



A COMPREHENSIVE METHODOLOGY FOR EVALUATING ECONOMIC SECURITY IN THE DIGITALIZATION OF INVESTMENT PROCESSES

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ABSTRACT

Purpose: This article aims to present a methodology for evaluating economic security within digitalized investment processes, addressing the evolving financial landscape's demands for innovative assessment approaches.

Methods: The methodology developed integrates key components, indicators, and measurement techniques to offer a holistic evaluation of economic security. Case study countries are analyzed to identify common patterns, trends, and best practices, enriching the methodology's robustness.

Results and discussion: The methodology provides valuable insights into maintaining economic security in digitalized investment environments, emphasizing factors such as legal and regulatory frameworks, technological infrastructure, data security, and investor protection. The analysis facilitates a nuanced understanding of economic security dynamics in digital transformation.

Implications of the research: This research has significant implications for policymakers, researchers, and industry practitioners by offering a comprehensive tool to navigate the complexities of economic security in the digital era. It enables stakeholders to adapt effectively to digitalization challenges and opportunities, ensuring investor protection and financial system stability.

Originality/value: This research contributes to the discourse on economic security and digital transformation by presenting a reliable and efficient evaluation methodology. It fills a critical gap in current methodologies, enhancing the ability of stakeholders to address the intricacies of digitalized investment processes and safeguard economic security.

Keywords: Economic Security, Digitalization, Investment Processes, Fraud Detection and Prevention, Risk Management, Evaluation Methodology, Strategic Partnership.

UMA METODOLOGIA ABRANGENTE PARA AVALIAR A SEGURANÇA ECONÔMICA NA DIGITALIZAÇÃO DOS PROCESSOS DE INVESTIMENTO

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RESUMO

Objetivo: O presente artigo tem por objetivo apresentar uma metodologia de avaliação da segurança econômica no âmbito de processos de investimento digitalizados, abordando as exigências do panorama financeiro em evolução no que diz respeito a abordagens de avaliação inovadoras.

Métodos: A metodologia desenvolvida integra componentes-chave, indicadores e técnicas de medição para oferecer uma avaliação holística da segurança econômica. Os países em estudo de caso são analisados para identificar padrões comuns, tendências e melhores práticas, enriquecendo a robustez da metodologia.

Resultados e discussão: a metodologia fornece informações valiosas sobre a manutenção da segurança econômica em ambientes de investimento digitalizados, enfatizando fatores como estruturas legais e regulamentares, infraestrutura tecnológica, segurança de dados e proteção do investidor. A análise facilita uma compreensão diferenciada da dinâmica da segurança econômica na transformação digital.

Implicações da pesquisa: Esta pesquisa tem implicações significativas para os formuladores de políticas, pesquisadores e profissionais da indústria, oferecendo uma ferramenta abrangente para navegar as complexidades da segurança econômica na era digital. Permite que as partes interessadas se adaptem eficazmente aos desafios e oportunidades da digitalização, assegurando a proteção dos investidores e a estabilidade do sistema financeiro.

Originalidade/valor: Esta pesquisa contribui para o discurso sobre segurança econômica e transformação digital, apresentando uma metodologia de avaliação confiável e eficiente. Preenche uma lacuna crítica das metodologias atuais, reforçando a capacidade das partes interessadas para abordar as complexidades dos processos de investimento digitalizado e salvaguardar a segurança econômica.

Palavras-chave: Segurança Econômica, Digitalização, Processos de Investimento, Detecção e Prevenção de Fraudes, Gestão de Riscos, Metodologia de Avaliação, Parceria Estratégica.

UNA METODOLOGÍA INTEGRAL PARA EVALUAR LA SEGURIDAD ECONÓMICA EN LA DIGITALIZACIÓN DE LOS PROCESOS DE INVERSIÓN

RESUMEN

Propósito: Este artículo tiene como objetivo presentar una metodología para evaluar la seguridad económica dentro de los procesos de inversión digitalizados, abordando las demandas del cambiante panorama financiero de enfoques de evaluación innovadores.

Métodos: La metodología desarrollada integra componentes clave, indicadores y técnicas de medición para ofrecer una evaluación holística de la seguridad económica. Se analizan los países del estudio de caso para identificar patrones, tendencias y mejores prácticas comunes, enriqueciendo la robustez de la metodología.

Resultados y discusión: La metodología proporciona información valiosa para mantener la seguridad económica en entornos de inversión digitalizados, enfatizando factores como marcos legales y regulatorios, infraestructura tecnológica, seguridad de datos y protección de inversores. El análisis facilita una comprensión matizada de la dinámica de la seguridad económica en la transformación digital.

Implicaciones de la investigación: Esta investigación tiene implicaciones significativas para los responsables políticos, los investigadores y los profesionales de la industria al ofrecer una herramienta integral para navegar por las complejidades de la seguridad económica en la era digital. Permite a las partes interesadas adaptarse eficazmente a los retos y oportunidades de la digitalización, garantizando la protección de los inversores y la estabilidad del sistema financiero.

Originalidad/valor: Esta investigación contribuye al discurso sobre la seguridad económica y la transformación digital al presentar una metodología de evaluación confiable y eficiente. Colma un vacío crítico en las metodologías actuales, mejorando la capacidad de las partes interesadas para abordar las complejidades de los procesos de inversión digitalizados y salvaguardar la seguridad económica.

Palabras clave: Seguridad Económica, Digitalización, Procesos de Inversión, Detección y Prevención de Fraudes, Gestión de Riesgos, Metodología de Evaluación, Alianza Estratégica.



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1 INTRODUCTION

The digitalization of investment processes has profoundly transformed the landscape of the financial industry, revolutionizing the way investments are conducted, managed, and evaluated (Gonchar et al., 2022). With the integration of advanced technologies such as artificial intelligence, big data analytics, and blockchain, investment processes have become more efficient, accessible, and interconnected than ever before. These technological advancements have paved the way for new investment platforms, automated trading systems, and alternative forms of financing, enabling individuals and organizations to participate in the global financial markets with unprecedented ease. However, along with the numerous opportunities that arise from the digitalization of investment processes, new challenges and risks have emerged that can potentially impact economic security. Economic security, defined as the stability and protection of a country's economy and its participants, is a crucial foundation for sustainable development, prosperity, and social well-being. It encompasses aspects such as financial stability, employment opportunities, income distribution, and access to essential goods and services.

