>; Roza Thohiri et al., "Kajian Literatur Penerapan Persamaan Linear Dalam Analisis Permintaan Dan Penawaran Pada Matematika Ekonomi," *Jurnal Ilmiah Global Education* 6, no. 4 (2025): 3025–36, <https://doi.org/https://doi.org/10.55681/jige.v6i4.4816>; 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>.

Mathematics is implicitly present in various entrepreneurial activities, meaning that everyday business practices are never truly free from quantitative thinking processes. Although many entrepreneurs don't consciously use formal mathematical formulas or models, their decisions still involve numerical considerations, value comparisons, and logical estimations¹⁰. This demonstrates that mathematics has become an inherent part of entrepreneurial practice, even though it is often not recognized as part of a specific discipline. In activities like pricing, for example, an entrepreneur indirectly performs calculations involving production costs, profit margins, and market purchasing power. This process reflects the use of basic mathematical concepts such as addition, percentages, and ratios. Even if performed simply or based on experience, this process still demonstrates the existence of a mathematical thought structure underlying the decisions made.

The same is true in managing profits and expenses. Entrepreneurs routinely evaluate income and expenses to ensure their businesses remain profitable. In this process, they perform calculations, variance analysis, and simple projections, all of which are mathematical activities¹¹. Without realizing it, they are applying accounting and financial principles based on mathematics. Furthermore, in estimating future costs, entrepreneurs also use mathematical logic. They consider price trends, operational needs, and potential market changes to create estimates that are close to reality. This process demonstrates the ability to recognize patterns and make predictions, which are essential components of mathematical thinking.

This implicit presence of mathematics also demonstrates that entrepreneurship does not rely solely on intuition. While intuition is often considered a key factor in decision-making, it is often shaped by experience involving quantitative processes. Experience in various business situations indirectly trains entrepreneurs to recognize patterns and make decisions based on previous calculations. In other words, intuition in entrepreneurship can be understood as the result of internalizing experience that has gone through a process similar to mathematical analysis. When an entrepreneur feels "sure" about a decision, that confidence often stems from accumulated experience that has formed a specific pattern of thinking¹². This pattern then operates quickly and automatically, thus appearing to resemble intuition.

However, because this process occurs unconsciously, many entrepreneurs are unaware that they are actually using mathematical principles. This can be a limitation, as without such awareness, they may not be able to develop their analytical skills more systematically. As a result, the potential for improving decision-making is less than optimal. Therefore, it is important to recognize that mathematics is not something foreign to entrepreneurship but rather an integral part of business practices. By increasing awareness of the implicit use of mathematics, entrepreneurs can develop a more structured and accurate approach to decision-making. This will ultimately help improve efficiency, accuracy, and success in running a business.

¹⁰ K Sharath Babu, Mr V Nagaraju, and Geena Johnson, *Mathematics In Everyday Life: The Hidden Language Of The World* (Shineeks Publishers, 2023); Adeniyi A Ayeni, "Effects Of Qualitative Instructional Methods On Critical Reasoning, Innovative and Entrepreneurship Skills Development Among Mathematics Students," *Oladejo Ayinla*, n.d., 385; Joana Pais Zozimo et al., "Beyond The Entrepreneur: A Study Of Entrepreneurial Learning From A Social Practice Perspective Working With Scientists In West Africa," *Management Learning* 54, no. 5 (2023): 802–24, <https://doi.org/https://doi.org/10.1177/13505076221111399>.

¹¹ Rafrini Amyulianthy et al., *Kecerdasan Finansial: Mengelola Keuangan Bisnis Untuk Pertumbuhan Berkelanjutan* (PT. Sonpedia Publishing Indonesia, 2025); S E Nurhasanah, S E Iwil Suprianto, and S E Syahida, *Pengetahuan Manajemen Keuangan Bisnis Dalam Berwirausaha* (Penerbit Widina, 2025).

¹² Retno Purwani Setyaningrum et al., *Kewirausahaan: Teori, Proses, Dan Implementasinya* (PT Kimhsafi Alung Cipta, 2024); Saparila Worokinasih, Nila Firdausi Nuzula, and Cacik Rut Damayanti, *Youth Entrepreneur* (Media Nusa Creative (MNC Publishing), 2021).

Many entrepreneurs use quantitative logic without realizing it.

Entrepreneurial activity is fundamentally inseparable from numerical thinking. In everyday practice, entrepreneurs routinely perform various simple calculations, such as cost estimation, profit comparisons, and business performance evaluations. While not always recognized as mathematical, these processes reflect a strong use of quantitative logic. In business decision-making, entrepreneurs are often faced with choices that require rational consideration. For example, when determining a more profitable marketing strategy, they compare the potential outcomes of each option. This process involves a simple analysis of available figures, such as promotional costs and projected sales increases. Unconsciously, they are applying the basic principles of quantitative analysis.

