GLOBAL DIGITAL ERA, SOCIAL, PEACE & BUSINESS PERSPECTIVES IN SOCIETY

Editors

Assoc. Prof. Dr. Muhammad Ali Tarar
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PREFACE

How well people work together is a crucial factor in the success of any business & organization. Social behavior and good leadership play important role in adoption of new innovations, technologies, and skills that ultimate change the pattern of communication to promote business, enhance sales and strengthen organization and industry in present era. The development of the Industrial Revolution brought changes to the adjustment of work in humans, machines, technology and processes in various professional fields, including the accounting profession. The Industrial Revolution requires the accounting profession to adapt to the development of information technology and big data. Facing today's latest industrial era, the development of the digital economy has opened new possibilities while simultaneously increasing risk. These changes have a significant impact on the development of accounting. In this era, technological developments and innovations seem to keep pace with time. New innovations encourage the creation of new markets and shift the existence of old markets. Smart machines and robots are now taking on many roles and seem to rule the world. In the Industrial Revolution 4.0 there was an extraordinary shift in various fields of science and profession, therefore the way accountants work, and practice needs to be changed to improve service quality and global expansion through online communication and the use of cloud computing and artificial intelligence.

Thank you for the hard work of the Steering Committee who has assessed the articles to be published in Social Behaviour, Leadership, Sales, Communication, Organization, Branding, Feasibility Analysis for Business Management: Inquiries with New Approaches in the Post-Pandemic Era.

This publication is dedicated to the world of science in the field of Accounting which is currently growing so rapidly. The development of Cloud Computing and Artificial Intelligence has played a role in changing the work order of Accountants.

Assoc. Prof. Dr. Muhammad Ali Tarar
Bursa – January 2024

CONTENTS

CHAPTER 1

Does Digital Transformation Affect Banks' Resilience? A Perspective Analysis of Strategic IT Governance Competence 2.0 in Commercial Bank in Indonesia

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ABSTRACT

The COVID-19 pandemic has accelerated sustainability and digital transformation across industrial sectors. This situation encourages banks to adopt financial technology (fintech) and its aligned governance structures. So far, IT governance is dominated by the silo management paradigm, which is the main challenge in aligning strategy. Top management teams face the challenge of increasing strategic IT governance competence (ITGOV) following increasing regulations and best practice standards. In addition, banks are also required to disclose action plans on sustainable finance and risk management of information technology (IT). This research develops an ITGOV Index based on the COBIT5 standard. We use content analysis of banks' annual report disclosure as a proxy for the maturity level of ITGOV practices, consisting of leadership and project process excellence. We examine the effect of the ITGOV Index on the banks' resilience through fintech adoption, operational efficiency, and profitability. We use the I/O Intermediation Stochastic Frontier Analysis to determine the technology change of 40 banks listed on IDX during 2015–2021. The research results show that ITGOV does not directly affect bank resilience, but there is a mediating role in fintech adoption and operational efficiency. Besides that, ITGOV harms profitability in the early stages due to adapting the governance structure. However, the sensitivity analysis shows that the negative effect weakens at t+1 and t+2 as the maturity level of ITGOV increases, potentially increasing bank resilience. The results give practical implications for commercial banks and policy recommendations for regulators to accelerate sustainable digital transformation.

Keywords: Strategic IT governance competence, Fintech adoption, Operational efficiency, Profitability, Banks resilience.

1.1 INTRODUCTION

The global crisis has taught us a valuable lesson: excessive emphasis on financial aspects can result in the oversight of social and environmental considerations, leading to failures within the financial system and the emergence of reputation risks. Over the past decade, the banking sector has endeavored to rebuild its reputation by devising an action plan on sustainable finance (Agirre-Aramburu & Gomez-Pescador, 2019), complemented by investments in financial technology (Fintech) (Zuo et al., 2021). Implementing sustainability strategies aims to foster the sustainability of the natural environment, human society, and the economy, with anticipated effects on operational efficiency, profitability, and bank resilience. (Nosratabadi et al., 2020).

Through the integration of Fintech, financial institutions can offer cutting-edge services (Tseng & Guo, 2022) encompassing payment systems, electronic money, online loans, big data, blockchain, cloud computing, artificial intelligence, and smart contracts, resulting in significant transformations to banking operations (Zuo et al., 2021). The adoption of Fintech also empowers banks to leverage machine learning algorithms and big data analytics for more effective credit decision-making (Cheng & Qu, 2020) and to employ intelligent investment advisors in guiding investment choices and financial supply chains (Tantri, 2020). Consequently, Fintech presents a formidable challenge for banks to enhance the inclusivity and effectiveness of their control systems and risk management procedures (Weber et al., 2017).

Integrating Fintech into banking strategies introduces additional risks (Sutarti et al., 2019; Helen, 2021; Thakor, 2021). Numerous case studies reveal that a significant number of companies incurred losses during the process of transitioning their information technology (IT) infrastructure. On average, IT project implementations surpass the allocated budget by 27%, with one in six projects experiencing cost overruns of up to 200% (Forbes, 2021). Furthermore, a PwC study examining 10,640 IT projects disclosed that merely 2.5% were completed within the designated timeframe, while the majority still needed to meet objectives and exceed the predetermined budget. These findings underscore that governance issues associated with digital transformation extend beyond the execution phase, presenting a much more intricate challenge (Weinzeimer, 2023).

Following the recovery from the global crisis in 2010, the financial services sector in Indonesia has established sustainable finance regulations aimed at constructing a corporate sustainability system, which includes the Risk Governance Framework (RGOV) (FSB, 2013; Karyani et al., 2019). This initiative involves the formulation of the Roadmap to Sustainable Finance, expanding information disclosure guidelines associated with the Action Plan on Sustainable Finance (OJK, 2017), and introducing the Green Taxonomy (OJK, 2021). These measures are designed to incentivize structural changes across all industrial sectors and address acute and chronic climate change risks (TCFD, 2021; IFRS, 2021). The financial services sector is anticipated to take the lead in driving the transition toward a low-carbon economic system, accomplishing this through incorporating environmental, social, and governance (ESG) screening in allocating credit and investment (Schoenmaker, 2017).

More empirical research needs to examine the impact of aligning sustainability strategy with IT strategy, except Zuo et al. (2021), who investigated sustainability innovation in commercial banks in China. Their study revealed that investments in digitalization significantly enhanced production efficiency. This observation aligns with research conducted in Indonesia, where the level of sustainability innovation in the banking sector is moderate. In the initial stages, the banking industry prioritizes a balance between financial, social, and environmental considerations, which may initially have a detrimental effect on profitability. However, operational efficiency positively mediates (Anis et al., 2023). The appropriateness of contextual factors exhibits a favorable impact on performance and serves as a moderating factor in the influence of innovation capability on the performance of strategic business units within the banking sector (Berman, 2012; Anis & Shauki, 2023).

Moreover, statistics from the Ministry of Information of the Republic of Indonesia revealed that 888,711,736 cyber threats were recorded throughout 2020, translating to an average of 42 threats per second (OJK, 2022). The risks associated with digital transformation encompass the potential for personal data breaches and cyberattacks, which can be exacerbated by limited digital technology literacy and uneven infrastructure development (CNBC, 2021). Despite implementing Bank Indonesia Regulation Number 9/15/PBI/2007 and SEOJK Financial Services Authority Circular Letter No.21. 2017 focuses on Commercial Bank IT Risk Management, and the Digital Maturity Assessment for Banks (DMAB) indicates that the maturity level of IT governance within the banking sector in Indonesia remains relatively low at 50%. This level must be deemed sufficient to adequately support the transition and sustainability transformation efforts (OJK, 2021).

Studies focusing on digital transformation underscore the significance of strategic alignment, characterized by the appropriate coherence between business strategy and IT strategy (Henderson & Venkatraman, 1999). Nevertheless, there needs to be more consensus among researchers regarding the optimal approach for gauging the impact of digital transformation on company performance (Coltman et al., 2015). Typically, research relies on static alignment models, offering limited practical guidance on enhancing IT-business alignment (Luftman et al., 2017). Studies predominantly conducted in developed nations consistently report a robust correlation between strategic alignment, agility, and overall performance. However, ongoing debate remains concerning the type of alignment that contributes most significantly to performance outcomes (Panda & Rath, 2018; Panda, 2022).

Conversely, studies about sustainability transformation have underscored the substantial costs associated with such initiatives, which can disrupt the operational efficiency of banks (Nidumolu et al., 2009). Despite the costs, sustainability endeavors have been shown to enhance a bank's reputation and decrease capital costs by facilitating more accessible access to funding (Bassen et al., 2020). These initiatives also contribute to fortifying industry standards and elevating competitors' costs (Clarkson et al., 2011). The overarching findings from the research suggest that the positive impacts of sustainability outweigh the negative consequences. Therefore, the hypothesis that sustainable banks are more efficient than conventional banks can be substantiated.

There have been limited studies that explore the profitability of sustainable banking comprehensively (Platovova et al., 2018). Empirical findings suggest that sustainability initiatives contribute profitability in banks, with market forces playing a significant role in determining profitability for conventional banks. But, market forces do not exert the same level of influence on the profitability of sustainable banks. Despite increased costs, both conventional and sustainable banks exhibit high profitability. Consequently, it can be asserted that the market power hypothesis is less relevant in explaining sustainable banks' profitability than conventional banks (Olmo et al., 2021).

Another constraint lies in applying stakeholder, legitimacy, and institutional theory within sustainability research, which has limitations in elucidating the political-economic facets of the sustainability transformation process. In contrast, the examination of the digital transformation process is predominantly conducted in an empirical setting utilizing the Contingency and Diffusion of Innovation theory. However, this approach is constrained to evaluating the interaction of two variables based on managerial selection and a restricted analysis employing a systemic approach. At the practical field level, contemporary literature underscores the emergence of a novel paradigm: strategic IT governance competence 2.0 (ITGOV). This paradigm incorporates the active involvement of top management teams (TMTs) in aligning and spearheading IT project execution (Weinzeimer et al., 2023, p. 19).

The overview above underscores the intricacies of strategy, necessitating a thorough analysis to mitigate insolvency risk, particularly in the financial services sector grappling with substantial losses from credit defaults, elevated uncertainty levels, and constrained funding (Valencia, 2017). This situation holds significant importance as insolvency risk extends beyond individual banks, impacting the entire financial system (Scholten & Klooster, 2019). Aligning sustainability with IT strategies proves instrumental in mitigating the risk of bankruptcy, as it enhances brand image, attracts customers, and diminishes reputation risks (Bassen et al., 2020). Sustainable banks, characterized by transparency and elevated moral standards, are better positioned to alleviate adverse selection and moral hazard concerns (Lopatta et al., 2016). Consequently, the proposition is that sustainable banks have lower risk than conventional banks.

This study aims to bridge the existing research gap by approaching the Analysis through a lens of governance and competence (capability) (Williamson, 1999). Governance challenges top management teams (TMTs) competence in minimizing economic transaction costs by making strategic choices in routine business processes that align with regulations and adhere to standard best practice guidelines (Teece et al., 2007). This research examines the impact of strategic IT governance (ITGOV) competence on banks' resilience, utilizing agility as a proxy for the number of fintech adoptions and operational efficiency. This scrutiny gains significance due to the heightened regulatory environment in responding to financial crises, which prompts investment and adoption of technological innovations influencing operational efficiency. This exploration will unveil distinctions between efficient and inefficient banks (Olmo et al., 2021).

This study introduced the ITGOV Index, formulated by aligning sustainability regulations, risk management, and the COBIT5 standard. Additionally, data on bank ITGOV practices was acquired through content analysis of annual reports. The theoretical frameworks guiding this research encompass New Institutional Economics, Dynamic Capability, Diffusion of Innovation, and Contingency theory. The subsequent sections of the paper are organized as follows: Part 2 delves into the literature review and hypotheses, Part 3 outlines the research methods, Part 4 presents the research results, and Part 5 concludes with insights, implications, limitations, and directions for future research.

1.2 LITERATURE REVIEW AND HYPOTHESIS

2.1. Theoretical underpinning of strategic IT governance competence 2.0

The New Institutional Economic (NIE) theory, as articulated by Williamson (2000), posits that the pace of organizational adaptation can be assessed within a four-level institutional framework. Firstly, the internalization of social and ethical norms ensures that spontaneous behavior evolves over a timeframe of 100 to 1000 years. Secondly, the state-level institutional environment, with establishing property rights, offers first-order economic opportunities within 10-100 years. Thirdly, if corporations adopt state-level institutions and integrate them into contractual arrangements with stakeholders, it yields second-order economic opportunities within 1-10 years (Williamson, 2022). Lastly, allocating resources and employment, coupled with incentives and rewards, secures profit margins in routine business processes. The speed of adaptation is contingent on causal relationships between institutional levels, with change typically originating from lower to higher institutional levels. However, change is not always positive, as opposing influences between institutional levels can create counteractive effects that impede adaptation (Williamson, 2000).

Dynamic Capability theory proposes that organizations embrace flexible governance beyond legal compliance (Teece et al., 1997). Incorporating digital technology enables organizations to enhance their agility (Cˇirjevskis, 2017), contingent upon IT-business alignment. Agility, viewed as a high-level organizational capability, is systematically cultivated through prolonged learning efforts (Mao et al., 2015). Contrarily, Contingency theory asserts that no one-size-fits-all management system is applicable across all scenarios. Instead, an effective organization fits with the contextual factors within its environment (Drazin & Van de Ven, 1985).

A robust risk governance framework (RGOV) plays a pivotal role in risk mitigation, as emphasized in the "Corporate Governance Lessons from the Financial Crisis" (OECD, 2014). RGOV is characterized by the shared responsibility of the board, chief risk officer (CRO), and chief information officer (CIO) in making IT investment decisions and overseeing risks as part of an enterprise-wide management system (Weinzeimer, 2023). A new senior management role has emerged within sustainable companies — the chief sustainability officer (CSO), responsible for spearheading the sustainability transition and transformation. The board of directors (BOD) is responsible for establishing the bank's risk appetite and principles, with support from the Board Risk Management Committee (BRMC), which regularly reports on risk exposure, profile, concentration, and trends. Meanwhile, CROs independently assess credit, market, operational, liquidity, and other key management risks daily (FSB, 2013).

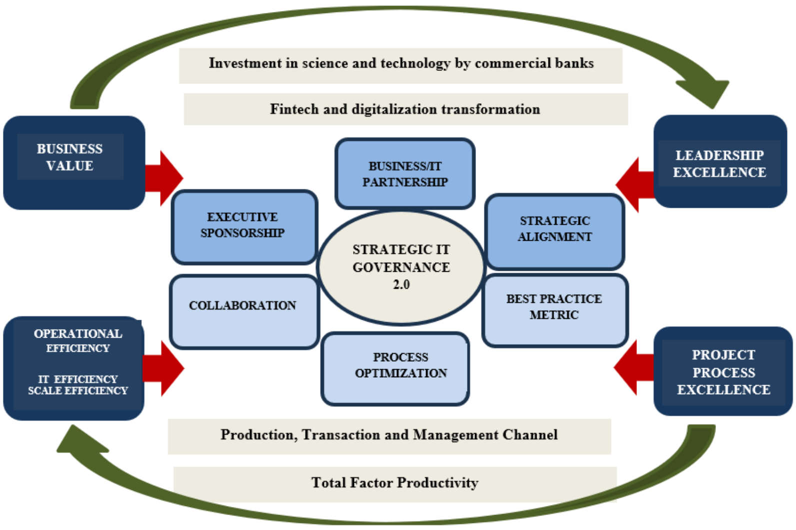

Figure 1. Strategic IT Governance Competence 2.0
Sumber. Diadaptasikan dari (Weinzimer, 2023) dan (Zuo et al., 2021)

As illustrated in Figure 1, the strategic IT governance competence (ITGOV) model encompasses A) IT Leadership excellence in generating business value through 1) sponsoring IT projects, 2) collaborating with stakeholders, and 3) aligning IT strategy; B) Excellence in executing IT projects by 4) fostering collaboration, 5) optimizing processes, and 6) employing best practice metrics (Weinzimer, 2023). These six domains collectively ensure the efficacy of IT investments (Lee & Mithas, 2008). Organizational (individual) innovativeness, as categorized by the Diffusion of Innovation (DOI) theory, includes the first mover firm (early adopter), the deliberate adopter (early majority), and late majority (laggard firm) (Rogers, 1983; 2004).

Based on the theory, conceptual literature, and prior empirical investigations, the research framework is depicted in Figure 2 below.

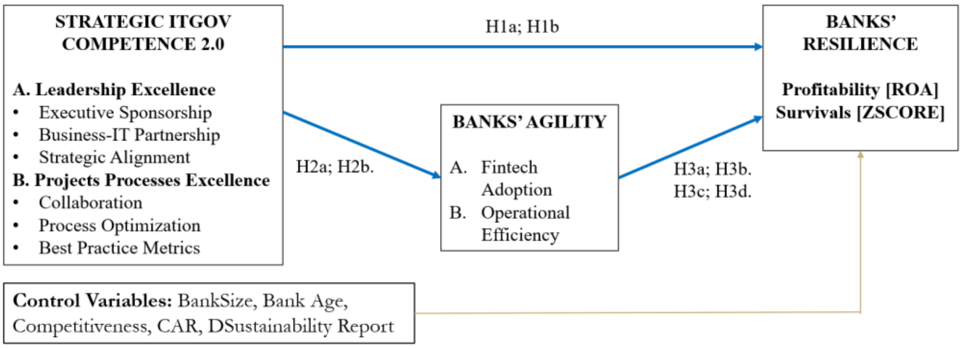

Figure 2. Research framework

2.2. Strategic IT governance competence and banks' resilience

Past studies have identified a positive correlation between IT-business strategic alignment and performance (Panda, 2022). The engagement of top management teams (TMTs) in sponsoring IT projects and aligning strategies has demonstrated efficacy in cost control, profitability enhancement, market growth, and the promotion of innovation capabilities (Chan et al., 1997),

Recent investigations have revealed the impact of strategic alignment on corporate agility (Panda & Rath, 2018), positioning it as a precursor to performance (Panda, 2022). According to the dynamic capability theory, corporate agility is considered a high-level capability intentionally developed through long-term learning (Teece, 2007). Strategic ITGOV competence fosters communication and coordination between IT units, departments, managers, and business executives. This dynamic enhances the quality of decision-making in IT development and related alignment activities. ITGOV is crucial for fostering a robust banking system, a key element in safeguarding sustainable economic growth (Wu et al., 2015). ITGOV competency further leads to collaborative governance and the realization of enhanced IT business value. Recognizing alignment as a dynamic concept necessitates examination from a process-oriented perspective to mitigate risks and sustain profit stability (Tallon, 2008). Strategic IT governance competence is explored as a construct linked to the learning process, with an anticipated impact on banking resilience. This premise forms the basis for the following hypothesis.

H1a. Strategic IT governance competence positively affects banks' profitability.
H1b. Strategic IT governance competence positively affects banks' survival.

2.3. Strategic IT governance competence and banks' agility

In line with the Diffusion of Innovation (DOI) theory, the transformation process unfolds as a protracted learning journey with outcomes realized incrementally through stages (step-by-step innovation model) (Rogers et al., 1983). Effective strategic alignment hinges on knowledge sharing between the top management team and senior IT management, fostering increased coordination and collaboration. This proactive approach enables the top management team to assess the situation before responding to environmental conditions (Barki & Pinsonneault, 2005). Knowledge sharing exemplifies agility in embracing exploitative innovations, enhancing business practices, optimizing product creation costs, and exploring novel services and distribution channels (Lavie & Rosenkopf, 2006; Anis & Shauki, 2023).

A culture of knowledge sharing can be expanded to involve business partners, customers, and suppliers, creating opportunities for IT and business alignment and enriching comprehensive strategic decision-making. Consequently, strategic ITGOV competence nurtures agility, empowering organizations to steer the direction of change. This competency supports top management teams (TMTs) in scanning environmental conditions, encouraging organizations to proactively scale up product and service offerings to address uncertainty. As a result, strategic ITGOV competence promotes efficient resource utilization, enabling the detection and identification of changes (Tallon, 2008). Moreover, ITGOV enhances core business process reengineering capabilities to adapt to change and foresee threats and opportunities. ITGOV develops flexible responses to market changes by concentrating on internal business processes, enhancing operational efficiency, and boosting profits. Hence, the second hypothesis is formulated as follows:

H2a. Strategic ITGOV competence positively affects the adoption of fintech innovation

H2b. Strategic ITGOV competence positively affects banks' operational efficiency.

2.4. The mediating role of banks' agility on the relationship between strategic IT governance competence and banks' resilience

To transform into a sustainable bank, top management teams (TMTs) must articulate objectives that consider meeting the needs of local communities, environmental protection, and fostering healthy economic prospects (Boitan, 2018). Attaining this objective involves TMTs avoiding excessive risk-taking and implementing effective risk-management strategies (Cui et al., 2008). Building positive stakeholder relations becomes instrumental in garnering local support, attracting customers, and mitigating bank risks (Panda & Rath, 2018). Environmentally friendly actions by banks reduce reputation risks and enhance customer loyalty, contributing to funding stability (Bassen et al., 2020).

In a dynamic environment, employees' entrepreneurial spirit determines organizational agility, which is evident in their prompt response to customer requests (Cai et al., 2013). Market capitalization plays a crucial role in decision-making regarding products and services (Panda, 2022), with profitability as a vital indicator of improved performance. Furthermore, organizations endowed with high strategic ITGOV competence can integrate internal resources, modify product and service schemes, and operate more efficiently. Ultimately, strategic alignment enhances customer trust, enabling organizations to navigate market fluctuations, gain competitive advantage, and achieve higher performance.

Aligned with NIE theory, the pace of organizational adaptation is shaped by reciprocal two-way relationships across institutional levels at the country level, organizational governance through performance contractual agreements and resource allocation, and incentive and reward arrangements (Williamson, 2000). In contingency theory, organizational change transpires through collective action, exerting systemic effects on community life. Given the existing research demonstrating the positive impact of fintech adoption on innovation capability (Anis & Shauki, 2023) and agility (Panda, 2022), alongside the mediating role of operational efficiency on profitability (Sutarti et al., 2019; Anis et al., 2023), the ensuing hypothesis is formulated as follows:

H3a. The fintech adoption positively mediates the relationship between strategic ITGOV competence and banks' profitability.

H3b. The adoption of fintech positively mediates the relationship between strategic ITGOV competence and banks' survival.

H3c. Banks' operational efficiency positively mediates the relationship between strategic ITGOV competence and banks' profitability.

H3d. Banks' operational efficiency positively mediates the relationship between strategic ITGOV competence and banks' survival.

1.3 METHODOLOGY

3.1. Sample framework and data collection

The research sample comprised 40 banks on the Indonesia Stock Exchange spanning 2015 to 2021, constituting 280 bank-years. Indonesia has progressed through Sustainable Finance Journey Phase I (2015-2019) and is presently in Sustainable Financial Journey Phase II, emphasizing the establishment of corporate sustainability systems (CSSs). The anticipation is that strategic ITGOV competence will expedite shifting toward a circular economic system (OJK, 2021).

3.2. Research design and regression model

Three main models were developed to test the following hypotheses

Model 1: Effect of strategic ITGOV competence on banks' resilience

$$ROA_{it} = \alpha_0 + \alpha_1 ITGOV_{it} + \alpha_2 LNSIZE_{it} + \alpha_3 LNAGE_{it} + \alpha_4 CAR_{it} + \alpha_5 CMPT_{it} + \alpha_6 DSR_{it} + \varepsilon$$

$$ZSCORE_{it} = \beta_0 + \beta_1 ITGOV_{it} + \beta_2 LNSIZE_{it} + \beta_3 LNAGE_{it} + \beta_4 CAR_{it} + \beta_5 CMPT_{it} + \beta_6 DSR_{it} + \varepsilon$$

Model 2: The effect of strategic ITGOV competence on banks' agility

$$FINTCH_{it} = \rho_0 + \rho_1 ITGOV_{it} + {}_2 LNSIZE_{it} + \rho_3 LNAGE_{it} + \rho_4 CAR_{it} + \rho_5 CMPT_{it} + \rho_6 DSR_{it} + \varepsilon$$

$$OPREFF_{it} = \lambda_0 + \lambda_1 ITGOV_{it} + \lambda_2 LNSIZE_{it} + \lambda_3 LNAGE + \lambda_4 CAR_{it} + \lambda_5 CMPT_{it} + \lambda_6 DSR_{it} + \varepsilon$$

Model 3: The mediating role of banks' agility on the relation between strategic ITGOV competence and banks' resilience

$$ROA_{it} = \varphi_0 + \varphi_1 ITGOV_{it} + \varphi_2 FINTCH\_FIT_{it} + \varphi_3 OPREFF\_FIT_{it} + \varphi_4 LNSIZE_{it} + \varphi_5 LNAGE_{it} + \varphi_6 CAR_{it} + \varphi_7 CMPT_{it} + \varphi_8 DSR_{it} + \varepsilon$$

$$ZSCORE_{it} = \pi_0 + \pi_1 ITGOV_{it} + \pi_2 FINTCH\_FIT_{it} + \pi_3 OPREFF\_FIT_{it} + \pi_5 LNSIZE_{it} + \pi_6 LNAGE_{it} + \pi_7 CAR_{it} + \pi_8 CMPT_{it} + \pi_9 DSR_{it} + \varepsilon$$

The hypothesis will be accepted under condition:

H1a,b: $\alpha_{1:}\ \beta_1 > 0$; H2a,b: $\rho_{1:}\lambda_1 > 0$; H3a,b: $\varphi_{2,}\ \varphi_{3,}\ \pi_{2,}\ \pi_3 > 0$.

3.3. Operational Variables

The independent variable in this study is the self-constructed ITGOV Index, which serves as a proxy for the maturity level of ITGOV practices. The development of the ITGOV Index assumes that increased regulation will result in the convergence of various governance systems (Salvioni et al., 2016). The ITGOV Index was formulated by mapping sustainability regulations (FSB, 2013; KNKG, 2021; SEOJK No.21. 2017) onto the ITGOV model. Criteria were then developed based on the IT COBIT5 standard. The ITGOV Index emerged from content analysis of information disclosure, encompassing 6 Domains, 18 Subdomains, and 40 ITGOV practice criteria. Scoring was done using the Capability Maturity Grid: Score 1 (Index ≤ 0.25: Unaware-Undisciplined), Score 2 (Index ≤ 0.50: Open-minded-Reactive), Score 3 (Index ≤ 0.75: Widely practiced-Proactive), and Score 4 (Index ≤ 1.00: Walk the Talk-Enterprise culture). For a detailed overview of the ITGOV development process and criteria, please refer to the following link: https://drive.google.com/file/d/1R4ovvajHt8RbN_Z9DDCjGp8DV_5yFIwd/view?usp=sharing

The dependent variable in this study is banks' resilience, gauged through a measure of capital risk-taking, proxied by bank profitability (ROA) and survivals (ZSCORE), indicating a bank's distance from insolvency (Bolton, 2013). ZSCORE is calculated as the return on assets (ROA) plus the capital-to-asset ratio divided by the standard deviation of return on assets (σ(ROA). A higher ZSCORE denotes a more stable financial condition for the bank (Boyd et al., 2006).

The mediating variables include banks' agility, with three proxies: (1) fintech adoption, (2) operational efficiency, and (3) profitability. Fintech adoption involves strategic expenditure with ten criteria: 1) ATMs; 2) SMS banking; 3) EDC electronic payment; 4) Mobile banking; 5) Internet banking; 6) Video banking; 7) Phone banking; and 8) Credit cards (Sutarti et al., 2019), and 9) Enterprise resources planning, 10) Enterprise risk management (Otley, 2016). A bank is assigned a score of 1 for each disclosed fintech adoption criterion, with a total score ranging from 1 to 10. Fintech adoption is measured by the sum of fintech adoption scores divided by the total score and multiplied by 100% (FINTCH ≤ 1).

Operational efficiency is represented by 'technology change,' reflecting a deviation in the non-parallel cost curve that illustrates how the bank minimizes output production costs, adjusts the input mix, and enhances efficiency within a specific technological state. The measurement of technology change is based on the current technology state (meta frontier) connected to the available best technology set, utilizing the input-output model of intermediary stochastic frontier analysis (SFA) in two stages. The initial step involves calculating operational efficiency as follows:

$$TC_{it} = f^{*}(w_{it}, y_{it}, z_{it})e^{v_{it}+u_{it}} \quad \text{(a)}$$

$$\begin{aligned} LN\_TC_{i,t} &= \zeta_0 + \zeta_1 LNFixAsset_{I,\,t-1} + \zeta_2\, LNHrd_{i,\,t-1} + \zeta_3 LNDeposit_{i,\,t-1} \\ &+ \zeta_4 NegEarn_{I,\,t-1} + \zeta_5\, Growth_{i,\,t} + \zeta_6\, CashR_{it} + \zeta_7\, DebtR + \zeta_8\, EquityR_{it} \\ &+ \zeta_9\, NPL_{it} + \zeta_{10}\, NIM_{it} + \zeta_{11}\, FOWN_{it} + \zeta_{12}\, DDIV_{it} + \zeta_{15}\, D\_M\&A_{it} + \varepsilon_{it} \quad \text{(b)} \end{aligned}$$

Where w: input price vector, namely investment in fixed assets and technology, human resources, third party fund savings; y: output vector, namely the amount of financing and investment allocation; z: vector of bank risk profile such as financial conditions (Andries et al., 2016) as well as institutional factors influencing innovation adoption (Zuo et al., 2021) such as foreign-owned banks, bank mergers and acquisitions (Bos et al., 2013); v: random noise iid N (0, σv); μ: inefficiency term N|(μ, σv). The error term eit=mit + uit describes the overall specific inefficiency. In the second stage, banks functioning on the annual cost frontier, signifying no inefficiency, attain a cost efficiency value 1. In contrast, inefficient banks operate above and below the annual cost frontier, resulting in an efficiency score below 1 (<1). The absolute distance between the annual cost frontier and the meta cost frontier hinges on whether the annual cost frontier surpasses the total cost meta frontier. Technology gap is calculated as GAPit = f meta (wit, yit, zit) / f * meta (wit, yit, zit). Innovation adoption will reduce GAPit due to technological change (meta frontier). Next, to get an interpretation of the direction of the positive influence of strategic ITGOV competence on operational efficiency, the GAPit value is multiplied by minus one (-1).

This research controls bank size represented by the natural logarithm of total assets (LNSIZE), bank age (LNAGE), capital adequacy ratio (CAR) (Karyani et al., 2019), competitiveness level proxied by the Lerner index (CMPT) (Bos et al., 2013), along with a dummy variable set to 1 if the bank issues a sustainability report (DSR).

3.4. Endogeneity issues

This study recognizes endogeneity as a significant governance challenge. Some researchers posit that the governance structure of directors and boards is influenced by past performance (Karyani et al., 2019), while others contend that the governance structure is shaped by dynamic endogeneity factors (Nahar et al., 2016). In the banking context, past performance does not dictate future risk governance. The composition of the board of directors and commissioners serve as a proxy (Adam & Mehran, 2012), alongside the count of committees and risk management units (Karyani et al., 2019). This research uses two-stage least squares (TSLS) to overcome endogeneity issues.

RESULT AND ANALYSIS

4.1. Strategic IT Governance Competence 2.0 (ITGOV) Index

The validity and reliability of the ITGOV Index were assessed using a significance level of 5% and an r-table of 0.113. All domains, subdomains, and criteria surpassed a value of 0.500, establishing the validity of the ITGOV Index. Additionally, Cronbach's alpha values for Leadership Excellence (LEAD) and Project Process Excellence (PROJ) were 0.902 and

0.890, respectively. These high values signify the ITGOV Index is both "valid" and "reliable," affirming its suitability for empirical testing.

4.2. Statistic descriptive and correlation between research variables

Table 1 presents the main variables' mean, standard deviation, and correlations. The mean of ITGOV Index is 0.722, with a standard deviation of 0.158, indicating a capability maturity level 3 (Widely practiced/Proactive). This result suggests a transition towards a higher emphasis on Environmental and Social aspects than Financial aspects, aligning with the shift from Sustainable Finance SF2.0 to 3.0 (Schoenmaker, 2017).

In terms of correlation, ITGOV exhibits a strong positive correlation with FINTCH and a weak positive correlation with OPREFF and CAR. On the other hand, ITGOV demonstrates a strong negative correlation with ROA, ZSCORE, and LNSIZE and a weak negative correlation with LNAGE, CMPT, and DSR.

4.3. Multivariate Testing

Hypothesis testing employs the estimation of a fixed-effect model using panel data. The outcomes of hypothesis testing are outlined in Table 2. Two sensitivity tests were conducted in this study. Firstly, it examines the impact of the ITGOV Domain and Sub-domain on bank agility, specifically fintech adoption, operational efficiency, and profitability. Secondly, assessing the influence of the ITGOV time-lag effect on bank profitability and resilience in years t+1 and t+2.

4.3.1. Analysis of the effect of strategic ITGOV on banks resilience

The results from Model 1 indicate that strategic ITGOV competence harms profitability (ROA) ($\alpha 1$ = -0.799, p-value = 0.091) and banks' survivals (ZSCORE) ($\beta 1$ = -0.799, p-value = 0.182). Consequently, the hypotheses regarding the influence of ITGOV on bank resilience (H1a and H1b) are not substantiated by the data.

In the sensitivity tests, the negative impact on profitability weakens at t+1 (Coeff = -6.746, p-value = 0.091*) and t+2 (Coeff = -3.543, p-value = 0.251). The influence on banks' survivals varies, showing a positive effect at t+1 (Coeff = 0.967, p-value = 0.035**) and no effect at t+2 (Coeff = 0.080, p-value = 0.453). These results suggest a highly dynamic environmental condition for banks.

Consistent with prior research findings, the adverse effect on profitability may stem from a lack of alignment between IT and business strategy and a mismatch with customer needs (Kearns & Sabherwal, 2007). Furthermore, a low capacity for innovation can lead banks to miss opportunities to enhance efficiency and gain a competitive edge (Oh & Pinsonneault, 2007; Yahya & Hu, 2012). In addition, insufficient attention to security and legal compliance may heighten the risks associated with data security, resulting in financial losses, erosion of customer trust, and legal consequences, which can diminish profitability and reputation, thereby affecting survival (Wu & Shen, 2011).

Additionally, adverse consequences may arise from the mismanagement of IT projects, encompassing cost, time, and quality issues, leading to implementation failures with potentially harmful ramifications. Project management errors can further impact resilience, making it challenging to adapt to changes or market pressures (Berman, 2012). There needs to be more planning and testing of disaster recovery strategies to increase the likelihood of data loss and unproductive downtime, impeding the business's capacity to operate seamlessly in the aftermath of unforeseen events (Panda & Rath, 2018).

Inadequate IT governance may lead to uncontrolled operational costs, such as a lack of control over IT resources, suboptimal vendor relationship management, or inefficient excess capacity, negatively impacting profitability. Simultaneously, the escalating regulatory demands challenge banks to adapt costly governance structures to accommodate TMTs' competence that aligns with regulatory requirements. The findings affirm the Dynamic

Capability theory, asserting that achieving resilience in banks necessitates strategic IT governance competence developed and integrated in a planned manner (Teece et al., 1997) within a long-term learning system (Chan et al., 1997). IT governance is pivotal for sustaining a healthy banking system, serving as a cornerstone for safeguarding sustainable economic growth (Wu & Shen, 2011).

Table 1. Mean, standard deviation, and correlation between research variables

	Mean	Stdev	ITGOV2.0	FINTCH	OPREFF	ROA	ZSCORE	LNSIZE	LNAGE	ROA$_{t-1}$	CAR	CMPT	DSR
ITGOV2.0	0.722	0.158	1										
FINTCH	0.784	0.174	0.058**	1									
OPREFF	0.762	0.192	0.042	0.097	1								
ROA	0.004	0.020	-0.081*	0.120	0.093	1							
ZSCORE	3.205	0.206	-0.030*	0.115	0.078	-0.025	1						
LNSIZE	13.500	0.185	-0.125**	0.522***	0.089	0.141**	0.118**	1					
LNAGE	2.637	2.208	-0.002	0.343***	0.031	0.062	-0.048	0.330***	1				
CAR	0.194	0.096	0.006	-0.156***	-0.259	-0.180	0.008	-0.160***	-0.084	0.263	1		
CMPT	0.852	0.249	-0.089	0.270***	0.025	0.046	0.158**	0.579***	0.043	-0.037	-0.133	1	
DSR	0.107	0.09	-0.122	-0.050	-0.019	-0.033	0.075	-0.238***	0.043	0.265***	-111**	0.132**	1

Note(s): *N=280; *** Significant at 1%; ** 5%; and *10%* Sources(s) = Data analysis from the Annual and Sustainability Report of each bank listed on the Indonesia Stock Exchange (IDX)

Table 2. Regression result model 1 (H1a,b), model 2 (H2a,b) and model 3 (H3a,b,c,d)

	Pred Sign	MODEL 1		MODEL 2		MODEL 3	
		ROA (H1a)	ZSCORE (H1b)	FINTCH (H2a)	OPREFF (H2b)	ROA (H3a;H3b)	ZSCORE (H3c:H3d)
Independent							
ITGOV	+	-0.564 (0.091)**	-0.799 (0.182)	0.254 (0.071)*	0.073 (0.043**)	-0.746 (0.051**)	-0.334 (0.102) *
FINTCH_FIT						0.250 (0.031**)	0.450 (0.041) **
OPREFF_FIT						0.023 (0.09*)	0.098 (0.075) *
Control							
LNSIZE	+/-	-0.156 (0.095)	-0.202 (0.101)	0.085 (0.000) ***	-0.075 (0.145) **	-0.042 (0.004)	-0.220 (0.082) *
LNAGE	+/-	0.032(0.065) *	0.027 (0.051) **	0.006 (0.001) ***	0.006 (0.053) **	0.002 (0.051)	0.027 (0.004**)
CAR	+/-	6.23 (0.041) **	7.54 (0.045) **	-0.999 (0.022) **	0.204 (0.315)	0.274 (0.256)	8.042 (0.033**)
CMPT	+/-	-0.453 (0.222)	-0.575 (0.242)	-0.275 (0.000) ***	-0.275 (0.000) ***	-0.121 (0.056)	-0.582 (0.234)
DSR	+/-	0.952 (0.015) **	0.952 (0.0112) **	0.139 (0.001) ***	0.135 (0.001) ***	0.052 (0.110)	1.012 (0.014**)
N		280	280	280	280	280	280
Adj R - Square		0.317	0.336	0.649	0.646	0.173	0.336
F Statistic		4.643	4.532	13.780	13.784	3.480	4.457
Prob (F-statistic)		0.000	0.000	0.000	0.000	0.000	0.000

Note(s): *N=280 Significant at 1%; ** 5%; and *10%* Sources(s) = Data analysis from the Annual and Sustainability Report of each bank listed on the Indonesia Stock Exchange (IDX

Table 3. Sensitivity analysis - the effect of domain and sub-domain of ITGOV on banks' agility and resilience at t+1 and t+

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	Pred Sign	BANKS' AGILITY				BANKS' RESILIENCE			
		FINTCH t+1		OPREFF t+1		ROA t+1	ROA t+2	ZSCORE t+1	ZSCORE t+2
Independent									
ITGOVX	(+)					-0.746 (0.091*)	-0.543 (0.251)	0.967 (0.035**)	0.080 (0.453)
SPONSOR	(+)	0.049 (0.390)		-0.077 (0.132)					
PARTNER	(+)	-0.083 (0.270)		0.075 (0.302)					
ALIGNM	(+)	-0.458 (0.002**)		-1.146 (0.181)					
LEADER	(+)		-0.146 (0.023**)		-0.308 (0.033**)				
COLLAB	(+)	0.237 (0.085*)		0.255 (0.072*)					
OPTIMIZ	(+)	0.208 (0.035**)		0.004 (0.021**)					
METRIC	(+)	0.002 (0.410)		-0.004 (0.302)					
PROJECT			0.386 (0.004**)		0.223 (0.062*)				
Control									
LNSIZE	(+/-)	0.082 (0.000***)	0.086 (0.000)	-0.040 (0.001***)	-0.039 (0.015**)	0.007 (0.004**)	-0.005 (0.015**)	0.155 (0.201)	0.080 (0.450)
LNAGE	(+/-)	0.005 (0.000***)	0.005 (0.003**)	-0.041 (0.010)	-0.03 (0.090*)	-0.003(0.027**)	0.062 (0.361)	0.040 (0.014**)	0.012 (0.241)
CAR	(+/-)	0.562 (0.031**)	0.426 (0.061*)	0.651 (0.032**)	0.228 (0.302)	0.023 (0.064*)	-0.033 (0.035**)	0.878 (0.341**)	2.068 (0.111*)
CMPT	(+/-)	-0.261(0.007***)	-0.274(0.000***)	-0.114 (0.131)	-0.119 (0.054)	0.026(0.000***)	-0.019 (0.012)	0.255 (0.352)	-0.596 (0.191)
DSR	(+/-)	0.154 (0.000***)	0.139 (0.001***)	0.045 (0.140)	0.044 (0.142)	0.093 (0.065*	0.007 (0.113)	0.174 (0.370)	0.618 (0.122)
N		240	240	240	240	240	200	240	200
Adj R - Square		0.882	0.657	0.186	0.175	0.559	0.624	0.341	0.149
F Statistic		35.697	14.890	24.987	23.675	69.665	58.873	28.452	6.809
Prob (F. Statistic)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note(s): ****Significant at 1%; ** 5%; and *10%*
Sources(s) = Data and information analysis from the Annual and Sustainability Report of each bank listed on the Indonesia Stock Exchange (IDX)

4.3.2. Analysis of the effect of strategic ITGOV competence on banks' agility

The findings from hypothesis testing in Model 2 reveal that strategic IT governance competence positively influences fintech adoption (FINTCH) (ρ1=0.254, p-value=0.071) and operational efficiency (OPREFF) (λ1= 0.073, p-value=0.043**), supporting the hypotheses regarding the impact of ITGOV on bank agility (H2a and H2b).

The sensitivity test indicates that the positive effect on banks' agility stems from the opposing influence of the IT Leadership (LEAD) domain, which negatively impacts fintech adoption (Coeff= -0.146, p-value=0.023) and operational efficiency (Coeff= -0.308, p-value 0.033). Conversely, the IT Project Execution (PROJECT) domain exerts a positive effect on fintech adoption (Coeff=0.386, p-value=0.004**) and operational efficiency (Coeff=0.223, p-value=0.062*).

Moreover, the sensitivity test reveals that Executive Sponsorship and IT-business partnership have no effects, and even strategic IT-business alignment has a negative effect. However, this negative effect is offset by the positive impact of collaboration and process optimization, while best-practice metrics show no effect. These findings align with prior research emphasizing the vital role of IT Leadership, led by the Top Management Team (TMT), in establishing strategic priorities for effective resource allocation to support the adoption of relevant Fintech, positively impacting operational efficiency (Barki & Pinsonneault, 2005; Thakor, 2020; Carney, 2021; Helen, 2021).

The significance of IT Leadership extends to ensuring the integration of IT systems and architecture, involving developing and maintaining a cohesive IT architecture. Leadership Excellence in IT ensures seamless integration of bank information systems and applications with fintech adoption solutions, considering regulatory compliance and information security risks (Wu & Shen, 2011; Panda & Rath, 2018; Panda, 2022).