The rapid advancement of digital technologies presents both opportunities and vulnerabilities, necessitating the development of comprehensive methodologies to assess and evaluate economic security in this evolving landscape. The evaluation of economic security in the digitalization of investment processes requires considering a wide range of factors, including technological infrastructure, cybersecurity, regulatory frameworks, investor protection, market transparency, and ethical considerations.

The existing literature on economic security provides valuable insights into its various dimensions and factors that contribute to its preservation. Scholars and policymakers have extensively studied economic security in the context of traditional financial systems, macroeconomic stability, and national security (Hutsaliuk et al., 2023; Mints et al., 2021). However, there is a scarcity of research specifically addressing the evaluation of economic security in the digitalization of investment processes. This research gap necessitates the development of a comprehensive methodology that can effectively measure and evaluate economic security in this dynamic environment.



This study aims to bridge this gap in research by proposing a comprehensive methodology for evaluating economic security in the digitalization of investment processes. The methodology will be designed to capture the multidimensional nature of economic security, incorporating variables such as financial stability, investor protection, market efficiency, technological resilience, and ethical considerations. By incorporating these dimensions into the evaluation process, the methodology will provide a holistic and comprehensive assessment of economic security in the digitalization of investment processes.

This paper is organized to solve the following tasks: first, an overview of the key concepts and definitions related to economic security and the digitalization of investment processes will be provided. This will lay the foundation for understanding the complexities of economic security in the digital era. Next, a review of the current state of research on economic security in the context of digital transformation will be presented, highlighting the existing gaps in the literature. Subsequently, the proposed comprehensive methodology for evaluating economic security will be presented, discussing the key components, indicators, and measurement techniques. The methodology will be designed to be adaptable and flexible, allowing for customization based on specific contexts and characteristics of different economies. Finally, the paper will conclude by emphasizing the significance of this research and outlining potential avenues for future exploration.

By developing a comprehensive methodology for evaluating economic security in the digitalization of investment processes, this study aims to contribute to both academic research and practical decision-making. The findings of this research can help policymakers, financial institutions, and investors better understand the impact of digital transformation on economic security and guide them in making informed decisions to mitigate risks and maximize opportunities. Furthermore, the proposed methodology can serve as a valuable tool for monitoring and benchmarking economic security in the context of investment digitalization, facilitating evidence-based policy formulation, and regulatory interventions. Ultimately, the goal is to foster a resilient and secure investment environment that supports sustainable economic growth and inclusive development in the digital era.

2 THEORETICAL FRAMEWORK

Economic security and the digitalization of investment processes are two interconnected concepts that have garnered significant attention from scholars and practitioners alike. This



study delves into the key concepts, definitions, and relevant studies concerning economic security and the digitalization of investment processes.

2.1 ECONOMIC SECURITY

Economic security refers to a state of stability, resilience, and protection against economic risks and shocks. It encompasses various dimensions such as income security, employment security, and financial stability. In the context of investment processes, economic security extends to safeguarding the interests of investors, ensuring fair and transparent markets, and mitigating risks associated with investments (Skipper & Klein, 2000). This is a multidimensional concept that encompasses the protection and well-being of individuals, households, and societies in the face of economic uncertainties and vulnerabilities. It involves ensuring access to adequate income, stable employment opportunities, and financial resources necessary to meet basic needs and achieve long-term prosperity (OECD, 2020a,b).

In the context of investment processes, economic security extends beyond individual well-being to encompass the overall stability and integrity of financial markets. It involves creating an environment that fosters trust, transparency, and fairness in investment activities. Economic security promotes efficient allocation of resources, and reduces the potential for fraudulent practices and market manipulation (Fox et al., 2018).

One aspect of economic security in investment processes is income security for investors. This refers to the assurance of stable and sustainable returns on investments and protection against income fluctuations or losses. Income security is crucial for individuals and organizations to plan for the future, make informed investment decisions, and maintain financial well-being (Brüggen et al., 2017).

Employment security is another dimension of economic security that influences investment processes. A robust job market, with stable employment opportunities and favorable labor conditions, enhances investor confidence and promotes economic growth. It provides individuals with the means to generate income, accumulate savings, and participate actively in investment activities (Dasgupta, 2001).

Financial stability is integral to economic security in investment processes (Kopp et al., 2017). It entails the stability of financial institutions, the resilience of financial markets, and the effective management of risks (Hutsaliuk et al., 2020a). Maintaining financial stability is crucial for ensuring the sound functioning of investment processes, reducing the likelihood of disruptions, and safeguarding the value of investments (Borio et al., 2017).



To achieve economic security in the digitalization of investment processes, it is important to harness the potential of digital technologies while addressing associated risks and challenges. The rapid advancement of technologies such as artificial intelligence, blockchain, and big data analytics has transformed investment processes, enabling automation, real-time data analysis, and improved decision-making (BIS, 2020). However, the digitalization of investment processes also brings new risks, including cybersecurity threats, data privacy concerns, and algorithmic biases (Bank for International Settlements, 2020).

It is crucial to ensure the protection of investors' interests, foster trust and transparency, and effectively manage risks associated with digital transformation in investment processes. By understanding the key concepts and definitions related to economic security and the digitalization of investment processes, policymakers, financial institutions, and investors can work together to create a resilient and secure investment environment in the digital era.

2.2 DIGITALIZATION OF INVESTMENT PROCESSES

The digitalization of investment processes involves the adoption and integration of digital technologies, platforms, and tools to streamline and enhance various aspects of investment activities. These technologies include artificial intelligence, machine learning, robo-advisors, blockchain, and data analytics (Shiller, 2019b). Digitalization aims to improve efficiency, accessibility, and transparency in investment decision-making, portfolio management, and trade execution (Shiller, 2019a; Hutsaliuk et al., 2020b). Digitalization has revolutionized investment processes, enabling individuals and institutions to access and manage investments with greater ease and efficiency. Artificial intelligence and machine learning algorithms, for example, have empowered investors to make data-driven decisions and gain insights from vast amounts of financial data. Robo-advisors, automated investment platforms powered by AI algorithms, have gained popularity as they provide personalized investment recommendations based on clients' financial goals and risk preferences (Tan, 2020).