Furthermore, quantitative logic is also evident in the way entrepreneurs evaluate their business performance. They tend to look at whether revenue has increased, whether costs have been reduced, or whether profits have changed. This type of evaluation requires the ability to read and interpret numerical data, even if it is done simply and without the use of complex analytical tools. This phenomenon demonstrates that mathematical thinking skills do not always require formal education. In many cases, these abilities develop naturally through experience and direct involvement in business activities. Entrepreneurs learn from their experiences, mistakes, and successes, gradually developing a mindset based on quantitative logic¹³.

However, the informal development of these skills also has limitations. Because they are not based on a strong theoretical understanding, the analysis performed is often intuitive and unsystematic. This can lead to inaccurate decision-making, especially when faced with more complex situations or situations requiring more in-depth analysis. A lack of awareness of the use of quantitative logic also prevents entrepreneurs from optimally developing their analytical potential. They may have performed calculations but are unaware of how to improve the accuracy or efficiency of the process. As a result, the decisions made still have considerable room for error.

Furthermore, without a more systematic understanding, entrepreneurs tend to struggle to use more sophisticated analytical tools. Yet, in the modern business context, the use of technology and data is becoming increasingly important¹⁴. Without an adequate mathematical foundation, this data cannot be utilized optimally¹⁵. Therefore, it is important for entrepreneurs to not only rely on experience but also to raise awareness of the use of quantitative logic in business activities. By understanding that they are already using mathematical principles, entrepreneurs can develop a more structured and

¹³ Ethan C Howard and Daniel I Castaneda, "Entrepreneurs in the Making: A Qualitative Exploration of Entrepreneurial Mindset in Engineering Learners," in *2025 Systems and Information Engineering Design Symposium (SIEDS)* (IEEE, 2025), 215–20, <https://doi.org/https://doi.org/10.1109/SIEDS65500.2025.11021144>; Aldo Valencia, Matthew Lievesley, and Trevor Vaugh, "Four Mindsets Of Designer-Entrepreneurs," *The Design Journal* 24, no. 5 (2021): 705–26, <https://doi.org/https://doi.org/10.1080/14606925.2021.1958601>.

¹⁴ Embun Febryanti Panggabean et al., "Perkembangan Teknologi E-Business Terhadap Globalisasi Modern Pada Saat Ini," *Jurnal Manajemen Dan Ekonomi Kreatif* 2, no. 1 (2024): 132–39, <https://doi.org/https://doi.org/10.59024/jumek.v2i1.284>; Fauzy Imam Syah and Muhammad Irwan Padli Nasution, "Integrasi Teknologi Digital Sebagai Strategi Peningkatan Nilai Dan Produktivitas Bisnis Di Era Modern," *Jurnal Ilmiah Ekonomi Dan Manajemen* 4, no. 2 (2026): 10–18, <https://doi.org/https://doi.org/10.61722/jiem.v4i2.8508>; Riska Anggraeni and Isma Elan Maulani, "Pengaruh Teknologi Informasi Terhadap Perkembangan Bisnis Modern," *Jurnal Sosial Teknologi* 3, no. 2 (2023): 94–98, <https://doi.org/https://doi.org/10.59188/jurnalsostech.v3i2.635>.

¹⁵ Ishwor Bahadur Magar, "Use of Mathematics in Business Management," *Shaheed Smriti Journal* 13, no. 10 (2024): 71–76, <https://doi.org/https://doi.org/10.3126/shaheedsmriti.v13i10.76808>.

systematic approach. This will help improve the quality of decision-making and strengthen business competitiveness amidst increasingly complex market dynamics .

Lack of mathematical understanding can reduce the quality of decisions.

When entrepreneurs lack a strong mathematical foundation, they tend to rely on intuition or subjective experience when making business decisions. While intuition can aid in quick decision-making, without an objective analytical basis, the risk of error increases. Decisions made solely based on gut feelings often fail to consider important variables that should be analyzed quantitatively. One of the most obvious impacts of limited mathematical understanding is errors in estimating costs and revenue¹⁶. Entrepreneurs who lack the ability to perform calculations accurately may underestimate operating costs, misestimate selling prices, or fail to project realistic cash flow. These estimation errors can lead to shrinking profit margins or even significant financial losses.

Furthermore, a lack of mathematical understanding also impacts entrepreneurs' ability to assess investment feasibility. Analyzing investment opportunities and risks requires calculations involving costs, profit projections, and quantitatively measurable risk assessments. Without these skills, entrepreneurs risk making overly optimistic or overly conservative decisions, thus under-utilizing business growth opportunities. Limited mathematical understanding also impacts data interpretation. Many entrepreneurs encounter market data, financial reports, or operational statistics but are unable to process them effectively. As a result, the available information is not utilized optimally, and decisions made may not reflect the actual situation. This type of data misinterpretation can lead to strategic errors that are detrimental to the business.