In IT Project Execution, banks' adaptability to environmental changes is paramount. Excellence in IT Project Execution empowers banks to adapt to necessary operational changes swiftly, leveraging new features for heightened operational efficiency, thereby averting resource wastage and project delays (Berman, 2012). This mechanism engages key stakeholders in decision-making to ensure that fintech adoption aligns with strategic objectives and supports operational efficiency (Panda & Rath, 2018).

The research findings align with the Diffusion of Innovation theory, emphasizing that the digital transformation process is a prolonged learning process with outcomes realized gradually (step-by-step innovation model) (Rogers et al., 1983). Through optimizing strategic IT governance competence, banks can maximize their potential for adopting fintech innovations and optimize overall operations (Berman, 2012).

4.3.3. Analysis of the mediating role of banks' agility on the relationship between strategic ITGOV and bank resilience.

The results of hypothesis testing for model 3, examining the mediating role of banks' agility in the impact of strategic ITGOV competence on bank resilience, indicate that fintech adoption (FINTCH) positively mediates the influence of ITGOV on profitability (ROA) (φ2=0.250, p-value=0.031**) and survivals (ZSCORE) (π2=0.450, p-value=0.041**). Additionally, operational efficiency affects profitability (φ3=0.023, p-value=0.09*) and survival (π3=0.098, p-value=0.075*). Thus, the data substantiates the hypothesis proposing the mediating role of banks' agility in the relationship between strategic ITGOV competence and bank resilience.

The research findings are consistent with prior studies, indicating that adopting Fintech, encompassing process automation, enhanced risk management, and the advancement of digital services, can directly enhance operational efficiency and business resilience. This situation is achieved through diversifying services like mobile banking, digital payments, and peer-to-peer lending (Zuo et al., 2021). The diversification of services contributes to bolstering the bank's resilience against economic risks and market fluctuations. Effective IT governance is crucial in aiding banks in strategically designing and managing this diversification of services (Thakor, 2021). Fintech adoption is a valuable tool for banks in improving risk management practices through advanced data analysis, artificial intelligence, and real-time monitoring.

Strategic ITGOV competence ensures banks establish robust information security infrastructure and policies, enhancing effective risk management and fortifying resilience against security threats (Cheng & Qu, 2020). Fintech adoption empowers banks to enhance the availability and affordability of their financial services. By leveraging Fintech, banks can respond promptly to evolving market dynamics and changing customer needs. Effective IT governance is pivotal in expediting decision-making processes and facilitating the swift implementation of technological changes necessary for maintaining competitiveness. The capacity to adapt rapidly contributes to elevating a bank's resilience in the face of fluctuations in the business environment.

In light of the details above, the results align with the NIE theory, suggesting that the organizational pace of adaptation is shaped by reciprocal relationships between institutional levels at the national scale, organizational governance through performance contracts, and the allocation of resources, incentives, and rewards (Williamson, 2000). Fintech adoption and operational efficiency connect strategic ITGOV competence with bank resilience, empowering banks to respond more to change and enhance resilience in confronting external challenges.

The findings from the control variable tests reveal that bank size exerts a negative influence on both profitability and survival. Conversely, bank age and capital adequacy ratio exhibit a positive effect, while banks publishing sustainability reports demonstrate higher profitability and survival than those not. The competitiveness level, however, needs to show more impact on bank resilience. The sensitivity test results at t+1 and t+2 indicate an attenuation of the negative influence and an augmentation of the positive influence, suggesting an enhancement in strategic IT governance competence over time.

4. CONCLUSION, IMPLICATION, LIMITATION AND FUTURE STUDIES

This study seeks to assess sustainability strategies through the lens of strategic IT governance competence. More precisely, it introduces the Information Technology Governance Index (ITGOV) as a representative measure for the strategic IT governance competence of banks listed on the Indonesia Stock Exchange (BEI) during the period 2015-2021 (280 banks-year). Subsequently, the research evaluates the impact of the ITGOV Index on bank resilience, gauged by banks' profitability (ROA) and survival (ZSCORE), through the prism of banks' agility proxied by fintech adoption and operational efficiency proxies.

The research results show an increase in the banking ITGOV Index in Indonesia during the observation period. Empirical test results show that ITGOV negatively impacts bank resilience, reducing profitability and survival. However, this negative effect diminishes with the increase in risk governance structure and ITGOV at t+1 and t+2. Strategic IT governance competence positively affects the adoption of fintech innovations and the operational efficiency of banks. This positive effect stems from various regulations affecting the domains and subdomains of banks' strategic IT competencies. Within the Leadership Excellence domain, Executive sponsorship and IT-business partnerships do not impact banks' agility, while Strategic IT-business alignment has a negative effect.

Nevertheless, the negative effect is offset by the growing competence in IT project execution, where the IT-business collaboration and process optimization subdomain positively influence bank agility. However, the best-practice metrics subdomain has no effect. Furthermore, banks' profitability and operational efficiency (banks' agility) mediate between ITGOV and bank resilience. The research findings align with new institutional economics (NIE), dynamic capability (DC), diffusion of innovation (DOI), and Contingency theory. The study offers practical implications for the banking sector in digital transformation and sustainability, along with recommendations for reinforcing ESG practices and risk governance frameworks to expedite the transition to a low-carbon economy.

The study is subject to certain limitations, and avenues for future research are suggested. Firstly, the testing scope is confined to the banking sector in Indonesia, prompting a recommendation for broader testing within the non-financial industrial sector across different countries. Secondly, the ITGOV Index was exclusively developed through content analysis of seven-year annual reports. Future studies could incorporate longitudinal data and integrate interview procedures to understand companies' ITGOV practices better.

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CHAPTER 2

The Roles of Business Ethics, ESG Committee, Institutional Ownership, and Board Independence in Reducing Carbon Emissions

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ABSTRACT

Global warming has become an increasingly important issue for most countries. One of the main factors of causing global warming is carbon emission. Damage caused by carbon emissions has been felt by many countries, included Indonesia. Indonesia's commitment to reducing carbon emissions is contained in the law number 71 of 2021. Indonesia also has a target of achieving net zero emission by 2060 or sooner. This paper aims to measure the role of business ethics in influencing environmental, social, governance (ESG) committee, institutional ownership and board independence commissioner in reducing carbon emission. This paper applied regression analysis. The carbon emission is measured directly from individual companies' annual reports and sustainability reports. There are 180 data examined as sample in this study for the period of 2019-2022. The result shown that ESG committee, institutional ownership and board independence has positive influence significantly in reducing carbon emission. ESG committee play crucial roles in reducing carbon emission in companies by providing control and pressure on management to disclose all the information about carbon emission. Reducing carbon emission is one strategy to secure the companies in the long run, especially in acquiring raw materials and improving efficiencies.

Keywords: *Business ethics, ESG committee, Institutional ownership, Board Independence, Carbon emission*
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1.1 INTRODUCTION

Climate change has become an increasingly important issue globally (Darus et al, 2019). Carbon emissions remain the primary catalyst and underlying factors contributing to climate change. This issue ultimately led 171 countries sign Paris Agreement. Countries' commitments are expressed through Nationally Determined Contribution (NDC) for 2020-2030. The commitment is the countries contribute to reduce carbon emission by 55% (https://ppid.menlhk.go.id). Indonesia, being seen as a very attractive growing economy, has also made a firm commitment to mitigate carbon emissions and attain net zero emissions by the year 2060, or potentially even earlier (SP. 380/HUMAS/PP/HMS.3/11/2021).

The Indonesian Government has demonstrated its dedication to mitigating carbon emissions through the implementation of several policies, including Presidential Regulation No. 61 of 2011, which outlines the National Action Plan for Reducing Greenhouse Gas Emissions (RAN-GRK), and Presidential Regulation No. 71 of 2011, which focuses on the execution of the National Greenhouse Gas Inventory. In order to achieve the objective of net zero emissions or substantial emission reduction, the Deputy Minister of Environment and Forestry emphasizes the urgent need for collaboration and active involvement from all stakeholders, particularly private sector entities. The implementation of legislation plays a crucial role in exerting pressure on enterprises, compelling them to mitigate the adverse environmental consequences resulting from their operational activities, particularly in carbon emissions (Bui et al., 2020). Reducing carbon emission should be disclosed in sustainability report in order to inform stakeholders regarding companies' effort to support environmental preservation.

Based on regulation number 51/POJK.03/2017, sustainability is obligatory and information about carbon emission is one requirement to be included in sustainability report. In addition to regulatory requirements, firms are guided by the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and/or the Climate Disclosure Standards Board (CDSB) in disclosing emissions within their sustainability reports. In addition, one particular framework in carbon emission is Task Force on Climate-Related Financial Disclosures (TCFD). In 2019, TCFD has updated its recommendations on climate-related financial disclosure, aiming to integrate carbon disclosure with financial risk disclosure. This increasing significance of carbon disclosure in practical contexts has spurred a surge in research over the past decade (Hahn et al., 2015).

Haque and Ntim (2018) and Oyewo et al (2022) have posited that managing carbon emission performance requires a strong corporate governance (CG). The implementation of sustainability in firms has relied heavily on governance as a fundamental pillar. According to Oyewo (2023), the most efficient approach to attaining decarbonization objectives is to enhance corporate governance. The correlation between corporate governance and carbon emissions is increasingly attracting attention. Corporate governance functions as a method for attaining equilibrium between the economic and social concerns of corporations, guaranteeing that the interests of shareholders are in harmony with those of the wider society (Giannarakis et al., 2019).

Corporate governance mechanism consists of institutional ownership, board independence, business ethics, and ESG committee (Waweru, 2019). They are the most important mechanism in corporate governance to support carbon reduction (Waweru, 2019). According to Jizi (2017), the adherence of firms to sound corporate governance (CG) procedures results in enhanced allocation of resources, specifically in the realm of environmental strategy formulation and disclosure policies. Adel et al. (2019) and Garcia-

Torea et al. (2016) assert that corporate governance structures have a vital role in influencing the quality of sustainability reporting at a global level.

Despite the significant importance of carbon disclosure in research, practice, and regulatory initiatives, there is still a lack of comprehensive understanding regarding their practical implementation, the factors related to governance at the firm level (Velte et al, 2020).

Prior research indicates diverse outcomes, as evidenced by Fernandes et al. (2019), Elsayih (2018), Wang (2017), Choi (2013), Acar et al. (2021), Naciti (2019), Khrisnamurti and Velayutham (2018). The inconsistencies in the relationship between corporate governance and carbon disclosure arise from the complexity of factors influencing environmental reporting practices. For instance, Fernandes et al. (2019) highlight the positive impact of board independence on carbon disclosure, indicating that companies with independent boards are more inclined to embrace environmental transparency. Elsayih (2018) supports this, arguing that a higher level of board independence contributes to sustainable corporate behavior, emphasizing the pivotal role of governance in environmental practices. Similarly, Wang (2017) demonstrates a positive association between institutional ownership and carbon disclosure, suggesting that external ownership structures can foster environmental responsibility.

However, contrasting results are evident in studies conducted by Acar et al. (2021), Naciti (2019), and Khrisnamurti and Velayutham (2018). These studies propose that the relationship between corporate governance and carbon emission disclosure is not universally straightforward and can be influenced by external factors. Acar et al. (2021) specifically find that the impact of corporate governance mechanisms on environmental disclosure practices may vary, challenging the generalizability of positive associations found in prior research. Naciti (2019) underscores the importance of industry context, suggesting that variations in environmental impact across sectors can affect the relationship between governance structures and carbon disclosure. Khrisnamurti and Velayutham (2018) suggest that regulatory variations could contribute to differences in disclosure practices, complicating the understanding of the relationship.

This study put efforts in filling the gaps by examining the role of CG in reducing carbon emission in consumer good industries. The selection of this particular industry was based on the predominant presence of consumer cyclical sector companies listed on the Indonesian Stock Exchange (IDX), accounting for 16.9% or 152 companies out of the total. Then, the non-cyclical consumer sector was 13.7% (market.bisnis.com).

The main objective of this paper is to present empirical findings about the influence of corporate governance, specifically institutional ownership, board independence, and the presence of an environmental, social, and governance (ESG) committee, on the reduction of carbon emissions. Additionally, this study seeks to explore the role of business ethics within the Indonesian setting. This topic is significantly importance due to climate change is a very serious challenge in consumer goods industries (Saka and Oshika, 2014), resulting in a growing demand for carbon-related information from stakeholders (Luo and Tang, 2014). The implementation of robust corporate governance practices is believed to enhance managers' accountability to stakeholders regarding reducing carbon emission (Liao et al., 2015; Rupley et al. (2012), Peters and Romi (2013), and Paek et al. (2013).

1.2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Legitimacy Theory

Legitimacy theory, as commonly employed in the field of social and environmental accounting, is based on the premise that managers must ensure their organization appears to operate in accordance with societal expectations in order to maintain successful operations (Deegan, 2019). This perception of conformity with community norms grants the organization the status of being "legitimate." Legitimacy theory posits that organizations are perceived as integral components of a wider societal framework, devoid of any intrinsic entitlement to resources. In contrast, Mathews (1997) argues that the entitlement to resources should be contingent upon one's efforts, suggesting that individuals must "earn" this right. Moreover, Mathews (1997) posits that it is only "legitimate organizations" that has the capability to maintain their access, or "rights," to essential resources.

This paper has employed the concept of legitimacy theory to elucidate the rationale behind corporate management's decision to engage in specific acts, such as the disclosure of specific social and environmental information. The purpose of this theory is not to offer prescriptive guidance on managerial actions or recommendations. Therefore, it is widely acknowledged that legitimacy theory is classified as a positive theory, as its primary objective is to elucidate and forecast specific management behaviors (Kejriwal, 2022).

Legitimacy theory is applied in this study to explain why companies choose to disclose their carbon emissions. First, it relates to acceptance and social approval, where organizations realize that society's expectations and norms shift towards greater environmental awareness and responsibility. By revealing their carbon emissions, the company seeks to align with these expectations and gain social approval (Galán-Valdivieso et al., 2019). Second, companies often have various stakeholders, including customers, investors, regulators, and communities. These stakeholders may exert pressure on companies to be more transparent about their environmental impact, and carbon emission disclosure is a way for organizations to respond to these expectations (Gunawan and Susilo, 2021; Dayuan Li et al., 2017).

Third, failure to disclose carbon emissions or engage in sustainable practices may lead to negative public perception and criticism. By voluntarily disclosing this information, companies aim to avoid scrutiny and demonstrate a commitment to environmental responsibility (Perera et al., 2019). Fourth, concerning the company's efforts to maintain long-term relationships, legitimacy theory suggests that organizations strive to build and maintain long-term relationships with their stakeholders. By disclosing carbon emissions, companies signal a commitment to sustainability, which can enhance their reputation and strengthen relationships with stakeholders over time (Kim et al., 2020).

Finally, this pertains to the organization's adherence to relevant legal statutes and regulatory frameworks. While legitimacy theory emphasizes voluntary actions to gain societal approval, regulatory requirements and standards also play a role. Companies may disclose carbon emissions to comply with legal and regulatory frameworks, avoiding legal repercussions and enhancing their legitimacy in the eyes of regulators (Di Tullio et al, 2020).

2.2. ESG Committees and Carbon Emission Disclosure

In the context of practice and research on sustainability reporting, there are several different terms used to define a group or body within the company responsible for ensuring that the company adheres to the principles of environmental, social, and sustainable governance, for example, the sustainability committee, ESG commitee, CSR committee, board of sustainability commitee (Lopez-Arceiz and del Rio, 2021; Sheehan et al., 2023;

Saeed et al., 2021; Orazalin and Maragila, 2023). This research specifically uses the term ESG committee because stakeholders such as investors, customers, and rating agencies are increasingly aware of the importance of the ESG aspect. However, the word of 'ESG Committee' can be interchangeable with similar notions, such as Sustainability Committee, CSR Committee, and Board Sustainability Committee. Hence, those terminologies are applicable to show the existence of sustainability governance. According to Grabs (2023) sustainability governance shows the companies' commitments, and therefore investors and other stakeholders will consider by evaluating the effective of sustainability governance's roles.

According to Qaderi et al (2022), there is scholarly debate surrounding the role of ESG committees in representing enterprises' commitment to environmental responsibility and the strategic approach of management in releasing environmental information to meet shareholders' demands. The rationale for the formation of these committees is additionally supported by their ability to offer specialized insights to managers, aiding in the assessment of the merits and drawbacks of climate risk mitigation initiatives, the evaluation of investments in pollution reduction, and the formulation of strategic determinations pertaining to the disclosure of environmental information, specifically carbon-related information (Orazalin, 2020).

ESG committees function as a mechanism to incentivize reluctant management to recognize their environmental obligations and compel them to divulge carbon-related data to external parties. One approach employed by ESG committees involves engaging with management and providing guidance on many tactics to facilitate the formulation of complete sustainability and transparency initiatives. As a result, the formation of a ESG committee engenders the anticipation of heightened levels of transparency pertaining to a company's environmental endeavors, encompassing those specifically associated with carbon emissions. The increased level of anticipation serves as a further motivation for managers to reveal a greater amount of carbon-related information in order to meet the expanding need for such information (Jaggi et al., 2018).

Furthermore, the establishment of ESG committees can play a significant role in facilitating the development of a robust monitoring system, hence enhancing the credibility and dependability of disclosed data. Moreover, ESG committees serve as a vital governance instrument by providing guidance to management regarding strategies that effectively cater to investors' requirements for carbon-related information (Orazalin, 2020).

Prior studies have investigated the beneficial association between the presence of ESG committees and the level of sustainability performance (Peters et al., 2019; Orazalin, 2020; Orazalin and Mahmood, 2021; Uyar et al., 2021). The positive influence is heightened when the committees have a diverse composition (Ramon-Llorens et al., 2021).

Furthermore, Kilic and Kuzey (2018) provide evidence of a favorable relationship between the presence of a ESG committees and a company's engagement in investor relations practices. This indicates that the committee acknowledges pressure from stakeholders and reflects the board's commitment to sustainable development (Garcia Martin and Herrero, 2020). Additionally, Vitolla et al. (2020) show that companies with ESG committees produce higher-quality investor relations reports, associated with their ability to take action and make decisions regarding sustainable performance.

The findings of prior studies provide additional support to the assertion that ESG committees assist managers in formulating strategic policies for carbon performance and disclosure, while also serving a crucial function in overseeing managers' conduct to fulfill investors' informational requirements (Abdullah et al., 2022; Gupta and Chanchal, 2022). In addition, the recommendation put out by the ESG committees is expected to serve as a strong indication to both managers and external stakeholders, signifying the company's dedication towards mitigating carbon emissions on a national scale (Jaggi et al., 2018). To examine the influence of ESG committees in promoting increased carbon emission disclosure, this study states the following first hypothesis:

H1: The ESG committees has a significantly positive influence in reducing carbon emissions.

2.3. Institutional Ownership and Carbon Emission Disclosure

Krueger et al. (2020) performed a survey to shed light on the increasing apprehensions of institutional investors over the financial consequences of climate risks, with a specific focus on regulatory risks, for the companies included in their investment portfolios. As nations over the globe endeavor to diminish the release of greenhouse gases, businesses are encountering interruptions and the possibility of reassessing the value of their assets as they shift towards economies with reduced carbon footprints. The presence of this transition risk, in conjunction with the implementation of governmental legislation and the growing public consciousness, is prompting companies to reassess their business models and operational strategies in order to align with environmentally sustainable practices, commonly referred to as "green" initiatives (Zhang and Berhe., 2022).

In the current period of transition, enterprises have the ability to benefit from the adoption of low-carbon products and practices. This adoption can improve business operations, generate positive cash flows, and result in cost savings (Ang and Copeland, 2018). Therefore, climate change is perceived not only as a tangible hazard, but also as a potential avenue that can impact investment choices (Daugaard, 2020). In light of this, institutional investors have begun integrating climate-related filters into their investment strategies, resource allocation choices, and asset valuations through the establishment of portfolios that prioritize investments with a focus on environmental sustainability.

Cohen et al. (2023) found that institutional investors' engagement activities positively influenced firms' carbon disclosure. This suggests that institutional shareholdings can act as a catalyst for improved carbon disclosure by prompting firms to adopt more robust environmental reporting frameworks and respond to the increasing demand for climate-related information.

In the realm of corporate finance, institutional investors possess the potential to contribute significantly to the enhancement of the linkage between carbon emission disclosure and the valuation of firms. The disclosure of environmental information holds considerable importance for institutional and individual shareholders in the French list companies, as highlighted by Baalouch et al. (2019). According to Mama and Mandaroux (2022), certain studies propose that the disclosure of carbon emissions can reveal the current strategy and readiness of enterprises, hence assisting institutional investors in generating more precise predictions regarding future cash flows and earnings. Institutional investors, known for their longer-term investment perspectives, may find a greater appeal in a heightened level of carbon disclosure (Diza-Rainey et al., 2023).

Generally, an increased percentage of institutional investors' ownership tends to lead to heightened scrutiny of publicly traded companies. The proactive monitoring by institutional investors positively influences the level of information disclosure by companies. Moreover, it motivates companies to conduct their business activities in a socially responsible manner, such as advocating for the utilization and advancement of environmental protection technology and urging enterprises to take measures against environmental pollution (Cohen et al., 2023). Based on these assertions, the statement on the second hypothesis is as follow:

H2. Institutional ownership has a significantly positive influence on reducing carbon emissions.

2.4. Board Independence and Carbon Emission Disclosure

According to Temprano and Gaite (2020), board independence is a crucial component of effective corporate governance. Their role in the organization is crucial in ensuring transparency and the provision of the company's financial statements, promoting fair treatment of minority shareholders and other stakeholders, striving for compliance with applicable laws and regulations, and ensuring accountability of company entities, including the general meeting of shareholders (Astuti and Setiany, 2021). According to Ardi and Yulianto (2020) will improve the efficiency of managerial supervision and provide more unbiased evaluations of the company's activities and achievements.

In its role as the supervisory board, the board of independent commissioners holds the responsibility of overseeing the board of directors' performance in implementing effective corporate governance practices, particularly in environmental matters. Ideally, through efficient supervisory functions and the independence of commissioners, the board can exert influence on company management to engage in non-financial disclosure activities, including social and environmental aspects, for the benefit of providing information to both internal and external stakeholders (Siew et al., 2016).

The study conducted by Liu et al. (2017) provides evidence that organizations that possess strong corporate governance frameworks are inclined to provide environmental disclosures of superior quality. Furthermore, Vitolla et al. (2020) argued that the presence of non-executive directors, who are associated with greater board independence, might act as an efficient tool to align the interests of stakeholders with those of firm management, specifically in relation to the inclusion of environmental disclosure information in annual reports.

Building on this foundation, Nekhili et al. (2017) discovered a positive impact of an independent commisioner board on carbon disclosure. The findings of Astuti and Setiany (2021) support the notion that the presence of an independent board of commissioners is associated with a higher level of voluntary disclosure. Furthermore, their research suggests that such a board has a favorable impact on corporate carbon disclosure. Hence, the third hypothesis can be articulated as follows:

H3. Board independent has a significantly positive influence on reducing carbon emissions.

2.5. Business Ethics, ESG Committee, Institutional Ownership, Board Independence, and Carbon Emissions Reduction

The business ethics of a company reflects the values and norms that guide the organization's behavior. Companies with high business ethics tend to be more concerned about the environmental impact and may be more likely to voluntarily disclose carbon emission information as part of their social responsibility (Rossi et al., 2021).

The moderating role of business ethics in the relationship between corporate governance practice and carbon disclosure is a significant area of investigation. Corporate governance practices provide a framework for decision-making and accountability within organizations, while carbon disclosure involves the transparent reporting of a company's carbon emissions and related environmental impact. Ethics, on the other hand, encompass moral principles and values that guide behavior and decision-making (Small and Lew., 2021). Given the growing importance of addressing environmental concerns, it is essential to explore how business ethics can influence the relationship between corporate governance and carbon disclosure.

Firstly, it is hypothesized that a strong business ethical culture within the organization will positively moderate the relationship between the sustainability committee and carbon disclosure. An ethical culture promotes values such as transparency, accountability, and responsible business practices (Grigoropoulos, 2019). When combined with a dedicated ESG committee, an ethical culture can create an environment that fosters commitment to carbon disclosure. Employees will be more inclined to support the committee's initiatives, engage in data collection and reporting, and adopt sustainable practices throughout the organization (Dey et al., 2022). Consequently, the effectiveness of the sustainability committee in driving comprehensive carbon disclosure practices is expected to be enhanced.

Second, institutional ownership plays a crucial role in monitoring and influencing corporate behavior, including environmental practices (Cohen et al, 2023). However, the effectiveness of institutional ownership in driving carbon disclosure practices may be enhanced in organizations with a strong ethical culture. A strong ethical culture fosters an environment where ethical considerations are embedded in decision-making processes, leading to a higher level of voluntary carbon disclosure (Roy et al, 2023). Institutional owners, being more inclined towards sustainable investment practices, are likely to support and reward organizations that demonstrate a strong ethical culture and a commitment to carbon disclosure (Mili et al., 2019).

A strong ethical culture promotes values, such as transparency, accountability, and responsible business practices (Grigoropoulos, 2019), which are closely aligned with the expectations of institutional investors. Therefore, organizations with a strong ethical culture are more likely to demonstrate a higher level of commitment to carbon disclosure in response to the demands of institutional owners.

Third, board independence refers to the proportion of independent directors on the board, who are expected to provide objective oversight and decision-making (Astuti and Setiany, 2021). However, the effectiveness of board independence in driving carbon emission reduction is likely to be enhanced in organizations with a strong ethical culture. Organizations with a strong ethical culture are more inclined to adopt sustainable and responsible business practices, including comprehensive carbon disclosure. This ethical orientation creates an environment that promotes transparency, accountability, and integrity, values that are crucial for effective board oversight (Grigoropoulos, 2019). Independent commissioners, being separate from management, can play a pivotal role in encouraging and monitoring carbon disclosure practices. Building upon this foundation, the following hypotheses were stated:

H4 Strong business ethical culture within the organization positively moderates the relationship between the ESG committee and carbon emission reduction.

H5 Strong business ethical culture within organizations positively moderates the relationship between institutional ownership and carbon emission reduction.

H6 Strong business ethical culture within organizations positively moderate the relationship between board independence and carbon emission reduction.

1.3 RESEARCH DESIGN

This study employs a quantitative research methodology to investigate the relationship between variables. The data for this research is obtained from the financial report, sustainability report and/or annual report of consumer good companies that are publicly listed on the IDX. The financial statements are accessed through various sources, including the official websites of IDX (www.idx.co.id), and the companies' official websites for the period of 2019 to 2022. The E-views 12 program used panel data regression to evaluate this research.

This study applies the dependent variable of carbon emission, while the independent variables are ESG committee, institutional ownership, and board independence. In addition, the moderating variable of this study is business ethics, and the control variable consists of profitability and firm size.

3.1. Variables Measurement

The measurement of carbon emission reduction are used items from Choi et al (2013). There are 18 items and in this paper, there are addition 6 items from the National Greenhouse and Energy Reporting Act (NGER Act). This additional items are important because these 6 items are the most recent and momentous development that may have a significant impact on the actions and reporting of carbon emissions. (Choi et al, 2013).

Table 1

CER Disclosure Items

Climate Change: risks and opportunities	CC1- Assessment /description of the risks (regulatory, physical or general) relating to climate change and actions taken or to be taken to manage the risks
	CC2- Assessment/description of current (and future) financial implications, business implications and opportunities of climate change
GHG Emissions	GHG 1- Description of methodology used to calculate GHG emissions (e.g. GHG protocol or ISO)
	GHG 2- Existence external verification of quantity of GHG emission - if so by whom and on what basis
	GHG 3- Total GHG emissions - metric tones CO2-e emitted
	GHG 4- Disclosure of scopes 1 and 2, or scope direct GHG emissions
	GHG 5- Disclosure of GHG emissions by sources (e.g. coal, electricity, etc)
	GHG 6- Disclosure of GHG emissions by facility or segment level
	GHG 7- Comparison of GHG emissions with previous years
Energy Consumption	EC1- Total energy consumed (e.g. tera-joules or peta-joules)
	EC2- Quantification of energy used from renewable sources
	EC3- Disclosure by type, facility or segment
GHG Reduction and Cost	RC 1- Detail of plans or strategies to reduce GHG emission
	RC 2- Specification of GHG emissions reduction target level and target year
	RC 3- Emissions reductions and associated costs or savings
	RC 4- Cost of future emissions factored into capital expenditure

	planning
Carbon Emission Accountability	AEC 1- Indication of which board committee (or other executive body) has overall responsibility for actions related to climate change
	AEC 2- Description of the mechanism by which the board (or other executive body) reviews the company's progress regarding climate change
Direct GHG Emissions (Scope 1)	DGE 1- Emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc
	DGE 2- Emissions from chemical production in owned or controlled process equipment
Electricity Indirect GHG Emissions (Scope 2)	EIG 1- Accounts for GHG emissions from the generation of purchased electricity consumed by the company
	EIG 2- Emissions physically occur at the facility in which electricity is generated
Other Indirect GHG (Scope 3)	OIG 1- Activities are the extraction and production of purchased materials
	OIG 2- The transportation of purchased fuels and the use of sold products and services

ESG committee was examined by dummy variables, awarding 1 for company that have ESG committee and 0 for the company that don’t have. ESG committee can be interchangeable sustainability committee, or sustainability manager. According to (Esteban and Perez, 2019) all of these committees have similar roles and they are just different preference of terminologies. Institutional ownership was measure by amount of institutional ownership divided with total ownership. Board independence in this study was measure by amount of number of independent of board divided with total board of commissioner.

There are 4 categories that in the business ethics, namely : employee, community, customer and investor. There are 44 items in this variable. This paper applies content analysis by awarding 0 for those companies that don’t disclose anything regarding the item, score 1 is awarded for disclosures in narrative, score 2 is awarded for disclosures with number and narrative, and score 3 is awarded for disclosures with number, narrative and graphic. These scores classification was addressed in Gunawan & Abadi (2017). There are 2 variable control in this study, namely profitability proxied by return on asset and firm size that measured by Ln of total asset.

Regression Equation

$$CER = \beta_0 + \beta_1\, ESGC_{it} + \beta_2\, INST_{it} + \beta_3\, BI_{it} + \beta_4\, BE_{it} + \beta_5\, (ESGC_{it}*BE_{it}) + \beta_6\, (INST_{it}*BE_{it}) + \beta_7\, (BI_{it}*BE_{it}) + \beta_8\, SIZE_{it} + \beta_9\, ROA_{it} + \varepsilon_{it}$$

Where are:

CER : Carbon emission reduction of a company i in year t

ESGC : ESG committee of a company i in year t

INST : Institutional ownership of a company i in year t

BI : Board independence of a company i in year t

BE : Business ethics of a company i in year t
SIZE : Firm size of a company i in year t
ROA : Profitability of a company i in year t
e : Errors

RESULT AND DISCUSSION

Descriptives statistic of all variables is presented in table 2. All the variable generally exhibits wide spreads. For example, CER ranges from minimum 0 to possible maximum scores of 72. This result shown that carbon emission disclosure still challenging and companies in Indonesia are in stage of disclose carbon emission in act of participation in reducing carbon emission. ESG committee also new things to consider for companies. There are 39% of companies have ESG committee than 61% haven't. It shows that Indonesia still need more effort to participate in reducing carbon emission.

Table 2

Descriptive Statistics

Variable	Mean	SD	Min	Max
CER	0.090	0.084	0.000	1.000
ESGC	0.122	0.333	0.000	1.000
INST	0.697	0.204	0.133	0.999
BI	0.440	0.134	0.250	1.000
BE	0.159	0.073	0.000	1.000
ROA	0.062	0.104	-0.279	0.416
SIZE	28.702	1.691	25.286	32.826

The study did not conduct tests for normality and autocorrelation assumptions since, as stated by Gahsemi (2012), Gujarati (2014), and Ekananda (2016), these tests are not necessary for panel data analysis. In addition, heterokedasticity test have been performed, showing the probability is 0.0003 (<0.05) indicates heterokedasticity. Rectification of the standard error or problem to address heteroscedasticity in Eviews, one can utilize the white robust standard error. The white robust standard error yields immediately usable results, indicating the absence of heteroscedasticity in the data. Furthermore, a test for multicollinearity was conducted in this study, showing there are no tolerance values below 0.10 in this dataset, with tolerance values ranging from 0.425 to 0.812. Similarly, there are no VIF values over 10, with VIF values ranging between 1.03 and 1.12. The absence of multicollinearity in the data has been demonstrated.

Table 3

The Extent of Disclosures from Total Sample

Indicator	Criteria	Total Disclosures
Climate Change: risks and opportunities	CC1- Assessment /description of the risks (regulatory, physical or general) relating to climate change and actions taken or to be taken to manage the risks	67%
	CC2- Assessment/description of current (and future) financial	11%

	implications, business implications and opportunities of climate change	
GHG Emissions	GHG 1- Description of methodology used to calculate GHG emissions (e.g. GHG protocol or ISO)	48%
	GHG 2- Existence external verification of quantity of GHG emission - if so by whom and on what basis	4%
	GHG 3- Total GHG emissions - metric tones CO2-e emitted	7%
	GHG 4- Disclosure of scopes 1 and 2, or scope direct GHG emissions	0%
	GHG 5- Disclosure of GHG emissions by sources (e.g. coal, electricity)	0%
	GHG 6- Disclosure of GHG emissions by facility or segment level	0%
	GHG 7- Comparison of GHG emissions with previous years	17%
Energy Consumption	EC1- Total energy consumed (e.g. tera-joules or peta-joules)	11%
	EC2- Quantification of energy used from renewable sources	35%
	EC3- Disclosure by type, facility or segment	0%
GHG Reduction and Cost	RC 1- Detail of plans or strategies to reduce GHG emission	43%
	RC 2- Specification of GHG emissions reduction target level and target year	11%
	RC 3- Emissions reductions and associated costs or savings	28%
	RC 4- Cost of future emissions factored into capital expenditure planning	0%
Carbon Emission Accountability	AEC 1- Indication of which board committee (or other executive body) has overall responsibility for actions related to climate change	41%
	AEC 2- Description of the mechanism by which the board (or other executive body) reviews the company's progress	35%

	regarding climate change	
Direct GHG Emissions (Scope 1)	DGE 1- Emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc	26%
	DGE 2- Emissions from chemical production in owned or controlled process equipment	11%
Electricity Indirect GHG Emissions (Scope 2)	EIG 1- Accounts for GHG emissions from the generation of purchased electricity consumed by the company	15%
	EIG 2- Emissions physically occur at the facility in which electricity is generated	20%
Other Indirect GHG (Scope 3)	OIG 1- Activities are the extraction and production of purchased materials	4%
	OIG 2- The transportation of purchased fuels and the use of sold products and services	7%
Total average of GHG Disclosures		18%

Table 3 displays the proportion of companies that disclose each individual item. The level of disclosure in this research can be categorized into three distinct groups: (1) low, which represents less than 20% disclosure; (2) medium, which ranges from 20% to 50% disclosure; (3) high, which denotes disclosure above 50%. The data presented indicates that, on average of total disclosures GHG is 18% of enterprises in the basic materials and industrial sectors have made disclosures with the intention of reducing carbon emissions. It shows that basic material and industrial companies in Indonesia still in low category (very early stage) for disclosure carbon emission reduction. The corporation has endeavored to disclose its approach for reducing carbon emissions, but in a narrative format without any specific numerical or graphical targets specified. The most disclosed information is about description of methodology used to calculate GHG emission (48%). It means, company in this sample is in early stage to disclose about GHG emission. They are still using methodology to start calculating GHG calculation.

On the other hand, there are 2 indicator: information of GHG emissions by sources and by facilities demonstrate 0% disclosure. This finding may show that identification of GHG emission and facility used by companies haven’t been undertaken. Regarding Kongboon et al (2022) , identification emission by source and facilities should be calculated by companies when they identify GHG data inventory.

The research period spans from 2019 to 2022, encompassing the years 2020 and 2021, during which Indonesia had the Covid pandemic. Consequently, corporations prioritized their financial success over sustainability issues. This could also impede the ability of business ethics to enhance the correlation between the independent variable and the dependent variable. The company's precarious financial state throughout the pandemic is evident from the descriptive statistics in this research, which indicate a negative Return on Assets (ROA) value.

Reducing carbon emission is challenging for Indonesia companies right now. In this study find that average 8% of sample is disclose about the strategic for reducing carbon emission in their sustainability or annual report. It shows there are still barriers and challenging for company to disclose about carbon emission reducing. They are implements dan show intention and effort to reduce carbon emission but not yet fully disclose. They also disclose with the number about carbon emission reduction target and when the targeted their companies can reduce carbon emission.

Table 4

Multiple Regression Analysis

Variable	t-Statistic	Prob.
ESGC	2.377831	0.0185
INST	-3.060037	0.0026
BI	-2.450629	0.0153
ROA	1.529255	0.1281
SIZE	3.738363	0.0003
BE	-0.994401	0.3214
ESGC*BE	-2.500626	0.0133
INST*BE	5.009344	0.0000
BI*BE	1.155998	0.2493
Prob (F-Statistic)		0.0000000
Adjusted R Square		41.6%

Result or regression model:

$$CER = -23.90 + 9.04\,ESGC_{it} - 8.38\,INST_{it} - 15.10\,BI_{it} - 0.16\,BE_{it} - 0.35\,(ESGC_{it}{*}BE_{it}) + 0.89\,(INST_{it}{*}BE_{it}) + 0.29\,(BI_{it}{*}BE_{it}) + 0.97\,SIZE_{it} + 4.72\,ROA_{it} + \varepsilon_{it}$$

The multiple regression analysis results are presented in Table 3. This study analyzes that independent variable can explain the dependent variable by 41.6%, whereas 58.4% explained by other variable outside this research. ESG committee has positive significant effect to reducing carbon emission, it shows the probability 0.0185 (< 0.05) significance level. This finding supports hypothesis 1, which posits that the ESG committee has a positive significant influence to reducing carbon emission. The significance level of institutional ownership is 0.0026 (<0.05), indicating statistical significance. However, the correlation between institutional ownership and carbon emissions is negative. Therefore, the second hypothesis, which suggests that institutional ownership has a positive significant influence on reducing carbon emissions, is rejected. The p-value for board independence is likewise less than 0.05, however, it is associated with a negative t-value. As a result, we reject the third hypothesis, which suggests that board independence has a positive significant influence on reducing carbon emissions.

The impact of ESG committees on the reduction of carbon emissions can be explained by the assertion that these committees have the capacity to provide specific insights to managers, assist in evaluating the strengths and weaknesses of initiatives aimed at mitigating climate risks, assess investments in reducing pollution, and make strategic decisions related to disclosing environmental information, particularly information related to carbon (Orazalin, 2020). Furthermore, the creation of ESG committees generates expectations for a heightened level of transparency regarding corporate environmental initiatives, specifically those linked to carbon emissions (Jaggi et al., 2018). Moreover, ESG committees serve as essential governance instruments by offering guidance to management in developing strategies that effectively address investors' requirements for information related to carbon (Inderst and Stewart, 2018). Within this research sample, the majority of organizations possess an ESG committee (67% in this sample use ESG committee term), 17% using sustainability manager and 17% establishing a dedicated chief executive officer (CEO) for sustainability. Based on the available sample data in this study, it is evident that corporations will commence their awareness of producing sustainability reports and establishing sustainability committees starting in 2022.

A plausible explanation for why institutional ownership and board independence do not exert influence on carbon emissions reduction is that significant institutional ownership and an independent board may have limitations in controlling the day-to-day operations of the company. Decisions regarding carbon emissions reduction strategies are often made by the executive management and the board of directors, which may not be entirely influenced by institutional ownership or board independence. Furthermore, even in the absence of significant institutional ownership and board independence, companies are obligated to disclose their support and strategy for reducing carbon emissions in their sustainability reports in accordance with government regulation number 51/POJK.03/2017. There is negative correlation between institutional ownership and carbon emissions disclosure, indicating that an increase in institutional ownership does not lead to a higher level of disclosure on carbon emissions. This phenomenon may be attributed to the increasing prevalence of institutional ownership, which is causing a delay in the disclosure of information until a significant number of corporations have already made their disclosures. When corporations possess knowledge of carbon emission disclosures and are backed by enforceable rules, the outcome is might be positive.

The variable of board independence is shown to be inconsequential as seen by the research's sample data, which reveals that the average business had 44% independent commissioners. According the PO OJK 57 laws, which stipulate that a minimum of 30% of corporations should have independent commissioners. It is evident that the companies in this research sample solely adhere to the regulations set by the independent commissioner. If the board of commissioners is now unaware of the disclosure of carbon emissions and is backed by a regulator that is not yet prepared, then the board of commissioners can mutually use influence to delay the disclosure. This is further corroborated by carbon accounting computation methodologies that remain unfamiliar to numerous enterprises. The company's financial performance, whether in a deficit or surplus, does not impact the disclosure of its carbon emissions, as carbon emissions primarily reflect the company's dedication to environmental responsibility.

The moderating variable, namely business ethics, does not have the ability to impact the reduction of carbon emissions. Business ethics mostly pertains to regulations. The disclosure items for business ethics are specifically related to regulatory matters. The absence of a carbon emissions policy renders business ethics irrelevant to the disclosure of carbon emissions.

Overall the findings show that legitimacy theory may not be applicable in this study as companies have not been in the state to be ‘legitimate’ by reducing carbon or having sustainability board independent. Kongboon et al (2022) states that legitimate may suit if the Government formalize of giving pressures by regulations. However, it seems that stakeholder theory is more applicable to show the pressure of particular stakeholder, in this case is investors. Investor can be the utmost influential party who can drive the carbon emission reduction (Wang et al, 2019).

1.4 Conclusion

The aim of this paper is to measure the role of business ethics in influencing ESG committee, institutional ownership and board independence in reducing carbon emission. The research findings indicate that hypothesis 1, which posited that the ESG committee had a substantial beneficial impact on carbon emission reduction, were supported. Hypothesis 2, which posits that institutional ownership has a significant positive impact on carbon emission reduction, is refuted. Similarly, the third hypothesis, which suggests that independent commissioners have a notable positive influence on carbon emission reduction, is also denied. Hypothesis 4, which proposes that business ethics can enhance the impact of ESG committees in mitigating carbon emissions, is refuted. In contrast, hypothesis 5, which suggests that business ethics strengthens the connection between institutional ownership and the reduction of carbon emissions, is supported. Meanwhile, hypothesis 6, namely that business ethics strengthens the influence of independent commissioners in reducing carbon emissions, is rejected

The result shows that strong business ethic moderates relationship between institutional ownership in reducing carbon emission. ESG committee plays a significant role in reducing carbon emission, because ESG committee operates in operational in companies. Reducing carbon emission still challenging for consumer goods industries in Indonesia, they are still put effort on reduction of carbon emission. The data shows that average 18% of industry discloses about 18 item on carbon emission disclosure and average 8% focus disclose on reduction carbon emission. The average for reduction carbon emission is still below 10%, so this topic in Indonesia still interesting and need further research in another year. From this study, Indonesia can measure readiness towards net zero emissions; until 2022 from consumer goods sector about 18% of sample disclose about carbon emission disclosure.

The implication of this study suggests that the government has to establish policies for calculating carbon accounting. The government can additionally offer educational programs on carbon accounting methodologies and establish policies and assessors to evaluate these computations. In the educational sector, it is suggested that academics can incorporate carbon accounting and carbon emission calculations into the curriculum.