Blockchain technology has also emerged as a transformative force in investment processes. Its decentralized and immutable nature enhances transparency, security, and trust in transactions, fund transfers, and record-keeping (Sharin et al., 2023). Smart contracts, powered by blockchain, automate and enforce contractual agreements, reducing the need for intermediaries and enhancing the efficiency of investment processes (Arner et al., 2019). Furthermore, data analytics play a crucial role in the digitalization of investment processes. By analyzing large volumes of structured and unstructured data, such as historical market trends,



news sentiment, and social media data, investment professionals can gain valuable insights to inform their investment strategies (Fang & Zhang, 2016). This data-driven approach enables investors to make more informed decisions, mitigate risks, and identify potential investment opportunities.

Examples of digital investment platforms include well-known platforms like Robinhood and eToro, which provide users with a seamless and user-friendly interface for trading various financial instruments. These platforms, along with countless others, have helped democratize investment by making it more accessible to a broader range of individuals, especially through mobile applications.

The digitalization of investment processes has not only transformed the way individuals and institutions invest but has also disrupted traditional financial models and practices. However, it also introduces new challenges and risks, such as cybersecurity threats, algorithmic biases, and ethical considerations (Buckley et al., 2019). Therefore, it is essential to evaluate the impact of digitalization on economic security to ensure its benefits are maximized and risks are properly managed.

Through technologies such as artificial intelligence, blockchain, and data analytics, investment activities have been streamlined and personalized. However, careful consideration must be given to evaluating the impact of digitalization on economic security to ensure long-term stability and resilience in financial markets.

2.3 KEY CONCEPTS AND DEFINITIONS

2.3.1 Transparency

Transparency is a fundamental principle in economic security and the digitalization of investment processes. It refers to the availability and accessibility of accurate and timely information to market participants. Transparency enables investors to make informed decisions, enhances market integrity, and reduces information asymmetry (Fung, 2014).

2.3.2 Fraud Detection and Prevention

With the increasing digitalization of investment processes, the risk of fraud and financial crimes has become a significant concern. Fraud detection and prevention mechanisms, such as



advanced analytics, machine learning algorithms, and cybersecurity measures, are crucial for safeguarding economic security and investor trust (Kunduru 2023).

2.3.3 Risk Management

Effective risk management is vital in ensuring economic security and minimizing investment uncertainties. Digitalization offers new tools and techniques for risk assessment, portfolio diversification, and hedging strategies. Risk management in the digital era involves the analysis of big data, real-time monitoring, and automated risk mitigation strategies (Dicuonzo et al., 2019).

2.3.4 Investor Protection

Investor protection refers to regulatory measures and mechanisms designed to safeguard the rights and interests of investors. In the context of digitalization, investor protection encompasses data privacy, cybersecurity, regulatory compliance, and consumer rights. It aims to create a secure and trustworthy environment for investors to participate in digital investment platforms (Yang & Li, 2019).

2.4 RELEVANT STUDIES

Numerous studies have explored the implications of digitalization on economic security and investment processes (Zubko et al., 2021; Kryshchanovych et al., 2022; Cardinali & De Giovanni, 2022). For instance, Ozili (2018) investigated the impact of digitalization on financial inclusion and economic security in developing countries. They highlighted the potential of digital channels to improve access to financial services and enhance economic resilience. Another study by Lotfi & Bouhadi (2022) focused on the role of artificial intelligence and machine learning in investment decision-making. They discussed how digital technologies can improve investment performance by analyzing vast amounts of data, identifying patterns, and making intelligent predictions.

Eltweri et al. (2021) examined the impact of digitalization on investment fraud detection and prevention. Through a comprehensive analysis of fraud detection techniques and the use of advanced technologies such as machine learning and data analytics, they demonstrated the potential of digitalization in reducing investment fraud and enhancing investor protection.



The study by Creazza et al. (2022) explored the role of digitalization in improving risk management in investment processes. They highlighted how digital technologies enable real-time monitoring, analysis, and mitigation of investment risks, thereby enhancing the overall security and stability of investment activities. In a study by Gorkhali & Chowdhury (2022), the authors analyzed the impact of digitalization on financial markets and economic security. They emphasized the potential of blockchain technology in enhancing transparency, reducing settlement times, and mitigating systemic risks in investment processes.

Research conducted by Back et al. (2023) examined the implications of digitalization on investor behavior and decision-making. By exploring the role of online trading platforms and social media in shaping investment decisions, they highlighted the need for investor education and awareness in the digital era.

A study by Jung et al. (2019) focused on the digital transformation of the wealth management industry and its impact on economic security. They discussed the opportunities and challenges associated with the use of robo-advisory platforms in wealth management, emphasizing the need for regulatory frameworks to ensure investor protection.

These studies collectively contribute to the understanding of how digitalization affects economic security and investment processes, highlighting the benefits and challenges associated with the adoption of digital technologies in the financial industry.

2.4.1 The Current State of Research on Economic Security in the Digital Era

Let us identify and discuss key themes, concepts, methodologies, and gaps in the literature while also presenting relevant sample studies.

2.4.1.1 Key Themes and Concepts

In the realm of income security, studies have investigated the effects of digital platforms and the gig economy on individuals' earning potentials. For instance, Rani & Furrer (2029) conducted a comprehensive study examining the impact of digitalization on income security. Their findings revealed that digital platforms have created new income opportunities for individuals, but also raised concerns about income volatility and job insecurity. This demonstrates the intricate relationship between income security and digital transformation.

Furthermore, the literature has examined the effects of digitalization on employment security. Researchers have explored the changing nature of work in the digital era, including



the rise of remote work, automation, and the gig economy. Vučinić & Luburić (2022) investigated the effects of digitalization on financial stability, focusing on the role of fintech innovations in promoting financial inclusion. They identified potential risks related to cybersecurity and data privacy, which pose challenges to economic security.

Regarding financial stability, studies have investigated the impact of digital transformation on individuals' and households' ability to manage their finances effectively. For instance, Durai & Stella (2019) analyzed the influence of mobile banking applications on financial decision-making and found that digital tools can enhance financial literacy and facilitate better financial management. However, they also highlighted the need for strategies to address the potential risks associated with financial fraud and the digital divide.