In the long term, poor decision-making quality can negatively impact business performance and sustainability¹⁷. Mistakes in pricing, cost management, or investment strategy selection can reduce profitability, waste resources, and weaken a company's competitive position. This demonstrates that mathematical foundations are not merely technical but also crucial for ensuring business continuity. A lack of mathematical understanding can also limit entrepreneurs' ability to respond adaptively to market dynamics. Businesses that lack quantitative analysis skills tend to be slow to adjust their strategies when faced with changes in demand, competition, or economic conditions. Slow or inaccurate decisions increase the risk of failure amidst increasingly fierce competition.

Furthermore, a lack of understanding of relevant mathematical concepts makes it difficult for entrepreneurs to utilize modern tools, such as financial analysis software or market prediction models. While these tools can improve decision-making accuracy, their effectiveness relies heavily on the user's ability to understand the underlying logic and mathematical concepts. Without this foundation,

¹⁶ Raynathan Rafael Mansur, Gytha Nurhana Dhea Praadha Gitama, and Wiwiek Nurkomala Dewi, "Pentingnya Pengetahuan Matematika Ekonomi Sebagai Konsep Dasar Berbisnis Menggunakan Fungsi Biaya," *Jurnal Witana* 3, no. 2 (2025): 59–64, <https://jurnalwitana.com/index.php/jw/article/view/79>; Arif Setiawan and Joni Maulindar, "Analisis Pengaruh Pemahaman Matematika Finansial Terhadap Kesuksesan UMKM Di Kota Surakarta," *DutaCom* 17, no. 2 (2024): 154–62, <https://doi.org/https://doi.org/10.47701/dutacom.v17i2.4183>; 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>; Lisa Oktaviani and Nurma Tambunan, "Pengaruh Pentingnya Pembelajaran Matematika Ekonomi Terhadap Pengelolaan Keuangan Pribadi Siswa," *Jurnal Ilmiah Wahana Pendidikan* 10, no. 16 (2024): 488–95, <https://doi.org/https://doi.org/10.5281/zenodo.13764155>.

¹⁷ Salsabila Salsabila et al., "Analisis Peran Etika Ekonomi Dalam Mengintegrasikan Moralitas Dalam Pengambilan Keputusan Bisnis," *Jurnal Ilmiah Wahana Pendidikan* 11, no. 7 (2025): 136–43, <https://www.jurnal.peneliti.net/index.php/JIWP/article/view/10877>.

technology will not deliver its full potential. Therefore, enhancing mathematical skills is a crucial strategic step for entrepreneurs. By understanding and mastering mathematical principles, entrepreneurs can combine intuition and quantitative analysis to make more rational, accurate, and sustainable decisions. This not only improves decision quality but also strengthens the competitiveness and long-term sustainability of their businesses.

Integration of mathematics improves business efficiency and sustainability.

In everyday practice, entrepreneurs who use a mathematical approach can plan resource use more precisely, so that every business step is based not only on intuition but also on rational quantitative considerations. This approach allows for optimal management of capital, labor, and inventory, thereby minimizing waste. The efficiency created through mathematical integration is also evident in faster and more accurate decision-making. When entrepreneurs have structured data and are able to analyze it mathematically, they can more accurately assess various alternative courses of action. For example, when determining marketing strategies or allocating production budgets, numerical analysis allows entrepreneurs to choose the option that yields the best results with the lowest risk.

Besides increasing efficiency, the use of mathematics also makes a significant contribution to business sustainability. Decisions made based on quantitative analysis tend to be more stable and resilient to market fluctuations. By understanding numerical patterns in consumer behavior or sales trends, entrepreneurs can predict potential changes and develop risk mitigation strategies. This makes businesses more adaptable and capable of long-term sustainability. The integration of mathematics also helps entrepreneurs systematically plan business growth. Through revenue projection calculations, cost estimates, and profitability analyses, entrepreneurs can create realistic expansion strategies. This numerical planning reduces the likelihood of taking overly ambitious or overly conservative steps, allowing for sustainable and measurable business growth.

Furthermore, mathematics enables entrepreneurs to identify risks early and assess the consequences of each decision. With simple and complex risk analysis models, potential losses can be estimated, and anticipatory measures can be planned. This approach not only protects businesses from financial failure but also fosters a culture of more prudent, evidence-based decision-making. The presence of mathematics in entrepreneurship also enhances accuracy in strategic planning¹⁸. For example, in cash flow management, entrepreneurs who can accurately calculate working capital requirements will reduce the risk of cash shortages or inefficient inventory accumulation. This thorough planning directly impacts operational stability and a business's ability to adapt to market changes.