This research highlights the limited progress in reducing carbon emissions in Indonesia, which contradicts Indonesia's goal of achieving net zero emissions. Therefore, the findings of this study serve as a clear indication for the government and industry stakeholders to promptly address the issue of carbon emissions reduction. In addition, the research was conducted between 2019 and 2022, with 2020 and 2021 being the years affected by the covid pandemic. Therefore, it is crucial to continue this research in the upcoming time to assess the progress made by industrial players in Indonesia in their efforts to reduce carbon emissions.

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CHAPTER 3

Analysis of Food and Beverage Stock Prices During the Covid 19 Pandemic

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ABSTRACT

The aim of this study is to analyze the impact of fundamental macroeconomic and financial factors on the stock prices of food and beverage companies listed on the Indonesia Stock Market. The macroeconomic factors considered are the growth of PDB and interest rates, while the financial factors are the current ratio and ROE. The data used in this study is from 2020-2022, and the estimation method is based on pooled Ordinary Least Square Regression. Historical data from the Indonesian Stock Market, Bank Indonesia, BPS, and Indonesia Capital Market Directory have been used in this research.

Keywords: *Food and Beverages, Covid-19 Pandemi , Panel Data, Fundamental Macro.*

INTRODUCTION

Making strategic investment decisions is a key aspect of allocating funds to generate optimal returns for investors" (Utomo et al., 2019). The capital market, which serves as a versatile investment vehicle, plays an important role in the national economy. The capital market primarily serves to assist companies in obtaining additional operational funds while offering investment prospects for capital owners (Sultana & Reddy, 2017). The Indonesian stock market, known for its considerable daily fluctuations, has experienced rapid growth, attracting more investors every year (Basri et al., 2022). As a platform that facilitates interaction between investors and issuers, the stock market trades securities, including shares, which are typically held for more than one year. Stocks provide returns through capital appreciation and dividends, depending on the company's financial performance outlined in its reports.

The development of capital markets hinges upon two primary approaches: microeconomic and macroeconomic perspectives (West & Worthington, 2017). Esfahani (2016) emphasizes that the microeconomic approach scrutinizes factors influencing the economic status and performance of companies listed on the Indonesia Stock Exchange, while the macroeconomic approach focuses on factors impacting the broader national economy. This study, in particular, explores the dynamic interplay between capital markets and macroeconomic conditions. Capital markets are notably responsive to shifts in national and global economic dynamics and alterations in world capital markets. While macroeconomic changes often occur gradually and don't immediately impact individual company performance, they swiftly affect stock prices (Niyazbekova et al., 2016). Investors tend to assess the long-term implications of these changes, directly influencing their decisions to buy, sell, or retain stocks. Consequently, stock prices often adjust more rapidly to macroeconomic shifts compared to the performance of specific companies. Various factors act as benchmarks for evaluating stock returns, including the assessment of a company's financial performance (Abdullah, 2020). Notably, fundamental analysis emerges as a prominent method in this regard.

However, fundamental analysis transcends the realm of mere financial ratios. External elements like interest rates and inflation wield substantial influence on this evaluation. Interest rates impact borrowing expenses and investment choices, while inflation alters purchasing power and the long-term value of money (Liow et al., 2017). Consequently, fundamental analysis integrates internal scrutiny utilizing financial ratios with a comprehensive comprehension of external dynamics. This approach furnishes a holistic view of the factors that impact company growth and valuation within the broader market context.

Earlier empirical investigations by Sugitajaya et al. (2020), Pratama et al. (2019), and Utami & Triyonowati (2021) have underscored the noteworthy impact of microeconomic factors—specifically, the debt-to-equity ratio (DER) and return on equity ratio (ROE)—on the stock prices of food and beverage companies enlisted on the Indonesia Stock Exchange (IDX) spanning 2017-2021. These findings imply that metrics such as earnings per share, debt-to-equity ratio, and return on equity possess the potential to influence stock prices. These metrics mirror the company's performance, shaping investors' anticipations regarding the company's future prospects, consequently affecting the supply and demand dynamics for shares in the market.

Similarly, research conducted by Yubiharto and Siti Maul (2022) directed its focus on macroeconomic factors influencing stock prices on the Indonesia Stock Exchange (IDX) during the period from 2015 to 2019. Their study revealed a significant negative correlation between inflation and interest rates with stock prices. Elevated inflation tends to erode individuals' buying capacity, potentially diminishing demand for a company's products and services. This decline in demand can lead to reduced company profits, subsequently impacting stock prices negatively. These conclusions highlight the intricate relationship between macroeconomic factors and stock prices, emphasizing how economic conditions can intricately shape market dynamics.

In the middle of 2020, Indonesia encountered significant disruptions due to the Covid-19 pandemic, causing widespread effects, notably on the economy. This pandemic's repercussions extended across multiple industries, including the IDX-listed stock market, which generally saw a decline in share prices. However, amid this downturn, specific sectors, such as food and beverage, didn't witness as drastic an impact. Particularly, the pharmaceutical sector, involved in producing and vending food and beverage items, exhibited relatively more resilience. Consequently, the food and beverage industry emerged as a perceived secure and promising investment avenue. Taking note of these observations, the goal of this research is to scrutinize.

Research Problem and Research Question

It looks like you're seeking to investigate several relationships between various financial and macroeconomic factors and their impact on the stock prices of food and beverage companies, particularly during the Covid-19 period. Here are the revised questions:

1. Does the return on equity influence the stock price of food and beverage companies?
2. Is there a relationship between the debt-to-equity ratio and the stock price of food and beverage companies?
3. Does the price-earnings ratio affect the stock price of food and beverage companies?
4. How does inflation impact the stock price of food and beverage companies?
5. What is the influence of interest rates on the stock price of food and beverage companies?
6. To what extent does Covid-19 moderate the effect of return on equity on the stock price of food and beverage companies?
7. How does Covid-19 moderate the impact of the debt-to-equity ratio on the stock price of food and beverage companies?
8. What is the moderating effect of Covid-19 on the relationship between the price-earnings ratio and the stock price of food and beverage companies?
9. How does Covid-19 moderate the effect of inflation on the stock price of food and beverage companies?
10. What is the influence of Covid-19 on the relationship between interest rates and the stock price of food and beverage companies?

LITERATUR REVIEW

Literatur Review from each variable

Agency Theory

The concept of agency theory, first introduced by Jensen and Meckling (1976) and expanded upon by (Sultana & Reddy, 2017), delves into the interplay between agents performing tasks for principals and principals entrusting tasks to agents. Fundamentally, agency theory articulates the conflict resulting from differing interests between shareholders and management. This conflict arises due to the information asymmetry between managers and shareholders, potentially leading managers to prioritize personal objectives over organizational goals (Queku et al., 2022)

Profitability

The profitability ratio is a metric that indicates a company's ability to generate profits concerning its sales, total assets, and shareholders' equity (Tan, 2017). In this study, we will gauge profitability using Return on Equity (ROE), which measures the earnings generated within a specific period relative to the total capital invested. A higher ROE typically correlates with an increase in share prices, thereby enhancing the overall value of the company. This assertion finds support in research conducted by (Badruzaman, 2017; Almira & Wiagustini, 2020), affirming the positive impact of ROE on stock prices.

Leverage

The leverage ratio demonstrates a company's capacity to fulfill long-term obligations and the degree to which debt is employed for financing (Adjasi, 2019). In this research, the leverage ratio is denoted by the Debt Equity Ratio (DER), also recognized as the Debt to Equity Ratio. DER contrasts a company's debt against its equity, furnishing analysts and investors with a gauge to assess the company's debt concerning its ownership equity. Typically, a higher DER signifies heightened risk to the company's liquidity (Šimáková et al., 2019)

Price Earning Ratio

The Price-to-Earnings Ratio (P/E Ratio) functions as a financial metric evaluating stock valuation by examining the connection between stock price and earnings per share (EPS) (Egbunike & Okerekeoti, 2018). Essentially, the P/E Ratio delineates the extent to which investors are inclined to invest for each dollar of company earnings. Kabir et al.'s research (2014) delineated a positive correlation between the price-earnings ratio and stock prices, particularly notable in small-cap and high-value stocks.

Inflation

Inflation denotes a persistent rise in prices driven by market mechanisms influenced by diverse factors like heightened consumer spending, surplus market liquidity fostering consumption or speculation, and disruptions in goods distribution (Endri et al., 2020). Talla (2013) highlighted the substantial impact of inflation on the share prices of public companies listed on the Stockholm Stock Exchange..

Interest Rates

Interest rates denote the expense of borrowing or the fee charged for each unit borrowed annually, often expressed as a ratio or percentage. Specifically, deposit interest rates signify the cost of borrowing through deposit accounts (Liow et al., 2017). This research quantifies interest rates using the monthly BI rate spanning from 2017 to 2022. Ratnasari's study in 2019, concentrating on firms listed on the Indonesia Stock Exchange, unveiled a noteworthy correlation between interest rates and stock prices.

Previous Research

Numerous studies have explored the factors influencing stock prices, encompassing investigations into both macroeconomic and microeconomic variables. Nonetheless, disparities in findings across these studies have led to an insufficient depth of research in this domain.

2.3 Hypothesis Development

To elucidate the problem statement or research questions, we formulate hypotheses encompassing the potential impacts of various factors on stock prices, particularly within the context of the Covid-19 pandemic

H1: There is a positive relationship between Return on Equity and stock prices.

H2: Debt-to-equity ratio negatively influences stock prices.

H3: Price-to-Earnings Ratio positively affects stock prices.

H4: Inflation has a negative impact on stock prices.

H5: Interest rates negatively impact stock prices.

H6: The presence of Covid-19 weakens the relationship between Return on Equity and stock prices.

H7: Covid-19 strengthens the connection between Debt-to-Equity ratio and stock price.

H8: Covid-19 weakens the association between Price-to-Earnings Ratio and stock price.

H9: The presence of Covid-19 strengthens the impact of inflation on stock prices.

H10: Covid-19 strengthens the relationship between interest rates and stock prices.

2.4 Research Framework

Figure 1 illustrates the research framework, encompassing independent variables that involve microeconomic performance indicators—specifically, return on equity, debt-to-equity ratio, and price-earnings ratio—as well as macroeconomic factors like inflation and interest rates. Within this study, the Covid-19 pandemic assumes the role of the moderating variable. The stock price stands as the focal dependent variable under

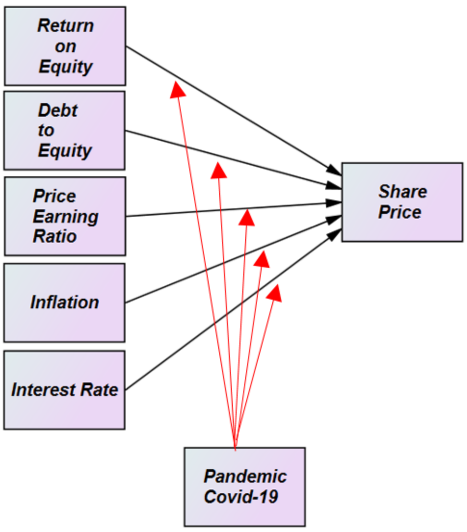

Figure 2.1 Research Framework

Research Method

Data Collection

The study relies entirely on secondary data collected annually from various sources. Utilizing a panel data approach, it integrates time series data covering the period from 2017 to 2022 and conducts a cross-sectional analysis specifically focused on the food and beverage sector. The panel data was obtained from the Indonesia Stock Exchange (IDX) and company annual reports.

Research Population and Samples

The research concentrated on the complete set of consumer goods companies operating within Indonesia's food and beverage subsector, all of which were listed on the Indonesia Stock Exchange (IDX) during the period from 2017 to 2022. Through a purposive sampling method, specific data samples were deliberately selected, leading to the inclusion of 17 companies in the study.

Econometric Model and Variables

The research method used to test the hypothesis is a multiple linear regression analysis method that aims to test the form of the data in the form of a cross section and time series.

$$HS = \alpha + \beta_1 ROE_{it} + \beta_2 DER_{it} + \beta_3 PER_{it} + \beta_4 INF_{it} + \beta_5 SB_{it} + \beta_6 COVID_{it} + \beta_7 ROE{*}COVID_{it} + \beta_8 DER{*}COVID_{it} + \beta_9 PER{*}COVID_{it} + \beta_{10} INF{*}COVID_{it} + \beta_{11} SB{*}COVID_{it} + \varepsilon_{it}$$

Information:

HS	= Share Price
α	= Constant
i	= Number of Observations in The Period
t	= Company
$\beta_{1\text{-}3}$	= Regression Coefficient
ROE	= Return on Equity
DER	= Debt Equity Ratio
PER	= Price Earning Ratio
INF	= Inflation
SB	= Interest Rate
COVID	= Pandemic Covid
ε	= *error term*

Table 3.1 Measurement Variable

Variable	Symbol	Measurement	Variable Scale
Share Price	HS	*Price per year*	Nominal
Return on Equity	ROE	$\frac{Net\ Income}{Total\ Equity}\ x\ 100\%$	Ratio
Debt to Equity	DER	$\frac{Total\ Liabilities}{Total\ Equity}\ x\ 100\%$	Ratio
Price Earning Ratio	PER	$\frac{Price\ Per\ Share}{Earning\ Per\ Share}\ x\ 100\%$	Ratio
Inflation	INF	$\frac{IHPBt - IHPBt - 1}{IHPBt - 1}\ x\ 100\%$	Ratio
Interest Rate	SB	BI 7 Day Repo Rate	Nominal

Variable	Symbol	Measurement	Variable Scale
Covid	COVID	Dummy Variabel 0 = Before Covid 1 = After Covid	Nominal

**Source : Processed Data*

Testing the panel data regression model is carried out in stages

1. Evaluate the suitable model using the coefficient of determination (R2), indicating the extent to which variations in the independent variable account for variations in the dependent variable..
2. Conduct a global test (F-test) to determine if there exists at least one independent variable exerting a significant influence on the dependent variable, following a set of hypothetical steps..
   a. "Ho : $\beta_1 = \beta_2 = \beta_3 = \ldots\ldots = \beta_3 = 0$ In other words, all independent variables do not affect the dependent variable."
   b. "Ha : Dependent variable decision making is influenced by at least one independent variable. If the p-value F is less than 0.05, Ho is rejected; if the p-value F is greater than 0.05, Ho is accepted."
3. Conduct a global test (F-test) to determine if there exists at least one independent variable exerting a significant influence on the dependent variable, following a set of hypothetical steps.
   a. "Ho : $\beta i = 0$ which means that certain dependent variables are not influenced by independent variables."
   b. "Ha : $\beta i \neq 0$, which means that certain Dependent variables are influenced by independent variability in decision making. If the p-value $t \leq 0.05$, Ho is rejected; if the p-value t is greater, Ho is accepted."

RESULT AND DISCUSSION

Table 4.1 Descriptive Statistical Results

Variabel	N	Minimum	Maximum	Mean	Std. Deviasi
HS	90	73.000	15442	3026	3315.57
ROE	90	-1.783	1.455	0.148	0.378
DER	90	-2.130	17.560	1.437	2.882
PER	90	-3.280	805.05	28.316	85.050
INF	90	-0.377	0.055	-0.032	0.156
SB	90	0.035	0.060	0.047	0.009

Source : Eviews12

Table 4.1's descriptive statistics provide a comprehensive summary of diverse variables: HS, ROE, DER, PER, INF, and SB. These statistics encompass the number of observations (N), minimum and maximum values, mean, and standard deviation for each variable. HS demonstrates a wide range from 73.000 to 15442, indicating substantial variability within the dataset. Conversely, ROE, DER, PER, INF, and SB showcase narrower ranges, suggesting comparatively less variability among these variables. For instance, ROE spans from -1.783 to 1.455, with a mean of 0.148 and a standard deviation of 0.378. DER ranges from -2.130 to 17.560, with a mean of 1.437 and a standard deviation of 2.882. PER fluctuates from -3.280 to 805.050, having a mean of 28.316 and a standard deviation of 85.050. INF shows variation between -0.377 to 0.055, with a mean of -0.032 and a standard deviation of 0.156. SB ranges from 0.035 to 0.060, with a mean of 0.047 and a standard deviation of 0.009. Overall, while HS displays considerable variability, the other variables exhibit relatively smaller ranges, implying lesser dispersion within their respective datasets

Model Selection Test

Chow Test

The process of model selection, distinguishing between the Fixed Effect Model (FEM) and the Common Effect Model (CEM), was executed utilizing the Chow test. The findings, detailed in Table 4.2, indicate a cross-section chi-square p-value of 0.000, falling below the significance level of 0.05. This result leads to the rejection of the null hypothesis (Ho) and the acceptance of the alternative hypothesis (Ha). Therefore, the Fixed Effect Model is considered the suitable model for this analysis.

Table 4.2 Chow Test

Model	Cross-section Chi-square	Prob.
HS	195.988406	0.000

Source : Data Processed (Eviews12)

Hausman Test

The Hausman test was applied subsequent to the Chow test to validate the suitability of the Fixed Effect Model (CEM) suggested in the earlier analysis. As indicated in Table 4.3, the Hausman test exhibited a Cross Section Random value of 1.000. This outcome supports the continuation with the Fixed Effect Model as the appropriate choice for this study. However, due to certain considerations leading to inconclusive results from the Hausman test, the model selection reverts back to relying on the Chow test.

Tabel 4.3 Hausman Test

Model	Cross-section Random	Prob.
HS	0.000000	1.0000

Source : Data Processed (Eviews12)

Research Hypothesis Testing Results

The regression outcomes illustrated in Table 4.4 unveil that the fitted model produces an adjusted R-squared value of 0.962824. This suggests that roughly 96.82% of the variability in stock prices is elucidated by the interaction among the independent variables. These encompass macroeconomic factors like interest rates, inflation, and microeconomic metrics such as return on equity, debt-to-equity, and price-earnings ratio, all moderated by the Covid-19 pandemic. The residual 3.18% signifies unexplained variations that could potentially stem from other unaccounted independent variables influencing stock prices beyond the scope of the research model. Furthermore, the global test exhibits an F-statistic value of 93.20095 with a p-value of 0.000, indicating significance at the 0.05 level. Therefore, rejecting the null hypothesis (Ho) and accepting the alternative hypothesis (Ha) affirms that at least one independent variable significantly impacts the dependent variable, stock prices

Table 4.4 Output t-Test (Partial Test)

Variable	Prediction	Coef (B)	Sig.	Decision
ROE	+	1712.767	0.022	Supported
DER	-	142.9634	0.006	Not Supported
PER	+	-1.292800	0.082	Not Supported
INF	-	-4064.689	0.001	Supported
SB	-	11328.39	0.000	Not Supported
COVID	-	978.5703	0.000	Not Supported
ROE*COVID	-	-1996.137	0.009	Supported
DER*COVID	+	-224.9202	0.000	Not Supported
PER*COVID	-	-5.570121	0.057	Not Supported
INF*COVID	+	4067.751	0.001	Supported
SB*COVID	+	-6014.356	0.000	Not Supported
R-squared	0.973267			
Adjusted R-squared	0.962824			
F-statistic	93.20095			
Prob(F-statistic)	0.000000			

Source : Data Processed (Eviews12)

Result Analysis and Discussions

Hypothesis 1

"The t-test analysis revealed a significant association between Return on Equity (ROE) and stock prices within the food and beverages sector. The substantial coefficient of 1712.767 denotes a direct correlation: an increase in ROE corresponds to elevated stock prices, whereas a decrease in ROE aligns with lower stock prices. The resulting p-value of 0.0000 (<0.05) decisively rejects the null hypothesis (Ho) in favor of the alternative hypothesis (Ha). This underscores the statistically significant and positive impact of ROE on stock prices, in line with prior research by Sugitajaya et al. (2020), Pratama et al. (2019), and Utami & Triyonowati (2021), thereby reinforcing the consensus on ROE's favorable influence on stock valuation within this sector

This underscores the pivotal role of a company's effective utilization of equity in augmenting shareholder value within the food and beverages industry. The alignment of this study with established literature provides empirical backing, emphasizing ROE as a critical metric shaping market perceptions and bolstering investor confidence. It underscores the significance for firms in this sector to prioritize strategies that enhance ROE, potentially uplifting their stock performance. However, future research could delve into how variations in ROE impact stock prices under diverse market conditions or explore specific ROE components influencing stock valuation within this sector, offering more nuanced insights conducive to strategic decision-making.

Hypothesis 2

"The statistical analysis unveiled a potential relationship between Debt-to-Equity Ratio (DER) and stock prices within the examined sector. The estimated coefficient of 142.9634 hints at a probable correlation, suggesting a possible association between DER fluctuations and changes in stock prices. However, the resulting p-value of the t-statistic at 0.006 (>0.05) leads to the acceptance of the null hypothesis (Ho), signifying that DER lacks a statistically significant negative impact on stock prices in this sector. These findings echo earlier research by Pratiwi et al. (2020), Andhani (2019), and Dewi & Suwarno (2022), indicating a lack of conclusive evidence supporting DER's adverse effect on stock prices"

The exploration of DER's relationship with stock prices suggests a potential but inconclusive connection, as implied by the estimated coefficient. Yet, the non-significant p-value indicates an absence of a definitive negative impact of DER on stock valuation within this sector. These results align with prior research, collectively pointing to insufficient substantial evidence supporting DER as a decisive factor influencing stock prices. Future investigations could explore industry-specific nuances or examine DER's interaction with other financial metrics to garner deeper insights, contributing to more informed financial strategies within this sector.

Hyphothesis 3

"The statistical analysis unveiled a potential inverse correlation between Price-Earnings Ratio (PER) and stock prices within the studied sector. The estimated coefficient of -1.292800 suggests a trend where PER fluctuations might correspond to changes in stock prices. However, the non-significant p-value of the t statistic at 0.082 (>0.05) leads to the acceptance of the null hypothesis (Ho), indicating a lack of statistically significant positive effect of PER on stock prices in this sector. These findings align with prior research by Suharti & Tannia (2020) and Putra et al. (2021), emphasizing the absence of proven positive impact of PER on stock prices"

The analysis hints at a potential inverse association between PER and stock prices, suggesting a link between PER fluctuations and changes in stock prices. However, the lack of statistical significance emphasizes caution in attributing a direct positive influence of PER on stock valuation in this sector. These outcomes echo earlier research, collectively indicating a lack of robust evidence supporting PER as a decisive factor shaping stock prices. Future investigations could explore sector-specific intricacies or examine how PER interacts with other financial indicators to reveal its nuanced impact on stock valuation, aiding in more informed financial decision-making strategies within this sector.

Hypotehsis 4

"The analysis indicates a significant negative correlation between inflation and stock prices within the food and beverages sector. The estimated coefficient of -4064.689 suggests that an increase in inflation might lead to a decrease in stock prices, while a decrease in inflation could relate to an increase in stock prices. The obtained p-value of the t statistic at 0.001 (<0.05) rejects the null hypothesis (Ho) and supports the alternative hypothesis (Ha), providing robust evidence of inflation's statistically significant negative impact on stock prices in this sector. These findings align with prior research by Efriyenty (2020), Dewi (2019), and Adikerta & Abundanti (2020), supporting the view of inflation's detrimental effect on stock prices"

The analysis underscores a substantial negative correlation between inflation and stock prices, backed by statistically significant evidence rejecting the null hypothesis. These results consistently highlight the adverse impact of inflation on stock valuation within this sector. Future studies could explore the varying impact of inflation under different economic conditions or delve into strategies to mitigate its effects on stock prices in the food and beverages industry, offering insights for risk management and financial planning.

Hypothesis 5

"The statistical analysis explored the relationship between interest rates and stock prices in the food and beverages sector. The estimated coefficient of 11328.39 suggests a potential positive correlation, indicating that an increase in interest rates might correspond to increased stock prices and vice versa. However, the derived p-value of the t statistic at 0.000

(<0.05) leads to the acceptance of the null hypothesis (Ho), suggesting that interest rates lack a statistically significant negative effect on stock prices within this sector. These findings align with prior research by Amri & Gultom (2022), Sari (2019), and Maulani & Riani (2021), supporting their conclusions regarding the absence of a proven negative impact of interest rates on stock prices"

While the analysis suggests a potential positive association between interest rates and stock prices, the lack of statistical significance urges caution in affirming a direct negative influence of interest rates on stock valuation in this sector. These outcomes align with previous research, indicating insufficient evidence supporting interest rates as a decisive factor influencing stock prices. Future investigations could delve into industry-specific nuances or explore the interaction between interest rates and other economic indicators to develop a more comprehensive understanding of their impact on stock valuation within the food and beverages industry, aiding in more informed financial decision-making strategies.

Hypothesis 6

The statistical analysis delved into the moderating impact of the COVID-19 pandemic on the relationship between Return on Equity (ROE) and stock prices. The estimated coefficient of -1996.137 suggests that the severity of the pandemic might weaken ROE's effect on stock prices. The derived p-value of the t statistic at 0.009 (<0.05) rejects the null hypothesis (Ho) and supports the alternative hypothesis (Ha), indicating that COVID-19 weakens the effect of ROE on stock prices. These findings highlight the pandemic's substantial influence in altering the relationship between ROE and stock valuation, emphasizing the need for adaptive strategies during crises.

The analysis reveals the pandemic's moderating role in the association between ROE and stock prices, indicating that heightened pandemic severity weakens ROE's impact on stock prices while reduced pandemic impact strengthens this relationship. The statistically significant p-value emphasizes the pandemic's discernible effect in diminishing ROE's effect on stock prices. These results underscore the importance of businesses adapting strategies amidst crises like COVID-19, recognizing the altered dynamics impacting financial metrics and stock valuation. Future studies might explore the mechanisms through which the pandemic modifies ROE's impact or investigate adaptive strategies for companies navigating changing stock valuation during crises, offering valuable guidance for effective risk management and strategic decision-making.

Hyphotesis 7

The statistical analysis examined the moderating impact of the COVID-19 pandemic on the relationship between Debt-to-Equity Ratio (DER) and stock prices. The estimated coefficient of -224.9202 suggests that the pandemic's severity might weaken DER's effect on stock prices, yet the derived p-value of the t statistic at 0.000 (<0.05) accepts the null hypothesis (Ho), indicating that COVID-19 lacks a statistically significant strengthening effect on the DER-stock prices relationship. These findings suggest that while there are indications of a potential impact, the pandemic does not conclusively enhance DER's influence on stock valuation in this context.

The examination of COVID-19's moderating role in the DER-stock prices association suggests a trend where pandemic severity might weaken DER's impact on stock prices. However, the lack of statistical significance indicates that COVID-19 does not decisively augment DER's influence on stock prices. This prompts consideration of other factors or dynamics overshadowing the pandemic's impact. Future studies could explore nuanced aspects of DER or examine how different crisis scenarios, beyond COVID-19, might affect financial metrics and stock valuation, aiding in more comprehensive risk management strategies for businesses in similar contexts.

Hyphotesis 8

The statistical analysis investigated how the COVID-19 pandemic moderates the relationship between Price-Earnings Ratio (PER) and stock prices. The estimated coefficient of -5.570121 suggests that the pandemic's severity might weaken PER's effect on stock prices. However, the derived p-value of the t statistic at 0.057 (>0.05) accepts the null hypothesis (Ho), indicating that COVID-19 lacks a statistically significant weakening effect on the PER-stock prices relationship. These findings imply that while there are potential indications of an impact, the pandemic does not definitively diminish PER's influence on stock valuation in this context.

The exploration of COVID-19's moderating role in the PER-stock prices relationship implies a trend where a worsening pandemic might weaken PER's impact on stock prices, while a less severe pandemic might strengthen this association. However, the lack of statistical significance suggests that COVID-19 does not decisively diminish PER's influence on stock prices. This prompts consideration of other contextual factors or dynamics that might overshadow the pandemic's impact. Future research could explore industry-specific nuances or investigate diverse crisis scenarios beyond COVID-19, contributing to a deeper understanding of risk management strategies for businesses in similar contexts.

Hyphotesis 9

The statistical analysis examined how the COVID-19 pandemic moderates the relationship between inflation and stock prices. The estimated coefficient value of 4067.751 suggests that the pandemic's severity might strengthen inflation's impact on stock prices. The derived p-value of the t statistic at 0.001 (<0.05) rejects the null hypothesis (Ho) and supports the alternative hypothesis (Ha), indicating that COVID-19 amplifies the effect of inflation on stock prices. These findings emphasize the substantial impact of the pandemic in altering the relationship between inflation and stock valuation, highlighting the need for adaptive strategies amidst crisis-induced fluctuations.

The exploration of COVID-19's moderating role in the inflation-stock prices relationship reveals a significant influence of the pandemic. The estimated coefficient implies that increased pandemic severity might intensify inflation's effect on stock prices, while reduced pandemic impact might weaken this association. The statistically significant p-value supports the pandemic's discernible role in strengthening inflation's impact on stock prices. These outcomes stress the importance for businesses to adapt strategies amid crises like COVID-19, recognizing the altered dynamics affecting financial metrics and stock valuation. Future studies might delve deeper into mechanisms through which the pandemic modifies inflation's impact or explore adaptive strategies for companies navigating changing stock valuation during crisis periods, offering guidance for effective risk management and strategic decision-making.

Hyphotesis 10

The statistical analysis examined how the COVID-19 pandemic moderates the relationship between interest rates and stock prices. The estimated coefficient suggests that increased pandemic severity might weaken the influence of interest rates on stock prices. However, the derived p-value leads to the acceptance of the null hypothesis (Ho), indicating that COVID-19 lacks a statistically significant strengthening effect on the interest rates-stock prices relationship. These findings suggest that despite potential indications, the pandemic does not conclusively amplify interest rates' influence on stock valuation in this context.

The examination of COVID-19's moderating role in the interest rates-stock prices relationship offers intriguing insights, implying that worsening pandemic conditions might weaken interest rates' impact on stock prices. However, the lack of statistical significance suggests that COVID-19 does not decisively enhance the effect of interest rates on stock prices. These results prompt consideration of other factors or dynamics overshadowing the pandemic's impact. Future research could explore specific contextual nuances or investigate diverse economic scenarios beyond COVID-19, contributing to more comprehensive risk management strategies for businesses in similar contexts.

CONCLUSION

"In this research, a study was conducted on a sample comprising 90 instances across seventeen distinct companies operating within the food and beverage industry. The primary aim was to analyze the influence of various independent variables, notably macroeconomic and microeconomic factors, on stock prices. The study also explored the moderation effect of the COVID-19 pandemic on these companies in the food and beverage sector. The research outcomes distinctly delineate the central objective of this investigation. Return on Equity demonstrates a statistically significant and positive impact on stock prices. Debt-to-Equity Ratio does not exhibit a negative effect on stock prices. Similarly, Price-Earnings Ratio does not show a positive effect on stock prices. Inflation, however, exhibits a significant and negative impact on stock prices. Contrarily, interest rates do not display a negative influence on stock prices; instead, they are observed to mitigate the effect of Return on Equity on stock prices. Regarding the moderation by COVID-19, it was not found to enhance the effect of debt-to-equity on stock prices. However, it was observed to strengthen the influence of inflation on stock prices. Conversely, COVID-19 did not exhibit a reinforced impact on interest rates affecting stock prices"

IMPLICATION

For Academic

Academically, the demonstrated positive and substantial impact of Return on Equity (ROE) on stock prices emphasizes the importance of a company's efficient utilization of its equity for generating shareholder value. Conversely, the absence of a negative effect of Debt-to-Equity Ratio (DER) and Price-Earnings Ratio (PER) on stock prices prompts a reconsideration of the traditional belief regarding their influence, urging further nuanced exploration. The observed adverse effect of Inflation on stock prices highlights the vulnerability of stock values to macroeconomic fluctuations, signaling the need for risk mitigation strategies.

For Managerial

The findings of this study hold significant academic and managerial implications. Academically, the demonstrated positive and substantial impact of Return on Equity (ROE) on stock prices emphasizes the importance of a company's efficient utilization of its equity for generating shareholder value. Conversely, the absence of a negative effect of Debt-to-Equity Ratio (DER) and Price-Earnings Ratio (PER) on stock prices prompts a reconsideration of the traditional belief regarding their influence, urging further nuanced exploration. The observed adverse effect of Inflation on stock prices highlights the vulnerability of stock values to macroeconomic fluctuations, signaling the need for risk mitigation strategies. Moreover, the identified moderating effect of COVID-19, particularly in reinforcing the impact of inflation on stock prices, underscores the necessity for adaptive managerial strategies during crisis periods. Managers in the food and beverage sector should consider these insights when devising financial and operational policies, emphasizing prudent equity utilization, robust risk management practices, and adaptable strategies to navigate through uncertain economic landscapes.

RECOMMENDATIONS FOR FURTHER RESEARCH

Building upon the insights gleaned from this investigation, future research avenues can explore several uncharted territories within the context of stock price dynamics amid economic fluctuations and crises. Further investigations could delve deeper into the nuanced relationship between company-specific financial metrics, such as Return on Equity (ROE) and Debt-to-Equity Ratio (DER), and their impact on stock prices across varying industry landscapes. Exploring the intricacies of how different sectors within the food and beverage industry respond to macroeconomic factors like Inflation and Interest Rates can offer a more comprehensive understanding of stock price variations. Moreover, given the observed moderating effect of COVID-19 on certain financial indicators, future studies could focus on developing predictive models or frameworks to assess the resilience of businesses during unforeseen crises. Additionally, examining the long-term implications of managerial strategies adopted during economic downturns, particularly in mitigating risks associated with inflationary pressures, would provide valuable insights for strategic planning in uncertain market conditions.

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CHAPTER 4

Analysis of The Effect of Tax Burden, Profıtabılıty and Tunnelıng Incentıve on Transfer Pricing (Case Study on a Coal Sub-Sector Energy Sector Company for The 2015-2022 Period Listed on The Indonesian Stock Exchange)

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ABSTRACT

This study aims to examine tax burden, profitability and tunnelling incentive on transfer pricing action indication decisions. The population in this study is coal sub-sector energy sector companies listed on the Indonesia Stock Exchange in 2015-2022. The sample selection technique uses the purposive sampling method. This study used multiple linear regression analysis method using Eviews9 program in conducting data processing. The results of this study show that the variable tax burden measured by effective taxes rates has a positive and significant effect on the indication of transfer pricing actions, the tunnelling incentive variable has proven to have a positive and significant effect on the indication of transfer pricing actions and the profitability variable measured by return on assets has no effect on the indication of transfer pricing actions.

Keywords: *Transfer Pricing, Tax Burden, Profitability, Tunnelling Incentive*

INTRODUCTION

Tax revenue in Indonesia has shown a downward trend reflecting Indonesia's low tax ratio to Gross Domestic Product (GDP) in recent years. In 2019, the tax ratio stood at 9.76% of GDP, categorized as low by the OECD among 24 Asian and Pacific countries. In 2021, this figure dropped to 9.11%, signaling a decline from the 2019 ratio. The Ministry of Finance report shows a trendline decline in Indonesia's taxation ratio from 2016 to 2021. Low tax revenue is not only caused by tax avoidance practices, but also indicates the existence of an untaxed tax base. One of the main issues is the practice of Base Erosion and Profit Shifting (BEPS) which is a challenge not only in the context of national but also international taxation. BEPS is the practice of corporate tax avoidance by utilizing differences in tax rates in various countries to allocate profits to countries with low tax rates in order to reduce the company's tax burden.

Base Erosion and Profit Shifting (BEPS) practices are often associated with international trade, especially in affiliate transactions of multinational companies that aim to move business profits to low-tax rate regions. OECD data shows that around 60 to 80 percent of international trade transactions take the form of related party transactions, leading to profit shifting to jurisdictions with low tax rates. In Indonesia, related-party transactions account for about 37 to 42 percent of GDP, becoming one of the factors that shrink Indonesia's tax ratio, according to the Head of the Fiscal Policy Agency of the Ministry of Finance. Multinational companies utilize the location of companies in different countries to conduct transfer pricing through related party transactions, often at prices that do not comply with fairness rules, especially in the significant coal exploitation and export sector in Indonesia. For example, PT Adaro Energy Tbk conducted transactions with its affiliates in Singapore at unfair prices on coal, resulting in potential Indonesian tax losses of approximately IDR 9.121 trillion in 2005-2006 along with potential royalty taxes of approximately 1.231 trillion, negatively impacting Indonesian tax revenues, as outlined by Suprianto & Pratiwi (2017). This practice highlights the importance of monitoring transfer pricing in an effort to mitigate its impact on state tax revenue.

The case highlights the potential for substantial tax revenue losses encountered by the Indonesian government. In response to this concern, policies have been instituted to regulate and mitigate the risk of revenue loss. These policies include Law Number 36 of 2008 regarding Income Tax, the Regulation of the Director General of Taxes Number PER-32/PJ.2011 of 2011 governing the Application of the Arm's Length Principle, and PMK No. 22/PMK.03/2020, specifically addressing the Advance Pricing Agreement (APA) procedure.

Various factors, such as tunneling and differing financial incentives like varied tax burdens across countries, significantly influence transfer pricing practices. Minimizing the tax burden stands as a central objective in tax planning due to its substantial impact on a company's financial structure and investment decisions. Studies indicate a positive relationship between taxes and transfer pricing (Prananda & Nur Triyanto, 2020).

Additionally, profitability emerges as a financial factor intricately tied to transfer pricing. This practice materializes when companies transfer goods or services between subsidiaries or divisions, impacting both profits and taxes (Ijlal Alfarizi et al., 2021.

A non-financial variable that can affect transfer pricing practices is tunneling incentive. In this context, companies use asset transfer, also known as tunneling, as a strategy in transfer pricing to transfer assets and income for the personal benefit of shareholders. This tunneling incentive has been shown to have a positive effect on transfer pricing practices because the majority of shareholders make use of related party transactions to take advantage of opportunities. Tunneling practices in Indonesia rely on a clear leadership structure that gives major shareholders control over management decisions. Most studies have shown that this method is beneficial to Transfer Pricing. Financial factors such as tax burdens also influence Transfer Pricing, with research showing that tax burdens have a significant influence on this practice. In addition, a company's decision to implement Transfer Pricing is also influenced by profitability, although research findings on this issue vary. Transfer Pricing may improve company performance, but it also has a negative effect on it.

1.1 Research Problem and Research Question

This study develops several research questions which are as follow

1. Does Tax Expense affect the Transfer Pricing of Energy Sector Companies in the Coal Sub-Sector for the 2015-2022 Period?
2. Does Profitability affect the Transfer Pricing of Energy Sector Companies in Coal Sub-Sector for the Period 2015-2022?
3. Does Tunneling Incentive affect the Transfer Pricing of Energy Sector Companies in Coal Sub-Sector 2015-2022?

LITERATUR REVIEW

2.1 Literatur Review from each variable

2.1.1 *Agency Theory*

The agency theory, initially proposed by Jensen and Meckling (1976) and further elucidated by Putri (2019) and Wahyudi & Fitriah (2021), revolves around the dynamics between agents executing tasks for principals and principals delegating tasks to agents. At its core, agency theory explicates the conflict arising from divergent interests between shareholders and management. This conflict stems from the asymmetry of knowledge between managers and shareholders, where managers might prioritize personal objectives over organizational goals (Hitten & Novita, 2020).

Transfer Pricing emerges as a strategic tool wielded by management to minimize tax liabilities, capitalizing on their control over company assets and acting as agents inclined towards their own interests rather than those of the shareholders (Yulia et al., 2019)

2.1.2 Transfer Pricing

According to Wahyudi & Fitriah (2021), transfer pricing is the purchase of goods or services by one organization to the same company to increase profits. It is becoming more common among companies around the world and covers companies all over the world. Inter-company transfer pricing is an example of developing transfer pricing that covers companies throughout the world.

2.1.3 Tax Burden

Undang-Undang Perpajakan (UU Nomor 28 Tahun 2007) states that taxes are "mandatory contributions to the State owed by individuals or entities used for state purposes for the greatest prosperity of the people, have no direct balance, and are compelling based on law.

2.1.4 Profitability

Sari & Djohar (2022) define profitability as the company's ability to generate profits within a certain period of time, because this ratio affects all aspects of the company's operations. Investors can ensure the level of financial health of a healthy company by looking at this rasio.

2.1.5 Tunneling Incentive

The majority of shareholders take part in the Tunneling Incentive, which is a transfer of company and profits for personal gain. Minority owners bear some of the associated costs (Rahayu et al., 2020). Research (Khotimah, 2018) shows that, because companies are required to pay dividends to parent corporations and other minority shareholders, Tunneling Incentive influences decisions about transfer pricing and transfers to majority shareholders compared to dividend payers.

2.2 Previous Research

Much research has been conducted on the elements that contribute to transfer pricing. This includes studies on tunneling incentives and profitability tax burden, among others. However, many different findings from previous studies lead to a lack of necessary research.

2.3 Hypothesis Development

We develop hypotheses to provide clarification of the problem statement or research questions:

H_1 : Tax burden has a positive effect on transfer pricing

H_2 : Profitability has a positive effect on transfer pricing

H_3 : Tunneling Incentive has a positive effect on transfer pricing

2.4 Research Framework

Figure 1 shows the research framework. For the independent variables, we used the financial performance variables that consist of the *tax burden* (X_1), return on assets (X_2), and tunneling incentive (X_3). For the dependen variable, this study used transfer pricing.

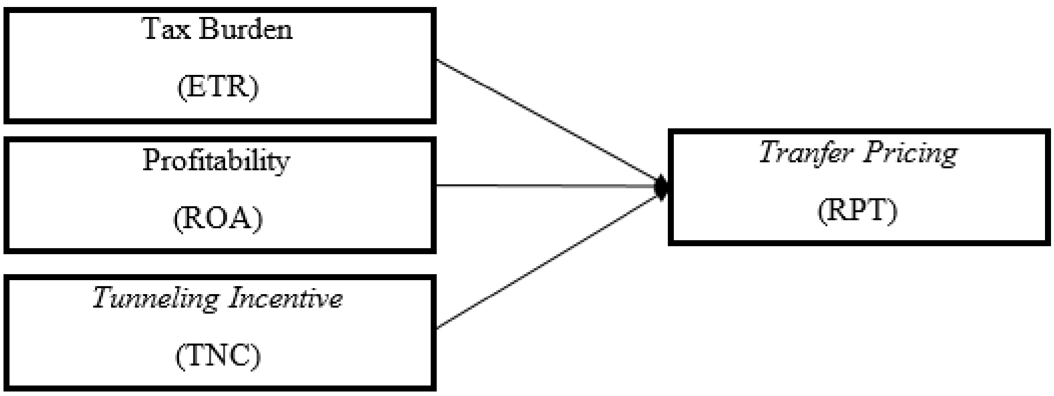

Figure 2.2 Research Framework

Research Method

3.1 Data Collection

All data used in this study is secondary data collected annually from various sources. A panel data approach uses a combination of time series from 2015 to 2022 and a cross section of energy sector and mining subsectors. The panel data is collected from the Indonesia Stock Exchange (IDX) and the company's annual report.

3.2 Research Population and Samples

Population taken from all energy companies in the Indonesian mining subsector, listed on the Indonesian Stock Exchange (IDX) from 2015 to 2022, was used in this research. In this study, a purposive sampling method was used to choose data samples, and in the end, 9 companies were used.