Access to financial services has also been a key focus in the literature on economic security. Studies have explored the role of digital technologies in expanding financial inclusion and reducing financial disparities. For instance, Tiwari et al. (2020) examined the impact of digital banking services on financial inclusion in developing countries. They found that digitalization has the potential to improve access to banking services, particularly for underserved populations. However, they also identified the need to address infrastructure gaps and promote digital literacy to ensure equitable access for all.

Despite the growing body of literature on economic security in the context of digital transformation, several gaps in knowledge remain. First, there is a need for more comprehensive and longitudinal studies to understand the long-term implications of digitalization on economic security. Many existing studies focus on specific aspects or short-term effects, limiting our understanding of the broader dynamics at play. Second, more research is needed to explore the impact of digitalization on vulnerable populations, such as low-income individuals, marginalized communities, and those with limited digital literacy. Understanding and addressing the potential inequalities arising from digital transformation is crucial for ensuring inclusive economic security. Finally, there is a need for interdisciplinary research that combines perspectives from economics, sociology, technology, and policy to provide a holistic understanding of economic security in the digital age.

2.4.1.2 Methodological Approaches

Researchers have employed various methodological approaches to study economic security in the context of digital transformation. These approaches include quantitative analysis of large-scale datasets (Peng et al., 2010), qualitative interviews and surveys Shackleton et al.,



2021, case studies (Yin, 2009), and econometric modeling (Li et al., 2005). Each approach offers unique insights and contributes to a comprehensive understanding of the topic.

Quantitative analysis has been utilized to examine trends and patterns in economic security indicators, such as income levels, employment rates, and financial stability. Such studies often leverage large-scale datasets and statistical techniques to identify the impact of digitalization on these indicators. Thus, Chiu et al. (2023) conducted a quantitative analysis to assess the impact of digitalization on income security. They utilized large-scale survey data and regression analysis to examine the relationship between digital technology adoption and income levels. The study found that individuals who embraced digital technologies experienced higher income growth compared to those who did not, highlighting the positive impact of digitalization on income security.

In a study by Aroles et al. (2019), a quantitative analysis was conducted to explore the relationship between digitalization and employment security. The researchers utilized employment data from various industries and applied econometric techniques, such as panel data analysis, to examine the impact of digital transformation on employment rates. The findings revealed that industries that embraced digital technologies experienced higher job creation and lower unemployment rates, emphasizing the role of digitalization in enhancing employment security.

Kasri et al. (2022) employed quantitative analysis to assess the impact of digitalization on financial stability. The study utilized financial market data and statistical modeling techniques, such as time series analysis, to examine the relationship between digitalization measures (e.g., online banking penetration, digital payment adoption) and financial stability indicators (e.g., volatility, risk levels). The results demonstrated a positive association between digitalization and financial stability, suggesting that digital transformation can contribute to a more stable financial system.

These researches showcase the use of quantitative analysis methods in investigating the impact of digitalization on various dimensions of economic security.

Qualitative research methods, such as interviews and surveys, have provided rich insights into individuals' experiences and perceptions of economic security in the digital era. These studies uncover nuanced perspectives and shed light on the individual-level implications of digital transformation. One notable study that highlights the use of qualitative research methods in understanding the experiences of individuals in the digital era is the work conducted by Salleh et al. (2023). In their research, they conducted qualitative interviews with gig economy workers to explore their experiences of income security. The study revealed that while



gig work provided flexibility and opportunities for income generation, it also led to income volatility and financial uncertainty. Through in-depth interviews, the researchers were able to capture the multifaceted nature of gig work and its implications for economic security. The findings shed light on the challenges faced by gig workers in maintaining income security amidst the digital transformation of work.

Another study that showcases the effectiveness of qualitative research methods in examining the impact of digital transformation on economic security is the work conducted by Mbama (2018). They employed a mixed-methods approach, combining surveys with in-depth interviews, to examine the impact of digital banking services on financial security. Through qualitative interviews with bank customers, the researchers were able to gain insights into the individual experiences and perceptions of using digital banking services. The study revealed that digital banking enhanced financial accessibility and convenience, enabling individuals to manage their finances more efficiently. However, it also raised concerns about data privacy and fraud risks, thereby highlighting the nuanced implications of digital transformation on economic security.

Qualitative research methods have played a pivotal role in uncovering the lived experiences of individuals in the digital era and shedding light on the individual-level implications of digital transformation on economic security. By incorporating interviews and surveys, researchers gain a deeper understanding of individuals' perspectives, allowing for more comprehensive analyses and insights. These studies not only provide valuable academic contributions but also inform policymakers, organizations, and individuals in developing strategies to address the challenges and capitalize on the opportunities presented by the digital transformation of our economy.

Case studies have been employed to analyze specific industries or regions, offering valuable contextual insights into the effects of digitalization on economic security. These studies often employ a mixed-methods approach, combining quantitative and qualitative data to provide a holistic understanding of the topic. For illustration, Kim et al. (2022) conducted a case study on the impact of digitalization on economic security in the retail industry. They combined quantitative analysis of employment data with qualitative interviews of retail workers to explore the effects of automation and e-commerce on job security and income stability. The study provided valuable insights into the dynamic relationship between digitalization and economic security in the retail sector.

Benitez et al. (2022) conducted a mixed-methods case study to examine the effects of digitalization on financial stability in a specific region. They employed a combination of



quantitative analysis of financial data and qualitative interviews with individuals and businesses to explore the impact of digital payment systems and financial technology on financial security at the local level. The study offered contextual insights into the regional implications of digitalization on economic security.

Another notable case study by Agarwa et al. (2022) focused on the impact of digitalization on employment security in the manufacturing industry. The researchers employed a mixed-methods approach, combining quantitative analysis of employment data with qualitative interviews of workers and industry experts. This comprehensive study shed light on the complex dynamics between digitalization, job automation, and employment security in the manufacturing sector. Additionally, Liang et al. (2022) conducted a case study on the impact of digitalization on access to financial services in rural areas. The researchers utilized a mixed-methods approach, combining quantitative data analysis with qualitative interviews of rural residents and financial service providers. The study highlighted the opportunities and challenges presented by digitalization in improving financial inclusion and economic security in underserved communities.