Furthermore, the integration of mathematics helps reduce overreliance on intuition alone. Intuition is certainly important for recognizing opportunities or making quick decisions, but when combined with quantitative analysis, decisions become more objective and accountable. This creates a balance between creativity, experience, and rationality in decision-making. Strengthening mathematical understanding also encourages more measurable innovation. Entrepreneurs can experiment with new strategies based on clear calculations, so that each innovative step has a logical

¹⁸ Joel Uchenna Odo et al., "Mathematical Models: A Tool For Enhancing Educational Management Effectiveness," *International Nexus Multidisciplinary Research Journal* 1, no. 2 (2025): 208–21, <https://inmrj.org/index.php/nexus/article/view/35>; Salsabila et al., "Analisis Peran Etika Ekonomi Dalam Mengintegrasikan Moralitas Dalam Pengambilan Keputusan Bisnis"; Huan Wen and Risheng Gao, "Strategic Planning and Forecasting in Financial Management: Integrating AI-Driven Mathematical Modeling Techniques," *International Journal of High Speed Electronics and Systems*, 2025, 2540771, <https://doi.org/https://doi.org/10.1142/S0129156425407715>.

basis. This increases the chances of innovation success while reducing the risk of unnecessary failure, which often occurs when decisions are made solely based on intuition.

Furthermore, businesses that consistently utilize mathematics tend to have greater adaptability. When market conditions change, numerical analysis allows entrepreneurs to quickly adjust strategies based on current data. This capability makes businesses more resilient in the face of economic uncertainty and dynamic competition. Thus, the findings of this study demonstrate that mathematics is not merely a technical tool, but a fundamental element in improving decision-making quality and business sustainability. Strengthening mathematical understanding is a crucial strategy for entrepreneurs to ensure their businesses not only survive but also thrive efficiently, adaptively, and sustainably in the long term. The integration of intuition and quantitative analysis is key to success in the modern entrepreneurial world.

DISCUSSION

The findings of this study confirm that mathematics is never truly separate from entrepreneurial practice, but rather is implicitly present in various business activities¹⁹. Activities such as determining product prices, calculating production costs, and estimating profits are examples of the use of mathematical principles, although often done simply and informally. The existence of these processes demonstrates that business decision-making is not entirely intuitive, but always involves quantitative logic, even if entrepreneurs are not aware of it. Many entrepreneurs routinely perform simple calculations, such as adding up costs, estimating profit margins, or comparing strategic options. While not using formal terms like "quantitative analysis" or "mathematical modeling," these processes are actually forms of mathematical thinking that have been internalized through everyday experience and practice. In other words, mathematical activities in entrepreneurship often occur naturally without academic labels.

However, research also shows that because this use of mathematics is not always recognized as an analytical process, its practice tends to be unsystematic. This lack of awareness can potentially lead to inefficiencies, such as wasted resources or suboptimal capital allocation. Decision-making that relies solely on intuitive estimates without a formal calculation framework can increase the risk of error, especially when facing complex business situations²⁰. In this context, it is important to uncover and understand what can be called the "hidden math" in entrepreneurship. Awareness of existing quantitative thinking patterns can help entrepreneurs be more systematic in analyzing data, calculating costs, and projecting profits. In this way, entrepreneurs rely not only on instinct but also on a stronger calculation basis in every decision they make.

Furthermore, applying a mathematical approach allows for a more objective evaluation of business performance. By using simple and complex financial indicators and analytical models, entrepreneurs can more clearly identify their business strengths and weaknesses. For example, cash flow or profit margin analysis can provide a clear picture of a business's financial health, allowing for

¹⁹ Achmad Zainul Rozikin, Amelia Dwi Astuti, and Fiarika Dwi Utari, "Literatur Review Penerapan Matematika Pada Ekonomi: Kewirausahaan Dan Literasi Keuangan," *Neraca: Jurnal Pendidikan Ekonomi* 11, no. 1 (2025): 87–93, <https://doi.org/https://doi.org/10.33084/neraca.v11i1.11703>; I Putu Pasek Suryawan, I Made Sutajaya, and I Gusti Putu Sudiarta, "Keterkaitan Entrepenruer Dan Pembelajaran Matematika Bermakna: Sebuah Kajian Literature," *Wahana Matematika Dan Sains: Jurnal Matematika, Sains, Dan Pembelajarannya* 17, no. 1 (2023): 23–36, <https://doi.org/https://doi.org/10.23887/wms.v17i1.60245>.