3.3 Econometric Model and Variables

The research method used to test the hypothesis is a multiple linear regression analysis method that aims to test the form of the data in the form of a cross section and time series.

$$\text{RPT} = \alpha + \beta_1\text{ETR}_{it} + \beta_2 ROA_{it} + \beta_3\text{TNC}_{it} + \varepsilon_{it}$$

Information:

RPT = Related Transfer Pricing
α = Constant
i = Number of Observations in The Period
t = Company
$\beta_{1\text{-}3}$ = Regression Coefficient
ETR = Effective Taxes Rate
ROA = Debt Equity Ratio
TNC = Tunneling Incentive
ε = *error term*

Table 3.2 Measurement Variable

Variable	Symbol	Measurement	Variable Scale
Transfer Pricing	RPT	$\frac{Related\ Party\ Receivables}{Total\ Trade\ Receivable}\ x\ 100\%$	Rasio
Tax Burden	ETR	$\frac{Income\ Tax\ Expense}{Earnings\ Before\ Tax}\ x\ 100\%$	Rasio
Profitability	ROA	$\frac{Net\ Income}{Total\ Assets}\ x\ 100\%$	Rasio
Tunneling Incentive	TNC	$\frac{Largest\ Shareholding\ Amount}{Number\ of\ outstanding\ shares}\ x\ 100\%$	Rasio

**Source : Processed Data*

Testing the panel data regression model is carried out in stages

4. Test the appropriate model using the coefficient of determination (R2), which shows how much variation in the independent variable can explain the variation in the dependent variable.
5. Global test (F) to find out whether there is at least one independent variable that has a significant impact on the dependent variable with hypothetical steps.
    a. Ho : $\beta_1 = \beta_2 = \beta_3 = \ldots\ldots = \beta_3 = 0$ In other words, all independent variables do not affect the dependent variable.

b. Ha : Dependent variable decision making is influenced by at least one independent variable. If the p-value F is less than 0.05, Ho is rejected; if the p-value F is greater than 0.05, Ho is accepted.

6. Individual test (t-test) to evaluate the influence of each independent variable on the dependent variable with testing steps.
   a. Ho : $\beta i = 0$ which means that certain dependent variables are not influenced by independent variables.
   b. Ha : $\beta i \neq 0$, which means that certain Dependent variables are influenced by independent variability in decision making. If the p-value $t \leq 0.05$, Ho is rejected; if the p-value t is greater, Ho is accepted.

RESULT AND DISCUSSION

Table 4.2 Descriptive Statistical Results

Variabel	N	Minimum	Maximum	Mean	Std. Deviasi
RPT	72	0.000426	1.002699	0.196919	0.209558
ETR	72	-13.81493	0.575298	-0.080525	2.030057
ROA	72	0.002622	0.719792	0.170900	0.184324
TNC	72	0.231454	0.717891	0.509632	0.148683

Source : Eviews12

Certainly, here's a revised version:

In this study, the primary focus lies on Transfer Pricing as the main variable. The observed values range from a minimum of 0.000426 (ADRO, 2017) to a maximum of 1.002699 (ITMG, 2020), with an average of 0.196919 and a standard deviation of 0.209558. A value closer to 1 at the maximum end suggests that a significant portion of the payable activity stems from transactions with related parties through Transfer Pricing. The notably high standard deviation signifies substantial variation in the volume of transactions with related parties across different companies.

Tax expense, utilized as an independent variable, refers to the Effective Tax Rate (ETR), computed by comparing the current tax expense with profit before tax and applying the relevant tax rate. ETR results depict the company's tax burden in accordance with the applicable tariff. The average value recorded is -0.080525 (BUMI, 2018), with a maximum value of 0.575298 (KKGI, 2016). The near-zero average indicates that most companies carry a tax burden nearly equivalent to the prevailing corporate tax rate. The small standard deviation suggests a homogeneity in the data, reflecting that the majority of companies exhibit a tax burden close to the average value.

Descriptive statistical analysis of profitability showcases a minimum value of 0.002622 (BUMI, 2019) and a maximum value of 0.719792 (ITMG, 2022). The average profitability stands at 0.170900, with a standard deviation of 0.184324. A higher Return on Assets (ROA) indicates commendable financial performance, signifying the profits generated relative to the assets owned. A greater ROA value signifies a company's ability to generate proportional profits concerning its asset base.

Regarding the size of the company, descriptive statistical analysis reveals a minimum asset ownership value of 0.231454 (BUMI, 2015-2022) and a maximum of 0.717891 (TOBA, 2015-2022). The average asset ownership stands at 0.509632, with a standard deviation of 0.148683. Most companies exhibit comparable Tunneling Incentive values, indicative of the complexity of their management practices. A standardized value below the median reflects lower data variation, highlighting that a majority of companies possess significant Tunneling Incentive values.

4.1 Model Selection Test

4.2 Chow Test

To determine whether the selected model is the Fixed Effect Model (FEM) or the Common Effect Model (CEM), the Chow test is performed. The results of the Chow test are shown in table 4.2. The results of the processing indicate that a cross-section chi-square p-value of 0.000 <0.05 indicates that Ho is rejected (Ha is accepted). Thus, the selection of the Fixed Effect Model is the Fixed Effect Model.

Table 4.2 Chow Test

Model	Cross-section Chi-square	Prob.
RPT	31.237575	0.000

Source : Data Processed (Eviews12)

4.3 Hausman Test

The Hausman test is used to determine if the Chow test results indicate a Fixed Effect Model (CEM). The results of the Hausman test are shown in table 4.3. The Hausman test found a Cross Section Random value of 0.000 <0.05, indicating that the appropriate model for this study is the Fixed Effect Model.

Tabel 4.3 Hausman Test

Model	Cross-section Random	Prob.
RPT	195.605715	0.0000

Source : Data Processed (Eviews12)

4.4 Research Hypothesis Testing Results

The results of the regression are shown in Table 4.4. The findings of the testing of the fit model resulted in an adjusted R square value of 0.5144, which indicates that variations from the independent variables—tax burden, return on assets, and tunneling incentive—have been able to explain the variation of 51.14% of the dependent variable, corporate tax income. The remaining variation, 48.56%, is the variation of other independent variables that affect corporate tax income but are not related to corporate tax income. The global test results show an F value of 7.837668 and a p-value of 0.000 < 0.05, which indicates that at least one independent variable has a significant impact on the dependent variable. In conclusion, this shows that Ho is rejected and Ha is accepted.

Table 4.4 Output t-Test (Partial Test)

Variable	Prediction	Coef (B)	Sig.	Decision
ETR	+	0.015761	0.001	Supported
ROA	+	-0.176600	0.044	Not Supported
TNC	+	1.306592	0.034	Supported
R-squared	0.589644			
Adjusted R-squared	0.514412			
F-statistic	7.837668			
Prob(F-statistic)	0.000000			

Source : Data Processed (Eviews12)

4.5 Result Analysis and Discussions

1. Effect of Tax Burden on transfer pricing

Transfer pricing serves as a strategic maneuver employed by multinational corporations to shift profits from high-tax jurisdictions to other nations. The study outcomes demonstrated a noteworthy and positive correlation between the tax burden variable and transfer pricing practices, exhibiting a statistical significance of 0.001, well below the threshold of 0.05. This underscores that as the tax burden escalates, there is a heightened inclination towards transfer pricing practices within the scope of this investigation. Numerous empirical inquiries into the impact of tax burden on transfer pricing have captivated researchers' interest, consistently affirming their association. For instance, Dewi & Nurhayati's (2020) research substantiates the substantial influence of tax burden on transfer pricing practices. Similarly, Nurkholic and Fitriyanti's (2021) findings accentuate a robust correlation between tax burden and the proclivity towards transfer pricing. Elizabeth Sugiarto Dermawan (2020) also contributes to this body of evidence by establishing a significant nexus between tax burden and Transfer Pricing, suggesting that companies are incentivized to implement transfer pricing strategies to curtail tax expenses.

2.Effect of Return on Assets on transfer pricing

The study findings indicate that the correlation between tax burden and transfer pricing remains unaffected by profitability variables. With a statistical significance of 0.044, slightly below the 0.05 threshold, and a coefficient of -0.176600, the results suggest that higher levels of profitability are associated with a propensity to engage in transfer pricing within the context of this research. Nevertheless, in cases where a company encounters financial challenges, there might be a shift in transfer pricing strategies to benefit other, more lucrative entities. Several empirical studies conducted by Sari (2020), Yudhistira (2021), and Anna (2019) collectively underscore that profitability lacks a significant influence on a company's adoption of transfer pricing practices.

3. Effect of Tunneling Incentive on transfer pricing

The study findings regarding the influence of tunneling incentives on transfer pricing practices revealed a statistically significant relationship, with a significance level of 0.034, falling below the 0.05 threshold, and a coefficient of 1.306592. This underscores that the tunneling incentive variable indeed affects the transfer pricing practices observed in this study, indicating a stronger prevalence of transfer pricing practices with higher tunneling incentives. Transfer pricing serves as a common tunneling technique adopted by companies where one party holds complete ownership. Entities controlled by majority shareholders often engage in transactions with related parties, aiming to transfer company profits and assets at unjust prices. Consequently, the interests of majority shareholders supersede those of minority shareholders. Empirical studies by Chen et al. (2009), Desai et al. (2009), and Sari (2020) collectively support this notion, affirming a positive and substantial impact of tunneling incentives on company transfer pricing practices. These findings bolster the argument that elevated tunneling incentives tend to foster a climate conducive to transfer pricing practices.".

CONCLUSION

This study, utilizing a sample of 72 data points across nine companies in the mining sector, aims to explore the impact of various independent variables—specifically, tax burden, profitability, and tunneling incentives—on the transfer pricing actions of companies within the energy sector. The findings distinctly outline the key objectives of this investigation. Initially, the study reveals a notable and positively significant impact of tax burden on the indicators of transfer pricing practices within mining sector companies. Conversely, the analysis indicates that profitability does not wield any discernible influence on the indicators of transfer pricing within the same sector. Finally, the research underscores a positive and significant effect of tunneling incentives on the indicators of transfer pricing practices within mining sector companies. These results encapsulate a concise yet comprehensive overview of the intricate dynamics governing the influence of each of these factors on transfer pricing practices in the mining sector.".

IMPLICATION

For Academic

Empirical studies have revealed that tax burden, profitability, and Tunneling Incentive are key factors that influence Transfer Pricing policy settings. These findings provide significant implications on theoretical aspects in accounting, especially in transaction cost theory and agency theory related to Transfer Pricing. These factors raise important considerations related to how internal corporate decisions are organized, including how internal interdivisional pricing decisions are made, how tax policy influences Transfer Pricing structures, and how risk management related to Tunneling Incentives can be identified and addressed in the context of Transfer Pricing. Taking into account the influence of these factors, the theories need to be updated and adjusted to reflect the dynamics that exist in Transfer Pricing arrangements in today's global business practices.

For Company

Companies should evaluate their transfer pricing policies to ensure that they are not intended to avoid taxes, reduce profitability, or conduct unfair Tunneling Incentive practices. It is also important for companies to develop mechanisms for monitoring and controlling transfer prices, so that the prices set are considered reasonable and do not harm the parties involved in the transaction.

RECOMMENDATIONS FOR FURTHER RESEARCH

Research on transfer pricing can be comprehensively expanded by involving broader samples, more diverse methods, and different perspectives to examine the impact of additional factors that may influence transfer pricing policies. Factors such as a company's objectives in a global context, characteristics of the industry in which it operates, government policies related to taxation and trade, ownership structure, corporate governance, level of competition, general performance of the company, and local and global economic conditions are important to consider. Research that incorporates these variables can provide a deeper understanding of the complexities of transfer pricing and the factors that contribute to a company's internal pricing decisions. Diverse research methods such as qualitative analysis, case studies, or experimental approaches can provide a more holistic view of the Transfer Pricing phenomenon. By considering these additional variables, further research can provide richer and more contextualized insights in shaping more effective policies and practices related to Transfer Pricing amidst the changing global business dynamics.

CHAPTER 5

The Influence of Population, Gross Regiona Domestic Product, And Area on Land and Buildıng Tax Revenue in Banten Province, Indonesia

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ABSTRACT

This research aims to examine the influence of Population, Gross Regional Domestic Product, and Regional Area on Land and Building Tax Revenue. The population in this study is data on Population Number, Gross Regional Domestic Product, and Area at the Central Regency and City Statistics Agency in Banten Province and data reports on the realization of Land and Building Tax Revenue for 2014-2022. The sample selection technique uses a purposive sampling method. This research uses a panel data regression analysis method using Eviews 9 in processing the data. The results of this research show that the Population Number variable has a positive effect on Land and Building Tax, the Gross Regional Domestic Product variable has a positive effect on Land and Building Tax, the Regional Area variable has a negative effect on Land and Building Tax.

Keywords: *Population, Gross Regional Domestic Product, Regional Area, and Land and Building Tax*

Introduction

Levies that must be paid to the state, both by individuals and entities, are taxes that must be fulfilled by the provisions set out in statutory regulations. Imposing taxes is one way for the government to obtain the funds needed to regulate the development budget and state administration, while also being used to implement social and economic regulations. Different authorities and collection methods in managing income, namely central taxes and regional taxes.

Local taxes are levied to fund the performance of local government obligations, providing funds for local governments. A specific local tax referred to as Land and Building Tax (LBT) is levied contingent upon the existence of land and buildings, with the rate established based on the condition of the land or building features, which significantly impact the levy.

The assumption that general taxation need not lower the net profit of the industry at all if the government uses the tax revenue in a way that benefits the industrial life of the people. And although there are problems with how such a tax will affect land revenue, it is possible that land rent will not rise with the amount of tax payments; If this is the case, the value of the land will definitely decline. (Hayes, 1920)

Table 1

Data on Land and Building Tax, Population, GRDP and Area in Banten Province

Year	Land and Building Tax (Million Rupiah)	Population (People)	GRDP (Million Rupiah)	Area (KM²))
2014	822,948,662,645	23,409,754	699,169,336	9,281.08
2015	724,854,873,628	23,910,486	738,418,576	9,281.08
2016	1,120,703,529,517	24,406,296	779,087,865	9,281.08
2017	1,210,494,154,139	24,896,320	825,279,237	9,281.08
2018	1,310,228,391,199	25,379,472	873,162,856	9,281.08
2019	1,555,558,053,485	25,854,632	919,332,832	9,281.08
2020	1,499,135,784,868	23,809,124	888,530,171	9,662.92
2021	1,611,498,616,359	24,122,950	926,939,319	9,662.92
2022	1,872,085,449,451	24,413,970	975,326,831	9,352.77

Source: https://banten.bps.go.id/

The table shows the figures for LBT, population, GRDP, and area . It's just that in 2020 there was a decline in every region due to COVID-19.

So that the results of Land and Building Tax revenue can be realized according to the target, it is necessary to know the factors that influence PBB revenue.

With economic growth and increasing population, demand for various facilities, including housing, is increasing. Land and buildings are objects of Land and Building Tax whose number and value are increasing from year to year so that in the end this will increase Land and Building Tax revenue (Budiharjo, 2003)

The increase in land value largely arises from people's efforts and expenditures. Public spending on infrastructure such as roads, water, gas, and electricity services will increase significantly as a result of public investment in infrastructure. There is a strong argument to be made that communities should benefit from most (or all) of the land-value gains over landowners, and many states have implemented development taxes that are levied on any increase in the market value of land. (Lichfield, 1997)

GRDP embodies the cumulative added worth of goods and services generated in a defined region over a specific duration, regardless of ownership of production factors, and is considered resident if economic activity occurs in that region, for example, Indonesia. An international organization is not resident in the area where the organization is located, but employees of the international/national agency are not residents of the area if they carry out a mission for less than 1 year.

Growth in Gross Regional Domestic Product (GRDP) reflects the state of the national economy each year, and an increase in income per individual in a region indicates the ability of its people to support daily expenses and local government development projects. Therefore, it can be inferred that as the per capita income of a region increases, so does the potential revenue source for that area. So that people's ability to pay taxes increases.

The extent of land and/or buildings in a specific area holds significant influence over the Land and Building Tax (PBB) revenue, given that PBB calculations frequently rely on a percentage derived from property values within that particular area. This tax is imposed on property owners and is usually regulated by local governments.

Formulation of the Problem

This research develops several research questions, namely as follows:

4. Does population influence on land and building tax revenues in Banten Province?
5. Does Gross Regional Domestic Product influence on Land and Building Tax revenues in Banten Province?
6. Does area size influence on land and building tax revenues in Banten Province?

Literatur Review and Hypothesis

Locally-generated Revenue

The source of regional funding is called Original Regional Income, which is obtained from taxes, levies, management of separate assets, and other original regional income, in line with Regional Taxes and Regional Levies Law Number 28 of 2009.

Several factors, including government spending, GRDP, inflation, and population, have an impact on Original Regional Income (PAD). Increasing people's payment capacity also contributes to increasing regional tax revenues, which are PAD influence through GRDP. When an augmentation in human resources (HR) coincides with an enhancement in talent and creativity within this workforce, leading to a surge in ideas and a growth in human resources, it positively impacts the population, influencing technological advancement.

Local Tax

According to Law Number 28 of 2009, a region is obliged to pay mandatory local taxes to individuals or entities that owe but do not receive equivalent or direct benefits. These funds can be collected in accordance with applicable laws and regulations and used to fund regional development and regional government operations.

Land and Building Tax

The existence of land and buildings determines the imposition of Land and Building Tax (LBT). One significant tax is LBT. As a result, the condition of the building or earth object determines the rate.

The seas of the Republic of Indonesia, as well as land and inland waters (such as ponds, swamps and waters), form the surface of the earth. Buildings, on the other hand, are engineering creations that are permanently anchored to the ground or other structures. Additionally, the following are included in the definition of buildings: toll roads, swimming pools, luxury fences, sports arenas, shipyards, docks, luxury parks, shelters, oil refineries, oil and gas, oil pipelines, and other useful facilities (Mardiasmo, 2016).

Population

The population is an important part of economic activities as well as workers, experts, company leaders, and entrepreneurs in creating economic activities. Population is the number of people who occupy a certain region or country for at least one year when population data collection or census is carried out. Three dominant factors influence the rate of population growth, namely death rate, birth rate, and migration rate or population movement.

H_1: *Population significant effect on land and building tax revenues.*

Gross Regional Domestic Product

The term Gross Regional Domestic Product, or GRDP, refers to the total gross value added produced by all of the region's economic sectors. The GRDP is calculated in order to provide information that describes regional economic performance, aid in the creation of regional planning or policies, and evaluate the results of development.

Gross Regional Domestic Product serves as a crucial indicator for knowing the economic conditions of a region in a certain period, both based current on prices and based on constant nutrients.

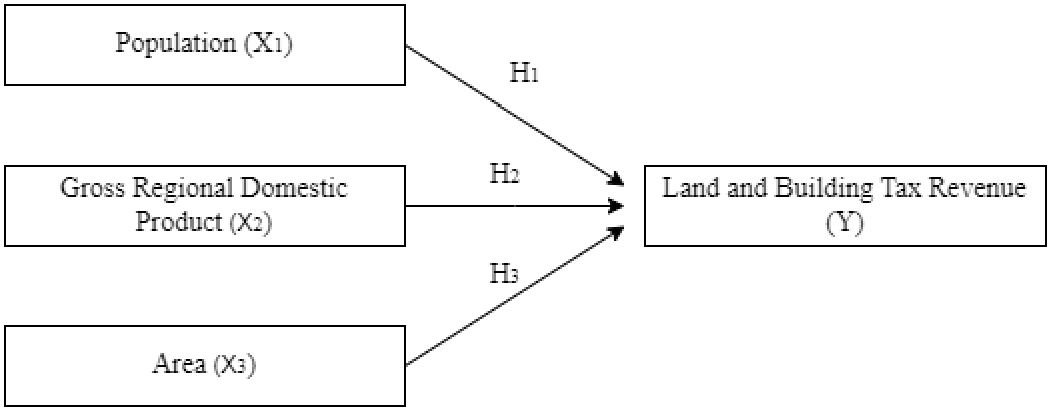
H_2: *Gross Regional Domestic Product significant effect on land and building tax revenue*

Area

Land is a resource that can provide space that can support all the needs of living things. the space provided is very limited, meanwhile, the need for land tends to continue to increase from year to year, both for housing, agriculture, industry, and so on. If population growth increases, the demand for land will increase. (Afriyanah, 2015)

H_3: *Area significant effect on land and building tax revenue*

Conceptual Research



Picture 2.3 Conceptual Research

Methodology

Secondary data in the form of Land and Building Tax income data for each Regency/City in the Province of Banten is required. The Banten Province Central Statistics Agency provided the data that was used.

The population research data is derived from reports on the realization of Land and Building Tax Revenue for the years 2014–2022, as well as data on Population Number, Gross Regional Product, and Area Area from the Central Regency and City Statistics Agency in Banten Province.

The subsequent research methodology for hypothesis testing involves employing the panel data regression analysis to assess data structured as time series and cross sections, employing the suitable panel data regression model through Microsoft Excel. The analysis tool utilized for this research is the Eviews 9 statistical application.

Variables and Meansurements

Land and Building Tax

Land and Building Tax constitutes a government levy applied to both land and structures, its value contingent upon the object's condition—specifically, the land surface and its underlying ground. This tax is assessed utilizing a proportional scale derived from information registered at the Directorate General of Financial Balance.

Population

Population is the total population of an area. Population is assessed using a ratio scale utilizing population data documented by the Banten Central Statistics Agency.

Gross Regional Domestic Product

Gross Regional Domestic Product represents the added value generated by economic sectors (goods and services) within a year. It is gauged using a ratio scale utilizing population data documented by the Banten Central Statistics Agency.

Area

Area is the size of an area which is generally measured in area units such as square kilometers, square miles, hectares or square meters. Area is quantified using a ratio scale utilizing population data registered by the Banten Central Statistics Agency.

Research Model

$$LBT_{it} = a_0 + a_1\, POP_{it} + a_2\, GRDP_{it} + a_3\, AREA_{it} + \mu_{it}$$

Result and Discussion

The Banten Province region is located at coordinates 105º01'11" - 106º07'12" East Longitude and 05º07'50" - 07º01'01" South Latitude. This area adjoins various neighboring regions: it faces the Java Sea to the north and is bordered by the Indian Ocean to the south. On the western side, it is connected to the Sunda Strait. Conversely, its eastern boundaries adjoin DKI Jakarta and West Java Province. Geographically, the majority of Banten Province comprises lowlands, ranging from 0 to 200 meters above sea level. However, a small portion encompasses elevations between 201 to 2,000 meters above sea level in Central Lebak and 501 to 2,000 meters above sea level in East Lebak. Administratively, Banten Province, with its capital situated in Serang City, spans an area of 9,352.77 square kilometers, encompassing 4 cities, 4 regencies, 155 sub-districts, 1,238 villages, and 313 administrative districts. Derived from data from the Banten Province Central Statistics Agency (BPS) in 2022, the total population of Banten Province reached 2,206,985 people.

Table 2
Descriptive Statistic

	LBT	POP	GRDP	Area
Mean	152,641.87	1,529,188	52,953.11	1,171.737
Median	53,456.68	1,382,630	52,482.50	639.2850
Maximum	579,294.29	3,800,787	112,780.0	3,426.560
Minimum	4,180,000	405,271.0	15,097.00	147.1900
Std. Dev.	176,951.09	881,924.4	31,073.62	1,163.224
Observations	72	72	72	72

Source: data processed with Eviews9, 2023

1. Land and Building Tax with a sample size of 72 has a minimum value of 4,180,000 in Tangerang City and in Tangerang Regency it has a maximum value of 579,294.29. Land and Building Tax with an average value of 152,641.87. The standard deviation value obtained was 176,951.09, which shows that there are variations in land and building tax between one district/city and another, due to the obtained standard deviation value being higher than the obtained average value.
2. The population with a sample size of 72 has a minimum value of 405,271.0 in Cilegon City and in Tangerang Regency has a maximum value of 3,800,787. Number of inhabitants with an average value of 1,529,188. The standard deviation value obtained is 881,924.4, which shows that there is no variation in the number of inhabitants between one district / city and another district / city, because the standard deviation value obtained is lower than the average value obtained.
3. Gross Regional Domestic Product (GRDP) with a sample size of 72 has a

minimum value of 15,097.00 in Tangerang Regency and in Tangerang City has a maximum value of 112,780.0. Gross Regional Domestic Product (GRDP) with an average value of 52,953.11. The standard deviation value obtained is 31,073.62, which indicates that there is no variation in Gross Regional Domestic Product between one district/city and another district/city, because the standard deviation value obtained is lower than the average value obtained.

4. The area with a sample size of 72 has a minimum value of 147.1900 in South Tangerang City, and in Lebak Regency it has a maximum value of 3,426.560. Areas with an average value of 1,171.737. The standard deviation value obtained is 1,163.224, which shows that there is no variation in area between one district/city and another district/city, because the standard deviation value obtained is lower than the average value obtained.

Panel Data Regression Analysis

Chow Test

In determining the appropriate panel model, whether it is the Common Effect Model (CEM) or the Fixed Effect Model (FEM) to use, the Chow test is employed.The test results are shown in table 3 which was obtained with a Cross section chi-square p-value of 0.0039 < 0.05, meaning that H_0 is rejected (H_a is accepted) and the model selected can be inferred as the Fixed Effect Model (FEM).

Table 4
Chow Test

Effects Test	*Statistic*	d.f.	Prob.
Cross-section F	2.939938	(7,61)	0.0102
Cross-section Chi-square	20.930759	7	0.0039

Source: data processed with Eviews9, 2023

Hausman Test

The Random Effect Model (REM) or the Fixed Effect Model (FEM) panel models are tested using the Hausman test to determine which is the better choice. The test results are shown in table 5 which was obtained with a Cross section chi-square p-value of 0.0003 < 0.05, meaning that H_0 is rejected (H_a is accepted) and the model chosen can be inferred as the Fixed Effect Model (FEM).

Table 5
Hausman Test

Test Summary	*Chi-Sq. Statistic*	*Chi-Sq. d.f.*	*Prob.*
Cross-section random	18.744070	3	0.0003

Source: data processed with Eviews9, 2023

Coefficient of Determination (R^2)

Table 6

Coefficient of Determination Test Result (R^2)

R-squared	0.781050
Adjusted R-squared	0.745156

Sour ce: data processed with Eviews9

According to previous data, the Adjusted value (R^2) for the Land and Building Tax variable is 0.745156, meaning that 74.51% of the variation can be explained by factors such as population, GDP, and area. Meanwhile, factors not covered in this research model impacted the remaining 25.49%.

Hypothesis Test

F Test (simultaneous)

The F test, also known as the Simultaneous Test, evaluates the combined influence of all independent variables on the dependent variable simultaneously. A sig value below 0.05 (5%) signifies statistically significant results. The outcomes of the F test in this research are listed below. Table 7 displays the processing results for the F test or simultaneous testing.

Table 7

F Test Result

F-statistic	21.76019
Prob(F-statistic)	0.000000

Source: data processed with Eviews9, 2023

From the data displayed in the table above, it is evident that the Prob (F-statisctic) value is 0.000000 < 0.05, meaning that H_0 is rejected (H_a is accepted). This indicates that at least one independent variable influences the dependent variable.

t-Test (Partial Test)

The aim of the t-test is to ascertain the specific influence of the independent variables on the dependent variable. According to the data in the table above, the following regression formulation is obtained:

$$\boldsymbol{LBT_{it} = \alpha_{it} + 9.726581POP + 182.1929GRDP + (-3488.302)Area_{it} + e_{it}}$$

Table 8 displays the findings of the t-test (simultaneous test), which were derived based on the data processing eviews9 results. It is possible to conclude that the independent variable significantly influences the dependent variable, and conversely, the dependent variable also influences the independent variable significantly if the test results indicate a probability significant less than 5% or 10% and the direction of the relationship is consistent with the hypothesis. Based on these criteria, the hypothesis testing outcomes of this study allow for the following deductions:

Table 8
t-Test Result

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	-5169888.	3450055.	-1.498494	0.1392
POP	9.726581	1.772127	5.488649	0.0000
GRDP	182.1929	62.98920	2.892447	0.0053
Area	-3488.302	1342.232	-2.598881	0.0117

Source: data processed with Eviews9, 2023

Effect of Population on Land and Building Tax

The population number has a positive beta coefficient value of 9.726581 and a p-value of 0.0000 < 0.05., according to the data processing results. An area's revenue from land and building taxes will rise as its population grows. Conversely, a declining population will result in lower earnings from land and building taxes.

The study outcomes align with the suggested hypothesis, demonstrating a positive influence of population on land and building tax revenue. Consequently, H_{a1} is accepted, affirming that population positively impacts land and building tax.

Effect of Gross Regional Domestic Product on Land and Building Tax

The outcomes of the data processing indicate that the Gross Regional Domestic Product has a positive beta coefficient value of 182.1929 and a p-value of 0.0053 < 0.05. Land and building tax receipts in a region will rise in tandem with a growing GRDP. Conversely, a declining GRDP will result in lower revenues from land and building taxes.

The study findings align with the proposed hypothesis, indicating a positive impact of GRDP on land and building tax revenues. Consequently, H_{a2} is accepted, affirming that GRDP positively influences land and building tax.

Effect of Regional Size on Land and Building Tax

From the outcomes of data analysis, it's evident that the Regional Area has a p-value of 0.0117 < 0.05 with a beta coefficient value of -3488.302 in a negative direction. This means that increasing regional area will increase land and building tax revenues in a region. On the other hand, decreasing regional area will reduce land and building tax revenues.

The research findings align with the proposed hypothesis, indicating that area has a detrimental impact on land and building tax revenues. Hence, H_{a3} is accepted, leading to the conclusion that area negatively influences land and building tax.

Discussion

Effect of Population on Land and Building Tax

In Table 8, a beta coefficient of 9.726581 with a p-value of 0.0000 < 0.05 is displayed, suggesting a positive correlation between the population variable and land and building tax. Population serves as an indicator of the performance of land and building tax revenue, therefore bigger populations correspond to more land and building tax revenue.

This aligns with the research carried out by Ari Budiharjo (2023), indicating that population positively influences land and building tax revenues in districts or cities. Efficiently managing the population, specifically through skill enhancement and improved education, can harness the potential of a sizable population, contributing significantly to the development process. The higher the population, the higher the tax revenue can be

However, This contrasts with Irfan's (2010) research findings, demonstrating that the rise in population does not yield a notable impact on PBB revenue. Thus, the increase in population is not a factor that can influence the increase in PBB.

Effect of Gross Regional Domestic Product on land and Building Tax

Table 8 demonstrates a beta coefficient of 182.1929 alongside a p-value of 0.0053, which is less than 0.05, signifying a positive association between the GRDP variable and Land and Building Tax. The revenue generated from land and building taxes experiences growth in tandem with the Gross Regional Domestic Product.

This aligns with Lisna Lisnawati's research (2020), indicating a positive correlation between GRDP and land and building tax revenues within districts or cities. As GRDP rises alongside economic growth, it consequently leads to an augmentation in land and building tax revenues within the region.

However, this contradicts the findings from Lutfi and Mike's (2022) research, demonstrating that GRDP does not wield a substantial impact on the actualization of Land and Building Tax. These results indicate the presence of other variables exerting a more pronounced influence on alterations in the realization of Land and Building Tax, such as strict regulations from the government, tax socialization, strict and indiscriminate sanctions and various other variables.

Effect of Regional Size on Land and Building Tax

According to Table 8, the beta coefficient is -3488.302 and the p-value is 0.0117 < 0.05. This suggests that the area variable weakens the relationship between Land and Building Tax or negatively impacts it..

Contrarily, this contrasts with the findings of Windah, Darwin, and Bagudek's (2020) research, indicating that regional factors indeed impact the acceptance of PBB. The larger the area of land, the greater the land and building tax revenue.

Conclusion

This research aimed to explore the influence of independent variables such as population size, gross regional domestic product, and area affect revenues from land and building taxes. Because the data requires interpolation, 72 data samples were used, representing 4 districts and 4 cities in Banten Province. From this sample, the following findings are taken:

1. Population has a positive effect on Land and Building Tax revenue.
2. Gross Regional Domestic Product has a positive effect on Land and Building Tax revenue.
3. Area negatively affects Land and Building Tax revenue.

Limitations

Some limitations in this research are as follows:

1. This research uses panel data with a very limited number of data samples and few variables.
2. This research involved interpolating data for analysis.
3. This research was only conducted for nine years.

Recommendation

In light of the discussion analysis's outcomes and the study's many conclusions, the research's findings can provide recommendations for improving future outcomes, including:

1. In order to facilitate future research on related topics using different objects, it is hoped that it will serve as educational material for academics to better understand the analysis of the effect of Gross Regional Domestic Product, Total Population, and area on Land and Building Tax Revenue.
2. Expanding the research by introducing diverse variables or utilizing samples from districts or cities beyond those examined in this study is suggested for further exploration.
3. In this study, the time used was only 9 years (2014-2022), it is hoped that future research can take a longer observation period.

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CHAPTER 6

Socio-Legal Study on the Indonesian Courts' Judgments Implementing International Humanitarian Law Norms

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ABSTRACT

The implementation of International Humanitarian Law (IHL), among other things, can be seen in court decisions in deciding cases, both in the form of the application of IHL norms contained in international IHL treaties, as well as the application of customary international humanitarian law (CIHL). This research discusses the court judgments in Indonesia that use IHL instruments and integrates them with the role of judges in formulating judgments. The purpose of this research is to examine the role of judges from a sociological perspective in the implementation of IHL norms in judicial sector. This study is a normative research with the approach of socio-legal study supported by literature review and bibliometric analysis on the selected journals indexed by Scopus completed by a series of Indonesia national courts judgments. The result shows that judge's decisions are greatly influenced by other factors such as the expertise and the background, performance in the judicial sector, including integrity and economic, social, cultural and political factors.

Keywords: *Judgment, Socio-legal study, National Court, International Humanitarian Law*

INTRODUCTION

In the last decades, the development of legal research grows rapidly, among other, into socio-legal researches (Menkel-Meadow, 2019; Noor, 2023; Purwanti et al., 2021). Socio-legal research, based on several authors, is believed to be the solution for normative or doctrinal research that only focused on studying legal concept, legal norms, and legal objectives (Christiani, 2016). Because the law is part of the society, the discussion and development of law should not merely stop at the discussion of doctrinal research, but the law should go beyond doctrinal or normative study to fill the gaps and measure the function of law as the living law in society (Mack, 2020). This issue makes the actors connected to the legal norms such as judges, have to consider many factors out of legal norms itself. According to Menkel-Meadow, the judges' task, among other, is to make the law (judge made law), to give an interpretation, to enforce the law without actually referring to verifiable data or empirically valid patterns of social data (Menkel-Meadow, 2019).

However, according to Supriyadi and Suriyati the judges legal culture in dealing is important because they have to make a decision based on their personal consideration, for example in the case of marriage during the Covid-19 pandemic. In this case, the judge have to consider on customary belief rather than legal regulation, legal facts in the trial court and the value of justice (Suriyati, 2022).

This study examines the relation between the judgment of the courts which implementing international humanitarian law (IHL) and the judges with the perspective of socio-legal study (Rosidah & Ritonga, 2019; Suriyati, 2022). The aim of this study is to seek benefit of socio-legal study to the role of the judges from the international courts in deciding cases.

DATA AND METHODOLOGY

To achieve our aim, we used data from reputable international journal indexed by Scopus. We inserted keywords of ICC OR ICTY OR ICTY AND judgment OR "international criminal trial practices" OR judge OR "judges role" OR "judge opinion" AND "humanitarian law" OR "judicial policy making". All published articles were collected from 2002 to 2023. This filtering resulted in 35 article documents that have been analysed.

To display those result, we use bibliometric analysis supported with VOSviewer software. Bibliometric analysis can display the map of socio-legal research used in the courts' judgments and this kind of analysis are considered as the common methods used among big data available on the internet, and commonly used in the legal research around the world (Chen et al., 2022; Kumar et al., 2020; Liu & Pan, 2023; Vlase & Lähdesmäki, 2023; Zhou et al., 2023). Bibliometric analysis is conducted to look for trends and to seek pattern of collaboration of several parameters (Ahmi & Mohamad, 2019; Naveen Donthu, Satish Kumar, Debmalya Mukherjee, Nitesh Pandey, 2021; Sweileh et al., 2017; van Eck & Waltman, 2010).

VOSviewer software offers three types of analysis: 1). Co-occurrence analysis with the authors and indexed keywords, 2). Co-citation analysis consists of cited references, cited sources and cited authors, 3). Co-authorship analysis divided into authors, organizations and countries. Of the 35 selected documents, we decided to consider the minimum number of occurrences of one keyword resulting in 70 resulted keywords. These keyword are categorized into 6 clusters and 69 items following Thesaurus filtering. This clusters and items can be seen in Table 1 below:

Table 1. Clusters and Item from 35 selected documents for Co-occurrence

Cluster	Item				
1	Accuracy	Age determination	Anthropology	Balkans	Bayes theorem
	Conf. paper	Continental population	Criminal justice	Demography	DNA fingerprint
	Eastern Europe	Forensic	Human rights	Identification	Population variation
	Priority journal	Reliability	Sex determination	Stature	Transitional justice
	United States	Validity	Western Hemisphere	Yugoslavia	
2	Armed conflict	Armed group	Arms control	Corpse desecration	German criminal law
	Impact analysis	International criminal law	Prosecutions	Protected person	Syrian civil war
	Targeting	Terrorism	War crimes		
3	Compensation	Complementarity	Gender-based violence	Humanitarian law	ICC
	Violation	Islamic international law	Judges	Siyar	Victims
	International law commission				
4	Access to justice	Belgrade district court	Commission by omission	Concept of control	Individual criminal responsibility
	Ovcara	Prisoner of war	Vukovar hospital	Wounded and sick	
5	Corpus linguistics	Critical discourse	Disproportionate attack	Distinction	ICTY
6	Customary international law	International human rights law	Normative conflict		

Results from VOSviewer Software

Analysis of Co-occurrence

The displaying of Network Visualization of the co-occurrence of all the keywords derived from 35 resulted documents shows linkages between one cluster to another clusters, or one keyword to another keywords. The bigger the circle shows the more frequent of a keyword occurred on the documents. This relation shown in Figure 1 below:

Figure 1. Network Visualization of Co-occurrence of 35 selected documents

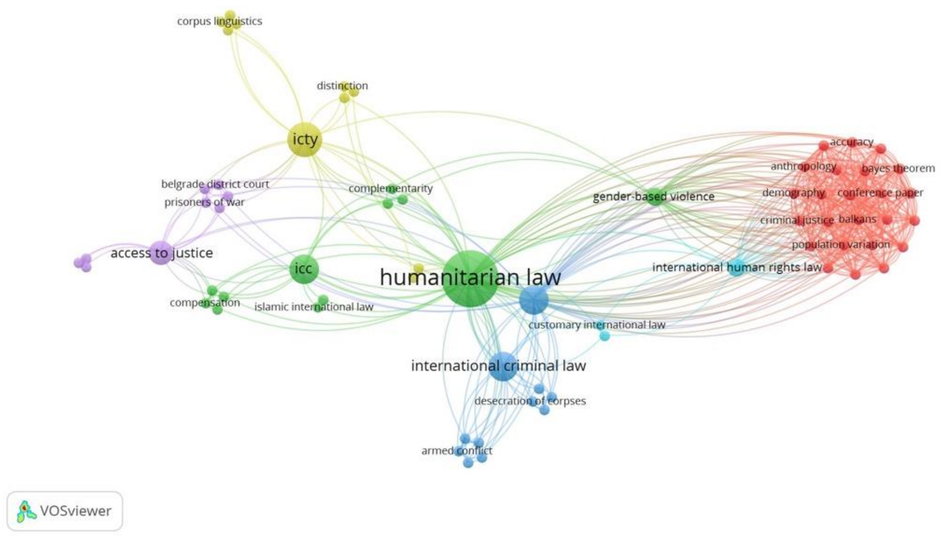

Figure resulted from VOSviewer

From the resulted 35 documents VOSviewer displays the Overlay Visualization to show publication time of each resulted documents. The yellow colour shows the publication in the year 2008-2016 with the topic of international criminal law, desecration of corpses, armed conflicts and protected person, that can be seen from Figure 2 as follows:

Figure 2. Overlay Visualization of Co-occurrence of 35 selected documents

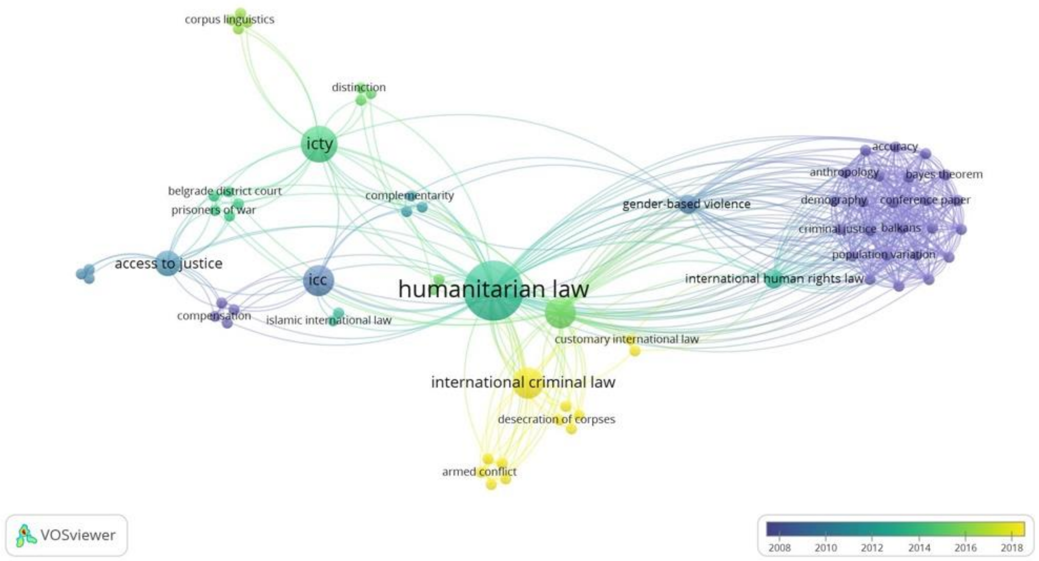

Figure resulted from VOSviewer

Analysis of Co-citation

We decided to determine two citations of a cited author with minimum of five citation of author, resulting in 16 authors to be selected. As result there are only two clusters with 5 and 38 items of cited authors respectively selected. These experts can be seen in Table 2 as shown below:

Table 2. Clusters and Item from 35 selected documents for Co-citation of cited authors

Cluster	Item				
1	Abi-Saab, G	Bothe, M	Byron, C	Dinstein, Y	Doswald-Beck, L
	Krieger, H	Milanovic, M	Schmitt, M.N.	Vite, S	Zegveld, L
2	Akhavan, P	Bartels, R	Cryer, R	Darcy, S	Fenrick, W.J.
	Greenwood, C	Kalshoven, F	Kolb, R	Wuerzner, C	
3	Cassese, A	Damaska, M	Guellali, A	Meron, T	Roberts, S
	Robinson, D		Schabas, W.A.		
4	Bassioni, MC	Henckaerts,J-M	Mrksic, P	Peters, R	Pictet, J.S.
			Roberts, A		
5	Ambos, K	Clark, J.N	Dormann, K	Sandoz, Y	Swinarski, C
			Zimmermann, B		

2.2 Results from the reading of selected documents

From 35 resulted documents, we summarized the judgment under the perspective of socio-legal study in the international courts' judgments reflecting the use of international humanitarian law norms. This summary can be categorized into clusters as follows:

Table 3. Socio-legal perspectives on the International Courts' Judgments

Cluster	Issues	Socio-legal perspective
Field of Science	Existing laws: International Humanitarian law, International Human Rights Law, International Criminal Law	Linguistics, Forensic, Social, Economics, Politic, other Guidelines & Basic Principles
Applying Norms	Developing legal norms	Adopt mechanisms, new concepts, new professional norms, commentary of the conventions, Islamic Law

ANALYSIS

The use of other field of science

Based on the analysis of the documents, it was found that the application of legal norms in court trials still requires assistance and contributions from other field of science. For example, forensic science which provides physical evidence of crimes committed and function as the tool to interpret evidence, is very important to be used in the court trials, among others to conduct skeletal aging methods to predict the age and sex of the victims (Kimmerle et al., 2008).