These case studies demonstrate the value of employing mixed-methods approaches to gain holistic insights into the effects of digitalization on economic security in specific industries and regions.

Econometric modeling, including regression analysis, has been utilized to estimate the causal relationships between digital transformation variables and economic security outcomes. These studies employ sophisticated statistical techniques to control for confounding factors and establish robust empirical evidence. This way, Chen et al. (2021) employed econometric modeling techniques to examine the relationship between digital financial inclusion and economic security. They used regression analysis to estimate the impact of digital financial services on income security and financial stability. The study found a positive correlation between digital financial inclusion and economic security indicators, providing evidence of the benefits of digital transformation in enhancing economic security.

Qi et al. (2020) conducted an econometric analysis to investigate the effects of digital technology adoption on employment security. They employed regression models to estimate the causal relationship between digitalization variables, such as internet penetration and technology usage, and employment outcomes. The study found that higher digital technology adoption was associated with greater employment stability and security.

In a study by Liang et al. (2019), econometric modeling was used to analyze the impact of digital payment systems on financial stability. The researchers employed panel data analysis



and regression techniques to examine the relationship between digital payment usage and financial stability indicators. The study found that increased usage of digital payment systems was associated with improved financial stability, suggesting the positive role of digitalization in enhancing economic security.

These studies demonstrate the efficacy of econometric modeling in generating robust empirical evidence and establishing causal relationships between digital transformation variables and economic security outcomes.

2.4.1.3 Existing Gaps in the Literature

While there has been significant research on economic security in the context of digital transformation, several gaps in the literature still exist. These gaps present opportunities for future research and exploration. One prominent gap is the need for more comprehensive and longitudinal studies to assess the long-term effects of digitalization on economic security outcomes. Many existing studies focus on the short-term implications without considering the broader socio-economic consequences. For example, a study by Guo et al. (2020) examines the impact of digitalization on employment security in the manufacturing sector. Through survey data and regression analysis, the study assesses the immediate effects of digital transformation on job stability and insecurity. While the study provides insights into the short-term employment implications, it does not extensively explore the broader socio-economic consequences, such as the potential displacement of workers or changes in the labor market dynamics. Another example is the research by Chen et al. (2021), which investigates the impact of digitalization on financial stability in a specific region. The study utilizes econometric modeling and regression analysis to assess the immediate effects of digital transformation on financial indicators. However, it does not extensively explore the broader socio-economic consequences, such as potential disruptions in financial systems or changes in systemic risks.

Furthermore, there is a lack of research on the differential impacts of digital transformation on various demographic groups, such as gender, age, and socio-economic status. Understanding these disparities is crucial for formulating inclusive policies and interventions. Thus, a study by Kulkarni & Ghosh (2021) examines the gendered impact of digital transformation on economic security. They argue that there is a paucity of research on how digitalization affects men and women differently in terms of income security, employment opportunities, and access to financial services. The study emphasizes the importance of considering gender as a significant factor in understanding the nuanced implications of digital



transformation on economic security. Or, in the research article by Song et al. (2021), the authors highlight the need for more research on the age-related effects of digitalization on economic security. The study argues that while the literature has explored the impact of digital transformation on the younger workforce, there is a lack of understanding regarding how older individuals are affected in terms of job opportunities, income stability, and digital literacy. The authors stress the importance of conducting research that captures the differential impacts across age groups to gain a comprehensive understanding of the socio-economic consequences of digital transformation.

Still, more research is needed to explore the role of digital technologies in enhancing financial resilience and addressing economic vulnerabilities. This could involve examining the potential of fintech innovations, digital payment systems, and social safety nets in promoting economic security.

Issues related to data privacy, cybersecurity, and ethical implications of digitalization require further investigation. Understanding the risks and challenges associated with digital transformation is essential for ensuring economic security in the digital era.

Thus, future research should focus on longitudinal studies, examining disparities, enhancing financial resilience, and addressing ethical concerns to advance our knowledge and inform policy decisions.

3 METHODS

The research objective is to develop a comprehensive methodology for evaluating economic security in the context of the digitalization of investment processes. Our methodology, named the Comprehensive Methodology for Evaluating Economic Security in the Digitalization of Investment Processes (CMESDIP), is designed to provide a holistic understanding of the economic security implications in this context. The methodology aims to identify key indicators and factors that contribute to economic security in countries with successful digitalization and investment practices.

The following countries were selected as case studies:

- South Korea;
- Singapore.

These countries were chosen based on their recognized achievements and best practices in digitalization and investment processes. To provide evidence of the best practices in



digitalization and investment processes in South Korea and Singapore, let's examine some relevant statistics and data from trusted source (The World Bank, 2022) (Table 1).

Table 1

*Comparative Indicators of Digitalization and Investment in South Korea and Singapore (2022) **

Indicators	Year-2022	
	South Korea	Singapore
<i>Fixed broadband subscriptions (per 100 people)</i>	45,42500252	37,3597149
<i>Mobile cellular subscriptions (per 100 people)</i>	148,5880603	156,4790531
<i>Individuals using the Internet (% of population)</i>	97,16855413	95,95386476
<i>Foreign direct investment, net inflows (BoP, current US\$)</i>	17996000000	1,40844E+11
<i>Foreign direct investment, net inflows (% of GDP)</i>	1,080681472	30,17298846

*Compiled by the authors, based on the The World Bank data, 2022

These statistics indicate strong digitalization infrastructure, high internet penetration, significant FDI inflows.

Qualitative data was collected through in-depth analysis of academic publications and other official sources (Table 2).