²⁰ 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>.

more informed decisions. The importance of mathematical understanding is also evident in the context of business planning and forecasting. With quantitative skills, entrepreneurs can project revenue, assess investment risks, and design realistic growth strategies. This helps businesses operate more efficiently, reduce waste, and minimize the risk of poor decisions.

Furthermore, the integration of intuition and mathematical analysis is key to modern business success. Intuition remains crucial for recognizing opportunities and making quick decisions, but when combined with quantitative calculations, these decisions become more rational and accountable. This combination creates a balance between creativity, experience, and analytical accuracy. Mathematics also plays a role in increasing business resilience to market dynamics. Data-driven decisions and quantitative calculations are more stable when faced with changes in price, demand, or economic conditions. This demonstrates that mastering mathematical concepts is not just a matter of efficiency but also a strategy for maintaining business sustainability. Furthermore, awareness of the hidden uses of mathematics encourages the development of more systematic analytical skills. Entrepreneurs can begin to utilize analytical tools, such as financial software or simple predictive models, to support daily decisions. The use of these tools becomes more effective when grounded in a strong mathematical understanding.

With the increasing complexity of modern business, the ability to integrate mathematics into strategy also strengthens innovation²¹. Entrepreneurs can try new approaches, test business models, or assess the feasibility of new projects based on clear calculations. This reduces the risk of failure that often arises when innovation is based solely on intuition. In addition to enhancing innovation, a mathematical approach also aids in risk management. With simple risk analysis models, entrepreneurs can predict potential losses, plan mitigation measures, and prepare for contingency measures. This makes decisions more secure and supports long-term operational stability. Furthermore, mastery of quantitative logic aids entrepreneurs in both internal and external communication. Presentations of financial reports, business projections, and growth strategies become clearer and more understandable to teams, investors, and other stakeholders. Numerical information strengthens the credibility of decisions made.

In this context, mathematics is not merely a technical tool, but rather the foundation for strategic decision-making. The success of modern businesses is determined not only by intuition or experience, but also by the ability to systematically process data and numbers. Integrating these two aspects enables more precise, efficient, and sustainable decisions. Therefore, this study emphasizes the importance of recognizing the hidden role of mathematics in entrepreneurship. Strengthening the understanding and application of quantitative analysis not only improves decision quality but also builds businesses that are more adaptive, efficient, and ready to face market challenges. Intuition and mathematical analysis should be viewed as complementary aspects of modern entrepreneurial practice.

4. CONCLUSION

This research confirms that mathematics, while often hidden in entrepreneurial practice, plays a crucial role in business decision-making. Everyday activities such as determining prices, calculating costs, estimating profits, and assessing investment feasibility implicitly involve quantitative logic that

²¹ Raya Sulistyowati et al., "Transformasi Digital Dan Inovasi Dalam Bisnis Manajemen," *Penerbit Tahta Media*, 2025, <https://doi.org/http://tahtamedia.co.id/index.php/issj/article/view/1344>; Sugianto Sugianto, "Transformasi Pembelajaran Matematika Ekonomi Untuk Era Global: Systematic Literature Review Terhadap Implementasi Yang Relevan Dengan Tuntutan Pasar Global," *Suska Journal of Mathematics Education* 10, no. 1 (2024): 65–76, <https://doi.org/http://dx.doi.org/10.24014/sjme.v10i1.29533>.

underlies every entrepreneur's every move. In other words, while decisions may appear to be driven by intuition or experience, mathematical principles are actually at work behind the scenes, forming the basis of rational considerations. Furthermore, the research findings indicate that entrepreneurs with a strong mathematical understanding are able to make more accurate, measured, and sustainable decisions. The ability to read numbers, analyze data, and project potential outcomes allows entrepreneurs to optimize resources, reduce the risk of errors, and plan business growth more systematically. This confirms that the integration of intuition and mathematical analysis is not merely complementary, but a crucial factor in improving decision quality and business resilience.

Furthermore, this research opens the perspective that awareness of "hidden mathematics" can strengthen overall business strategy. When entrepreneurs recognize the presence of quantitative processes in everyday decisions, they can utilize analytical tools, financial models, and calculation methods to support more effective decision-making. This awareness also encourages a more systematic approach to business planning and innovation, resulting in more objective, accurate, and accountable decisions. As a recommendation for further research, empirical studies that explore how entrepreneurs apply mathematical concepts in real-world practice would be highly beneficial. An interdisciplinary approach that combines entrepreneurship, mathematics, and behavioral psychology could also provide more comprehensive insights into the interaction between intuition, experience, and quantitative logic. Such research could form the basis for more effective entrepreneurship education and training strategies, enabling entrepreneurs to maximize their business potential through the conscious understanding and application of mathematical principles.