Another field of science that is very useful for displaying the annual reports and case law on the internet or formal website is the linguistics. According to Potts & Kjaer, the methods from the linguistic fields colors the discursive construction of the achievements in the ICTY (Potts & Kjær, 2016).

Structural and cultural factors of the background of the Judges are needed as the significant factors for judicial policy-making both in international and national courts. Moreover, there is no any theory of judicial policy-making including professional norms among the court judges (Wessel, 2006). (Brown, 2006).

Applying the norms

From the total of 35 Journals, we minimize it to 12 main topics. The first topic will talk about victims' justice: legitimate sentencing, in which there is the inadequacy of the statutory guidance governing the International Criminal Court sentencing regime, it creates a sense of urgency for the International Criminal Court to bring a new legitimacy to International Humanitarian Law and adopt the mechanisms to ensure that minimal punishments for war criminals are being given (Glickman, 2004). Second issue is about the protection of emblem, which oftentimes there are attacks on objects and persons with special protection, and the misuse of the Red Cross and Red Crescent (Alimpić, 2014a). Therefore, it is necessary to relativize the level of accountability for such grave crimes and punishing only direct perpetrators (Alimpić, 2014b, p. 285). Another subject that was pointed out is gender in armed conflict situations. There is this wide social impact that is intrinsically linked to both genders, therefore there is a need for gender construction in International Humanitarian Law (Barrow, 2010). Furthermore, there is a link between International Humanitarian Law and Human Rights so it is essential to enforcing International Humanitarian Law through Human Right Bodies because in asymmetrical wars, it was found that more and more fighters resort to disregarding the rules of law, thereby human right bodies are obliged to apply in International Humanitarian Law (Steiger, 2015) .

Other topic that being discussed is about the ethnic cleansing and war crimes. The problem in this specific topic is the public perception tendency to associated the Yugoslav wars with all forms of ethnically violence, and the solution to this problem is that International Criminal Tribunal for Rwanda need to provide a document on the notion of direct participation in hostilities (Calic, 2009). The sixth topic will be discussed on using children to participate actively in hostilities, this particular topic matters on constitutive active participation in hostilities for the purpose of the child solider offences under the Rome Statue (Wagner, 2013a). The solution to that specific issue is to relativize the level of accountability for such grave crimes and punishing only direct perpetrators (Wagner, 2013b, pp. 197–203). On topic of the formulation of International Criminal Tribunal for the Former Yugoslavia, the issue that was seen here is judgements error that can broaden up the scope of International Humanitarian Law which can hyper-humanizing International Humanitarian Law, thus the formulation of a permanent international criminal court is a major key to solve the issue (Soares, 2012). Other topic relating to the International Criminal Tribunal for the Former Yugoslavia is regarding on rules of targeting, where the judges failed to make full use of the law of targeting in International Humanitarian Law, also failed to articulate the legal reasoning behind their findings and explaining the relationship between International Humanitarian Law and criminal law (Ariav, 2015a). In this case, there is a need to understanding the attacker's information at the time of the attack in sense of analyzing targeting issue and it is already proven by the Gotovina trials (Ariav, 2015b, pp. 354–355).

Ninth, the topic discussed on the applicability of occupation law by proxy, which analyzed the theoretical and practical foundations for applying the law of occupation to Tadic-type conflicts, and it can be concluded that the principle of control underlies all forms of active crime commission and should govern cases where omission is assimilated to criminal law purposes (Gal, 2014). Within the twelve topic, there is a discussion on the duty to act and commission by omission which exploring the required materials in International Criminal Court and conclude that there is transition of criminal responsibility for omission in International Criminal Law to a direct approach based on the principle of control (Berster, 2010). Then, there is also the topic of amnesty which analyzes the International or regional action to enforce compliance with human rights, it shown that there are trends around the amnesty law enactment (Mallinder, 2012). Lastly, the politics of conflict topic analyzing the judgment in the International Criminal Tribunal for Yugoslavia which tells how persecution operates within an armed conflict (Montgomery, 2016).

CONCLUSION

Bibliometric analysis shows a growing body of research focusing the judgment in international courts revealing the need to incorporate socio-legal aspects in their judgments. The judges should take into account of those social data in the application of IHL norms and push to make justice to the international community.

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CHAPTER 7

Two Decades Protection of Cultural Heritage in Times of Armed Conflicts: A Bibliometric Study

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ABSTRACT

Armed conflict is a pragmatic experience that is inevitable in human life which always causes loss and damage, including to cultural heritage objects. Cultural heritage objects have been recognized as the identity of a nation and some of them have been recognized as important human heritage, so they must be protected in an armed conflict, even though in reality there are still many cultural heritage objects that are lost, destroyed or damaged during war. This paper presents a bibliometric study of the development of humanitarian law, especially the protection of cultural objects during war, starting from the 1954 Hague Convention with sociological studies during the period 2003-2023. The bibliometric study describes co-occurrence and co-citation analysis as seen from the network, overlay and density visualization of the VosViewer application. The results of the bibliometric study produced clusters concerning the protection of cultural objects based on various scientific disciplines, parties, case examples, the role of the government or state, qualifications for criminal acts related to cultural heritage objects, humanitarian law in particular and protection of cemeteries as cultural objects in particular. This study shows the most cited and most influential publications, journals, authors and co-authors who expressed their views on the protection of cultural heritage in times of armed conflicts. However, compliance with a number of humanitarian law norms and international law which regulate the protection of cultural heritage objects is very dependent on the good faith and compliance of the parties with humanitarian law.

Keywords: *Cultural heritage, Cultural property, Protection, Armed conflict, Humanitarian Law*

INTRODUCTION

International and non-international armed conflicts always cause damage and loss to the countries in conflicts. One of the losses that is felt to be very significant is the loss resulting from the destruction of cultural heritage objects during armed conflict. Destruction or damage to cultural heritage objects during armed conflicts can occur for various reasons. For example the destruction of cultural heritage (Perović & Žegarac, 2000; Tripathi, 2022), the damage that occurs as a result of the use of explosive weapons resulting from collateral damage (Adams, 2001; Pollard, 2020; Rosén, 2023), loss of cultural heritage objects as a result of being stolen or looted from their place of origin and traded illegally (Amineddoleh, 2015; Soloshenko, 2021), or indeed the cultural heritage objects being deliberately destroyed for military purposes (Dunkley, 2023; González & Vázquez, 2014), or intended to as a symbol of defeat of the losing parties (Botti & Bianchi, 2023).

Since World War I, destruction aimed at cultural heritage objects has occurred in various countries that were experiencing war at that time. Based on their research, Munzi and Zocchi have analyzed the destruction of cultural heritage objects in Lecitanian territory and found out the use of the ancient mausolea, villas and *gsur* were used or destroyed by the opposing armies to build military structures in World War I and Italo-Turkish War. The military construction to be built were military roads, trenches, redoubts and strongholds including military reuse of farms (Munzi & Zocchi, 2017). The destruction of cultural heritage objects was continued to occur during World War II where Libya became one of major regions that has suffered major losses. The cultural heritage objects such as statue was partially looted, several decorations were mutilated, and monuments were damaged in war. After the 1960s, several areas such as cemeteries, ancient sites were explored, investigated, and urbanized, such as the area of Lepcis Magna and Khoms. Of 168 sites from the Punico-Numidian to the Ottoman Period, Munzi and Zocchi stated that 78 sites (46,4%) have been damaged or destroyed where 19 of 178 (11,3%) of such sites were completely destroyed for varying reasons. The major cause of those damages was related to the building activities such as the exploitation of building material to creating space for quarries and terrain levelling (60,2%). Another cause was the building of military infrastructures such as roads, electricity pylons, forts and strongholds (25,5%). In addition to the second reason, the heritage losses caused by unstable political and religious situations (6,4%) causing damaged to five sites, illegal excavations in four sites (5,1%), and agricultural activities (2,5%) (Munzi & Zocchi, 2017).

The destruction of the cultural heritage objects and site were not occurred only in international armed conflicts. In a non-international armed conflict, such as in the Syrian civil war, especially in the Old City of Aleppo which located in the north-western of Syria, the shelling, bombing and clashes during the Syrian civil war made the City of Aleppo as the city listed in the World Heritage in Danger in 2013. Of 16.000 buildings, around 3,150 building have been destroyed, 9,049 buildings have suffered severe structural damage and another 3.207 buildings have not suffered structural damage. About 14,9 tons of debris were produced caused by 30 % of the structures were completely destroyed and 60% severely damaged (Kousa & Pottgiesser, 2020).

In recent armed conflicts such as the armed conflict between Russia-Ukraine, the destruction of cultural heritage of Ukraine especially the Churches were still occurred although both Russia and Ukraine are already parties to the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflicts and its First Protocol. The destruction of Churches in the Ukraine shows the different historical perceptions of the Orthodoxy of both parties in conflicts, and in the end reflected how religious affiliation has affected the conflict. According to Botti and Bianchi, the destroying of religious symbolic places of Ukrainian religious identity (*urbicide*) affirm the spiritual unity of the Russian and the Ukrainian peoples, and the attempt of Ukrainians to erase Russian presence by destroying cultural roots of worship of Moscow tradition patriarchate (cancel culture) (Botti & Bianchi, 2023).

Based on the introduction in this article, the authors explored articles of international journals indexed by Scopus to find out bibliometric studies on the protection of cultural heritage objects during armed conflicts in the last two decades. The aim of this study is to provide statistical data concerning various items relating to the protection of cultural heritage objects and sites during times of armed conflicts, such as: the topics discussed in the last two decades which described in co-occurrence analysis; the most influential countries in relation to this issue; the most cited experts by the authors; the legal development governing the protection of cultural heritage over the last two decades; as well as the relationship between one topic to another based on the data produced.

DATA AND METHODOLOGY

This research is normative research based on selected data from international reputable journals completed by bibliometric analysis. The legal norms analysed qualitatively and the statistical data analysed with bibliometrics supported by VOSviewer software.

To achieve our aim, in the first place we used data from journal article published in the international reputable journal indexed by Scopus. We inserted keywords of “cultural property” OR “cultural heritage” AND “humanitarian law” AND protection. All published articles were collected from 1998 to 2023 and we used filters to this resulted database to journal articles that have been written in English only. The collected database counting with these parameters resulted in 39 article documents. We also provide a thesaurus filter to omit the redundancy of the same or similar keywords. These 39 article documents analysed with VOSviewer.

We also conducted the most appropriate methods and techniques of bibliometric analysis with VOSviewer software, due to several similar research in arts and humanities and social science are now using such methods (Chen et al., 2022; Kumar et al., 2020; Liu & Pan, 2023; Vlase & Lähdesmäki, 2023; Zhou et al., 2023). Bibliometric analysis is performed to find out trends in our research especially in the protection of cultural heritage in armed conflicts and to seek pattern of collaboration among researchers, authors, their countries and institutions, the prolific topics discussed during certain periods of time, even the funding or donor od the research (Ahmi & Mohamad, 2019; Naveen Donthu, Satish Kumar, Debmalya Mukherjee, Nitesh Pandey, 2021; Sweileh et al., 2017; van Eck & Waltman, 2010).

The use of VOSviewer application analysed with three types of analysis that we have been decided: the analysis of co-occurrence which displayed all keywords from the authors keywords and indexed keywords; the analysis of co-citation from cited references, cited sources and cited authors; and the analysis of co-authorship that divided into element of authors, organizations and countries. We determined the minimum number of occurrences of one keyword resulting in 56 keywords meet the threshold. These keywords are classified into 8 clusters and 51 items, after filtered by Thesaurus. This resulted clusters and items can be seen in Table 1 below:

Table 1. Clusters and Item from 39 selected documents for Co-occurence

Clusters	Items			
1	1954 HC	CA 1, 1949 GC	Compliance	Dissemination
	Domestic IHL implementation	Enhanced protection	Innovation	National Committees
	Protection of cultural heritage		Syria	Cultural heritage
2	Accountability	Belligerent occupation	Compensation	Post-conflict heritage
	Fight against terror	International human rights		Law enforcement
3	Armed groups	Cultural heritage protection	1954 HC	International armed conflict
	Iraq	Juridical framework		Uruk
4	Cultural rights	Environmental damage	Prevention protection	Religious heritage
	Restitution	State succession	territoriality	
5	Civilian objects	Confiscation	Pillage	Iconoclasm
	Military necessity		Extensive, wanton destruction	
6	Human security	Intangible cultural heritage		Islamic law
	Non-international armed conflict		Protection of cultural heritage	
7	Geneva Conventions		International criminal law	
	Peace operation	UNESCO	International humanitarian law	
8	Antiquity	Just war tradition	Sanctuary	Spatial protection

Results from VOSviewer Software

Analysis of Co-occurrence

From the analysis of co-occurrence viewed by Network Visualization, the relationship between one keyword to another keywords can be seen in 8 clusters and 51 items The bigger the dots means that the more frequent for the keywords to be occurred in the journal articles since 1998. Each of cluster as shown in Figure 1 below shows interrelationship between one journal article to another:

Figure 1. Network Visualization of Co-occurrence of 39 selected documents

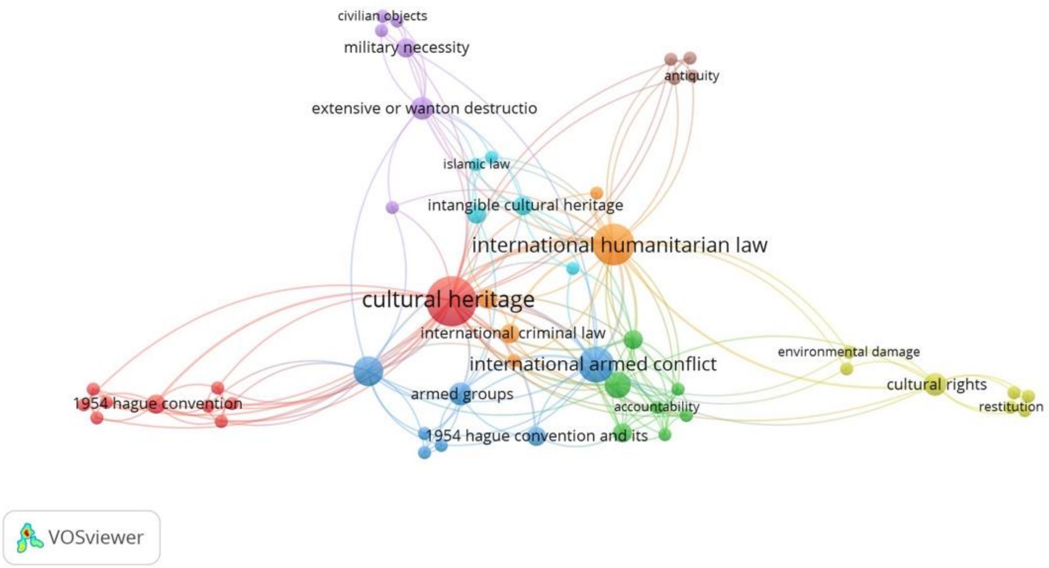


Figure resulted from VOSviewer

In addition to the display of Network Visualization, VOSviewer application offers the display viewed as the Overlay Visualization, which shows the duration publication starting from 2010-2020. The lighter the color shows that the articled have been published in near recent times. The darker the color shows the old publication of a journal. These relationship between the author keywords and indexed keywords can be seen in the Overlay Visualization as shown in Figure 2:

Figure 2. Overlay Visualization of Co-occurrence of 39 selected documents

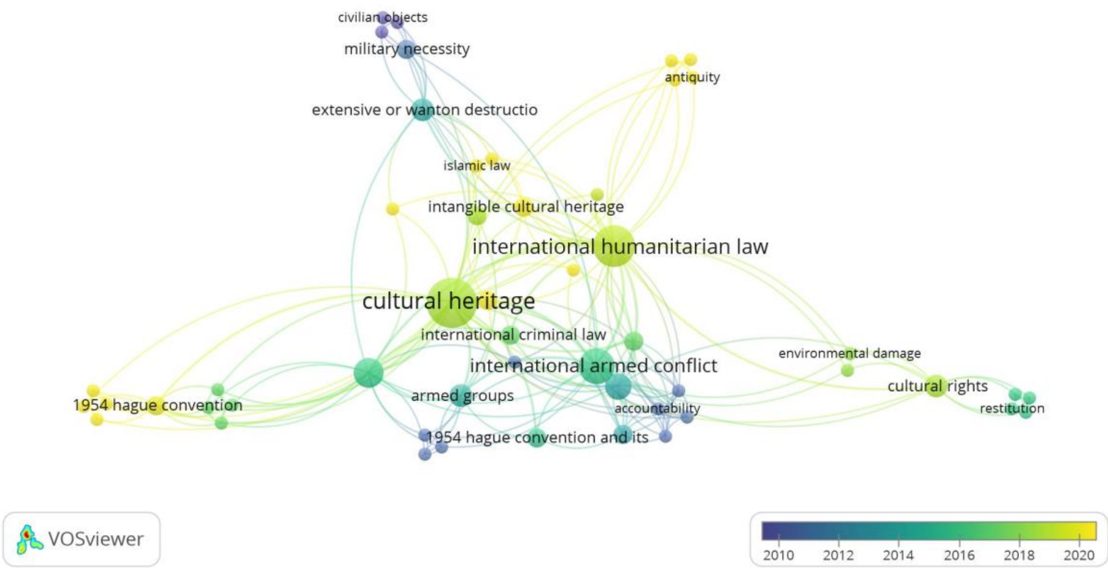


Figure resulted from VOSviewer

Analysis of Co-citation

We decided to determine two citations of a cited author with minimum of five citation of author, resulting in 16 authors to be selected. As result there are only two clusters with 8 and 7 items authors respectively selected. These experts can be seen in Table 2 as shown below:

Table 1. 15 Item from 39 selected documents for Co-citation

Doswald-beck, L	Francioni, F	Hausler, K
Henckaerts, J-M	Jakubowski, A	Lenzerini, F
Lostal, M	O'Keefe, R	
Boyland, P.J	Brodie, N	Gerstenblith, P
Kila, J	Stone, P.G	Toman, J
	Van der auwera, S	

The relationship over the selected experts above can be shown in two clusters, i.e. cluster one or red cluster and cluster two or green cluster as shown in Figure 3. The most influence experts that have been frequently cited are Lostal M, O'Keefe and J-M Henckaerts from cluster red, and Jiri Toman and Stone from green cluster. This relationship can be in Network Visualization as shown in Figure 3:

Figure 3. Network Visualization of Co-citation of 39 selected documents

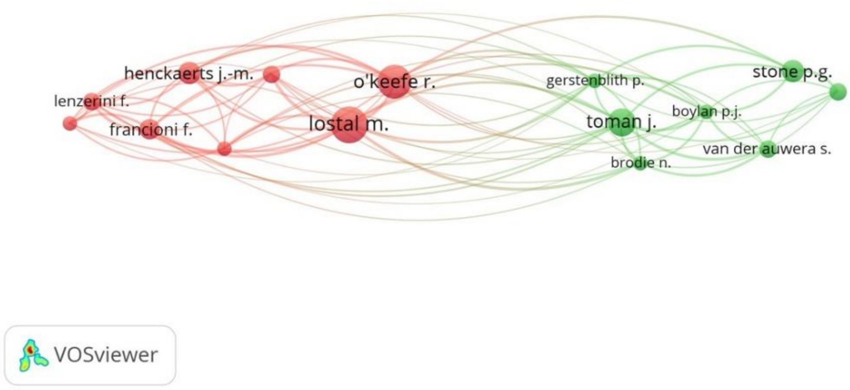
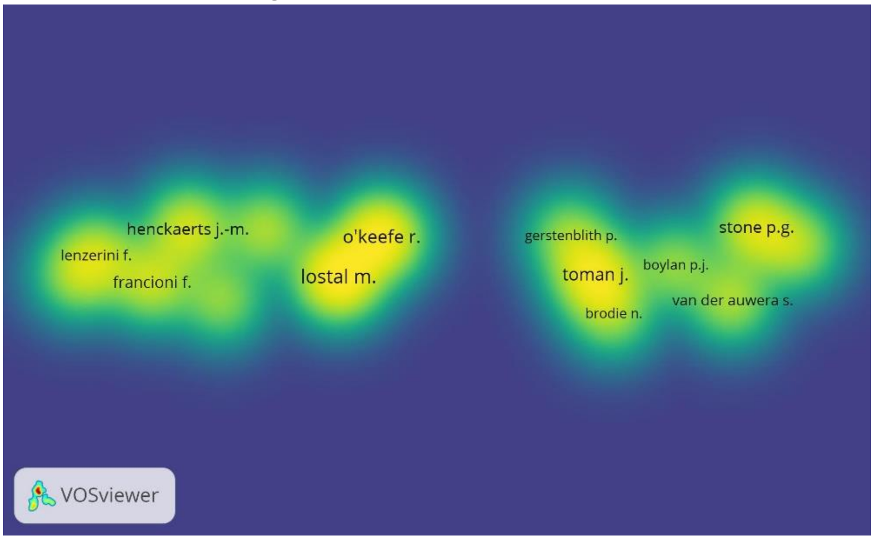


Figure resulted from VOSviewer

Although there are relation between one experts to another, the density of the citation from 16 selected experts were different as shown in Figure 4 below:



Results from the reading of selected documents

From 39 selected documents, we determined the classification of the substance that can be divided into the legal basis used in the journal articles and their development; the problem faced by the warring parties concerning the protection of cultural heritage and the types of their protection.

The Development of legal basis concerning the protection of cultural heritage in times of armed conflict

Article 45 of the Hague Convention 1954 provides that in times of armed conflict, governments shall maintain the protection of cultural objects, both movable and immovable, which have significance in terms of the cultural heritage of all persons (Schipper, 2020; Toman, 2017). While the First Protocol of the 1954 often face the limitation of its application although it provides basic and special protection for the protection of cultural properties in times of armed conflict (Roger, 2021), the Second Protocol might seem to offer a better protection of cultural heritage in time of armed conflict with the enhanced protection (Hladík, 2022; “Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict The Hague (March 26, 1999),” 1999). Additional Protocol I of the Geneva Conventions (1977) states that the destruction of historic sites is a violation of international humanitarian law, and perpetrators of violations of international humanitarian law may be punished for war crimes (ICRC, n.d.; Roger, 2021). Of the several provisions governing cultural heritage there are only a few provisions that can be a permanent basis for protection for cultural heritage in a war conflict, such as the Hague Convention and the Additional Protocol to the 1977 Geneva Convention which provides general arrangements.

Besides the development in the perspective of humanitarian law, the international community seeks another protection system of cultural heritage under the Unesco legislation (Hladik, 2001; Lixinski, 2013; Oluranti Ojo, 2022).

Problems & types of protection

Cultural property benefits from the traditional protections or that called general protection enjoyed by human resources under IHL, especially in situations of occupation and threat. In addition, it offers additional protection to cultural property in the event of armed conflict. This additional protection is based on the concept that some objects represent human heritage and protect this value. In accordance with Article 27 of the Hague Regulations of 1907 (Tileubergeno et al., 2016), in times of war every measure must be taken to save, as far as possible, buildings, historical monuments, hospitals and places dedicated to religious, artistic, scientific or charitable causes. Place of reception for the sick and wounded, if used for military purposes. The Geneva Conventions give cultural property the same protection as all public property, although the Convention does not address it. This gap, or lack of attention to cultural property, was corrected with the adoption of the Hague Convention of 1954, which deals with cultural property.

For Special Protections on Article 8 of the 1954 Hague Convention provides the highest level of protection for a minority of refugees seeking protection against movable cultural property. These temples must be registered in the UNESCO International Register of Cultural Heritage under special auspices (Jaffal & Mahameed, 2018). According to Article 9, the parties to the conflict have the obligation not to use such goods for purposes that may cause aggression, destruction or damage during the armed conflict.

With the limitation of the 1954 system of “special protection” for cultural property, Protocol II established a new system in 1999 (Ryška, 2021). Cultural property of great human importance is entitled to effective protection if it is properly protected in accordance with national laws and not are used for military purposes. or for the protection of military sites. Enhanced protection is granted when it appears on the list of cultural goods subject to enhanced protection.

In the Hague Convention of 1954, the general principle of protection against historical cultural objects are based on obligations to preserve and respect for the historic place, as described in Article 2 of the Convention. The safeguarding of the historic site consists of every preparatory step to be taken in peacetime for the best conditions for the protection of historic sites such, as set forth in Article 3. Meanwhile, respect for place historic means avoiding hostile actions directed directly against such historic places, and prohibit, prevent and if necessary stop everything forms of theft, looting or abuse, and any acts of vandalism aimed directly at the historic place (M. Adil Ibraheem Taha Al-Mihimdi, 2019).

It also means that use of historic sites for military purposes and to support military action is prohibited, as affirmed in Article 4. Aimed retaliatory measures direct exposure to historical places is also prohibited, and there is no justification for or exceptions to retaliatory measures, defined in Article 4, paragraph 4, and contained in Article 53(c) of Additional Protocol I of 1977 (Arnal, 2020; Junod, 1987).

The Hague Convention on the Protection of Cultural Property in Time of Armed Conflict of 1954 was the first universal law to include provisions for the protection of cultural property, in this case historical sites, in times of armed conflict. The protocol of this convention also provides special protection in situations where the territory of one state is controlled or occupied by another state. Two decades later, the Additional Protocol to the Geneva Conventions of 1949 added provisions for the protection of cultural objects, including historical sites, in times of international armed conflict and non-international armed conflict. Where immunity of civic objects or civic objects is also granted to historical sites. These protocols clearly stipulate that the military may not use historical sites as military targets to attack and damage or even destroy and conduct hostage operations against historical sites.

It must be emphasized that the responsibilities contained in all regulation international humanitarian law instruments addressed to both sides who are involved in the conflict, both those who control historical sites and those who attack or opposing side. The theory of military necessity is the only reason for which the obligation of countries to respect historical places can be ignored. The theory that Being listed in the 1954 Hague Convention is a very unfortunate thing, considering this theory is a justification for the violation of the protection of places historical.

ANALYSIS

The international community has already faced at least three phases of the legal development of law in relations to the situations of armed conflict. The first phase shows that the customary norms governs the protection of cultural heritage in time of armed conflict that was develop in ancient history before 1880, replaced by the positive regulations concerning the protection of cultural heritage in the second phase of legal development. The non-international aspects of those regulations made such rules only binding to the warring parties only. But the advantage of this period is the adoption of the cultural property emblem that must be protected by the parties that already ratified. This development enforced by the adoption at the third phase, with the adoption of the 1954 Hague Convention and its Protocols. Rather than the initiative of producing other legal instrument, the customary of international humanitarian law may function as the legal source for the States to protect their cultural properties in times of armed conflicts (Permanasari, 2019). This development of legal basis in times of armed conflict are complementary to the UNESCO regulations that has been operated in times of peace (Breen, 2007; Broude, 2018; Lixinski, 2013).

In addition to those legal development, the current discussion of the cultural heritage objects is not only focused in times of armed conflicts, but also how they are protected in times of peace. Cultural heritage object is also a terminology that also includes elements of intangible cultural heritage objects (Saini, 2023), civilization, religious culture and even digital developments (Silberman, 2014; Sotirova-Valkova, 2019).

CONCLUSION

The protection of cultural heritage during armed conflicts is a complex and multifaceted issue. Through bibliometric analysis and the use of VOSviewer software, it becomes evident that there is a growing body of research focusing on the interpretation of IHL treaties and the Unesco legislation on such issue. The historical development and types of cultural heritage emphasis the need for a better legal framework to address the responsibility of countries for the unlawful destruction and looting of cultural property during armed conflicts.

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CHAPTER 8

Quality Improvement of Air Cylinder Using Six Sigma and Heart Methods

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ABSTRACT

This research focuses on the main object of air cylinder which aims at identifying and analyzing the causes of defects of the air cylinder products. From the historical data, the recorded average defect is 18%, a considerably high defect percentage from the industrial perspective.

For quality improvement purpose, the methods used in this study are Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control) and HEART (Human Error Assessment and Reliability Technique).

The HEART method is used at the DMAIC analysis stage to identify errors that occur due to human factors. The obtained Six Sigma level as a result of using the Six Sigma method is 3,185 while the DPMO value is 46.000. The results obtained from using the HEART method are: (i) a 38,4% probability error due to the operator's mistakes in using the chisel/drill bit; and (ii) 28,8% of the assembly is not in the correct order and/or connecting parts are not properly installed. The improvement methods proposed based on the biggest defect factors are by using drill bit storage and installing a poster that contains the assembly order of the air cylinder products. After these methods are implemented, the sigma level and the DPMO value are 3,338 and 33.000, respectively, indicating a positive quality improvement of the air cylinder products.

Keywords: *Quality; Six Sigma; DMAIC (Define, Measure, Analyze, Improve, Control), Human Reliability Assessment; Human Error Assessment and Reliability Technique (HEART).*

INTRODUCTION

In production, quality is one of the aspects used to evaluate the feasibility of the product. The object that is focused on in this study is the Air Cylinder. An Air Cylinder is a component that uses the power of compressed air to generate power in a linear reciprocating motion of the piston. From the data owned by Company X, there are defects in the Air Cylinder production which can be caused by several things, such as engine conditions, worker conditions, and environmental conditions. This study focuses on analyzing the causes of defects in the production of Air Cylinders at Company X and providing suggestions for improvements to the production process. This research is using the Six Sigma method. In the analyze step, further analysis will be carried out using other methods based on the most influential causes of defects. The objectives of this research are as follows:

a. Identify and measure the level of defects from the Air Cylinder Company X production process at the define and measure stages of the Six Sigma method.
b. Analyze the causes of defects in the production process of Air Cylinder Company X at the Analyze stage of the Six Sigma method.
c. Evaluate the probability of a human error occurring throughout the completion of a given task
d. Designing improvements to Company X for Air Cylinder production activities to minimize production defects.
e.

MANUSCRIPT CONTENT

Literature Review

• Quality Characteristics

Quality characteristics are determining elements the desired level of quality of a product or service. Characteristics Product quality is divided into several, namely structural includes elements such as section length, can weight or liquid viscosity. Sensory characteristics include food taste, aroma, appearance and others. Time-oriented characteristics such as fulfillment time purchase orders, product quality guarantees reach the customer's hands are some examples of suit quality characteristics (Fitriana *et.al*.,2021)

• Six Sigma

Six Sigma is an approach for taking the variability reduction and process improvement philosophy of Six Sigma upstream from manufacturing or production into the design process, where new products (or services or service processes) are designed and developed. The focus of Six Sigma is reducing variability in key product quality characteristics to the level at which failure or defects are extremely unlikely. The goal of Six Sigma, a 3.4 ppm defect level, may seem artificially or arbitrarily high, but it is easy to demonstrate that even the delivery of relatively simple products or services at high levels of quality can lead to the need for Six Sigma thinking (Montgomery, 2020)

• DMAIC

DMAIC is a structured problem-solving procedure widely used in quality and process improvement, often associated with Six Sigma activities. Almost all implementations of Six

Sigma use the DMAIC process for project management and completion. The letters DMAIC form an acronym for the five steps; Define, Measure, Analyze, Improve, and Control. The DMAIC structure encourages creative thinking about the problem and its solution within the definition of the original product, process, or service (Montgomery, 2020)

- Human Reliability Assessment

Human reliability assessment (HRA) involves the use of qualitative and quantitative methods to assess human contribution to risk. There are many and varied methods available for HRA, with some high-hazard industries developing ‘bespoke’, industry-focused methods (Bell, J., Holroyd J., 2009)

- HEART Method

The HRA method that is being used in this research is HEART (Human Error Assessment and Reduction Technique). Human Reliability Assessment done with the HEART method is a technique aiming to evaluate the possibility of human error that occurs during completing a certain task, with the basis that each time a task is completed, there is a chance of failure that is being influenced by one or more EPC (Error Producing Condition) such as fatigue, unstable workplace, etc. These factors that have a significant influence on performance are graded with the highest HEP value (Hasibuan,*et.al*.,2020)

Research Methodology

This research methodology serves to explain in detail how the research is done. The first stage of this research is to decide the place of research, and the object of research, collect data, and perform data analysis. The place used in this study is the place for the production of pneumatic engine spare parts focused on the object of Air Cylinders. Data collection was interviews and observation.

After data collection, the research is continued with preliminary studies, problem identification, literature study, determining research objectives, collecting data needed for calculations and analysis, data processing, data analysis, and conclusions and suggestions.

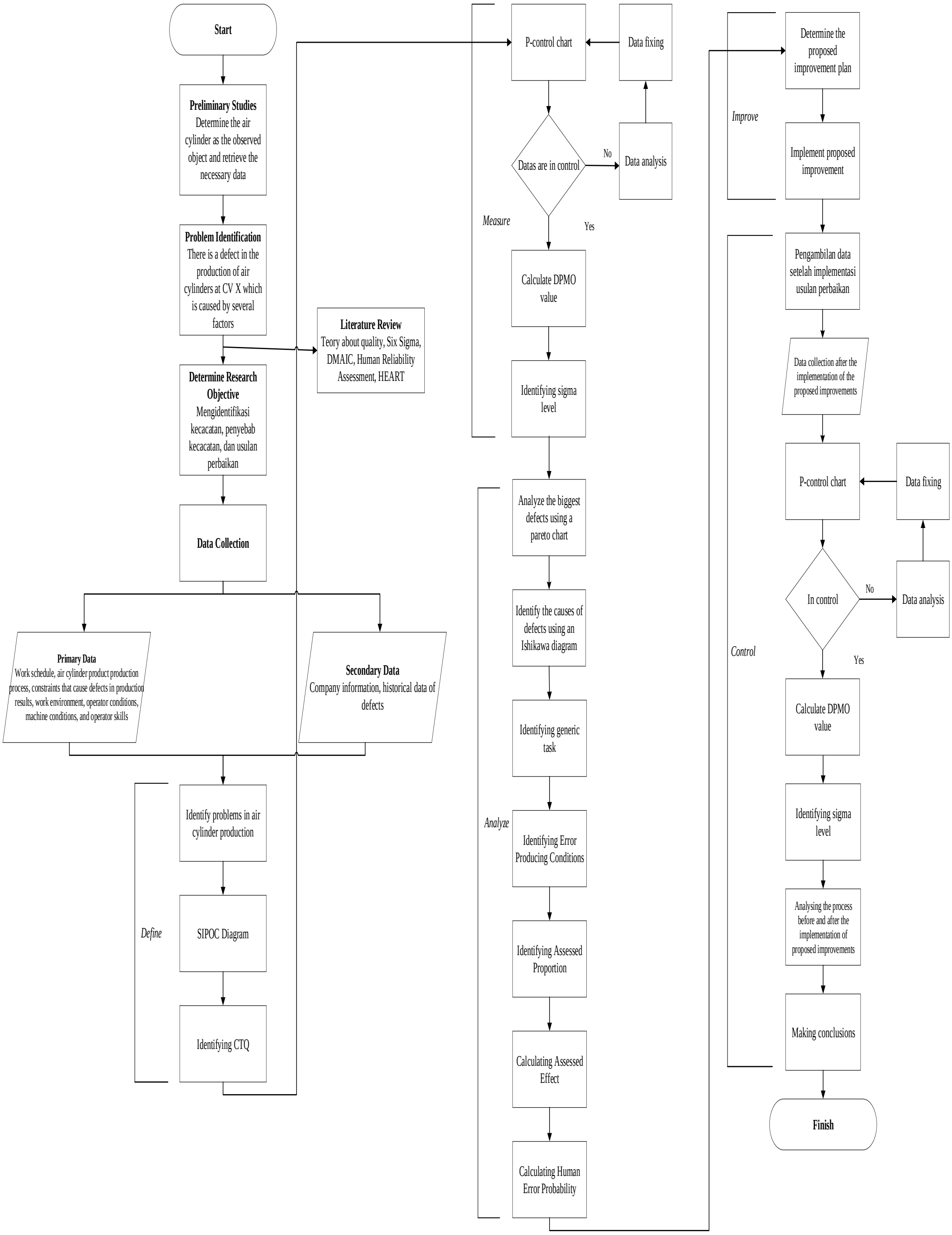

Figure 1 Research Methodology Flowchart

Previous Research

Table 1. Previous Research

No.	Year	Researcher	Research problem and result	Method
1	2020	C. F. Hasibuan, P. Yudi Daeng, and R. R. Hasibuan	In boiling station at palm oil production, the biggest potentials of human error are the age of the operator, education, discipline, and skill. (Hasibuan *et al., 2020)*	HEART Method
2	2017	D. M. Safitri, A. R. Astriaty, and N. C. Rizani	Shroud station at plastic component production, the biggest potential of human error is operator does not insert the shroud carefully(Safitri *et al.*, 2017)	HEART Method
3	2020	J. Saragih, R. Fitriana, and T. Andriyan	Body 2-1 automotive part, the sigma level is increasing from 3,57 to 3,59(Saragih et al., 2020)	Six Sigma methodology through the stages of DMAIC
4	2022	D. Sutjipto, R. Fitriana, and I. P. Sari	Speaker net production, the sigma level is increasing from 3,57 to 3,67(Sutjipto et al., 2022)	Six Sigma method with DMAIC
5	2019	J. P. Costa, I. S. Lopes, and J. P. Brito	Automatic pin insertion process, the number of defective units was reduced from 3231 PPM to 312 PPM, and the increase in sigma level from 4.22 to 4.92(Costa et al., 2019)	Six Sigma
6	2021	V. A. Muzaki and W. Prastiwinarti	Corrugated carton box, the sigma level of the production is 4,13 and the biggest human error probability is 38,6% in the wetting water control process(Muzaki & Prastiwinarti, 2021)	Six Sigma and HEART methods
7	2015	S. Indrawati and M. Ridwansyah	Iron ore production, the production of drying iron ore is not optimal due to production efficiency only at the level of 52% and the sigma level is 2,96. (Indrawati & Ridwansyah, 2015)	Lean Six Sigma method
8	2018	A . Profita and D. K. Rahayu	Clothing screen printing, The DPMO result is 21,000 and the sigma level is 3,53. (Nurhayati *et. al.*,2022)	Six Sigma DMAIC Method
9	2019	H. Hernadewita, M. Ismail, M. Nurdin, and L. Kusumah	In magazine production, the sigma level is 3,6. (Hernadewita *et al.*, 2019)	Six Sigma method
10	2019	A. C.R and J. J. Thakkar	Telecommunication cabinet door, the sigma level is increasing from 3,47 to 3,67, and decrease in the rework cost. (C.R & Thakkar, 2019)	Six Sigma DMAIC methodology
11	2019	N. Yadav, K. Mathiyazhagan,	Car windshield, the defect decreased from 16000 pcs to 2295 pcs (Yadav et al., 2019	Six Sigma method

		and K. Kumar		
12	2020	S. V. Patil, K. Balakrishna Rao, and G. Nayak	Recycled aggregate, 12 defects found, and several improvements are proposed. (Patil et al., 2020)	Six Sigma DMAIC Methodology
13	2020	Fitriana,R., Saragih,J., Larasati D.P.	Quality improvement of the bottle by six sigma, FMEA and Decision tree. Sigma level is 2,17 and the highest RPN 336 (Fitriana et.al.,2020)	Six Sigma, FMEA, Decison Tree
14	2022	B. Bakhtiar, S. Syukriah, and M. Iqbal	Tires refinishing, the biggest potential for human error is the absence of a procedure for correcting errors and inexperienced operators. (Bakhtiar et al., 2022)	Sherpa and HEART Methods
15	2018	L. P. Bowo and M. Furusho	Reducing marine accidents, the main causes of grounding accidents are the failure of a seafarer to maintain a proper look-out while sailing, and this is followed by the failure to decide on a course alteration. (Bowo & Furusho, 2018)	HEART Method
16	2015	S. Singh and R. Kumar	Railway sector, the biggest potentials for error are time pressure, the ability to detect and perceive problems, the existence of overriding information, the need to make absolute decisions, and a mismatch between the operator and the designer's model. (Singh & Kumar, 2015)	HEART Method

1.5 RESULTS AND DISCUSSION

3.1 Production Process

Company X runs its production process based on customer requests or make-to-order. Therefore, the number of Air Cylinders produced every day is different. Sometimes Air Cylinder production is also waiting for the availability of raw materials. In one product, the Air Cylinder consists of several parts: rod, piston, barrel, piston covers, and tie rod. The steps in the Air Cylinder production process are as follows: cutting, turning, grinding, drilling, assembly, and coloring. There are 5 parts that produced in Company X. Each part has its own function.

Table 2. Produced Parts

Part Name	Picture	Part Name	Picture
Rod		Piston Cover	

Barrel		Tie Rod	
Piston		Air Cylinder (Finished Good)	

3.2 DMAIC Stage

In this study, the Six Sigma method was used with the DMAIC (Define, Measure, Analyze, Improve, Control) stages. At each stage of DMAIC, different tools are used.

a. Define

The define stage aims to identify problems that will occur in the company.

- Total of Defective

The following is data on defects in Air Cylinder production results in June-August 2022 obtained from historical data (total production = 216 units of Air Cylinder).

Table 3. Number of Defective

Month	Defect				Total
	Chipped Part	Unstable Pneumatic System	Leaked Product	Scratched Part	
May	0	2	1	2	5
June	2	3	2	4	11
July	1	3	5	6	15
August	2	4	1	2	9

From the data above, can be concluded that the percetange of defect is 18%

- SIPOC Diagram

The SIPOC (Supplier-Input-Process-Output-Customer) diagram functions as one of the tools used to describe the process from start to finish and serves to identify relevant elements in process improvement.

Table 4. SIPOC Diagram

Supplier	Input	Process	Output	Customer
Raw material storage	Material	Taking raw material	Material	Circular saw machine
Circular saw machine	Material	Cutting	Cut material	Turning machine
Turning machine	Cut material	Turning	Turned part	Drilling machine
Drilling machine	Turned material	Drilling	Drilled part	Grinding machine
Grinding machine	Drilled part	Grinding	Ground part	Assembly area
Assembly area	Ground part	Assembly	Air Cylinder	Testing area
Testing area	Air Cylinder	Testing	Passed inspection product	Coloring area
Coloring area	Passed inspection product	Coloring	Colored product	Packing area

Packing area	Colored product	Packing	Packed product	Storing area
Storing area	Packed product	Storing	Ready to ship the product	Company X administration

- Critical to Quality (CTQ)

Critical to Quality (CTQ) is used to identify the quality of Air Cylinder products to meet customer standards. Following are the identified CTQs for Air Cylinder products:

a. Scratched part: caused by the careless placement of parts, so that they are exposed to waste from aluminum and stainless steel raw materials. Scratched parts can also be caused by human errors in the machining process.
b. Chipped part: caused by storage of raw materials that are too stacked to one another, human errors in the turning and drilling process, and carelessness placement of finished product.
c. Leaked product: caused by a mismatch in the size of the piston and tube. The tolerance of the size of the piston diameter with the tube is 0.2-0.3mm. This defect causes the air that is exhaled on the Air Cylinder product to leak out and cause the pneumatic system to not work.
d. Unstable pneumatic system: caused by the use of material that has been stored for too long, so the material causes excessive friction against other parts.