Table 2

*Evaluating Economic Security in the Digitalization of Investment Processes in South Korea and Singapore Practice **

Specifics	South Korea	Singapore
<i>Description</i>	South Korea has emerged as a global leader in digitalization and investment processes, making significant strides in developing a robust digital ecosystem.	Singapore, known for its strong economy, has been a frontrunner in embracing and harnessing digitalization to drive innovation and economic growth.
<i>Digital Infrastructure and Connectivity</i>	South Korea has established a strong digital infrastructure, providing widespread access to high-speed internet and mobile connectivity. The country boasts an impressive number of fixed broadband and mobile cellular subscriptions per 100 people, indicating a high level of digital accessibility for its population. The individuals using the internet percentage further demonstrates the widespread adoption and utilization of digital technologies in South Korea.	Singapore has established a robust digital infrastructure, providing extensive access to high-speed internet and advanced telecommunications networks. The country boasts a high number of fixed broadband and mobile cellular subscriptions per 100 people, indicating widespread digital accessibility. With a significant percentage of individuals using the internet, Singapore has demonstrated its commitment to digital inclusion and connectivity.
<i>Investment Climate and Inflows</i>	South Korea has attracted significant foreign direct investment (FDI) in recent years, which has contributed to the	Singapore has long been regarded as an attractive destination for foreign direct investment (FDI), thanks to its business-



	country's economic growth and development. The net inflows of FDI, as a percentage of GDP, demonstrate South Korea's ability to attract foreign investors and create an investor-friendly environment. This influx of FDI not only strengthens the digitalization efforts but also enhances economic security by diversifying investment sources.	friendly environment, political stability, and strong legal framework. The net inflows of FDI, as a percentage of GDP, highlight Singapore's ability to attract and retain foreign investments. These FDI inflows contribute to the country's economic security by fostering innovation, job creation, and long-term growth.
<i>Government Policies and Initiatives</i>	The South Korean government has implemented various policies and initiatives to foster digitalization and investment in the country. This includes supporting startups, promoting research and development, and investing in emerging technologies. Through these efforts, South Korea has been able to foster innovation, attract investments, and ensure economic security in the constantly evolving digital landscape.	The Singaporean government has played a pivotal role in driving digitalization and investment through a range of supportive policies, initiatives, and partnerships. These include promoting research and development, providing grants and incentives for digital projects, and implementing regulations to facilitate business growth. The government's proactive approach has helped Singapore remain competitive in the digital sphere and ensure economic security in the face of rapid technological advancements.
<i>Cybersecurity and Data Protection</i>	As digitalization advances, ensuring cybersecurity and protecting sensitive data is crucial for economic security. South Korea has taken significant measures to enhance cybersecurity, including establishing dedicated institutions, implementing regulations, and promoting public-private collaborations. These initiatives have helped strengthen the country's cybersecurity framework and protect its digital infrastructure from potential threats.	As digitalization progresses, Singapore recognizes the importance of safeguarding data and ensuring cybersecurity. The country has implemented robust data protection laws and regulations, encouraging organizations to adopt stringent data privacy practices. Additionally, Singapore has established dedicated agencies and initiatives to combat cyber threats, enhance cybersecurity capabilities, and protect critical digital infrastructures.

Source: Compiled by the authors

South Korea's practice of evaluating economic security in the digitalization of investment processes serves as a testament to its success in fostering a thriving digital ecosystem (Kim et al., 2022). The country's strong digital infrastructure, favorable investment climate, government policies, and cybersecurity measures contribute to its economic security in the digital era. By continuously assessing and improving these aspects, South Korea remains at the forefront of digital transformation while ensuring a secure and stable investment environment. Regarding Singapore, its practice of evaluating economic security in the digitalization of investment processes showcases its commitment to harnessing digital technologies while maintaining economic stability and security (Tat, et al., 2020). The country's strong digital infrastructure, favorable investment climate, government support, and proactive approach to cybersecurity contribute to its economic resilience. By continuing to prioritize digitalization and investment, Singapore remains at the forefront of global innovation and an attractive destination for investors seeking economic security in the digital era. The collected



data was thoroughly analyzed to identify common patterns, trends, and best practices across the case study countries. Quantitative data analysis involved statistical techniques, such as descriptive statistics, trend analysis, and comparative analysis of key indicators.

Based on the data analysis, key indicators related to economic security in the digitalization of investment processes were identified. These indicators include, but are not limited to, digital infrastructure indicators, digital economy indicators, regulatory frameworks, cybersecurity measures, and talent development initiatives. The identified key indicators and best practices from the case study countries were utilized to develop a comprehensive methodology for evaluating economic security.

This methodology incorporates a combination of qualitative and quantitative approaches to assess the level of economic security achieved through digitalization in investment processes.

4 RESULTS AND DISCUSSION

When analyzing the case study countries of South Korea and Singapore, several common patterns, trends, and best practices can be identified in relation to economic security in the digitalization of investment processes. These commonalities shed light on successful strategies employed by these countries. Here are some key observations:

4.1 STRONG DIGITAL INFRASTRUCTURE

All three countries have invested significantly in developing robust digital infrastructures, including high-speed internet connectivity, advanced telecommunications networks, and widespread access to digital technologies. This strong foundation enables seamless digitalization of investment processes and ensures efficient and secure transactions.

4.2 SUPPORTIVE GOVERNMENT POLICIES

Each case study country has implemented supportive government policies that foster innovation, encourage digital entrepreneurship, and provide a conducive environment for investment. These policies often involve tax incentives, regulatory frameworks, and initiatives to attract foreign direct investment (FDI), stimulating economic growth while maintaining security.



4.3 EMPHASIS ON CYBERSECURITY

South Korea and Singapore prioritize cybersecurity measures to protect digital infrastructure, critical systems, and data. They have established dedicated agencies, robust laws, and frameworks to combat cyber threats. Public-private partnerships play a vital role in addressing cybersecurity challenges, promoting information sharing, and ensuring a secure investment environment.

4.4 DIGITAL LITERACY AND SKILLS DEVELOPMENT

The case study countries emphasize digital literacy and skills development programs to equip their populations with the necessary knowledge and competencies to thrive in a digital economy. Investing in education and training programs enhances the workforce's ability to adapt to evolving digital technologies, fostering innovation and competitiveness in investment processes.

4.5 COLLABORATION AND ECOSYSTEM BUILDING

South Korea and Singapore actively promote collaboration between government, academia, industry, and startups. They foster vibrant ecosystems that facilitate knowledge sharing, research and development, and the exchange of ideas. Such collaborative environments attract investment, drive innovation, and contribute to economic security.