REFERENCES

- Amaludin, Asep, Lestari Wuryanti, Ayu Nursari, Harold Kevin Alfredo, and Detak Pustaka. *Leadership (Kekuatan Kepemimpinan: Mengubah Visi Menjadi Tindakan) 14 Dilihat*. Detak Pustaka, 2025.
- Amyulianthy, Rafrini, Mar'atun Shalihah, Titik Haryanti, Apriyanto Apriyanto, and Cecep Abdul Hakim. *Kecerdasan Finansial: Mengelola Keuangan Bisnis Untuk Pertumbuhan Berkelanjutan*. PT. Sonpedia Publishing Indonesia, 2025.
- Anggraeni, Riska, and Isma Elan Maulani. "Pengaruh Teknologi Informasi Terhadap Perkembangan Bisnis Modern." *Jurnal Sosial Teknologi* 3, no. 2 (2023): 94–98. <https://doi.org/https://doi.org/10.59188/jurnalsostech.v3i2.635>.
- Anshori, Mohamad Yusak, and Teguh Herlambang. *Manamatik Mengelola Bisnis Dengan Logika Angka Dan Strategi*. Deepublish, 2025.
- Ayeni, Adeniyi A. "Effects Of Qualitative Instructional Methods On Critical Reasoning, Innovative and Entrepreneurship Skills Development Among Mathematics Students." *Oladebo Ayinla*, n.d., 385.
- Babu, K Sharath, Mr V Nagaraju, and Geena Johnson. *Mathematics In Everyday Life: The Hidden Language Of The World*. Shineeks Publishers, 2023.
- Bachtiar, Alam. *The Magic Of Influencer Bagaimana Memberi Nilai Pada Diri Sendiri Dan Memikat Orang Lain*. Vol. 159. Araska Publisher, 2022.
- Budiman, Aristo Afrianto. "Pengaruh Heuristic Biases Dan Herding Bias Terhadap Keputusan Investasi Dengan Financial Literacy Sebagai Variabel Pemoderasi (Studi Empiris Perilaku Investor Di Pasar Modal Indonesia)." Sekolah Tinggi Ilmu Ekonomi YKPN Yogyakarta, 2024. <http://repositorybaru.stieykpn.ac.id/id/eprint/2468>.
- Cristofaro, Matteo, Pier Luigi Giardino, and Jeffrey Muldoon. "Entrepreneurial Decision-Making In The Age Of AI: Sector Knowledge At The Balance Of Intuition And Analysis." *Technology in Society* 85 (2025): 103200. <https://doi.org/https://doi.org/10.1016/j.techsoc.2025.103200>.
- Estede, Suprpto, Okto Irianto, Erna Ferrinadewi, Poppy Alvianolita Sanistasya, Andra Juansa, Taryati Sukmawati, A A Ngurah Bagus Aristayudha, Ayu Minarsi, and Hakim Hakim. *Kewirausahaan Kreatif: Inovasi Dan Strategi Dalam Bisnis Modern*. PT. Star Digital Publishing, Yogyakarta-Indonesia, 2025.