- Quality Plan

In general, before production is carried out, the company needs to determine the standards that will be used in the production line from start to finish. Therefore, a quality plan was made that contained the standards for each Air Cylinder production step at Company X.

b. Measure

The measuring stage aims to validate the problem by measuring or analyzing the existing data. At this stage, the calculation of the P control chart, DPMO value, and identifying the sigma value is carried out.

- P Control Chart

The P-control chart is used to measure the proportion of defects that exist in the production process. The P control chart can be used for observations with different numbers of data samples.

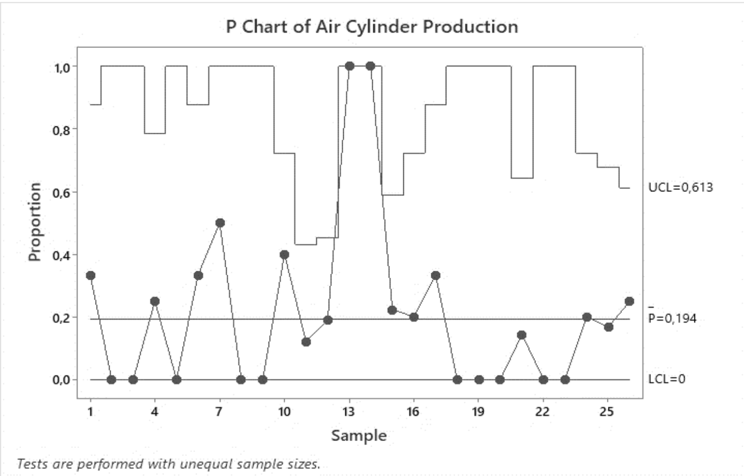

Figure 2 P Chart of Air Cylinder Production

MINITAB is used to help validate P control chart calculations. In the figure above, the red line is the UCL value from data that varies with an average of 1, while the red line at the bottom is an LCL value of 0 because the LCL calculation results are a negative number.

There is also a green line in the middle which indicates a CL value of 0.205. There is no out-of-control data shown on the chart.

- Calculation of DPMO and Sigma Level
  a. DPU (*Defects per Unit*) = $\frac{Defects}{Unit}$ = $\frac{40}{216}$ = 0,185
  b. DPO (*Defects per Opportunity*) = $\frac{DPU}{CTQ}$ = $\frac{5,4}{4}$ = 0,046
  c. DPMO (*Defects per Million Opportunities*) = DPO x 1.000.000 = 0,046 x 1.000.000 = 46.000
  d. Sigma Level = normsinv ((1.000.000-DPMO) / (1.000.000))+1.5 = normsinv ((1.000.000 - 46.000) / (1.000.000)) +1.5 = 3,185

c. Analyze

The analyze stage aims to find the causal factors of the problems that occur. In the analyze phase, the Pareto diagram is being used to identify the biggest defects, the Ishikawa diagram is being used to analyze the causes of defects from various factors, and the HEART method to evaluate the possibility of human error occurring in the Air Cylinder production process.

- Pareto Chart

A Pareto chart is a chart that shows problems based on the order of the number of times the events occur. The Pareto chart sorts the problems from largest to smallest. The Pareto chart uses the 80:20 principle, that is, 80% of defects are caused by 20% of the defect causes. The following is a Pareto chart of the production results of Air Cylinder Company X based on existing defects.

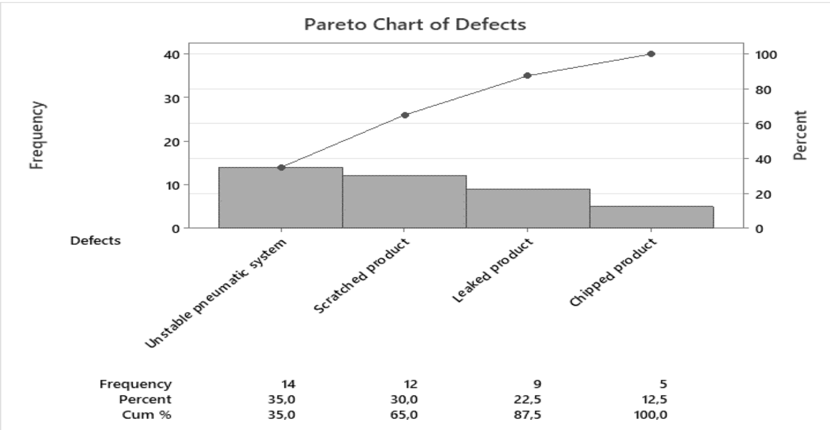

Figure 3 Pareto Chart of Defects

From the Pareto diagram above, it can be seen that there are 4 types of defects, namely unstable pneumatic systems, scratched products, leaked products, and chipped products. From a frequency of 40 defects, 14 scratched parts, 12 unstable pneumatic systems, 9 leaked products, and 5 chipped parts. Based on Pareto principle 80% of the effects come from 20% of the causes, the chipped parts is not analyze to the next step.

- Ishikawa Diagram

Ishikawa diagram is being used to identify the root cause of a problem, in this case, the cause of defects in the production of Air Cylinders. In an Ishikawa diagram, there are 3 parts, the head, branch, and sub-branch. The head shows the existing problems, the branch shows the main causes of the problem, and the sub-branch shows the root cause of the main problem.

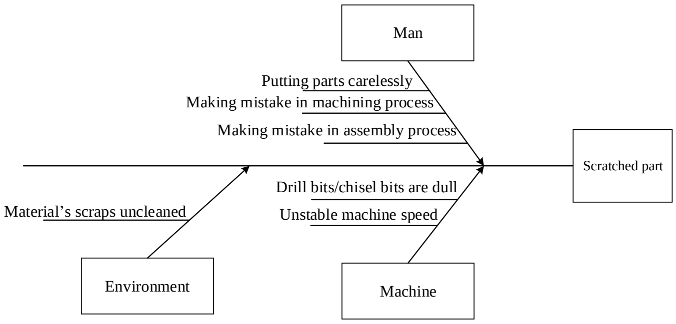

Figure 4 Ishikawa Diagram of Scratched Part

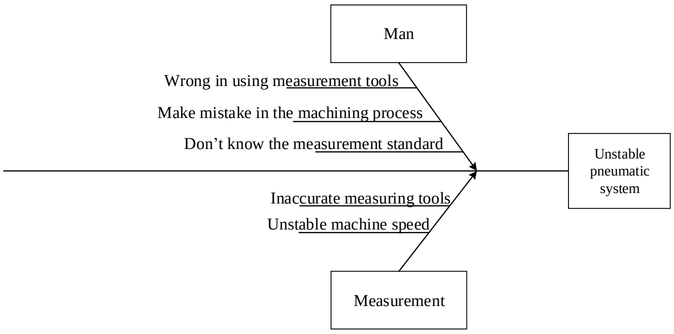

Figure 5 Ishikawa Diagram of Unstable Pneumatic System

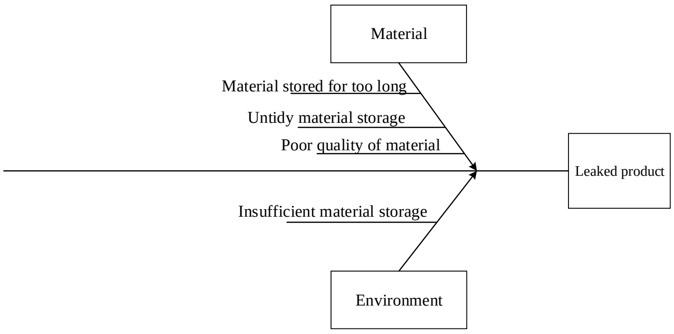

Figure 6 Ishikawa Diagram of Leaked Product

From the ishikawa diagrams above, can be seen that the defects are caused by man, material, machine, environment, and measurement factors.

- Human Error Analysis Using HEART Method

Human Error Assessment and Reduction Technique (HEART) is a method being used to evaluate the probability of a human error occurring throughout the completion of a given task. In Air Cylinder production at Company X, most of the defects are caused by the human factor. The steps in the HEART method are identifying the generic task, identifying error-producing conditions, identifying assessed proportion, identifying the assessed effect, and calculating human error probability.

Table 5. Human Error Identification in Air Cylinder Production

Tasks	Possible Error	Effect
Material taking	Not checking the size of the materials	The size of the raw material does not match the part that will be processed
	Not checking the quality of the materials	Raw materials break during the machining
	Not checking scratches/chips in the materials	The product leaked when testing
Material measurement	Misread the size of the product ordered	The part will not fit when assembled with other parts
	Using the wrong measuring tools	Incorrectly marked size on the raw material
	Incorrectly marking the size of the material	The part being machined will be the wrong size
Material cutting	Cutting material too short	The material should be welded with another material
Part turning	Wrong size of chisel bit	The expected size or pattern does not fit
Part drilling	Wrong size of drill bit	Wrong drill hole size
Part grinding	The grinding process takes too long	Too many eroded parts and there are scratches
Product assembly	Assembly in the wrong order	Some parts were not installed
	There is a connecting part that is not installed	Leaked product
Product testing	Not testing the whole product	The air cylinder can not move
	Not using lubricant	Unstable speed of air cylinder
	Air pressure is not up to standard	Unstable speed of air cylinder
Product coloring	Wrong part coloring	Not match the customer's order
	The coloring is too thick	Color clumps and melts easily
	The coloring is too light	The color fades when the product is dry

After identifying operator failures in the Air Cylinder production process, each task is first identified into a Generic Task Type. Each Generic Task Type has its Human Unreliability value. After that, the value of Error Producing Conditions is identified which is the cause of the failure caused by workers. Then, the value of the Assessed Proportion is identified which is the proportion of the value of the relationship between EPC and HEP. In addition to the relationship between the EPC and the HEP, the Assessed Proportion is determined based on the frequency and influence of other EPCs. After these three values are identified, the next step is to calculate the Assessed Effect value with the following formula:

$AE = [p_i(f_i - 1)+1)]$

p_i = Assessed Proportion value

f_i = Error Producing Conditions value

Human Error Probability can be calculated after getting the Assessed Effect value for each task. The HEP value is obtained by multiplying the GTT (Human Unreliability) value with the Assessed Effect. The following is a recapitulation of the results of the Human Error Probability calculation.

Table 6. Recapitulation of Human Error Probability Calculation

Tasks	Possible Error	GTT	EPC	AP	AE	HEP
Material taking	Not checking the size of the materials	0,09	1,2	0,4	1,08	0,0972
	Not checking the quality of the materials	0,02	1,2	0,4	1,08	0,0216
	Not checking scratches/chips in the materials	0,02	1,2	0,4	1,08	0,0216
Material measurement	Misread the size of the product ordered	0,09	1,2	0,4	1,08	0,0972
	Using the wrong measuring tools	0,09	1,2	0,4	1,08	0,0972
	Incorrectly marking the size of the material	0,09	1,2	0,4	1,08	0,0972

Material cutting	Cutting material too short	0,02	1,4	0,4	1,16	0,0232
	The material was accidentally struck by a machine in a place that was not supposed to	0,09	3	0,4	1,8	0,162
Part turning	Wrong size of chisel bit	0,16	3	0,7	2,4	0,384
Part drilling	Wrong size of drill bit	0,16	3	0,7	2,4	0,384
Part grinding	The grinding process takes too long	0,02	3	0,4	1,8	0,036
Product assembly	Assembly in the wrong order	0,16	3	0,4	1,8	0,288
	There is a connecting part that is not installed	0,16	3	0,4	1,8	0,288
Product testing	Not testing the whole product	0,09	3	0,7	2,4	0,216
	Not using lubricant	0,02	1,2	0,7	1,14	0,0228
	Air pressure is not up to standard	0,09	3	0,7	2,4	0,216
Product coloring	Wrong part coloring	0,09	3	0,7	2,4	0,216
	The coloring is too thick	0,09	1,6	0,4	1,24	0,1116
	The coloring is too light	0,09	1,6	0,4	1,24	0,1116

It can be seen from the calculation table above, that the largest value of Human Error Probability is the operator using the wrong chisel bit with HEP value of 0,384, the operator using the wrong drill bit with HEP value of 0,384, the operator assembly of the product in the wrong order with HEP value of 0,288, and there are connecting part that not installed with HEP value of 0,288. So, the improvement will be focused on these failures.

d. Improve

This stage aims to provide input and suggestions for improvements to the company regarding product defects that occur in the company. This is done so that the company can suppress or minimize the level of defects by the objectives and benefits of the research to be achieved. In the analysis using the HEART method, The failure that is most likely to occur due to human error with the HEP value 0,384 operator using the wrong chisel bit, the operator using the wrong drill bit, the operator assembly the product in the wrong order, and there are connecting part that not installed. The cause of the failure operator using the wrong chisel bit or drill bit is the irregularity of the storage space of the bits. So, the proposed improvement that will be made for this failure is to propose the use of a storage place for chisels and drill bits to make it easier for the operator to take them according to the correct size.

Figure 7 Drill Bit Storage

Drill bit storage specification:

- Material: Plastic
- Size: 220x200x70mm
- Price: ±Rp150.000
- Holes: 1-10mm(Difference 0.1mm)

Besides that, in the HEART method, the second biggest possibility of failure is the assembly is not in the order and there are connecting parts that are not installed with the HEP value

0,288. Therefore, the proposed improvement is to make a cylinder product assembly sequence as a guide for the operators.

AIR CYLINDER ASSEMBLY ORDER	
	
Made by:	Approved By:
Erlina Elyshia	Head of Operator

Figure 8 Assembly Order of Air Cylinder

e. Control

In this stage ensure that the proposed improvements given in the improve stage are carried out. It is intended that process performance increases and the expected research objectives are achieved. At this stage, the results of the process before and after the implementation of the proposed improvements can also be compared.

Figure 9 Usage of Drill Bit Storage

Irregular drill bit storage causes the operator to take the wrong drill bit size to be used for the machining process, causing the wrong hole size. This causes during the assembly and testing process, the wind will come out of the Air Cylinder. The purpose of using a drill bit storage area is to keep the drill bits neatly arranged to make it easier for the operator to retrieve them in the correct order. This is so that the size of the hole produced in the machining process is precise.

Table 7. Number of Defective After Improvements Implementation

January		
Date	Production	Defective
2	4	1
3	2	0
4	1	0
6	4	0
9	2	0
11	10	2
12	2	0
13	1	0
14	3	1
15	5	1
16	15	2
17	1	0
18	2	0
19	1	0
Total	53	7

It can be seen after the implementation, the defects have been reduced. This is because the operator has implemented a good and correct assembly sequence so that friction is reduced which results in a stable pneumatic system.

Calculation of DPMO and Sigma Level after implementation

a. DPU (*Defects per Unit*) = $\frac{Defects}{Unit}$ = $\frac{7}{53}$ = 0,132
b. DPO (*Defects per Opportunity*) = $\frac{DPU}{CTQ}$ = $\frac{0{,}132}{4}$ = 0,033
c. DPMO (*Defects per Million Opportunities*) = DPO x 1.000.000 = 0,033 x 1.000.000 = 33.000
d. Sigma Level normsinv ((1.000.000-DPMO) / (1.000.000))+1.5 = normsinv ((1.000.000 - 33.000) / (1.000.000)) +1.5 = 3,338

The DPMO result after the implementation of the improvements was 33,000, which was less than before the implementation, which was 46,000. The sigma value after the implementation of the improvements was 3.338, greater than before the implementation, which was 3.185. This shows that the implementation of improvements can reduce the number of defects and increase the sigma value.

CONCLUSION

Defects in the production of Air Cylinder at Company X consist of scratched parts, chipped parts, leaked products, and unstable pneumatic systems with a DPMO value of 46,000 and a sigma level of 3,185. The causes of defects in the production of Air Cylinder Company X are man, machine, material, environment, and measurement factors with the most causes of defects being man factors, so further analysis is carried out using the HEART method. The largest Human Error Probability values that have been analyzed by operators for Air Cylinder production at Company X are 0.384 and 0.288. The HEP value of 0.384 is for the possibility of failure using the wrong chisel and the wrong drill bit. The HEP value of 0.288 is for the possibility of failure to assemble in the wrong order and there are connecting parts that are not installed. Proposed improvements to Company X in Air Cylinder production activities to minimize production defects are to make a quality plan for the entire production, propose a place to store drill bits and chisel bits, and make a printout containing the product assembly order for operators. After implementation, the DPMO value is 33.000, and the sigma level is 3,338. The Six Sigma method using DMAIC stages is proven to be able to reduce defects in production as evidenced by the calculation of DPMO value (from 46.000 to 33.000) and sigma level (from 3,185 to 3,338). The HEART method can be used to analyze the biggest causes of human error so that appropriate improvement proposals can be designed and implemented for the company.

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CHAPTER 9

Enhancement of Accounting Understanding for SMEs in the West Jakarta Region

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ABSTRACT

The development of Small Medium Enterprise may be recognized through numbers, such as the financial aspect, only a few SMEs have excelled in terms of performance. The low level of consciousness of Small Medium Enterprise players of the importance of accounting contributes to slow growth of small medium enterprise. With regard the case of cooperatives in Indonesia, the Satu Hati Waste Bank Cooperative still desperately needs competency improvement in financial management, particularly with regard to accounting records. The One Heart Waste Bank Cooperative is a developing cooperative that requires good accounting records in line with the increase in cooperative business. The purpose of this study is to investigate the enhancement of the understanding of the management of the Satu Hati Waste Bank Cooperative regarding cooperative accounting records which are very necessary in managing cooperative businesses, especially cooperative financial management. At the end of the program period, it was obtained that the two target SMEs were able to carry out financial administration in accordance with simple accounting principles, so that the program objectives were 85% achieved.

Background/Problems: Indonesian Economy is dominant by SMES. SMES are the backbone for economic development and economic growth even in the most difficult times like pandemic.
Objective(s): The purpose of this study aims to determine the level of understanding of SMES in managing their financial situation and reporting properly to the investors. The method used is a case study conducted at Satu Hati Waste Bank Cooperative.
Results and Discussion The results show that prospective SMES have increased their managerial and financial skills by preparing annual report properly.
Conclusions: It is necessary to support SMEs as they are backbone of local economy development in West Jakarta.

Keywords: *Financial Management, Accounting, SMEs*

INTRODUCTION

In the vibrant economic landscape of Indonesia, Small and Medium Enterprises (SMEs) emerge as pivotal contributors, playing a crucial role in the nation's economic development. Defined by their relatively modest scale and scope, SMEs in Indonesia encapsulate a diverse array of businesses spanning various industries. These enterprises form the backbone of the country's economy, driving innovation, fostering employment, and bolstering local communities. As Indonesia continues to evolve as a major player in the global economic arena, understanding the dynamics, challenges, and opportunities inherent in its SME sector becomes imperative for policymakers, researchers, and industry stakeholders alike.

The SME sector in Indonesia exhibits a dynamic and resilient character, with countless entrepreneurs navigating a myriad of challenges to establish and sustain their businesses. These enterprises often serve as incubators for innovation, fostering a spirit of entrepreneurship that contributes significantly to economic growth. Against the backdrop of Indonesia's rich cultural tapestry and diverse economic landscapes, the SME sector reflects the entrepreneurial spirit deeply embedded in the nation's ethos.

This research endeavors to shed light on the nuanced dimensions of SMEs in Indonesia, examining their contributions to the national economy, the challenges they face, and the strategies they employ to navigate a rapidly changing business environment. Through a comprehensive exploration of the SME landscape in Indonesia, this study seeks to provide valuable insights that can inform policy decisions and support the sustainable growth of this vital sector. Nevertheless, the critical issues in SMEs are their ability to manage their business operations through accounting system. Many of SMEs are unable to record their business transactions properly.

The purpose of this study is to investigate the enhancement of the understanding of the management of the Satu Hati Waste Bank Cooperative regarding cooperative accounting records which are very necessary in managing cooperative businesses, especially cooperative financial management.

SWOT ANALYSIS

It is important to understand the strength, weaknesses and opportunity and threat the Small Medium Enterprise in Indonesia. SMEs are the backbone of Indonesian economy in the last 10 years.

SMEs Indonesia have strengths in term of diverse economic contributions, cultural and local expertise, innovation and flexibility. According to Indonesia Ministry of Cooperatives and SMEs (2022), SMEs in Indonesia contribute significantly to the country's GDP (61%), providing employment opportunities (97%) and contributing to economic diversification. In addition to that, it is also highlighted by Indonesian Chamber of Commerce and Industry that SMEs leverage local knowledge and cultural insights, allowing them to cater to specific market needs and preferences. In global trend, SMEs often display a high degree of innovation and adaptability, responding swiftly to market changes and technological advancements based on World Bank analysis for emerging economies.

At the same time, there are several weaknesses of SMEs that we cannot ignore such as limited access to finance, skill gaps, and infrastructure constraints. Asian Development Bank posits that SMEs in Indonesia face challenges in accessing finance, hindering their growth potential. For instance, banks will not provide credit to SMEs if they have no financial record and bookkeeping for at least 3 years consecutively. Second, Some SMEs struggle with a shortage of skilled labor, affecting their ability to compete and innovate based on International Labor Organization reports. Last, Inadequate infrastructure, especially in rural areas, poses challenges for SMEs in terms of logistics and connectivity especially between Indonesia's small islands.

Yet, SMEs should be able to take some opportunity in the era of 5.0 such as digital transformation, government support, and global market expansion. Embracing digital technologies presents an opportunity for SMEs to reach a broader market and enhance operational efficiency (McKinsey & company, 2016). External parties such as regulators also endeavor to support SMEs through policies, incentives, and capacity-building programs through National-Medium Term Development Plan issued by Ministry of Finance Republic of Indonesia. And, there is likely that some SMEs are able to do global market expansion.

SMEs are able to survive in long term only by managing the threat properly. There are three types of threats for SMEs: economic uncertainty, regulatory challenges, and competition from large corporations. External economic factors, both domestic and global, can pose threats to the stability and growth of SMEs especially if they have transaction overseas by buying raw materials or even foreign debt. Second, navigating complex regulations and compliance requirements may present challenges for SMEs, particularly those in highly regulated industries. At the same time, intense competition from larger corporations may pose challenges for SMEs, requiring strategic differentiation and innovation (Ernst & Young, 2022).

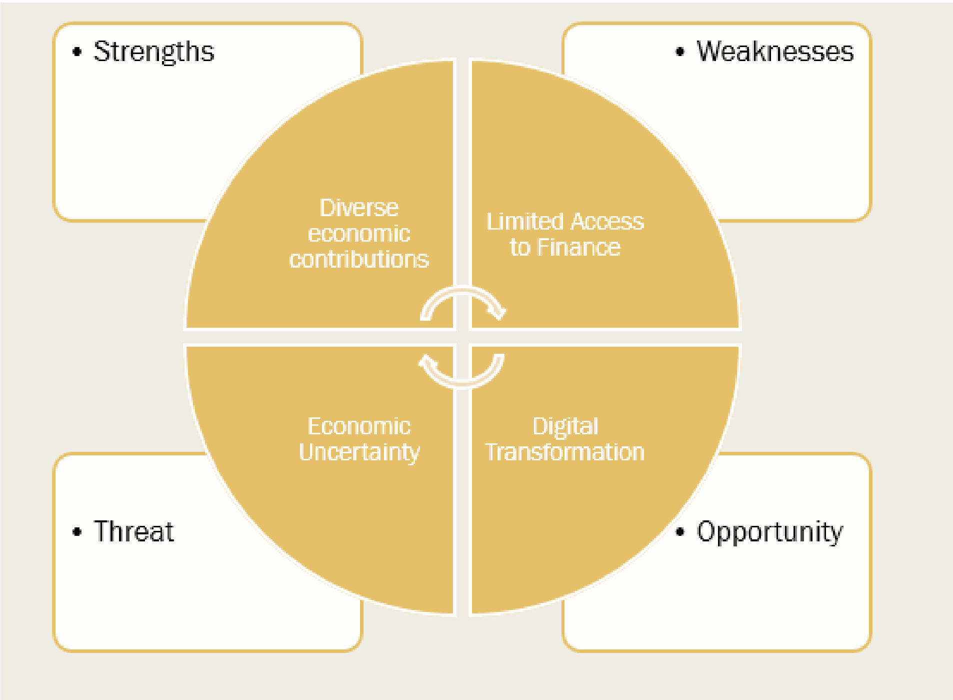

Figure 1. SWOT analysis of Indonesia SMEs

Literature Review

Accounting practices are fundamental to the financial health and sustainability of Small and Medium Enterprises (SMEs). In the context of Indonesia, where SMEs form a significant part of the economic landscape, the need for effective accounting training becomes paramount. Proper accounting procedures not only enhance financial transparency but also empower SMEs to make informed business decisions. It is important to synthesise recent study about SMEs in Indonesia for both qualitative and quantitative methods.

Given the literature with keywords of accounting training and SMEs, first, we focus on qualitative methods in the last three years to provide recent updates. In general, there are attempts to improve our SMEs through accounting training in several cities such as Pekanbaru and Pekalongan. Others are focusing on workshop and consulting. Interestingly, two papers are focusing on food and beverages SMEs.

Table 1
List of National Publication about Accounting Training for SMEs

Authors	Location	Competency	Subject	Method
Astuty (2021)	Yogyakarta	Accounting	Two SMEs	Workshop & Consulting
Herawaty & Andrian (2021)	Bekasi	Accounting	SMEs community	Online Training
Dewi & Trisnadewi (2023)	Bali	Accounting	30 SMEs	Workshop & consulting
Munir et al. (2023)	Pekanbaru	Accounting	Food & Beverages SMEs	Training
Azizah et al. (2023)	Pekalongan	Accounting	Food & Beverages SMEs	Training

Next, we focus on quantitative methods. Quantitative methods are dominated by using multivariate regression for investigating SMEs. Only Prihastiwi & Sholihin (2018) applies logistic regression. There are different perspectives on empirical evidence on accounting and SMEs. Ovami et al. (2023) focuses on the behavioural of SMEs in applying financial accounting while Purnamasari et al. (2023) focuses on SMEs culture and accounting knowledge that may affect the usage of accounting information. In contrast, Prihastiwi and Sholihin (2018) focuses on management accounting practices in SMEs.

Table 2
Summary of empirical papers presented in chronological order, on SMEs

Authors	Sample	Period	Country	Main Findings
Ovami et al. (2023)	135 respondents	2023	Indonesia	Regarding the behavior of SMES, performance expectations have a relationship with implementation of financial accounting in SMEs.
Prihastiwi & Sholihin (2018)	124 respondents	2017	Indonesia	The qualification of internal accounting staff enhance the management accounting practices in SMEs.
Purnamasari et al. (2023)	86 respondents	2023	Indonesia	SMEs culture and accounting knowledge have significant relationship with accounting information usage

1.4 METHOD AND DATA

To achieve the research objectives, there are several steps that have been done. First, our research team asked data of our potential respondents to the board of SMEs (*Dewan UMKM Indonesia Terpadu)* in West Jakarta. Next, we did some observations by having visitation. Third, we had coordination with the board of SMEs. Then, we delivered online training on 9th April 2023. Next, we evaluated our training by distributing pre-test and post-test. After the training, we had assistance to the board of SMEs.

Table 3
Stage of Case Study

No	Stage	Description
1	Respondent Data	Summarize the needs of SMEs managers regarding accounting records
2	Observation	Having visitation
3	Coordinate with Partner of SMEs	Plan training activities with Partner of SMEs
4	Provide Training	Deliver online training
5	Evaluate Training	Conduct pre and post-test training
6	Do Assistance	Ensure that Partner of SMEs are well-equipped with the materials of training

Outcome of the Training

There are significant improvement of accounting understanding by SMEs. During pre-test, participants are able to answer correctly 55% while after training 85% participants are able to answer correctly. The participants are dominated by male members of *Dewan UMKM Indonesia Terpadu* while female members are 20% of the board of SMEs. In light of these findings, it is imperative for stakeholders, including government bodies, industry associations, and educational institutions, to collaborate on designing comprehensive and accessible accounting training programs tailored to the unique needs of Indonesian SMEs. By addressing awareness gaps, the collective effort can contribute to the long-term sustainability and growth of SMEs in Indonesia.

Figure 2. The Chairman of Board SMES
Dewan UMKM Indonesia Terpadu

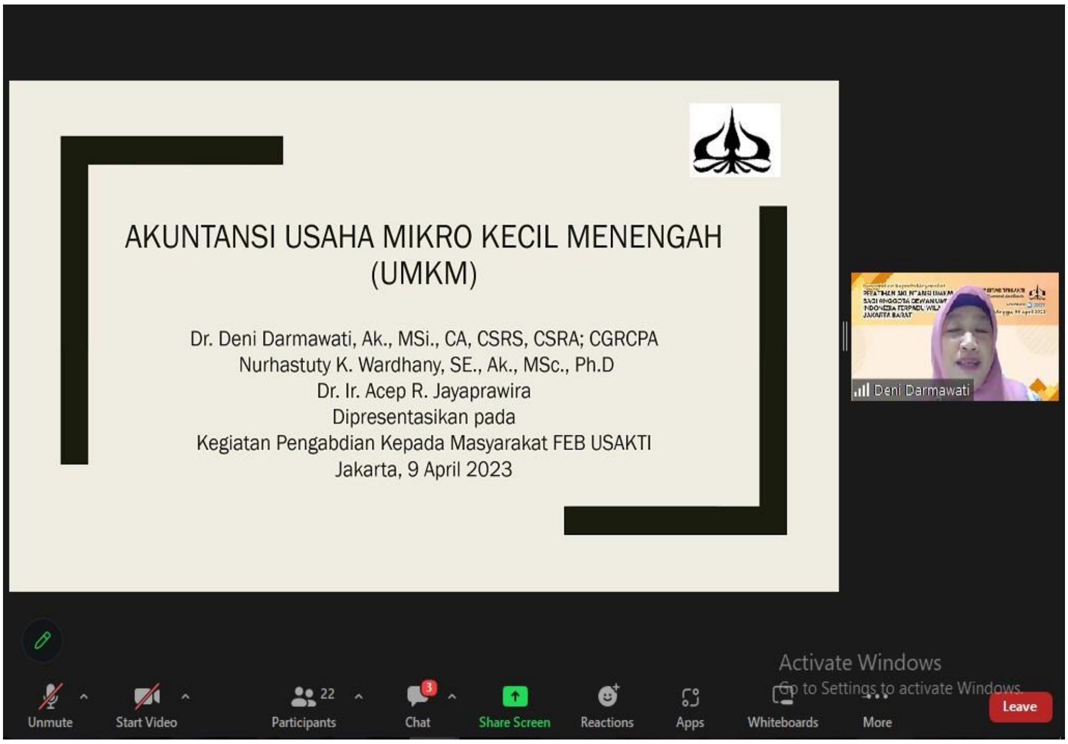

Figure 3. Deliver online training by team of research

CONCLUSION

The targets of this study are exploring the accounting understanding of members of the Integrated Indonesian SMEs Council in West Jakarta. In line with the increasing scale of SMEs businesses, there are needs of clearer and more complete accounting. Accounting records are in accordance with SMEs accounting standards required by internal and external parties such as members of the Integrated Indonesian SME Council and SME business actors. In conclusion, the investigation into accounting training within Indonesian Small and Medium Enterprises (SMEs) reveals several crucial observations and implications. In particular, the study aimed to assess the impact of accounting training on the financial management and overall performance of SMEs in Indonesia. Therefore, members of the Integrated Indonesian SME Council need to increase their understanding of MSME accounting so that it can be applied to the SME business. The findings also underscore the need for targeted initiatives to raise awareness among SME owners and managers regarding the benefits of proper accounting for sustainable business growth.

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CHAPTER 10

The Influence of Intellectual Capital on Performance Indonesian Food and Beverage Sub-Sector Company Finance

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ABSTRACT

The purpose of this study is to investigate the relationship between intellectual capital and financial performance as a proxy for ROA. The theory in this study uses Resource Based View (RBV). Calculation of Intellectual Capital using the VAIC method has 3 components, namely VACA, VAH and STVA. The type of data used is secondary data and the method used is panel data regression with purposive sampling resulting in a total sample of 14 food and beverage companies listed on the Indonesia Stock Exchange (IDX). This research was conducted using the year of observation, namely 2016-2021. Financial report data taken from www.idx.com. Data processing uses the eviews 9 software program. The results show that CEE, SCE and Intellectual Capital (VAICTM) have a positive effect on financial performance with ROA and ROE proxies. While the HCE variable has no effect on financial performance by proxy for ROA and ROE. The contribution of this research is to develop theories, such as the theory of resource based view and to provide input to users of financial reports and practitioners of corporate management in understanding Intellectual capital and its effect on financial performance, so as to increase corporate value and growth for corporate administrators and to assist the process decision making for users of financial statements.

Keywords: *Financial performance, Intellectual Capital, VAIC*

INTRODUCTION

Currently, the world has entered the 4.0 era, which can be seen by the rapid developments in the IT and economic world. In this era, business competition in various sectors continues to increase. Reporting from Detik Finance, there have been at least 3.98 million new companies in Indonesia in the last 10 years (Datik 2017). One sector that has strong competition is the food and beverage sector. The results of the KPPU survey found that the economic sector with the highest competition was the accommodation and food and beverage provision sector.
Apart from that, the sector producing food and beverages is one of the most mature industries in Indonesia. Every company competes to increase sales of the products they produce. PT Indofood CBP Sukses Makmur Tbk (ICBP) recorded the company's net sales as of the first quarter of 2022 or during the first three months of this year reached IDR 17.18 trillion, Wings Group, and Garuda Food, a subsidiary of the Tudung Group. Some of these companies use The strategy is not only to attract customers through price alone, but they also innovate to produce products that are tailored to have value added to attracting consumer preferences in Indonesia for traditional food that is packaged instantly, such as Mayora instant porridge.
Some of the innovations carried out by companies are knowledge assets , namely one of the intangible assets . One of the intangible assets is intellectual capital owned by the company. If the intellectual resources owned by the company are successfully managed and utilized well, then this can increase added value for the company so that it can influence the company's financial performance. The financial performance of companies that have intellectual capital with high capabilities, skills, competencies and commitment to the company can increase efficiency and productivity which indirectly has an impact on increasing company profits (Puspitosari, 2016). The higher the profit earned, So this shows that the company's financial performance is getting better, because company performance can be measured by measuring company profits (Nawangsari, 2016).
Pulic (1998) developed the Value Added Intellectual Coefficient (VAICTM) to be able to measure a company's intellectual capital . The main component of VAIC can be seen from company resources, namely capital employed efficiency (CEE) can be measured using value added capital employed (VACA), human capital efficiency (HCE) which is measured by value added human capital (VAHU), and structural capital efficiency (SCE) is measured by structural capital value added (STVA).
There are differences in results between previous studies such as the results of Intellectual Capital research between (Mariyantini & Putri, 2018) which states that Intellectual Capital as measured using VAIC has a significant effect on financial performance, whereas according to (Prastuti & Budiasih, 2019) VAIC has no effect on financial performance.This research is the result of replication of previous research using different sectors.
On the basis of previous research and seeing the importance of intellectual capital on the financial performance of food and beverage sector companies which are currently facing quite tight industrial competition, the researcher wants to re-examine the influence of Intellectual Capital on company profitability using ROA, because ROA is an indicator of the company's effectiveness in use the assets it owns to generate profits. Based on the background above, the researcher wants to conduct research on intellectual capital with the title **"The Influence of Intellectual Capital on the Financial Performance of Companies in the Indonesian Food and Beverage Sub Sector"**

Based on the background and problem formulation, this research aims to:

1. Analyze the influence of human capital efficiency on performance company finances
2. Analyze the influence of structural capital efficiency on financial performance company
3. Conduct analysis related to the influence of capital employed efficiency on company financial performance
4. Analyze the influence of intellectual capital (VAICTM) on financial performance company

It is hoped that this research can contribute to companies in explaining the relationship between the influence of intellectual capital on financial performance, especially in food and beverage sector companies. For theoreticians so they can contribute to theory development, such as the resource based view theory

especially in the study of intellectual capital financial accounting and its consequences in reported financial performance. Meanwhile, contributions to Practitioners are expected to be able to provide input to users of financial reports and company management practitioners in understanding intellectual capital and its influence on financial performance, so that it can increase the value and growth of the company and can help the decision-making process for users of financial reports.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Resource Based Theory

Resource Based View Theory or also known as Human Resources Theory. This theory explains the company's resources and the company's ability to manage these resources so that the company can have the ability to compete and have good long-term performance (Febriany, 2019).

The resources owned by the company consist of tangible assets and intangible assets. Intellectual capital is an intangible asset that can be managed by a company. The components of Intellectual Capital are employees or (human capital), physical assets (physical capital) and structural capital. If all intellectual resources owned by the company can be managed and utilized well, this can create added value for the company, thereby influencing the company's financial performance,company growth, as well as market value.

Stakeholder Theory

This theory explains the relationship between management and stakeholders. The stakeholders in question are investors, creditors, government, suppliers, customers and the community. The main aim of stakeholder theory is to assist company management in increasing value creation as a result of the activities carried out and minimizing losses that may arise for stakeholders (Devi et al., 2017).

The concept of Intellectual Capital according to (Ulum, 2015) states that stakeholder theory must be seen from both fields, both from an ethical and managerial perspective. From an ethical perspective, it is hoped that the company will be able to manage the organization optimally so that it can create good added value for the company in order to improve financial performance and have benefits for the interests of all stakeholders. From a managerial perspective, it states that stakeholders have an interest in influencing management in utilizing all the company's potential optimally so that it can create added value for the company and have a positive impact on the company's financial performance.

Intellectual Capital

Intellectual Capital is a collection of intangible assets that reflect the knowledge capabilities of human resources in managing a company to achieve efficient performance. Intellectual Capital is a unique resource because it is a collection of knowledge and information in creating a company's competitive advantage so that it can compete with other competitors and create added value for the company (Fardin Faza & Hidayah, 2017).

Sawarjuwono and Augustine (2003) define intellectual capital as the sum of what is produced by three main elements, namely organizational resource capital, structural capital, customer capital related to knowledge and technology which can provide added value to the company in the form of competitive organizational advantage. There is an explanation of the various components of intellectual capital as follows:

Human Capital Efficiency (HCE)

Human Capital Efficiency is one component of IC owned by the company. HCE is generally used to provide solutions and resolve problems in the best way using the knowledge possessed by people in a company. HCE can increase if the company succeeds in optimally maximizing the knowledge possessed by its employees (Tjiptohadi Sawarjuwono & Agustine Prihatin Kadir, 2003).

Structural Capital Efficiency (SCE)

SCE is a series of processes, organizational structures, and everything that can create optimal intellectual performance. Structural Capital relates to company systems and structures that can help employees achieve more optimal performance, so that overall company performance can increase (Tjiptohadi Sawarjuwono & Agustine Prihatin Kadir, 2003). Such as organizational culture, company operational systems, management philosophy, and structure. organization.

Capital Employed Efficiency (CEE)

CEE is a harmonious company relationship with its partners and management of physical capital that helps create higher value for a company. Good relationships come from relationships with reliable and quality suppliers, customer satisfaction, and relationships with the community and government (Tjiptohadi Sawarjuwono & Agustine Prihatin Kadir, 2003).

From the definition above, it can be concluded that the concept of intellectual capital is company-based resources and knowledge in the form of intangible assets which, if used optimally, can create company to carry out its strategy effectively and efficiently, then this can be used as a factor that influences the company's financial performance.

Value Added Intellectial Capital Coefficient (VAIC^{TM})

VAIC was first discovered by Pulic in 1998. The VAIC method was designed to provide information regarding value creation efficiency on tangible and intangible assets owned by a company. VAIC is a tool for measuring intellectual capital owned by a company which is relatively easy to measure and carry out because it comes from various accounts in the company's financial reports. VAIC consists of the components HCE (Human Capital Efficiency), SCE (Structural Capital Efficiency), CEE (Capital Employed Efficiency) and VAIC (Value Added Intellectual Capital). The VAIC model can help companies in measuring the efficiency of value creation of a company (Pulic 2001, 2002).

Financial performance

Financial performance is defined as determining certain measures that are the basis for a company's successful performance in generating profits. According to (Kurniasari, 2013) the company's financial performance is the work performance in the financial sector that has been achieved and is stated in the company's financial reports. Financial reports are the result of a calculation process that is used as a communication tool to stakeholders as well as a tool for measuring company performance. The financial performance of a company can be assessed using analytical tools and company performance in this research is measured through profitability ratios, namely Return on Assets and Return of Equity.

Return On Assets (ROA)

Return on Assets (ROA) is a ratio that describes management's effectiveness in generating profits using the total assets owned by the company (Purwanto, 2013). ROA reflects business profits and company efficiency in utilizing total assets. The higher the ROA value, the more efficient the company is in using its assets, both physical assets and non-physical assets (intellectual capital) to generate profits for the company.

Return On Equity (ROE)

Hery (2016:107) believes that ROE is a ratio that shows how much equity contributes to creating net profit. If ROE shows the higher the return on equity, it means the higher the net profit generated from each rupiah of funds invested in equity.

Size

Company size is a size grouped based on size big or small a company. Based on total assets, the greater the total assets, this shows that the company has fairly good prospects in the relatively long term (Widani, Mahaputra, 2019). Company size is shown through the log of total assets.

HYPOTHESIS

The Influence of Capital Employed Efficiency on Financial Performance

Capital employed is the relationship between a company and its external environment. Some examples from the company's external environment are e.g distributors, customers, suppliers and also investors. Companies must be able to maintain the best possible relationships with external parties, because this can influence external assessments of the company. So, if a good relationship is created between the company and external parties, this makes it possible for external parties to provide a better assessment of the company. So that a good assessment can improve the company's financial performance.

Research (Setiawan and Prawira 2018) proves that there is a positive influence between Capital Employed Efficiency (VACA) and company financial performance.

H1a: Capital Employed Efficiency has a positive effect on ROA

H1b: Capital Employed Efficiency has a positive effect on ROE

The Influence of Human Capital Efficiency on Financial Performance

Human capital is more knowledge possessed by company employees. These abilities include previous work experience, the ability to collaborate between employees, creativity, innovation and employee flexibility. If the company can apply and utilize the knowledge possessed by its employees to the maximum, then human capital employment can be effective. Effective use of human capital can provide an increase in industrial financial performance. Research (Fathi, Farahmand 2013) states that there is a positive impact between Human Capital Efficiency (VAHU) and the company's financial performance.

H2a: Human Capital Efficiency has a positive effect on ROA

H2b: Human Capital Efficiency has a positive effect on ROE

The Influence of Structural Capital Efficiency on Financial

The meaning of structural capital efficiency is the ability of the industry within improve the company's financial performance through software or hardware, or as facilities and infrastructure that can support employee performance in a company company. A company employee who has high intelligence is useless if it is not supported by supporting systems and facilities. However,If the industry has systems and facilities that support and are utilized as well as possible by employees, then the industry's financial performance will be able to grow optimally.

Research (Setiawan and Prawira 2018) proves that there is a positive influence between structural capital efficiency (STVA) and company financial performance.

H3a: Structural Capital Efficiency has a positive effect on ROA

H3b: Structural Capital Efficiency has a positive effect on ROE

The Influence of Intellectual Capital (VAIC^{TM}) on Financial Performance

Good companies can utilize the resources they have optimally and able to create added value and superiority competitive so that later it can lead to increased company performance.