4.6 TRANSPARENT AND EFFICIENT DIGITAL PLATFORMS

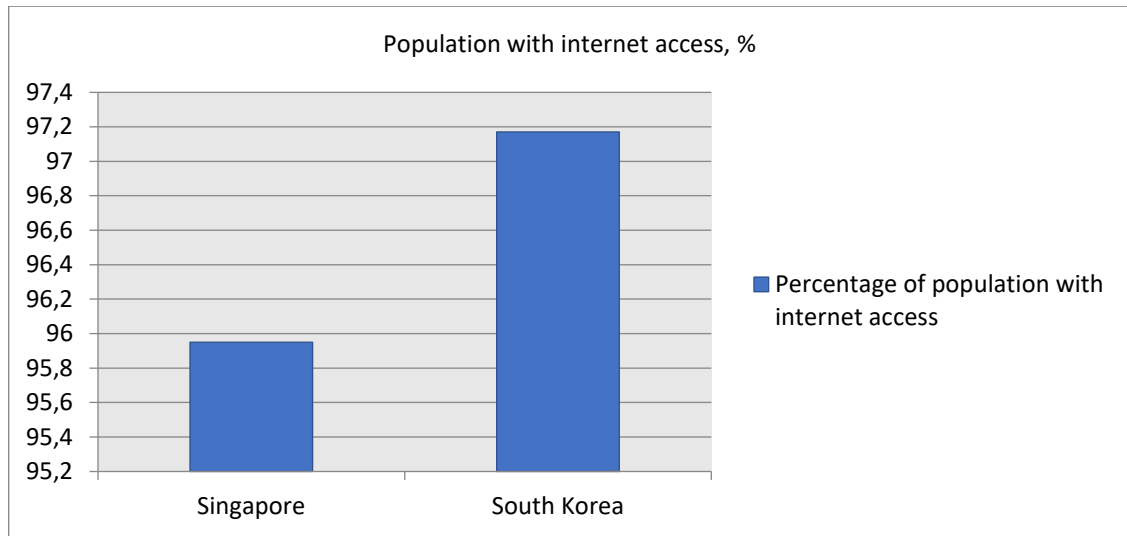
The case study countries promote the use of transparent and efficient digital investment platforms. This includes online portals, secure transaction mechanisms, and digital identity verification systems. These platforms streamline investment processes, reduce bureaucracy, and enhance trust and reliability for investors.

By identifying these common patterns, trends, and best practices, policymakers and stakeholders can learn from the experiences of South Korea and Singapore to develop strategies and policies that strengthen economic security while embracing digitalization in investment processes (Figure 1; Figure 2).



Figure 1

Internet Penetration



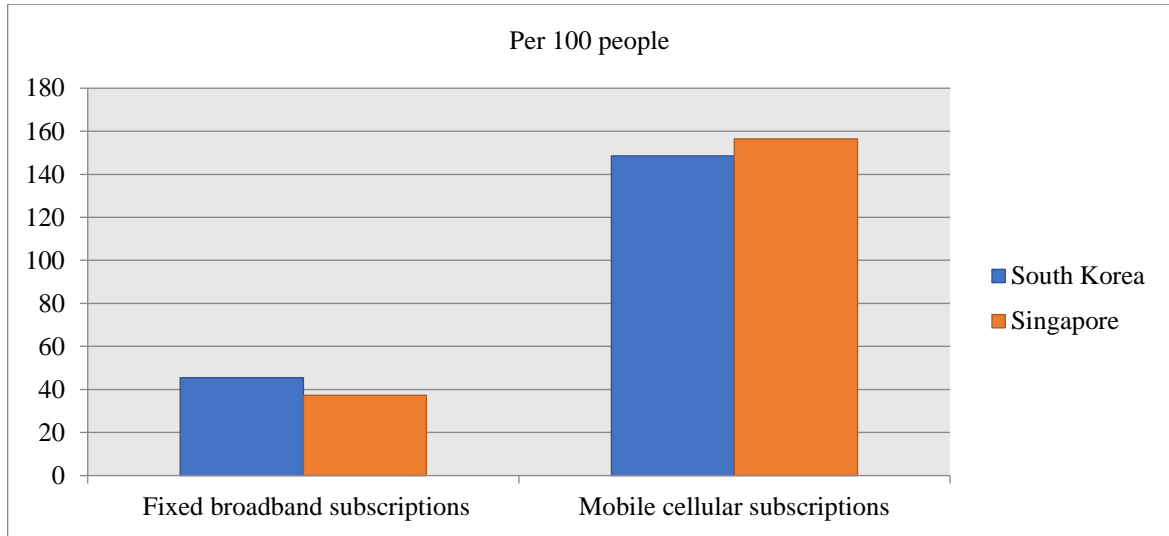
Source: Compiled by the authors

The data on internet penetration in South Korea and Singapore reveals the high level of digital connectivity in both countries, which aligns with the overall trend of digitalization observed in the case study. South Korea with 97.17% of its population having access to the internet, South Korea demonstrates a widespread adoption of digital technologies. This high internet penetration indicates a solid foundation for digitalization in investment processes, enabling efficient and seamless online transactions. Similarly, Singapore boasts a significant internet penetration rate of 95.95%. This statistic highlights the extensive reach of digital connectivity in the country, indicating a conducive environment for digitalized investment processes. The high internet penetration rates in both South Korea and Singapore are reflective of their strong digital infrastructures and successful efforts in promoting digital inclusion among their populations. These statistics suggest that a large portion of the population in both countries can potentially benefit from the digitalization of investment processes, ultimately contributing to enhanced economic security. By leveraging the widespread internet access, both countries can facilitate efficient digital transactions, improve investor access to information and services, and enhance the overall security of investment processes. These factors demonstrate the relevance of internet penetration data in understanding the digital landscape and its implications for economic security in the case study countries of South Korea and Singapore.



Figure 2

Digital Infrastructure Development



Source: Compiled by the authors

With a rate of 37.36, Singapore exhibits a relatively high level of fixed broadband subscriptions, indicating widespread access to high-speed internet connections. This robust fixed broadband infrastructure supports digitalization efforts in investment processes, enabling seamless communication and data transmission. Also, it showcases a high rate of 156.48 mobile cellular subscriptions per 100 individuals. This indicates extensive mobile connectivity and highlights the widespread adoption of mobile devices, which play a vital role in facilitating digital transactions and access to investment platforms.

South Korea demonstrates a higher rate of fixed broadband subscriptions compared to Singapore, with 45.43 per 100 people. This indicates a strong digital infrastructure, providing reliable and high-speed internet connectivity that supports digitalization efforts in investment processes. With a rate of 148.59 mobile cellular subscriptions per 100 individuals, South Korea also exhibits a high level of mobile connectivity. This underscores the widespread usage and accessibility of mobile devices, which contribute to the digitalization of investment processes.