- Febriansyah, Erwin, Hana Dhayan, Chendy Martya, Arina Azwani, Teddy Rianto L Gaol, Risma Carla Lydia Pascasia, Fennika Ayu Lestari, and Sy Ilham Zultami. "Pelatihan Penentuan Harga Pokok Produksi Dan Strategi Penetapan Harga." *IJTIMA': Jurnal Pengabdian Masyarakat* 2, no. 1 (2025): 21–30. <https://doi.org/https://doi.org/10.25299/ijtima.2025.21752>.
- Hansopaheluwakan, Scherly, Loso Judijanto, Wawan Ruswandi, Williya Meta, Muhammad Chasyim, Luh Putu Rara Ayu Ratnaningrum, Tri Kunawangsih Purnamaningrum, Candra Nuraini, Antyo Pracyo, and Husna Leila Yusran. *Kewirausahaan: Berpikir Kreatif Untuk Menciptakan Peluang Bisnis Yang Inovatif*. PT. Green Pustaka Indonesia, 2025.
- Howard, Ethan C, and Daniel I Castaneda. "Entrepreneurs in the Making: A Qualitative Exploration of Entrepreneurial Mindset in Engineering Learners." In *2025 Systems and Information Engineering Design Symposium (SIEDS)*, 215–20. IEEE, 2025. <https://doi.org/https://doi.org/10.1109/SIEDS65500.2025.11021144>.
- Kartika, Dewi, Naila Muqorriba, Hawa Athaya Dheanda Rusminto, and Abdul Pandi. "Menganalisis Faktor Penentu Kegagalan Wirausaha Di Indonesia: Sebuah Pendekatan Kualitatif." *Jurnal Ilmu Pendidikan Dan Sosial* 4, no. 1 (2025): 9–20. <https://doi.org/https://doi.org/10.58540/jipsi.v4i1.786>.
- Kenzu, Erika Nur, 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>.
- Khalis, Ichsan, Rido Satria, Yusnovi Putra, Winda Febrina, S Tr Tra, and Ir Zefriyenni. *Pengambilan Keputusan Dalam Diskriminasi Harga, Penentuan Harga Produk Baru, Dan Penetapan Harga Pada Pasar Yang Telah Mapan*. Fahmi Karya, 2024.
- Khusna, Agasta Amaliya. "Pengaruh Confirmation Bias, Self-Attribution Bias, Overconfidence Bias, Cognitive Dissonance Bias, Dan Herding Bias Terhadap Pengambilan Keputusan Investor Pemula Dalam Investasi Saham Di Masa Pandemi Covid-19." Universitas Islam Indonesia, 2023.
- Latifah, Eny, and Rudi Abdullah. "Pendekatan Metodologik Matematika Dalam Ekonomi Dan Bisnis Islam." *JIEM: Journal Of International Entrepreneurship And Management* 2, no. 2 (2023): 113–21. <https://doi.org/https://doi.org/10.62668/jiem.v2i02.1156>.
- Magar, Ishwor Bahadur. "Use of Mathematics in Business Management." *Shaheed Smriti Journal* 13, no. 10 (2024): 71–76. <https://doi.org/https://doi.org/10.3126/shaheedsmriti.v13i10.76808>.
- Mansur, Raynathan Rafael, Gytha Nurhana Dhea Praadha Gitama, and Wiwiek Nurkomala Dewi. "Pentingnya Pengetahuan Matematika Ekonomi Sebagai Konsep Dasar Berbisnis Menggunakan Fungsi Biaya." *Jurnal Witana* 3, no. 2 (2025): 59–64. <https://jurnalwitana.com/index.php/jw/article/view/79>.
- Nurhasanah, S E, S E Iwil Suprianto, and S E Syahida. *Pengetahuan Manajemen Keuangan Bisnis Dalam Berwirausaha*. Penerbit Widina, 2025.
- Odo, Joel Uchenna, Chizoba Nwanneamaka Nebo, Edut Egbe Obona, and Adaku Ngozi Ngene. "Mathematical Models: A Tool For Enhancing Educational Management Effectiveness." *International Nexus Multidisciplinary Research Journal* 1, no. 2 (2025): 208–21. <https://inmrj.org/index.php/nexus/article/view/35>.
- Oktaviani, Lisa, and Nurma Tambunan. "Pengaruh Pentingnya Pembelajaran Matematika Ekonomi Terhadap Pengelolaan Keuangan Pribadi Siswa." *Jurnal Ilmiah Wahana Pendidikan* 10, no. 16 (2024): 488–95. <https://doi.org/https://doi.org/10.5281/zenodo.13764155>.
- Pais Zozimo, Joana, Anthony N-Yelkabong, Nigel Lockett, Lola Dada, and Sarah L Jack. "Beyond The Entrepreneur: A Study Of Entrepreneurial Learning From A Social Practice Perspective Working With Scientists In West Africa." *Management Learning* 54, no. 5 (2023): 802–24. <https://doi.org/https://doi.org/10.1177/1350507622111399>.
- Panggabean, Embun Febryanti, Hesty Ananta Yunas, Taufiqurrahman Taufiqurrahman, and Nurbaiti Nurbaiti. "Perkembangan Teknologi E-Business Terhadap Globalisasi Modern Pada Saat Ini." *Jurnal Manajemen Dan Ekonomi Kreatif* 2, no. 1 (2024): 132–39. <https://doi.org/https://doi.org/10.59024/jumek.v2i1.284>.
- Poltak, Hendrik, 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>.
- Putri, Shilla Khairani. "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. <https://doi.org/https://doi.org/10.61722/jemba.v3i1.1958>.