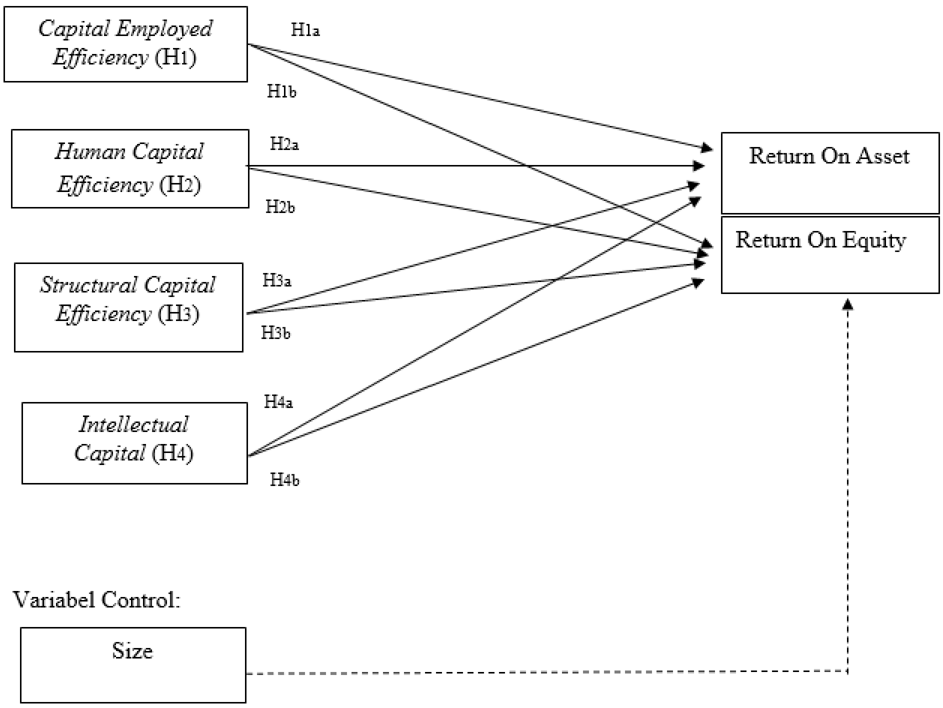
Intellectual capital is a resource that plays a role in increasing competitive advantage which can contribute to company performance while increasing competitiveness. The components of Intellectual Capital include Capital Employed Efficiency, Human Capital Efficiency and Structural Capital Efficiency.

(Nurhayati 2017) conducted research on the influence of intellectual capital (VAIC™) on market performance and financial performance. The data taken comes from LQ45 companies listed on the IDX in 2010-2013. The results of the research show that there is a significant influence of intellectual capital (VAIC™) on financial performance. This shows a positive correlation that the greater the VAIC™ of a company, the greater the profitability that will be generated.

H4a: Intellectual Capital (VAICTM) has a positive effect on ROA

H4b: Intellectual Capital (VAICTM) has a positive effect on ROE

Conceptual Framework



This research uses the panel data regression method. Panel data regression is a combination of cross-sectional data and time series data, measuring the same cross-sectional units at different times. And this research was carried out using statistical methods assisted by the Eviews 9 version program. The analytical methods used in this research are panel data regression, Chow-test, Hausman test. The regression equation in this research is:

$$ROAit = \alpha it + \beta_1 VAICTMit + \beta 5\ SZit + eit$$
$$ROAit = \alpha it + \beta 2VACAit + \beta 3VAHUit + \beta 4STVAit{+}{+}\ \beta 5\ SZit + eit$$
$$ROEit = \alpha it + \beta_1 VAICTMit + \beta 5\ SZit + eit$$
$$ROEit = \alpha it + \beta 2VACAit + \beta 3VAHUit + \beta 4STVAit{+}{+}\ \beta 5\ SZit + eit$$

Information:

ROA	: Return On Asset
ROE	: Return On Equity
α	: Konstanta
β1,2,3	: Koefisien
$VAIC^{TM}$	: Intellectual Capital
VACA	: Added Capital Value Employee
VAHU	: Value Added Human Capital
STVA	: Structural Capital Value Added
SZ	: Size
e	: error

1.5 DATA, TABLE, FIGURE

This research aims to examine the influence of intellectual capital which consists of capital employed efficiency, human capital efficiency and structural capital efficiency on financial performance which consists of return on assets and return on equity. Researchers use quantitative data in the form of financial reports of companies listed on the Indonesia Stock Exchange (BEI). In this research, the research data was obtained from the financial reports of food and beverage subsector companies for the period 2016 - 2021. This research was conducted in 2023 and the statistical test tool used was Eviews 9.

The objects used are food and beverage subsector companies listed on the Indonesia Stock Exchange (BEI). The method used in collecting data was purposive sampling. The sample that meets the requirements is 14 companies, in accordance with the conditions determined in sampling in this research, as follows:

1. Number of food and beverage companies listed on the Indonesia Stock Exchange during 2016-2021 Companies
2. That do not publish their annual reports consistently and the data is incomplete 3. Companies that do
3. not use the rupiah currency 4. Companies that experience losses
4. between the 2013-2015 period Number of companies studied in 2013-2015

Table

Tabel 3.1
Descriptive Statistics

	N	Minimun	Maximum	Mean	Std. Deviation
ROA	84	1.270000	52.67000	11.83714	9.014208
ROE	84	1.870000	124.1500	20.16262	22.50695
VACA	84	0.380000	4.860000	1.59023	0.969619
VAHU	84	3.880000	111.4300	26.466908	22.79360
STVA	84	0.740000	1.000000	0.928690	0.058181
VAIC	84	5.290000	116.2100	28.98619	23.60073
SIZE	84	26.64000	32.82000	28.94917	1.527587

The results of the descriptive analysis show that the total sample used for this research was 84 samples. Intellectual capital is an independent variable which is measured using CEE, HCE, and SCE. The results of the descriptive analysis show that IC has a minimum value of 5.290000 and a maximum value of 116.2100. CEE has a minimum value of 0.380000 and a maximum value of 4.860000, HCE has a minimum value of 3.880000 and a maximum value of 111.4300 and SCE has a minimum value of 0.740000 and a maximum value of 1.000000.

Company performance is a dependent variable that can be measured by using the ROA rate. The lowest ROA value is 1.270000 and the highest value is 52.67000, the average ROA is 11.83714 and the lowest ROE value is 1.870000 and the highest value is 124.1500 and the average ROE is 20.16262.

Tabel 3.2
Multicollinearity Test Results

	VACA	VAHU	STVA	VAIC
VACA	1.000000	0.781616	0.580874	0.797459
VAHU	0.781616	1.000000	0.685718	0.999665
STVA	0.580874	0.685718	1.000000	0.688662
VAIC	0.797459	0.999665	0.688662	1.000000

Source: E-views data processing 9

From the test results in table 3.2, it shows that the multicollinearity test results of all variables have a VIF value < 10, so it can be concluded that there is no correlation between independent variables or in other words, multicollinearity does not occur.

Tabel 3.3
Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.849404	12.22023	0.642329	0.5229
VACA	35.16772	44.58504	0.788779	0.4331
VAHU	35.89734	44.51124	0.806478	0.4229
STVA	31.11271	46.72157	0.665918	0.5078
VAIC	-35.88147	44.50672	-0.806203	0.4230

From the test results in table 3.3, the significance value of all independent variables is >0.05. Therefore, it can be concluded that this research is free from heteroscedasticity and has fulfilled the heteroscedasticity test.

Tabel 3.4
Regression Model Selection Results

Regression Model	Regression Model Selection Results
ROAit = αit + β_1VAICTMit + β5 SZit +eit	*random effect model*
ROAit = αit + β2VACAit + β3VAHUit + β4STVAit++ β5 SZit +eit	*fixed effect model*
ROEit = αit + β_1VAICTMit + β5 SZit +eit	*random effect model*
ROEit = αit + β2VACAit + β3VAHUit + β4STVAit++ β5 SZit +eit	*fixed effect model*

Based on the results of the panel data regression analysis test, each regression equation can be formed as a variable equation as follows:

The first equation has the following regression details:

ROAit = 37.37071+ 0.133176VAICTMit + -1.015360SZit +eit

Based on the equation that has been created, it can be interpreted that:

1) The constant of 37.37071 indicates that the amount of intellectual capital and size

is 0 or constant (does not experience increases or decreases) then the corporate income tax burden payable is 37.37071 (the company has a positive average ROA)

2) Intellectual capital has a positive coefficient value of 0.133176, meaning that every 1% increase in the IC value will increase the average return on assets by 0.133176

3) Size has a negative coefficient value of 1.015360. This means that every 1% decrease in company size value will reduce ROA by 1.015360.

The second regression equation has the following regression details:

ROAit = -134.1269 + 3.20452 VACAit + 0.046956 VAHUit + 126.5992STVAit++ ÿ5SZit +eit

Based on the equation that has been created, it can be interpreted that:

1) A constant of -134.1269 indicates that if the values of VACA, VAHU, STVA and size are 0 or constant (do not experience increases or decreases) then the return on assets is -134.1269 (the company has an average average return on assets negative)

2) VACA has a positive coefficient value of 3.20452, meaning that every 1% increase in the VACA value will increase the average return on assets by 3.20452

3)VAHU has a positive coefficient value of 0.046956, meaning that every 1% increase in the VAHU value means it will increase ROA by 0.046956.

4) STVA has a positive coefficient value of 126.5992, meaning that every 1% increase in the STVA value means an increase in ROA of 126.5992.

5) Size has a positive coefficient value of 0.761811, meaning that every 1% increase in the company size value means it will increase ROA by 0.761811.

Furthermore, the third regression equation has the following regression details:

ROEit = -92.66405 + 11.83381VAICTMit + 3.247351SZit +eit

Based on the equation that has been created, it can be interpreted that:

1) The constant is -92.66405, indicating that if the amount of VACA, VAHU, STVA and size is 0 or constant (does not increase or decrease) then the return on equity is

-92.66405 (the company has an average negative average return on equity)

2) Intellectual capital has a positive coefficient value of 11.83381, meaning that every 1% increase in the IC value will increase the average return on equity by 11.83381

3) Size has a positive coefficient value of 3.247351, meaning that every 1% increase in company size value means an increase in ROE by 3.24735.

And the last regression equation has the following regression details:

ROEit = -398.3589 + 13.16650VACAit + -0.070696VAHUit + 198.4360STVAit+ 7.432654SZit +eit

Based on the equation that has been created, it can be interpreted that:

1) The constant of -398.3589 indicates that if the magnitude of VACA, VAHU, STVA and size is 0 or constant (does not increase or decrease) then return on equity is -398.3589 (the company has a negative average return on equity)

2) VACA has a positive coefficient value of 13.16650, meaning that every 1% increase in the VACA value will increase the average return on equity by 13.16650

3) VAHU has a negative coefficient value of 0.070696, meaning that every 1% decrease in the VAHU value means it will reduce ROE by 0.046956.

4) STVA has a positive coefficient value of 198.4360, meaning that every 1% increase in the STVA value means an increase in ROE of 198.4360.

5) Size has a positive coefficient value of 7.432654, meaning that every 1% increase in the value of company size means an increase in ROE by 7.432654.

Tabel 3.5
Coefficient of Determination Test Results

Regression Equations	Adjusted R-square value
ROAit = αit + β_1VAICTMit + β5 SZit +eit	0.037967
ROAit = αit + β2VACAit + β3VAHUit + β4STVAit++ β5 SZit +eit	0.757184
ROEit = αit + β_1VAICTMit + β5 SZit +eit	0.211111
ROEit = αit + β2VACAit + β3VAHUit + β4STVAit++ β5 SZit +eit	0.820310

Based on table 3.5, the explanation regarding the value of Adjusted R-square is as follows:

Equation 1: the value of Adjusted R-square (R2) is 0.037967. This means that the variation or behavior of ROA can be explained by variations in the independent variables, namely intellectual capital and size, amounting to 3.7967% while the remaining 96.2033% is variation from other independent variables. that affect ROA but are not included in the model. And it can also be concluded that the model used is an unfit model because the adjusted R2 is not close to one.

Equation 2: the value of Adjusted R-square (R2) is 0.757184. This means that the variation or behavior of ROA can be explained by variations in the independent variables, namely VACA, VAHU, STVA and size, which is 75.7184% while the remaining 24.2816% is the variation of other independent variables that influence ROA but are not included in the model. And it can also be concluded that the model used is a fit model because the adjusted R2 is close to one.

Equation 3: the value of Adjusted R-square (R2) is 0.211111. This means that the variation or behavior of ROE can be explained by variations in the independent variables, namely intellectual capital and size, amounting to 21.1111% while the remaining 78.8889% is variation from other independent variables. that affect ROE but are not included in the model. And it can also be concluded that the model used is an unfit model because the adjusted R2 is not close to one.

Equation 4: the value of Adjusted R-square (R2) is 0.820310. This means that the variation or behavior of ROE can be explained by variations in the independent variables, namely VACA, VAHU, STVA and size, which is 82.0310% while the remaining 17.969% is variation in the independent variables. others that influence ROE but are not included in the model. And it can also be concluded that the model used is a fit model because the adjusted R2 is close to one.

Tabel 3.6
F Test Result

Regression Equations	*Prob (F-statistic)*
ROAit = αit + β_1VAICTMit + β5 SZit +eit	0.077656
ROAit = αit + β2VACAit + β3VAHUit + β4STVAit++ β5 SZit +eit	0.000000
ROEit = αit + β_1VAICTMit + β5 SZit +eit	0.000025
ROEit = αit + β2VACAit + β3VAHUit + β4STVAit++ β5 SZit +eit	0.000000

Table 3.6 shows that the second, third and fourth regression equations have a statistical probability value of F of 0.000000. The probability value of the F statistic is smaller than the significant value ÿ = 5%, so it can be concluded that Ho is rejected.

Thus, the independent variables in this research, namely VACA, VAHU, STVA, VAIC and size together have a significant effect on the dependent variables, namely ROA and ROE.

Tabel 3.7
T Test Result

No.	Variable Independent	Variable Dependent	Coefficient	Probability t-statistic	Conclusion
1	VACA	ROA	3.204521	0.0368	H1a Accepted
2	VAHU	ROA	0.046956	0.5851	H2a Rejected
3	STVA	ROA	126.5992	0.0000	H3a Accepted
4	VAIC	ROA	2.102774	0.0386	H4a Accepted
5	VACA	ROE	13.16650	0.0001	H1b Accepted
6	VAHU	ROE	-0.070696	0.7017	H2b Rejected
7	STVA	ROE	198.4360	0.0017	H3b Accepted
8	VAIC	ROE	11.83381	0.0000	H4b Accepted

The Influence of Capital Employed Efficiency on ROA

The results of the tests that have been carried out produce a coefficient of 3.204521 and a probability of 0.0368 < ÿ 0.05. So these results indicate that the Capital Employed Efficiency variable has an influence on the return on assets of food and beverage companies. From this test, it can be concluded that the hypothesis H1a which expects a positive relationship between CEE and ROA can be accepted.

This explains that efficient use of capital used can increase ROA. These results explain that the capital used is the asset value that contributes to the company's ability to generate income (investorword.com). So if a company uses a relatively large amount of capital, it will result in the company's total assets relatively increasing. This can increase the company's income level.

This also has the effect of increasing the company's profits on the number of assets they own as measured by Return on Assets (ROA). This means showing if Companies succeed in managing the resources they have well so that they can produce better company financial performance (Murdyanto, 2008). The results of this research are supported by research conducted by Setiawan and Prawira (2018); Dzenopoljac et al. (2016) which proves that there is a positive influence between VACA and company financial performance.

The influence of Capital Employed Efficiency on ROE

The results of the tests that have been carried out produce a coefficient of 13.16650 and a probability of 0.0001 < ÿ 0.05. So these results show that the Capital Employed Efficiency variable has an effect on the company's return on equity . From this test, it can be concluded that the hypothesis H2a expects a positive relationship between CEE and ROE to be accepted. This explains that the use of capital in the company will increase profits for the company. These results also show that the capital used is an asset value that contributes to the company's ability to generate income (investorword.com). If the capital used by a company is relatively large, it can have an effect on income from the use of company assets also increases. Based on research conducted by Nadeem et al., (2018) which proves that the higher the CCE by the company, the higher the ROE level obtained by the company as suggested by financial theory.

The Influence of Human Capital Efficiency on ROA

The results of the tests that have been carried out produce a coefficient of 0.046956 and a probability of 0.5851 > ÿ 0.05. So these results show that the human capital efficiency variable has no influence on the company's return on assets . From this test it can be concluded that the hypothesis H2a expecting a positive relationship between HCE and ROA is rejected. This provides empirical evidence that according to the VAIC model, human capital has not been managed optimally to generate profits.

As mentioned by Firrer and William (2003), companies use physical capital more than intangible assets, such as human capital. Even though companies innovate in service systems, they also Must use various operational tools to support the running of the company. So the development of human capital is still considered a company burden. In line with research conducted by (Almas Royhan, 2016; Ousama and Fatima, 2015; Razafindrambinina and Anggreni, 2017; Mohammad et al., 2018) but contrary to research conducted by (Fathi et al., 2013; Rhoma Simarmata, 2015) which proves that there is a positive impact between VAHU and the company's financial performance.

The Influence of Human Capital Efficiency on ROE

The results of the tests that have been carried out produce a coefficient of -0.070696 and a probability of 0.7017 > ÿ 0.05. These results show that the human capital efficiency variable has no influence on the company's return on equity . From this test, it can be concluded that the hypothesis H2b expecting a positive relationship between HCE and ROE is rejected. HCE test results for ROE shows that HCE has not been able to support increased company performance as proxied through Return On Equity (ROE).

These results indicate that investors do not have enough guarantees from the company's capital resources if they will get a decent return on what they invest. The salaries and allowances provided by the company to its employees are considered unable to motivate employees to increase the company's income and profits, without being accompanied by good HR management such as employee training and development. These results are in line with research by Chowdhury et al. (2019) and research conducted by Soewarno, Noorlailie and Bambang Tjahjadi (2020) but this contradicts the research results of Isnurhadi and Astari Lita (2020) which state that HCE has a positive relationship with ROE.

The Influence of Structural Capital Efficiency on ROA

The results of the tests that have been carried out produce a coefficient of 126.5992 and a probability of 0.0000 < ÿ 0.05. These results indicate that the Structural Capital Efficiency variable influences the company's return on assets . From this test, it can be concluded that the hypothesis H3a expects a positive relationship between SCE and ROA to be accepted. So if structural capital efficiency increases, the company's ROA will also increase.

STVA is the industry's ability to improve the company's financial performance, through software and hardware and also as facilities and infrastructure that can support the performance of company employees to influence the company's financial performance. The results of this research are supported by research by Setiawan and Prawira (2018) which proves that there is a positive influence between STVA with the company's financial performance. In contrast to the results of research conducted by Vishnu and Gupta (2014) and Bayraktaroglu et al. (2019) which shows that Structural Capital Efficiency does not affect financial performance as measured by ROA.

The Influence of Structural Capital Efficiency on ROE

The results of the tests that have been carried out produce a coefficient of 198.4360 and a probability of 0.0017 < ÿ 0.05. These results indicate that the Structural Capital Efficiency variable has an influence on return on equity of food and beverage companies.

From this test, it can be concluded that the hypothesis H3b which expects a positive relationship between SCE and ROE is accepted. So if structural capital efficiency increases, the company's ROE will also increase. In resources based theory, intangible assets in a company such as databases, structures, employee harmony are considered to be able to increase the company's rate of return on capital. The speed and accuracy of the company's access to information has been proven to increase the company's rate of return on capital. The results of this research are supported by research conducted by Soewarno, Noorlailie and Bambang Tjahjadi (2020) and Nadeem et al., (2018) which stated that SCE has a positive effect on ROE. However, this is contrary to the research conduc Isnurhadi and Astari Lita (2020).

The Influence of Intellectual Capital (VAIC^{TM}) on ROA

The results of the tests that have been carried out produce a coefficient of 2.102774 and a probability of 0.0386 < ÿ 0.05, so these results indicate that the Intellectual Capital (VAICTM) variable has an influence on the return on assets of food and beverage companies listed on the BEI for the 2016-2021 period. From this test, you can it is concluded that hypothesis H4a which expects a positive relationship between Intellectual Capital (VAICTM) to ROA is accepted. So if Intellectual Capital (VAICTM) increases, the company's ROA can increase.

By using intellectual capital properly and correctly, we can obtain ways to manage other resources owned by the company efficiently and economically. Using company resources efficiently and economically can minimize cost overruns. The higher the intellectual capital (VAICTM) , the profits generated by a company also increase, resulting in an increase in the ROA value. Increasing ROA can reflect that the company's profitability has increased. These results are in accordance with research conducted by Rhoma Simarmata (2015) which states that VAICTM has a positive effect on company financial performance (ROA).

The Influence of Intellectual Capital (VAIC^{TM}) on ROE

The results of the tests that have been carried out produce a coefficient of 11.83381 and a probability of 0.0000 < ÿ 0.05. So these results show that the Intellectual Capital (VAICTM) variable has an influence on return on equity of food and beverage companies listed on the IDX for the 2016-2021 period. From this test, it can be concluded that the hypothesis H4b which expects a positive relationship between Intellectual Capital (VAICTM) and ROE is accepted. So if Intellectual Capital (VAICTM) increases, the company's ROE will also increase.

This shows that food and beverage subsector companies that carry out IC management well can produce good ROE levels. Intellectual capital that is managed well by the company effectively and efficiently will reflect the company's financial performance well, so that this can provide a large level of return for management. These results are in line with research conducted by Parta Nyoman, Ayu Gusti and Andriyani (2016).

CONCLUSION

From the explanation above, the conclusions that can be drawn regarding the results that have been tested show that the CEE variable has a positive effect on ROA with a coefficient of 3.204521 with a significant value of 0.0368 < ÿ 0.05. CEE test results has a positive effect on ROE with a coefficient of 13.16650 and a significance value of 0.0001 < ÿ 0.05. The test results for the HCE variable have no effect on ROA because the coefficient value is 0.046956 and the prob is 0.5851 > ÿ 0.05. The test results for the HCE variable also have no effect on ROE because it has a coefficient of -0.070696 and a probability of 0.7017 > ÿ 0.05. The SCE variable has a positive effect on ROA with a coefficient of 126.5992 and a prob of 0.0000 < ÿ 0.05 and for the SCE variable on ROE it also has a positive effect with a coefficient of 198.4360 and a prob of 0.0017< ÿ 0.05. For the intellectual capital variable (VAICTM) it has a positive influence on ROA with a coefficient of 2.102774 and a prob of 0.0386 < ÿ 0.05 and for the intellectual capital variable (VAICTM) it has a positive influence on ROE with a coefficient of 11.83381 and a prob of 0.0000 < ÿ 0.05.

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CHAPTER 11

Hardship as a Defense to Non-performance of Contract: Can it be Applied in Indonesian Contract Law?

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ABSTRACT

A valid agreement establishes a legally binding relationship between parties, imposing an obligation on each to adhere to the terms. Any failure by one party to fulfill their agreed-to obligations is deemed a breach or default of the contract. Non-performance may arise due to events or circumstances beyond the party's control and ability to perform. In addition to force majeure, hardships are recognized as an additional factor in practical development. The problem is that, in contrast to the argument of force majeure, which Indonesian law regulates through the Civil Code, the argument of hardship remains unregulated. To address this gap, the purpose of this research is to clarify the concept of hardship in legal doctrine and its potential applicability in cases of non-performance under Indonesian law. The study raises a research question: Can Indonesian judges utilize the hardship argument in non-performance cases? This is normative legal research. The research is descriptive and employs primary and secondary legal materials. The analysis is qualitative, and conclusions are drawn through deductive methods. Based on this research, Indonesian courts and judges can utilize hardship arguments grounded in the principle of good faith or classified as relative force majeure.

Keywords: *Non-fulfillment of contract, Hardship, Indonesia.*

INTRODUCTION

The recent Covid-19 pandemic has been characterized as the "darkest period" since World War II[1].Given its unprecedented impact on the global economy, it has led to the revival of two classic principles in contract law: force majeure and hardship. Both principles are legal mechanisms to deal with the impact of unforeseen events and changes in circumstances in the performance of contracts.

During the Covid-19 pandemic in Indonesia, there were debates and dilemmas related to the application of force majeure and hardship principles. Not all force majeure arguments can be accepted by parties who are bound by the agreement because there are business sectors that actually benefit, on the other hand there are sectors that are negatively affected by Covid-19 but are unable to use force majeure as justification in view of the agreements they have made. In such context, the hardship argument, which was originally not very popular, has slowly emerged, causing a tug-of-war between the parties to the agreement to maintain their force majeure proposition in the midst of attempts to negate it to become the hardship argument.

Indonesian law provides for force majeure in Articles 1244 and 1245 of the Civil Code; such provisions relieve the debtor from all costs, damages, and interest as long as the debtor can prove that the performance of agreement is not possible due to force majeure. Unlike the principle of force majeure which is expressly provided for in the Civil Code, the principle of hardship has no legal basis in the Indonesian legal system[2]. The absence of a legal basis for the hardship principle in Indonesia indicates that there is a legal problem in the form of a norm void in the regulation of the hardship principle in contract law in Indonesia[3]. At the same time, the hardship principle is regulated in the UNIDROIT Principles of International Commercial Contracts (UPICC), which Indonesia has ratified through Presidential Regulation No. 59 of 2008 concerning the Ratification of the Statute of the International Institute for the Unification of Private Law.

Based on the foregoing background, the application of the hardship principle leaves room for discussion particularly on its application by judges in Indonesia in cases of default in domestic contracts. Therefore, for the purpose of legal certainty, there is certainly a need for legal norms which provide legal protection in order to ensure certainty and justice for the parties in the implementation of their contractual rights and obligations[4], especially in cases where there are changes in circumstances that cause constraints in contract implementation due to a difficult situation or hardship. Therefore, the research team believes that normative research needs to be carried out on the application of the hardship principle by Indonesian judges.

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[4] Dian Latifiani, "Renewal Of The National Contract Law," *Jurnal Hukum Progresif* 8, no. 2 (2020): 137–38, https://doi.org/10.14710/jhp.8.2.137-150.

This research is focusing on but is not limited to the discussion of the principle of force majeure, because as stated by Berger and Behn, in theory and practice the principle of force majeure and hardship often cannot really be distinguished[5]. The purpose of this study is to provide a description of where judges get their legal findings to be able to apply the hardship proposition in cases of non-performance of promises in domestic contracts in Indonesia.

This research is different from existing research in that the focus is on judge's legal finding allowing him to apply the hardship argument in cases of non-performance of agreement in domestic contracts in Indonesia. At the same time, research on existing hardship, was conducted, among others, by Gultom *et al* (2023) in the article "Contract Renegotiation Due to the Covid-19 Pandemic from the Hardship Perspective", discussing the influence of the Covid-19 pandemic on the implementation and fulfilment of contractual obligations; Effendy *et al* (2023) in the article "Application of Unidroit Hardship Principles to Renegotiate International Contracts Due to Covid-19", discussing UNIDROIT's role in regulating international contracts during the Covid-19 pandemic.

THEORITICAL FRAMEWORK

The Force Majeure Principle in the Indonesian Civil Code

Based on Indonesian law, if in a contractual relationship a situation arises where one of the parties does not fulfil its performance to the other party as promised, it is a state of breach of contract or default by one party against the other. Based on the causing factors, Purba distinguishes non-performance due to internal and external factors. Internal factors are circumstances due to mistake, in the form of negligence of the non-performing party. While failure to perform can arise due to external factors, namely a matter or cause or condition beyond the will and ability of the party which has the obligation to perform[6].

Indonesian law provides for force majeure only as a factor or circumstance beyond the ability of the party obligated to perform. The relevant provisions are set forth in Articles 1244 and 1245 of the Civil Code. Understanding of the provisions of the article is defined by several legal experts, including Shidarta, Dewangker, and Badrulzaman.

Shidarta in his explanation of the principle of force majeure states that if the meaning of Articles 1244 and 1245 of the Civil Code are combined, it is understood that force majeure is a pressing condition which occurs unexpectedly/cannot be prevented (at the time the contract occurs), as a result of which the debtor is unable to perform an obligation or perform an obligation in a timely manner. The legal consequence of such force majeure is that the debtor is not obligated to pay costs, damages, and interest, as long as it cannot be held accountable for the force majeure and all forms of non-performance/tort committed must be based on good faith[7].

Quoting Dewangker, Articles 1244 and 1245 of the Civil Code adopt the all-or-nothing principle, meaning that the event of force majeure terminates the contract because its

[5] Berger and Behn, "Force Majeure and Hardship in the Age of Corona: A Historical and Comparative Study," 88.

[6] Hasim Purba, *Hukum Perikatan Dan Perjanjian*, ed. Tarmizi, 1st ed. (Jakarta: Sinar Grafika, 2022), 84.

[7] Shidarta, "Force Majeure" Dan "Clausula Rebus Sic Stantibus," 2020, 5, https://doi.org/10.13140/rg.2.2.10699.92965.

complete execution becomes impossible, and it frees both parties from any obligations that must be implemented. To the extent that performance is still possible, even if it is extremely difficult and burdensome, it cannot be declared as force majeure[8].

Badrulzaman distinguishes between absolute force majeure and relative force majeure. Such distinction is based on the degree of impossibility. If impossibility is absolute, the possibility of change no longer exists, force majeure is absolute. Such impossibility does not only apply to the debtor, but to anyone in such a condition. If there is a chance for the impossibility to become possible, albeit at great sacrifice, then it is a relative force majeure[9].

Matter Considered to be Included in the Agreement

Article 1339 of the Civil Code provides that agreements are binding not only for matters expressly stated in the contract, but also for anything that based on the nature of agreement is required by propriety, custom or law. Thus, the binding nature of agreement on the parties is not limited only to matters included in the agreement; rather, it also includes other elements as long as required by propriety, custom and morals.

According to Subekti, Article 1338 paragraph (3) of the Civil Code provides that the agreement must be performed in good faith. The function of good faith here is as control in the execution of the agreement; where judges are given the power to supervise the implementation of an agreement, in order to ensure that its implementation is not contradictory to decency or justice. It means that judges have the authority to deviate from the textual content of the agreement, when execution based on verbatim interpretation of the content of agreement would be contrary to good faith[10]. Khairandy states that, good faith in the sense of contract performance must refer to rational and proper conduct of the parties in implementing the agreement, including the understanding that the parties' performance in implementing the contract must be proper and appropriate[11].

Legal Finding by Judges in Indonesia

Based on Article 5 (1) of Law No. 48 of 2009 concerning Judicial Power, judges and constitutional justices are required to explore, follow, and understand legal values and the sense of justice that lives in society. This provision is the juridical basis for requiring judges not only to find or create formal justice, but also to be the basis for legal discovery for judges in seeking values that live in society, not just through legislation alone [12].

According to Mertokusumo, finding the law is the process of shaping the law by judges through the application of legal regulations to concrete legal events. Finding the law is the process of concretization of legal regulations *(das sollen*) of a general nature by relating them to certain concrete events (*das sein*). In dispute resolution practices, this process is

[8] Arie Exchell Prayogo Dewangker, "Penggunaan Klausula Force Majeure Dalam Kondisi Pandemik," *Jurnal Education and Development* 8, no. 3 (2020): 312, https://journal.ipts.ac.id/index.php/ED/article/view/1959.

[9] Mariam Darus Badrulzaman, *Hukum Perikatan Dalam KUHPerdata Buku Ketiga: Yurisprudensi, Doktrin, Serta Penjelasan*, 1st ed. (Yogyakarta: Deepublish Digital, 2023), 35.

[10] Subekti, *Hukum Perjanjian*, 20th ed. (Jakarta: Intermasa, 2020), 41.

[11] Ridwan Khairandy, *Itikad Baik Dalam Kebebasan Berkontrak*, 1st ed. (Jakarta: Universitas Indonesia Fakultas Hukum Pascasarjana, 2003), 318–20.

[12] Muhammad Helmi, "Penemuan Hukum Oleh Hakim Berdasarkan Paradigma Konstruktivisme," *Kanun Jurnal Ilmu Hukum* 2, no. 1 (2020): 114, 119, https://doi.org/10.24815/kanun.v22i1.14792.

unavoidable especially when the terminology used in legislation is unclear or the law does not regulate the problem at hand, or the existing law provides differently from the situation at hand[13].

METHOD

This is a normative legal research positioning law as a norm system structure[14].The approach used in this study is not only through legislation (statute approach) and conceptual (conceptual approach) but also a review of court decisions (case approach). Hence, this research uses the "law in context" approach, namely the legal norms approach through the underlying "context"[15]. By taking such approach, law is not only examined as a norm in legislation (internal normative approach), but also as a norm applied in concrete cases (external normative approach) by judges in court decisions[16] as the living law [17].

The data used are secondary data in the form of primary legal material, namely the provisions of the Civil Code, UNIDROIT Principles of International Commercial Contract and court decisions. In order to obtain explanation on primary legal materials, secondary legal materials are used that discuss hardship according to expert opinions (doctrines) and various research reports published in journals. All data has been collected through document study and literature study.

This research is descriptive in nature, the analysis is carried out qualitatively with deductive thinking methods. Qualitative analysis in this study has been carried out by conducting a normative study of legal provisions and legal doctrines regarding hardship. Based on this normative study, through the method of deductive thinking, it was subsequently applied to cases of non-performance of contractual obligations, so that a comprehensive description of the legal basis is obtained that allows judges to apply the concept of hardship in cases of non-performance of obligations in domestic contracts in Indonesia.

FINDING AND DISCUSSION

To answer the research problem, a case was studied between PT Dua Cahaya Anugrah (plaintiff) *vs.* 34 workers (defendants), in decision Number 20/Pdt.Sus-PHI/2021/PN Dps. dated February 7, 2022. In brief outline, the case is as follows:

PT Dua Cahaya Anugrah (PT DCA) is the owner of "W Bali Seminyak" business engaging in the tourism sector in Badung-Bali. Until early 2020, it had employed around 600

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[13] Erma Rusdiana and Ahmad Agus Ramdlany, *Pengantar Ilmu Hukum: Mengenal Tata Nilai, Norma Dan Falsafah Dasar Pembentukan Ilmu Hukum*, ed. Safi, 1st ed. (Surabaya: Scopindo Media Pustaka, 2022), 172.

[14] Mukti Fajar and Yulianto Achmad, *Dualisme Penelitian Hukum Normatif Dan Empiris*, 4th ed. (Yogyakarta: Pustaka Pelajar, 2017), 33.

[15] Lilis Mulyani, "Pendekatan Sosial Dalam Penelitian Hukum," *Jurnal Masyarakat & Budaya* 12, no. 3 (2010): 42, https://doi.org/10.14203/jmb.v12i3.150.

[16] Jan M. Smits, *The Mind and Method of the Legal Academic*, 1st ed. (United Kingdom: Edward Elgar Publisging Limited, 2012), 44.

[17] Sulistyowati Irianto, "Tantangan Pendidikan Tinggi Hukum Di Era 4.0," in *Menemukan Kebenaran Hukum Dalam Era Post Truth*, 1st ed. (Mataram: Sanabil, 2020), 76.

(six hundred) workers, both regular and apprentices, dominated by workers from Bali Province[18].

Due to the Covid-19 Non-natural National Disaster, in March 2020 PT DCA partially closed (50%) of the "W Bali Seminyak" facility. After making various efforts to avoid termination of employment of its employees, in May 2020 PT DCA eventually terminated the employment of 100 (one hundred) of its workers. The decision had to be made under compelling circumstances considering that PT DCA suffered huge losses due to the Covid-19 Non-natural National Disaster. Meanwhile, in the midst of an extremely heavy financial burden due to the absence of income, PT DCA continued to carry out its obligations to the workers of "W Bali Seminyak" by paying wages and payment obligation arrears to its suppliers[19].

Of the 100 (one hundred) workers who were terminated, 66 (sixty-six) workers received termination of employment and received their rights in the form of compensation in accordance with the applicable Manpower Law; but the remaining 34 (thirty-four) workers objected to the termination of employment. Between PT DCA and the Independent Workers Union "W Bali Seminyak" as representatives of 34 (thirty-four) workers who objected to the Termination of Employment, negotiations were conducted on several occasions, both Bipartite and Tripartite, led by the Industrial Relations Mediator of the Badung Representative Office of the Ministry of Manpower. However, no consensus was reached[20].Therefore, in order to realize legal certainty related to the Termination of Employment of 34 (thirty-four) workers, PT DCA filed a lawsuit with the Industrial Relations Court at the Denpasar District Court requesting, among other things, that the employment relationship between the plaintiff and the defendants had been terminated due to force majeure with all its legal consequences[21].

In its decision, the panel of judges of the Industrial Relations Court at the Denpasar District Court stated, among other things, that the employment relationship between the plaintiff and the defendants had been terminated due to relative force majeure and used the UPICC provisions on hardship in its consideration. As a discussion, this research examines the process of finding the law by the judges to arrive at the provisions of the UPICC as a source to explore and obtain the law to be used as a basis for their decisions.

Legal Finding by Judges in Indonesia

To arrive at the consideration that hardship is the same as relative force majeure, the panel of judges first found the law in the opinion of jurists. In a *quo* case, the views of two legal scholars who acted as expert witnesses were raised, namely I Ketut Westra and I Wayan Gde Wiryawan.

I Ketut Westra, a lecturer at Udayana University Bali, gave the following statement,

[18] Pengadilan Negeri Denpasar, "Putusan Nomor 20/Pdt.Sus-PHI/2021/PN Dps" (Denpasar: mahkamahagung.go.id, 2021), 6, https://putusan3.mahkamahagung.go.id/direktori/putusan/zaec906129227a008a72303931393131.html.

[19] Pengadilan Negeri Denpasar, 8.

[20] Pengadilan Negeri Denpasar, 9–10.

[21] Pengadilan Negeri Denpasar, 13.

among other things [22]:

> "... there are two categories of force majeure, namely absolute force majeure, and relative force majeure. ... relative force majeure is an unexpected circumstance, beyond human capacity that can cause the debtor to be unable to perform his/her obligations ...;
> ... the Covid 19 pandemic which is global, can be considered as a relative force majeure because it occurred beyond human capabilities, itis inevitable and it has happened throughout the world ...;
> ... losses due to the occurrence of Covid-19 are evident, namely that force majeure conditions have resulted in direct material losses, meaning that both debtors and creditors are bound to suffer material losses as a result of the direct impact of force majeure...;
> ... Minister of Law and Human Rights Regulation No. 11 of 2020 and Presidential Decree No. 11 of 2020 are forms of implementation of Covid-19 prevention countermeasures, inevitably causing financial losses both directly and indirectly to the business world, both those engaging in the tourism sector and other areas of business. Its impact has not been limited to the business world; rather, it has also affected the health, social and other sectors, and it has been an issue of global proportion;
> ... with the event of force majeure, the debtor is relieved from the obligation to pay damages and it cannot be held accountable for anything; however, as provided for in applicable laws and regulations, the debtor can pay his/her obligations, in accordance with his/her financial capacity, and the creditor cannot claim anything beyond the debtor's financial capacity and the provisions of applicable laws ... ."

Furthermore, I Wayan Gde Wiryawan, Lecturer of Manpower Administration at Saraswati University, stated as follows, among other things, "... the principle of *rebus sic stantibus* also applies in force majeure circumstances ... force majeure is an uncontrollable external condition so that industrial relations cannot function (*Rebus Sic Stantibus*); ... relative force majeure, which is a condition that does not directly cause a party to be unable to perform its obligations"[23].

Based on literature search, the researchers are of the view that the finding of law by judges through the views of legal scholars (doctrine) is appropriate. Because, as Falahadi *et al* stated, the judge must not only be the mouthpiece of the law, but he/she must also conduct finding of the law as outlined in each of their decisions[24].Referring to Asikin's view as an expert in civil procedural law, it is stated that if no legal sources are available, judges are required to conduct law finding and law making, namely by legal interpretation of ambiguous legal norms, and exploring legal values embedded in laws, landmark decisions or legal doctrine[25]. In this case, if the existing legal source are not capable of providing an answer regarding the law, another source the judge can use as legal source is the opinion of legal scholars. If the legal opinion of a legal scholar is used by the judge as a source to find the law, it can be considered that such legal opinion is a doctrine[26]. According to Manulang, doctrine adopted or applied by judges in their decisions is a source of formal law [27].

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[22] Pengadilan Negeri Denpasar, 59–60.
[23] Pengadilan Negeri Denpasar, 71.
[24] Ruby Falahadi et al., "Hakim Bukan Corong Undang-Undang, Hakim Bukan Corong Masyarakat, Dan Hakim Adalah Corong Keadilan," *Jurnal Penegakan Hukum Indonesia (JPHI)* 1, no. 1 (2020): 90, https://doi.org/10.51749/jphi.v1i1.15.
[25] Zainal Asikin, *Hukum Acara Perdata Di Indonesia*, 1st ed. (Jakarta: Prenada Media Group, 2015), 109–10.
[26] Sudikno Mertokusumo, *Mengenal Hukum Suatu Pengantar* (Yogyakarta: Mahakarya Pustaka, 2019), 116.
[27] Herlina Manulang, "Sumber-Sumber Hukum," in *Pengantar Ilmu Hukum*, ed. Dede Nurul Hidayat, 1st ed. (Banten: PT Sada Kurnia Pustaka, 2023), 56.

Judge Find Law Outside the Civil Code

Considering the views of jurists (doctrine), the panel of judges held that the terms relative force majeure and hardship/*rebus sic stantibus* are one and the same circumstance[28]. Furthermore, the panel of judges in their legal considerations stated that it was necessary to find legal sources other than those provided for in Book III of the Civil Code regarding force majeure and other similar circumstances in order to ensure that the situation or condition of the plaintiff was indeed experiencing a state of force majeure, difficult circumstances or hardship.

The panel of judges was of the view that in addition to Article 1244 and Article 1245 of the Civil Code on force majeure and hardship or *rebus sic stantibus*, Article 7.1.7 of the UPICC also provides for force majeure. This is based on the Presidential Regulation of the Republic of Indonesia No. 59 of 2008 concerning the Ratification of the Statute of the International Institute for the Unification of Private Law, then the UNIDROIT Principles of International Commercial Contracts (UPICC) which provides for hardship conditions / *rebus sic stantibus* which is also applies in addition to Book III of the Civil Code[29].

Indonesian law only recognizes force majeure as set forth in Articles 1244 and 1245 of the Civil Code; at the same time, there is no regulation regarding hardship. Therefore, the search for written legal sources outside the Civil Code by the judge in this case is appropriate. This view of the researchers refers to Article 1339 of the Civil Code and at least five legal expert opinions, namely as follows:

In view of the provisions of Article 1339 of the Civil Code, Hernoko explains that in addition to contractual obligations derived from what has been agreed upon by the parties (autonomous factors), it is also necessary to pay attention to other factors (heteronomous factors). These heteronomous factors (factors outside the contract) must be part of the contract itself since the contract made by the parties sometimes only provides for basic matters. So that when problems arise in the implementation of the contract, heteronomous factors need to be applied[30].

In line with the mandate of Article 5 (1) of Law No. 48 of 2009 concerning Judicial Power, Harahap stated that in examining the case submitted to him/her, the judge must seek and find objective and material laws to be applied to resolve disputes. This needs to be done by judges in order to be able to apply the law not solely on a textual basis, but it must be contextual[31]. Rahardjo in his presentation stated that "law based on text" tends to be rigid and regimental. Therefore there is a need for "law with common sense", whereby the law is not merely a text; rather than that, it is related to the nature of the mind and conscience of those implementing it, each case is unique which requires conscience in handling it[32]. Panggabean, emphasized that modern law finding is characterized, among others, by the free flow of legal discovery with problem-oriented principles whereby the starting point for the law finding

[28] Pengadilan Negeri Denpasar, "Putusan Nomor 20/Pdt.Sus-PHI/2021/PN Dps," 76.