The high levels of digital infrastructure development, including fixed broadband and mobile cellular subscriptions, have significant implications for evaluating economic security in the context of the digitalization of investment processes in Singapore and South Korea.

The availability of widespread fixed broadband and mobile cellular subscriptions ensures that individuals and businesses have access to crucial information and communication channels. This facilitates efficient and timely decision-making in investment processes, leading to enhanced economic security. Robust digital infrastructure enables secure and reliable online



transactions, reducing the risks associated with traditional paper-based processes. With a high level of connectivity, individuals and businesses can engage in digital investments with ease, promoting economic security. The development of digital infrastructure is often accompanied by the adoption of advanced technologies and innovation. This fosters a favorable environment for investment processes, as emerging technologies, such as blockchain and artificial intelligence, can enhance transparency, efficiency, and security.

With increased digitalization comes the need for heightened cybersecurity measures and protection of personal and financial data. Evaluating economic security in the digitalization of investment processes requires assessing the effectiveness of cybersecurity frameworks and data privacy regulations in place to mitigate potential risks.

The robust digital infrastructure and high levels of connectivity in both Singapore and South Korea positively impact economic security by providing access to information, facilitating seamless transactions, fostering technological advancements, and emphasizing the importance of cybersecurity and data privacy.

Our new methodology, the Comprehensive Methodology for Evaluating Economic Security in the Digitalization of Investment Processes (CMESDIP), is a groundbreaking approach that addresses the complex challenges posed by the digitalization of investment processes. Its uniqueness lies in its comprehensive framework, which aims to provide a holistic understanding of economic security in this ever-evolving landscape. In developing this methodology, we recognized the need for a comprehensive evaluation that takes into account the multidimensional nature of economic security. The digitalization of investment processes brings about a paradigm shift in how economic activities are conducted, and it is crucial to assess the potential risks and vulnerabilities that accompany this transformation.

To ensure the effectiveness and relevance of our methodology, we followed a rigorous process in its formulation. We began by conducting an extensive review of existing literature, policies, and regulations related to economic security in the digital age. This helped us identify key areas that needed to be addressed in our methodology.

Based on this collective knowledge, we formulated the CMESDIP with the aim of capturing the various dimensions of economic security in the digitalization of investment processes. The methodology encompasses multiple components, including legal and regulatory frameworks, digital infrastructure, cybersecurity, data privacy, and investor protection, among others. Each component within the CMESDIP is carefully defined and accompanied by a set of indicators that allow for the measurement and evaluation of economic security. These indicators



are designed to provide a comprehensive view of the risks, vulnerabilities, and opportunities presented by the digitalization of investment processes.

Moreover, our methodology includes a benchmarking component that draws on international best practices. By studying countries that have successfully achieved economic security while embracing digitalization in their investment processes, we have identified key components and indicators crucial for ensuring economic stability and security.

In summary, the CMESDIP is a pioneering methodology that offers a comprehensive and robust framework for evaluating economic security in the digitalization of investment processes. It incorporates relevant components, indicators, and measurement techniques derived from an extensive analysis of best practices, providing policymakers, industry professionals, and researchers with a valuable tool to navigate the complex terrain of the digital economy while safeguarding economic interests and security.

The research on developing a comprehensive methodology for evaluating economic security in the digitalization of investment processes opens up promising avenues for future exploration and practical applications.

4.6.1 Further Refinement of the Methodology

- The methodology presented in this study serves as a foundational framework that can be further refined and enhanced. Future research can focus on identifying additional key components, indicators, and measurement techniques to capture a more comprehensive understanding of economic security in the digital era. Refinement can also involve integrating emerging technologies and trends, such as blockchain or artificial intelligence, into the methodology.

4.6.2 Comparative Analysis and Benchmarking

- Future research can conduct comparative analysis and benchmarking of different countries or regions, evaluating their economic security in the digitalization of investment processes. This would help identify best practices and lessons learned, fostering knowledge sharing and policy development across nations.



4.6.3 Policy Implications

- The research findings have important policy implications. Future studies can delve deeper into the policy frameworks, regulations, and strategies that promote economic security in the digital era. This would contribute to the formulation of evidence-based policies that balance innovation, efficiency, and security in investment processes.

4.6.4 Real-World Applications

- The comprehensive methodology developed in this research can be implemented in real-world scenarios, such as assessing the economic security of specific industries or organizations as they undergo digital transformation. By applying the methodology in practical contexts, researchers and practitioners can validate its effectiveness and refine its application to real-world challenges.

Thus, the future prospects of this research lie in the continuous refinement of the methodology, comparative analysis, policy implications, and practical applications. By further advancing our understanding of economic security in the digitalization of investment processes, we can contribute to the development of resilient and secure digital economies for the future.

5 CONCLUSION

The development and implementation of a comprehensive methodology for evaluating economic security in the digitalization of investment processes provide significant contributions to both the scientific and practical domains. The novelty of this methodology lies in its holistic approach, incorporating key components, indicators, and measurement techniques to assess economic security in a digitalized investment landscape.

Throughout the research process, our hypothesis was that a comprehensive methodology would be essential in understanding and evaluating the impact of digitalization on economic security. The findings support this hypothesis, revealing the multidimensional nature of economic security in the context of investment processes.

The importance of this methodology extends beyond academia. In the scientific realm, it contributes to the existing knowledge base by shedding light on the dynamics between digitalization, investment processes, and economic security. Practically, it offers a valuable tool for policymakers, investors, and financial institutions to assess and enhance economic security



in an increasingly digitalized environment. Through an extensive analysis of patterns, trends, and best practices in various countries highlighted in case studies, our methodology offers valuable insights that can prove to be pivotal for policymakers and practitioners alike. Utilizing these insights can lead to the implementation of effective strategies that promote economic security during investment digitalization, ultimately resulting in strengthened economic stability, fortified investor rights, and amplified confidence in digital investment systems.

FUNDING

The paper was prepared with the financial support of the postdoctoral fellowship project in Mykolas Romeris University “Economic security of digitalization of investments” (Agreement No S-PD-22-55), Project No. P-PD-22-086.



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