- Rozikin, Achmad Zainul, Amelia Dwi Astuti, and Fiarika Dwi Utari. "Literatur Review Penerapan Matematika Pada Ekonomi: Kewirausahaan Dan Literasi Keuangan." *Neraca: Jurnal Pendidikan Ekonomi* 11, no. 1 (2025): 87–93. <https://doi.org/https://doi.org/10.33084/neraca.v11i1.11703>.
- Salsabila, Salsabila, Era Widia Br Sinaga, Cindy Eleonora Sitohang, Dafa Ariza, and Khairani Alawiyah Matondang. "Analisis Peran Etika Ekonomi Dalam Mengintegrasikan Moralitas Dalam Pengambilan Keputusan Bisnis." *Jurnal Ilmiah Wahana Pendidikan* 11, no. 7 (2025): 136–43. <https://www.jurnal.peneliti.net/index.php/JIWP/article/view/10877>.
- Septiawan, Bambang, 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>.
- Setiawan, Arif, and Joni Maulindar. "Analisis Pengaruh Pemahaman Matematika Finansial Terhadap Kesuksesan UMKM Di Kota Surakarta." *DutaCom* 17, no. 2 (2024): 154–62. <https://doi.org/https://doi.org/10.47701/dutacom.v17i2.4183>.
- Setyaningrum, Retno Purwani, M M SE, M M Titik Purwati, H Novi Fitria, and M M SKM. *Kewirausahaan: Teori, Proses, Dan Implementasinya*. PT Kimhsafi Alung Cipta, 2024.
- Sugianto, Sugianto. "Transformasi Pembelajaran Matematika Ekonomi Untuk Era Global: Systematic Literature Review Terhadap Implementasi Yang Relevan Dengan Tuntutan Pasar Global." *Suska Journal of Mathematics Education* 10, no. 1 (2024): 65–76. <https://doi.org/http://dx.doi.org/10.24014/sjme.v10i1.29533>.
- Sulistyowati, Raya, Yessy Artanti, Dian Arlupi Utami, Yesa Cahyaning Ramadhani, Suharyoto Suharyoto, Aam Waro'Panotogomo, Novi Rahman Hidayat, Powell Gian Hartono, Dwijo Saputro, and Agung Evendy. "Transformasi Digital Dan Inovasi Dalam Bisnis Manajemen." *Penerbit Tahta Media*, 2025. <https://doi.org/http://tahtamedia.co.id/index.php/issj/article/view/1344>.
- Suryawan, I Putu Pasek, I Made Sutajaya, and I Gusti Putu Sudiarta. "Keterkaitan Entreprenuer Dan Pembelajaran Matematika Bermakna: Sebuah Kajian Literature." *Wahana Matematika Dan Sains: Jurnal Matematika, Sains, Dan Pembelajarannya* 17, no. 1 (2023): 23–36. <https://doi.org/https://doi.org/10.23887/wms.v17i1.60245>.
- Syah, Fauzy Imam, and Muhammad Irwan Padli Nasution. "Integrasi Teknologi Digital Sebagai Strategi Peningkatan Nilai Dan Produktivitas Bisnis Di Era Modern." *Jurnal Ilmiah Ekonomi Dan Manajemen* 4, no. 2 (2026): 10–18. <https://doi.org/https://doi.org/10.61722/jiem.v4i2.8508>.
- Syamil, Ahmad, Ucok Binanga Nasution, Diana Zuhroh, and Loso Judijanto. *Matematika Ekonomi Dan Bisnis*. PT. Sonpedia Publishing Indonesia, 2026.
- Thohiri, Roza, Nia Gracelia Purba, Anisa Putri Br Lubis, and Debora Cecilia Hutagalung. "Kajian Literatur Penerapan Persamaan Linear Dalam Analisis Permintaan Dan Penawaran Pada Matematika Ekonomi." *Jurnal Ilmiah Global Education* 6, no. 4 (2025): 3025–36. <https://doi.org/https://doi.org/10.55681/jige.v6i4.4816>.
- Valencia, Aldo, Matthew Lievesley, and Trevor Vaugh. "Four Mindsets Of Designer-Entrepreneurs." *The Design Journal* 24, no. 5 (2021): 705–26. <https://doi.org/https://doi.org/10.1080/14606925.2021.1958601>.
- Wen, Huan, and Risheng Gao. "Strategic Planning and Forecasting in Financial Management: Integrating AI-Driven Mathematical Modeling Techniques." *International Journal of High Speed Electronics and Systems*, 2025, 2540771. <https://doi.org/https://doi.org/10.1142/S0129156425407715>.
- Williams, Allan M, Isabel Rodriguez Sanchez, and Vlatka Škokić. "Innovation, Risk, And Uncertainty: A Study Of Tourism Entrepreneurs." *Journal of Travel Research* 60, no. 2 (2021): 293–311. <https://journals.sagepub.com/doi/abs/10.1177/0047287519896012>.

- Worokinasih, Saparila, Nila Firdausi Nuzula, and Cacik Rut Damayanti. *Youth Entrepreneur*. Media Nusa Creative (MNC Publishing), 2021.
- Zulfa, Anggun Eindhana, Brilliant Refa Damangsa, Farhan Nur Ashidiqi, Muhammad Faisal Farhan, Ratna Wulandari, Sania Dwi Ayu, and Tri Gusti Ayu. "Penerapan Matematika Pada Ilmu Ekonomi: Himpunan." *JIDE: Journal Of International Development Economics* 3, no. 2 (2024): 101–13. <https://doi.org/https://doi.org/10.62668/jide.v3i2.1326>.