[29] Pengadilan Negeri Denpasar, 77.

[30] Agus Yudha Hernoko, *Hukum Perjanjian: Asas Proporsionalitas Dalam Kontrak Komersial*, 5th ed. (Jakarta: Prenadamedia Group, 2021), 227.

[31] M. Yahya Harahap, *Hukum Acara Perdata: Gugatan, Persidangan, Penyitaan, Pembuktian, Dan Putusan Pengadilan*, 2nd ed. (Jakarta: Sinar Grafika, 2017), 913, 916.

[32] Satjipto Raharjo, *Penegakan Hukum Progresif*, 1st ed. (Jakarta: Penerbit Buku Kompas, 2010), 10.

process is conflict problems that occur in society and not solely in the legislative system[33].

Judge Apply the Hardship Principle Under the UPICC

After having explored, the panel of judges arrived at the law namely that the relative force majeure or hardship applies in a condition where the execution of the contract becomes more onerous for one of the parties. Then they searched for hardship provisions outside the Civil Code, namely in the UNIDROIT principles. So, further, to assess whether the plaintiff is truly in a difficult situation/facing hardship, the panel of judges referred to the definition of hardship set out in Article 6.2.2 of the UPICC.

Based on literature research, the researchers are of the view that the search for legal sources on hardship in the UNIDROIT Principle by the panel of judges is appropriate. As a basis for this thinking, the researchers refer to at least five research results, namely as follows:

Based on Amalia's article and Gea's article, it is stated that the UNIDROIT instrument is an instrument that binds as soft law as a form of principles and guide lines [34]. UNIDROIT principles of soft law allow states to utilize more effective methods to change the rule of law as circumstances change, by allowing individual states to act to coordinate provisions appropriate to such changes[35].

In their article, Folanda *et al*, stated that Indonesia has ratified the UNIDROIT Statute with Presidential Regulation No. 59 of 2008 concerning the Ratification of the Statute of the International Institute for the Unification of Private Law. This means that Indonesia is subject to the substance set out in UNIDROIT and the hardship principle in the UPICC can apply to contracts in Indonesia[36]. Likewise, Tan in his article said that to expand the scope of the Indonesian Civil Code, the provisions of the UPICC, among others regarding hardship, can be transformed into the Indonesian Civil Code[37].

Hutabarat stated that if no rules are found in governing law applicable to contracts, the UNIDROIT Principles can be used as a reference. The UNIDROIT Principles are used as a source of law to refer to in interpreting ambiguous contractual legal provisions[38].This opinion is supported by Fariduddin, who stated that UPICC is open to be used as an interpretive supplement for law enforcement when facing domestic contract law issues. Although there is no mandatory regulation, the use of UPICC as an interpretation tool is a rather common practice. The United States, for example, often uses the UPICC as a tool to interpret domestic contract law[39].

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[33] H.P. Panggabean, *Analisis Yurisprudensi Hukum Bisnis*, 1st ed. (Bandung: Alumni, 2022), 104.

[34] Prita Amalia, "Unidroit (The International Institute for the Unification of Private Law) Sebagai Organisasi Perdagangan Internasional Dalam Harmonisasi Perdagangan Internasional," in *Hukum: Dalam Pembangunan Berkelanjutan*, 1st ed. (Bandung: PT Alumni, 2017), 551.

[35] Gita Venolita Valentina and Gea, "Eksistensi UPICC Sebagai Instrumen Soft Law Dalam Praktik Perdagangan Internasional," *Al Qodiri* 19, no. 3 (2022): 625, https://doi.org/10.53515/qodiri.2022.19.3.621-635.

[36] Folanda, Adolf, and Trisnamansyah, "Pemberlakuan Klausula Hardship Berdasarkan Asas Freedom of Contractdalam Kontrak Jual Beli Batubara," 3.

[37] David Tan, "Law Transformation in The Field of International Trade Contract into Indonesian Positive Law," *Journal of Law and Policy Transformation* 3, no. 2 (2018): 149, https://doi.org/https://journal.uib.ac.id/index.php/jlpt/article/view/391.

[38] Samuel Hutabarat, "Harmonisasi Hukum Kontrak Dan Dampaknya Pada Hukum Kontrak Indonesia," *Veritas et Justitia* 2, no. 1 (2016): 124, https://doi.org/10.25123/vej.2068.

[39] Ahmad Mukhlish Fariduddin, "Bisnis Internasional, Prinsip-Prinsip UNIDROIT, Dan Relevansinya Dengan Pluralisme Hukum," *Jurnal Justitia* 6, no. 2 (2023): 311, http://jurnal.um-tapsel.ac.id/index.php/justitia.

The panel of judges in its consideration referred to Article 6.2.2 of the UPICC, where hardship is defined as an event that has fundamentally changed the balance of the contract, caused by the cost of contract execution increases being so high that it burdens the party executing the contract (debtor) or the value of contract execution becomes greatly reduced for the receiving party (creditor), and:

a. The event occurred or became known to the injured party after the conclusion of the contract;
b. The event could not have been reasonably foreseen by the injured party at the time of concluding the contract;
c. Events occur beyond the control of the injured party;
d. The risk of the event was not foreseen by the injured party[40].

The panel of judges in its consideration subsequently stated that it was true that PT DCA (plaintiff) had experienced hardship as intended in Article 6.2.2 UPICC. The basis for consideration of the panel of judges includes the following:

First, the panel of judges in its consideration stated that the force majeure postulated by PT DCA (plaintiff) was indeed unknown and / or unpredictable by the parties at the beginning of signing the work agreement, and it had notified the defendants of the force majeure circumstances suffered by it. The panel of judges was also of the view that the circumstances experienced by the plaintiff had also been experienced by business community globally (world), so the financial losses experienced by the plaintiff for the sake of law are valuable as *notoir* facts the truth of which does not need to be proven further[41].

The judges' said consideration is in line with Harahap's opinion as an expert on civil procedural law, namely that *notoir* fact is one of the doctrines of evidentiary law in civil procedural law which teaches that publicly known facts do not need to be proven[42]. As to the definition of "publicly known facts", Azikin, a civil procedural law expert, explains that a publicly known fact is any event, occurrence or circumstance that is considered to be known by an educated person or educated public, without having to conduct scientific research or discussion[43]. The event or circumstance is such that it can be used as a legal basis to justify a serious societal action in the form of a judge's decision [44].

Based on literature search, at least four studies have been identified stating that the situation caused by Covid-19 causes entrepreneurs to be affected by financial losses due to extremely high contract implementation costs. For example, Junaedi's research suggests that the Covid-19 pandemic has had a significant impact on the economic and labor fields[45]. Harahap in his article stated that the occurrence of the Covid-19 pandemic is a reality, where countries have frozen their community activities in the fields of economy, transportation and have posed restrictions on human movement. This is a reality that has the effect of stopping

[40] Pengadilan Negeri Denpasar, "Putusan Nomor 20/Pdt.Sus-PHI/2021/PN Dps," 78.
[41] Pengadilan Negeri Denpasar, 78.
[42] Harahap, *Hukum Acara Perdata: Gugatan, Persidangan, Penyitaan, Pembuktian, Dan Putusan Pengadilan*, 582.
[43] Asikin, *Hukum Acara Perdata Di Indonesia*, 110.
[44] Harahap, *Hukum Acara Perdata: Gugatan, Persidangan, Penyitaan, Pembuktian, Dan Putusan Pengadilan*, 510.
[45] Junaidi, Mila Surahmi, and Desmawaty Romli, "Force Majeure or Hardship Principle in Termination of Employment During The Covid-19 Pandemic," *Sasi* 28, no. 3 (2022): 345, https://doi.org/10.47268/sasi.v28i3.941.

the flow of money, and causing layoffs, loss of jobs and delays in plans for economic activity[46].

Likewise, Widiastiani in her research stated that the Covid-19 pandemic has had an impact on company revenues, so fulfilling obligations, including the payment of wages and workers' benefits, is bound to be difficult because there is an increase in the cost of implementing the agreement. In terms of nominal value, the fulfilment of wage and allowance payments is indeed fixed, but the Covid-19 pandemic has caused the real value of these fulfilment costs to increase. In such a case, the entrepreneur as a debtor is placed in a difficult situation (hardship)[47]. In his empirical research, Purwanto argues that the tourism industry has experienced a significant decline in occupancy rates, with some regions in Indonesia experiencing a decrease of up to tens of percent. Notably, tourism in Bali has experienced a staggering 95% decline[48]. According to Amankwah-Amoah, internationally the Covid-19 pandemic has resulted in a significant increase in unemployment and business failures. In the UK, for instance, the pandemic has caused a substantial rise in the number of financially struggling companies, with approximately half a million businesses at risk of bankruptcy. As a result, there has been widespread economic distress, which could have long-term effects on the global economy[49].

Based on proving Article 6.2.2, the panel of judges considered that the plaintiff had experienced a state of relative force majeure *or* hardship, therefore:

a. The defendants cannot request fulfilment of obligations (at a temporary force majeure to the end of the circumstances).
b. Loss of obligation to indemnify (Article 1244 and Article 1245 of the Civil Code).
c. The plaintiff does not need to request termination of the agreement for the defendants (Article 1266 of the Civil Code does not apply and it does not require a judge's decision).
d. The plaintiff's obligation to perform (as agreed in the employment agreement) to the defendants is lost[50].

The panel of judges' assessment that the plaintiff had experienced a state of relative force majeure or hardship was based on, among others, the following considerations: the employer (plaintiff) had implemented a contingency plan for its employees in accordance with Circular Letter of the Minister of Manpower Number M/3/HK.04/III/2020 Year 2020 concerning Worker/Labor Protection and Business Continuity in the Framework of Prevention and Control of Covid-19, enabling it to adjust the amount and method of payment of wages in the midst of the Covid-19 outbreak, which must be considered as the plaintiff's maximum and

[46] Syaiful Khori Harahap, "Renegosiasi Kontrak Sebagai Upaya Penyelesaian Pelaksanaan Kontrak Saat Pandemi Covid-19," *Jurnal Hukum Ius Quia Iustum* 29, no. 2 (2022): 240, https://doi.org/10.20885/iustum.vol29.iss2.art1.

[47] Nindry Sulistya Widiastiani, "Pandemi Covid-19: Force Majeure Dan Hardship Pada Perjanjian Kerja," *Jurnal Hukum & Pembangunan* 51, no. 3 (2021): 714, https://doi.org/10.21143/jhp.vol51.no3.3130.

[48] Agus Purwanto et al., "The COVID-19 Pandemic Impact on Industries Performance: An Explorative Study of Indonesian Companies," *Journal of Critical Reviews* 7, no. 15 (2020): 1969, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3986628.

[49] Joseph Amankwah-Amoah, Zaheer Khan, and Geoffrey Wood, "COVID-19 and Business Failures: The Paradoxes of Experience, Scale, and Scope for Theory and Practice," *European Management Journal* 39 (2021): 179, https://doi.org/https://doi.org/10.1016/j.emj.2020.09.002.

[50] Pengadilan Negeri Denpasar, "Putusan Nomor 20/Pdt.Sus-PHI/2021/PN Dps," 80.

final effort of the plaintiff to save its business and the survival of some of its remaining employees[51].

Second, the panel of judges in its consideration stated that *force majeure* resulted in such obligation, in this case in the form of an employment agreement, rendering it incapable of being implemented and no longer workable, even though the obligation itself remained, so that the panel of judges considered that the payment of wages that were not paid in full by the plaintiff to the defendants during the Covid 19 pandemic must be assessed as the plaintiff's maximum and final effort in fulfilling its performance set out in the employment agreement[52].

The researchers are of the view that the two considerations of the panel of judges are the application of the principle of good faith provided for in Article 1338 paragraph (3) of the Civil Code. Subekti explained that based on the principle of good faith, judges are given the power to supervise the implementation of an agreement, to ensure that its implementation is not contradictory to propriety or justice. This means that judges have the power to deviate from the textual content of the agreement, when the textual execution thereof would be contrary to good faith[53].

Furthermore, Khairandy emphasized that the function of contract law not only teaches that contracts must be interpreted in accordance with good faith, but it also has an enhancer function and a limiting and negating function[54].This was reiterated by Badrulzaman stating that the binding of the parties to the agreement (*pacta sun servanda*) is not solely limited to the matters agreed, but also to several other elements as long as it is desired by custom and moral propriety[55].

Finally, the panel of judges considered that *hardship* as set out in Article 6.2.3 of the UPICC had legal consequences for the contract and provided alternative solutions, namely as follows[56]:

a. The injured party has the right to request contract renegotiation with the other party. The request must be submitted promptly indicating the (legal) basis of such renegotiation request.
b. A request for renegotiation does not in itself entitle the injured party to terminate performance of the contract.
c. If negotiations fail to produce an agreement within a reasonable period of time, the parties may refer it to court.
d. If the court proves the existence of hardship, it may decide to:
    1) terminate the contract at a determined date and time; or
    2) amend the contract by restoring its balance.

Based on the foregoing considerations, the panel of judges believes that there has been evidence of hardship or relative force majeure circumstances, hence the termination of

[51] Pengadilan Negeri Denpasar, 79.
[52] Pengadilan Negeri Denpasar, 79–80.
[53] Subekti, *Hukum Perjanjian*, 41.
[54] Ridwan Khairandy, *Itikad Baik Dalam Kontrak: Di Berbagai Sistem Hukum*, 1st ed. (Yogyakarta: FH UII Press, 2017), 212.
[55] Badrulzaman, *Hukum Perikatan Dalam KUHPerdata Buku Ketiga: Yurisprudensi, Doktrin, Serta Penjelasan*, 100.
[56] Pengadilan Negeri Denpasar, "Putusan Nomor 20/Pdt.Sus-PHI/2021/PN Dps," 80.

employment by the plaintiff of the defendants as of October 1, 2020, for legal reasons is in accordance with applicable laws and regulations[57].

The researchers believe that the judges' decision is in accordance with Article 6.2.3 (4) sub-article b of the UPICC, because in this case there has been a relative force majeure or difficult situation or hardship, while the renegotiation of both bipartite and tripartite negotiations had failed until finally PT DCA filed a lawsuit at the court. Thus, it is appropriate that the court in its decision stated that the relationship between PT DCA (plaintiff) and 34 (thirty-four) employees (defendant) had terminated.

Another point of discussion in view of decision Number 20/Pdt.Sus-PHI/2021/PN Dps. is that the panel of judges in exploring and finding the law to be used as the basis for its decision did not raise landmark decisions or pre-existing court decisions in a *quo* case. At the same time, in Indonesia as a Civil Law country, the formal sources of law are legislation, customs, international treaties/agreements, judicial decisions/landmark decisions, opinions of legal scholars/doctrine. Such hierarchy of sources for finding the law positions and determines the main legal sources used among sources [58].Based on the hierarchy of sources of finding the law, judicial decisions or landmark decisions should also be used as sources where the panel of judges finds the law.

Based on literature search, several cases of termination of employment aimed at maintaining the continuity of the company have been decided by the Supreme Court, for example Supreme Court Decision Number 391 K / Pdt.Sus / 2010, Supreme Court Decision Number 217 K / Pdt.Sus / 2010 and Decision Number 881 K / Pdt.Sus-PHI / 2016. In the ruling, the judge accepted layoffs for efficiency reasons without having to close down the company. The termination of employment aims to maintain the continuity of the company's operational activities. The judge decided that employers could not have allowed their businesses to fail without rescue efforts, including manpower cost efficiency[59].

Likewise, courts in some cases have applied the doctrine of relative force majeure. For example, in the case between a resident of North Jakarta *vs*. PT Jawa Barat Indah as the developer in the case of the Agreement for the Sale and Purchase of Flats. The Supreme Court in decision No. 3087K/Pdt/2001 stated that economic difficulties can be classified into the category of relative force majeure[60].Similarly, the case of PT Pertamina (Persero) *vs.* PT Wahana Seno Utama related to the contract for the construction, operation, and management of the Gas Tower Building in 2003. The Supreme Court in its decision No. 1787K/PDT/2005 upheld the decision of the District Court No. 237/Pdt.G/2003/PN.Jkt.Pst which ruled that economic difficulties due to economic changes in the form of world economic recession are categorized as relative force majeure[61].

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[57] Pengadilan Negeri Denpasar, 80–81.

[58] Rusdiana and Ramdlany, *Pengantar Ilmu Hukum: Mengenal Tata Nilai, Norma Dan Falsafah Dasar Pembentukan Ilmu Hukum*, 176.

[59] Yusuf Randi, "Pandemi Corona Sebagai Alasan Pemutusan Hubungan Kerja Pekerja Oleh Perusahaan Dikaitkan Dengan Undang-Undang Ketenagakerjaan," *Jurnal Yurispruden* 3, no. 2 (2020): 130–31, https://core.ac.uk/download/pdf/327265941.pdf.

[60] Dewangker, "Penggunaan Klausula Force Majeure Dalam Kondisi Pandemik," 312.

[61] Taufiq Adiyanto, "Dealing with Unexpected Circumstances: Judicial Modification of Contract under Indonesian and Dutch Law," *Hasanuddin Law Review* 5, no. 1 (2019): 108–9, https://doi.org/10.20956/halrev.v5i1.1508.

According to the research team, the reason why the panel of judges of the Industrial Relations Court at the Denpasar District Court did not use rulings/landmark decisions as a legal source in adjudicating the *a quo* case, as Adiyanto stated, was probably the fact that Indonesia does not adhere to the system of judicial precedent; consequently judges have broad discretion in resolving a dispute without being bound by preceding decisions. However, despite the precedent of contract adaptation, it is uncertain whether other judges would rule in the same way[62].

CONCLUSION

As conclusion, hardship can be used as defence for non-performance of contract under Indonesian law, based on the following: The mandate of Article 5 paragraph (1) of Law No. 48 of 2009 concerning Judicial Power, namely that judges and constitutional judges are obligated to explore, follow, and understand legal values and a sense of justice that lives in Society; Article 1339 of the Civil Code which provides that agreements are binding not only in view of matters expressly specified in them; Article 1338 paragraph (3) of the Civil Code provides that agreements must be implemented in good faith; The legal doctrine of the broad definition of force majeure; Provisions of UNIDROIT Principles of International Commercial Contracts (UPICC) by virtue of Regulation of the President of the Republic of Indonesia No. 59 Year 2008 concerning Ratification of the Statute of the International Institute for the Unification of Private Law.

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CHAPTER 12

The Dynamic of Spatial Adaptation Strategies: A Review

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ABSTRACT

Spatial adaptation as a generic term is used in several scientific fields. We employ spatial adaptation in examining the context of space and time as an effort of endurance to meet the sustainability needs. How can human adapt to unbalanced and inharmonious conditions will provide opportunities to the uninterrupted activities or even to the sustainability of their lives. Recent issues state that failure to adapt and to deal with spatial conditions due to climate change causes failure in agricultural production, increase in pandemics of certain diseases, increase in the context catastrophic floods and forest fires, increase in buildings temperature and in thermal discomfort. On a broader scale, climate change and high migration have an impact on increasing urban density and natural disasters. In this regard, urban spatial planning policies need to consider the residents' spatial adaptation strategy. This review aims to explore spatial adaptation strategies related directly or indirectly to the architectural and urban fields, using a number of purposively selected articles as data. The result states that spatial adaptation strategies are comprehensive, complementary, and dynamic process, multidisciplinary and multidimensional concepts and actions accompanied by specific motivations, intentions and culture, economic opportunities, social agreements, public policies, technology, and methods.

Key Words: *spatial adaptation, strategy, survive, sustainability*

INTRODUCTION

Studying the results of spatial adaptation research is useful for understanding how humans can survive and predicting what will happen later in human life in certain contexts. Spatial adaptation can be seen from various dimensions, but the essence inherent in spatial adaptation is about the process and product/result of adaptation (Asikin et al., 2017). Spatial adaptation is used by a number of authors in the fields of psychology, medicine, agrarian/forestry, geography, architectural, urban, landscape and engineering aspects. This paper focuses on the study of spatial adaptation strategies, which are directly or indirectly related to the urban-architectural field through a review of articles that discuss spatial adaptation.

Lately, the inhabitants of the earth are facing climate change both regionally and globally. Mitigation and adaptation strategies because of these changes become the main need to overcome their impact on the socio-economic sector, activities and places (Access, 2009). Rapid urbanization, high urban density and increasing vulnerability of the urban poor have increased the frequency and intensity of natural disasters (eg floods). In this case, urban development policies need to integrate considerations of community adaptation to climate change (Brown, 2011). In the field of urban planning, adaptation strategies through Geo design instruments require several stakeholders to develop spatial planning for certain areas and land use [3]. From a historical perspective, the study of human adaptation to spatial changes due to the extreme behavior of nature in a certain period of time becomes significant to determine the growth or loss of historical settlement artifacts.

The phenomenon of human migration from one location to another has consequences for the need for adaptation to new environments and communities whose characteristics are different from the previously recognized and inhabited environments. The new environment is a challenge for migrants whether they can survive, be excluded or isolate themselves (Zheng et al., 2018). The uncertainty of the status of living in a new environment encourages migrants to use a number of strategies so that they can be accepted and get the opportunity to live either temporarily or permanently.

The process of adaptation of immigrants is in line with changes in the physical morphology of the village environment which as a whole is growing from time to time. In traditional environments, space occupancy opportunities are related to adaptation of social relations, recognition of kinship or closeness to certain figures, length of stay, similarity of survival motives and opportunities to obtain sources of livelihood (Puspitasari, Djunaedi, & Shri Ahimsa Putra, 2012). Spatial adaptation is influenced by accessibility to the location of urban economic activities, religious traditions that have an impact on economic activities, and competition for residential land and business land on narrow land. (Puspitasari et al., 2011a)(Puspitasari, Djunaedi, & Putra, 2012). Spatial adaptation is a dynamic process and product at the micro and meso scales. The adaptation process occurs through the phenomena of privatism, clustering, inclusion, exclusion, categorization, labeling, bordering processes, marking/identity expressions, which have an impact on the environmental change process. (Asikin et al., 2017).

METHOD

Study Literature Review (SLR) is a research method used to critically examine relevant research results. The purpose of SLR is to identify empirical evidence, evaluate and interpret it based on predetermined inclusion/exclusion criteria as a basis for answering research questions or hypotheses (Al-Hammadi & Grchev, 2023)(Kaiwartya et al., 2016). The stages that need to be followed in SLR research include: 1) Defining the objectives and research questions as well as the protocol for carrying out SLR; 2) Collecting a number of articles (curation) as references using certain search engines; 3) Evaluate and assess study results from each article through tabulation, categorization; 4) Narrate a qualitative synthesis from a summary of previous research findings which are used as references and are relevant to the research topic (Mariano et al., 2017).

Goals and Research Questions

The study aims at analyzing current topics in the context of spatial adaptation; 2) discovering a formulated the spatial adaptation strategy concept through a logical constellation among the cases. The research questions are: 1) What are the adaptation strategies and spatial patterns in urban and suburban areas based on the sporadically selected cases from the number of previous studies findings? 2) How is the conceptual model formulation of spatial adaptation strategy?

Research stage, and Inductive thinking for curating articles

The specific content of this research is knowledge related to architecture and geography, which can also be said to be related to the spatial footprint and occupancy strategies of a place. Units of information from the articles studied are represented as data, which is then constructed into themes. Next, the constellation between themes is constructed into concepts. The conceptual model at the end of this research is the result of inductive thinking which helps in formulating the Initial Schematic Concept. The position of the Initial Schematic Concept in theory building is the formulation of the concept as the forerunner of the theory.

The following is the implementation of inductive thinking for curating articles curation.

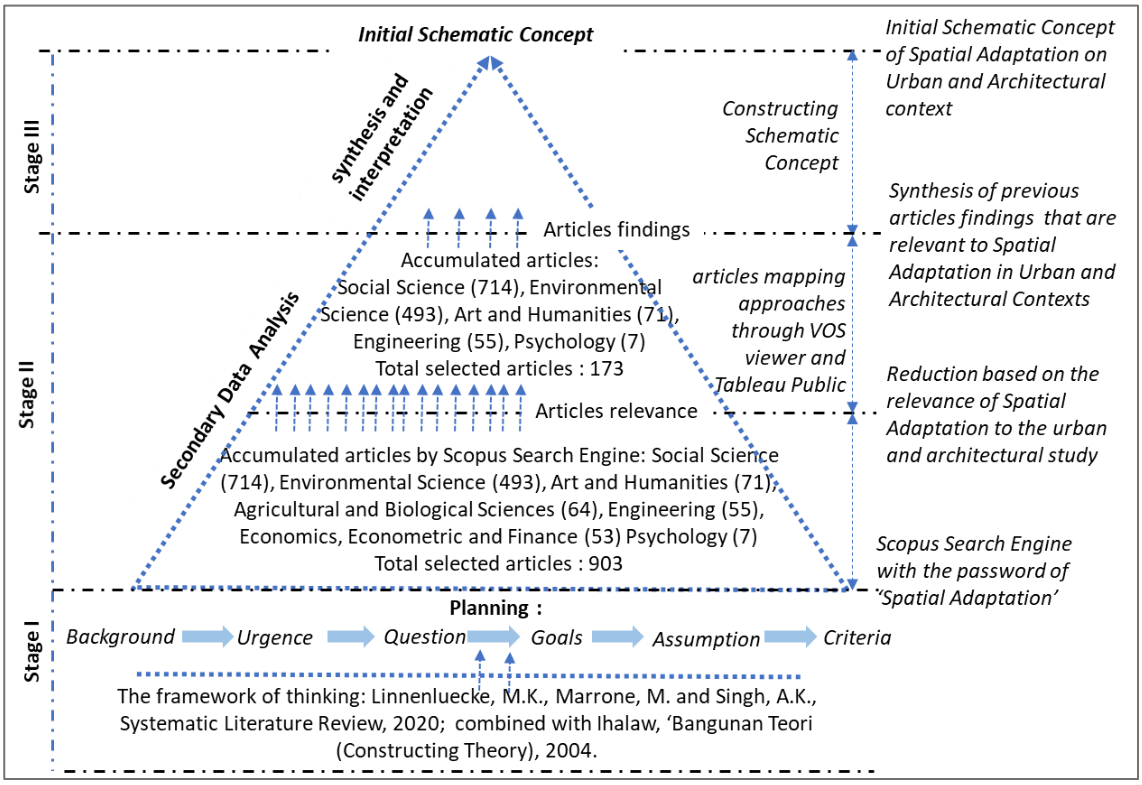


Figure 1. Research stage, and Inductive thinking for curating articles

Research Stages

To achieve the goals, the study uses inductive reasoning paradigm employing information units from several Scopus journal publications within a span of five years from 2017-2022. We have deployed Systematic Literature Review (SLR) for library sources searching, which are set as follows:

1) The first phase is search titles, abstracts, keywords of the articles under 'spatial adaptation' through scopus.com website without limiting the journal titles. At this phase, a total of 335 documents were gathered. This search was used to delineate in which contexts and disciplines the term 'spatial adaptation' are categorized.
2) The second phase is identifying issues of spatial adaptation and traditional culture in the context of urban environment. At this phase, articles publications were searched by using titles, abstracts, and keywords through scopus.com website (spatial AND adaptation AND culture AND urban AND environment). The selected subject areas using these keywords appear in journals, i.e., Social Sciences (714); Environmental Science (493); Arts and Humanities (71); Agricultural and Biological Sciences (64); Engineering (55); Economics, Econometrics and Finance (53); Psychology (7). At this phase, 903 documents were found.
3) The third phase is re-selecting the result of second search of articles by using titles, abstracts, and keywords through scopus.com website, i.e., Social sciences (714); Environmental science (493); Arts and Humanities (71); Agricultural and Biological Sciences (64); Engineering (55); Economics, Econometrics and Finance (53); Psychology (7), in an effort to reinforce its relevant to the topic of the research, and the final result was decreased to 173 documents.

4) The fourth phase is visualizing the searched result from phases 1, 2, and 3 by using VOS viewer and Tableau application, followed by description.
5) The sixth stage is to review the information units from relevant articles and add the substance of the author's own previous research. The research results were categorized and constructed inductively into a conceptual model (John J.O.I Ihalauw, 2004) as figure 1.

DISSCUSSION AND RESEARCH FINDING

Definition of Spatial Adaptation and Culture

Spatial adaptation, in the field of psychology, is elucidated as the process of adjusting one’s mental representation to capture spatial details in the form of description, whereas irrelevant details are disregarded. Therefore, the terminology of spatial adaptation is used to assess spatial ability within the domains of Science, Technology, Engineering and Math (STEM) through a computational model as an effort to describe spatial adaptation under mental rotation tasks (Lovett & Schultheis, 2021a). Spatial adaptation provides an understanding that humans with their abilities and rationalities have adapted themselves to the spatial dimension on the space scale and its contents for the survival purposes. Humans have the ability to create, shape, and manipulate the environment and all its contents that are purely physical or conceptual, both naturally and artificially. Spatial adaptation covers among others are distance manipulation, spatial perception, distance sense, boundary manipulation (by changing surrounding boundaries that were previously impossible become possible). Architecturally, previous definition of spatial adaptation is in line with the content of space and place by adding aspect of time (Tuan, 1977), (Carmona et al., 2003), (Puspitasari, Djunaedi, & Putra, 2012).

Culture is inherent in the conception and action of spatial adaptation. The passive form of the word ‘*cultura*’ is ‘*colere*’ which means tendency, guard, to develop. Furthermore, the word ‘*cultura*’ is used as a concept that describes ‘collective habits or achievements of a number of people.’ Denotatively meaning, *cultura,* covers inheritance of ideas, beliefs, values, knowledge as a basis for social action, statement of attitudes and feelings, distinctive behaviour, a total of various activities, traditions, artistic expressions or tasted that are valued, manners, the style of dress, the scientific method to produce innovation, efforts to improve certain qualities, the mechanism of growing in a certain way. In its entirety, the term ‘culture’ is defined as ‘the complex collection of knowledge, belief, art, law, morals, customs and any other capabilities or habits acquired by man as a member of society. The notion ‘culture’ was regarded as all the ways that humans imposed in prevailing over changes of human intelligence to become completely human. The term ‘culture’ is used to describe the improvement/change of refinement of individual intelligence. Changes in human intelligence involve two things: the folk-spirit (unique identity/authenticity) and the spirit of change in disobedience towards perfection (Alo Liliweri, 2019; Koentjaraningrat, 1988).

Cultural adaptation is explored through the evolutionary process which in its course shows changes in human life to harmonize with the condition of the natural environment. On the contrary, adaptation to the environment is one of the sources for the formation of cultural values in addition to historical factors, social and economic evolution, contacts with other cultural groups, messages in the family and others. Humans are actors in making changes and can manipulate these changes during the adaptation process. Adaptation is done by humans to cope with change so that humans can live sustainably (Alo Liliweri, 2019).

Articles' Trend Mapping

Spatial adaptation in relation to traditional culture has attracted many attentions of authors from major countries, such as America, England, the Netherlands, Italy, China, Canada, and Australia in the last five years (see figure 2). In 2019, the issue grew more intensively from American, Italian, and Spain writers. Further, in 2020 the same issue has attracted the attention of authors from England, the Netherlands, Canada, and Australia to work collaboratively with those authors from the surrounding countries. In 2021, however, the topic of spatial adaptation and traditional culture has been expanded by authors from China and other relatively small number of authors from Japan, Honduras, Saudi Arabia, Romania, Palestine, Lithuania, Peru, Albania, Nepal, Bangladesh, Turkey, Hungary, Jordan. From the articles being reviewed, the institutions, associations, and universities carried out the studies on spatial adaptation-traditional culture are mostly concomitant to the fields of geography, climatology, global green growth, agricultural economics, mountain research, anthropology and development, and interdisciplinary fields.

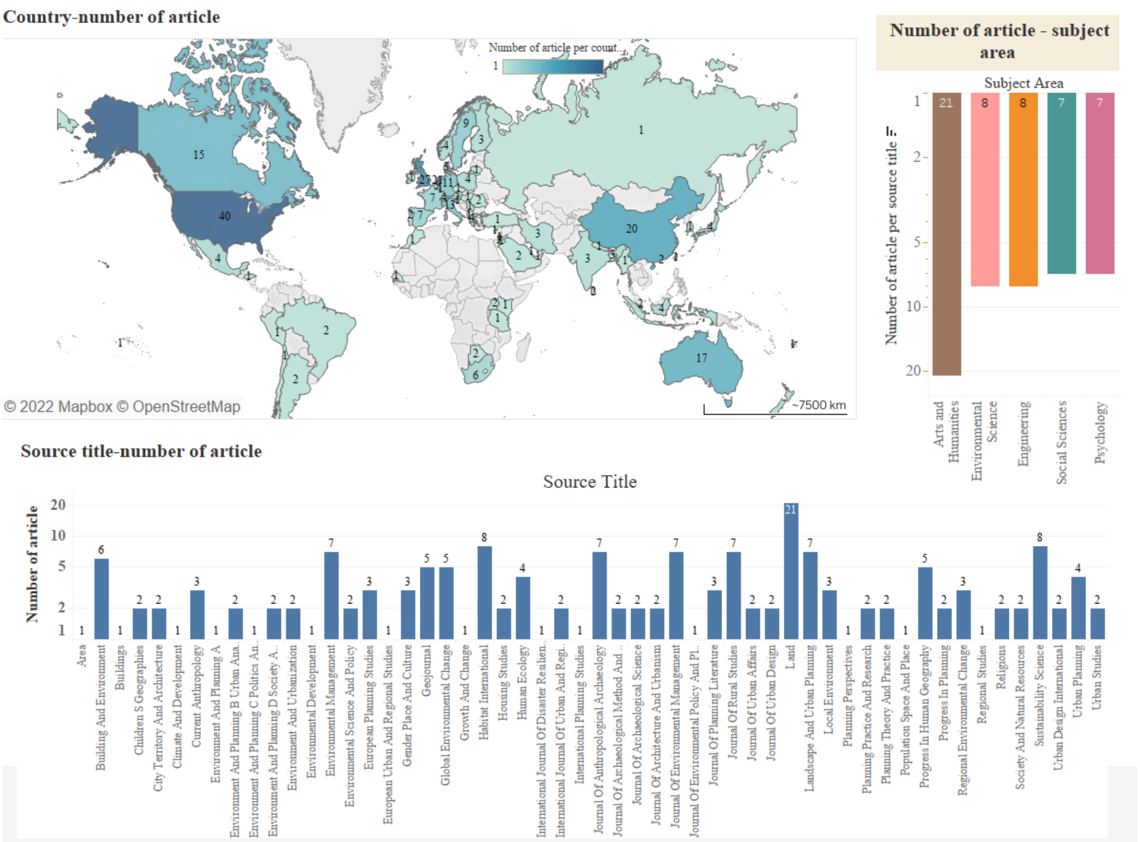


Figure 2. Mapping by country, subject area and number of articles

Articles with content related to spatial adaptation and traditional culture in five years ago (2018-2019) were published more intensively in 1) environmental journals such as environmental management, landscape and urban studies journals such as environmental science and politics, environment and planning, local government, environment and urbanization; 2) journals of urban/rural planning and theory/design/practice: International Journal of Urban, Journal of Urban Affairs, Journal of Urban Design, Urban Design International, Planning Theory and Practice, Journal of Landscape and Urban Planning, Journal of Rural Studies. In 2020-2021, the trend of writing on the same issue is shifting towards the global issues of climate change and social issues so that the topics revolves around sustainability and humanities contents. The articles were published in the following journals: Sustainable Science, City, Territory and Architecture, Regional Environment Change, Local Environment, Human Ecology, Journal of Archeological Science, Progress of Human Geography; Gender, Place and Culture, Society and Natural Resources. Recent thoughts on spatial adaptation in relation to architecture and urban are mainly published in the journals such as Land, Habitat International and Building Environment (see figure 3). Other journals are Journal of Anthropological Architecture, Journal of Archeological Methods, Journal of Urban and Architecture, Housing Studies, Journal of Architecture and Urban, International Journal of Disaster, European Urban and Regional Strategy, Regional Studies, Journal of Environment Policy, Environment and Planning. In general, the main authors collaborate with co-authors from various countries.

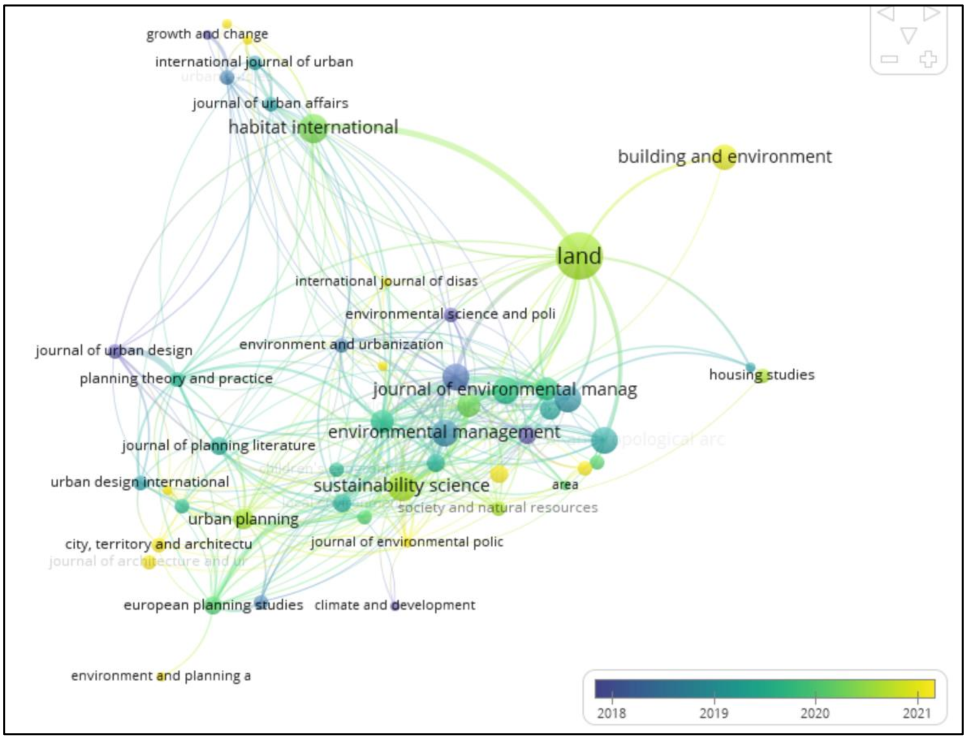


Figure 3. The mapping of Journals publishing articles on the topic of 'Spatial Adaptation'

Information categorization: towards the formulation of a conceptual model

The conceptual schema model uses information units from the contents of several selected articles, plus the results of the author's own previous research. The following is a description regarding this matter.

Theme-1: Spatial Adaptation Strategy related to Natural Landscape Context

Sub-theme_1.1: *Spatial adaptation strategy to survive and topographical changes of historic site*

Through an investigation of more than 2000 pre-historic sites during the Shang and Zhou Dynasties (pre-historical period to Shang and Zhou Dynasties) in the most important East China Coastal Plain in China by using DEM and GIS, it was found that the spatial and temporal distribution of Neolithic sites has been largely controlled by landscape evolution due to changes in sea level (Zheng et al., 2018). Atlas of Chinese cultural relics in Zhejiang Province, Atlas of Chinese cultural relics in Jiangsu Province, Atlas of Chinese cultural relics in Jiangsu Province, Atlas of Chinese cultural relics in Anhui Province and Pujiang Shangshan used as a source of information based on the classification of name, cultural periodization, location, and chronology. Research based on the assumption that abundant human activity at Paleolithic and Neolithic sites indicates that these places have been the destination of human activity since prehistoric times. Paleolithic sites are scattered and show no clear distribution pattern along the Yangtze River, in the mountainous-hill region.

Changes in sea level and geomorphic evolution, in this case, affect the type of topography, and had a major influence on the Neolithic way of life and migration strategies. Rising and decelerating sea levels facilitate the growth of settlements in both size and number. The coastal plains are susceptible to extreme environmental events such as storms and floods thus exerting a major influence on the rise and fall of Neolithic culture. Adaptation strategies to survive include: 1) Selection of locations that can increase agricultural production; 2) Development of agrarian techniques adapted to the characteristics of topographic changes due to the abrasion behaviour of sea and river water.

Sub-theme_1.2: *Landscape and behavioural mechanism of human interaction*

Landscape is an important variable in predicting or studying the behavioural mechanism of human interaction with the new or unknown environment. In the field of archaeology, landscapes can identify population expansion in the world which is known as human behavioural ecology. One study of static landscapes associated with adaptation processes to the colonization of South-eastern Alaska revealed that it may have been colonized by humans before their appearance in the archaeological record in the early Holocene. The location of the oldest archaeological sites in the early Holocene can be explained as the result of established populations adapting their settlement sites to sea level rise (Schmuck et al., 2022).

Sub-theme_1.3: *Adaptation techniques: Integrated multidisciplinary approach to manage natural disasters*

A multidisciplinary study supported by The Cooperative Research Centre for Water Sensitive Cities conducted a study of water management to provide multiple life benefits, sustainability, resilience, and productivity, with Elwood as the case. Adaptation efforts are carried out by the Elwood community, a suburb of Melbourne, Australia a location prone to pluvial and coastal flooding. Adaptation techniques integrate social, urban design, and environmental engineering aspects with the aim of increasing flood resistance and urban liveability. The complexity of the integrated fields promotes the use of an interdisciplinary approach. It is employed for the following needs: (i) to understand the concerns, aspirations and ideas of adaptation of the community under study (ii) to explore design measures that condense and use urban forms by taking into account adaptation measures in response to local context, (iii) to adopt modelling techniques to test performance, resilience and economic viability as possible adaptation solutions, and (iv) to innovate governance arrangements and principles needed to improve flood resilience in the Elster Creek catchment (Rogers et al., 2020).

Sub-theme_1.4: *Landscape design and thermal comfort*
Landscape design that has been planned strategically can improve local thermal pressure and increase climate resilience especially in urban areas with high population density and by experiencing extreme weather. Thermal comfort in the square (Hokuriku case) is influenced by the landscape layout, the configuration ratio of deciduous trees, and the vegetation structure. The use of PMV (Predicative Mean Vote) analysis and ENVI-met simulation showed that tree planting in an array layout with low PMV distribution was proved to improve thermal performance at 14.00 in the winter and summer microclimate at that location. The tree planting increases 0.3 PMV in summer. The tree configuration ratio is an important greening indicator that can be used to regulate thermal comfort during day and night (Xiao & Yuizono, 2022).

Theme-2: Spatial adaptation strategy to solve the local climate and energy saving.
Sub-theme_2.1: *Local Knowledge Resilience and Climate Change*

Climate change causes changes in migration patterns and the movement of communities to new areas. Rapid ecological changes in the Arctic region (the Arctic, especially in socially and ecologically vulnerable areas, or remote areas) are causing indigenous peoples to leave their birthplaces and abandon their traditional ways of life (Romero Manrique et al., 2018). The traditional knowledge possessed by migrants is knowledge that is in the process built over a long period of time through community social interactions to adapt effectively to effective strategies. Climate change affects the reduction of sea ice thickness, increased coastal erosion, disruption of the distribution and availability of species, and unstable availability of environmental infrastructure. These changes affect the availability of marine resources as the main source of food security and drinking water for Arctic communities. The possible adaptation strategies are to integrate traditional knowledge and the latest science as well as technology.

Sub-theme_2.2: *Local technique and energy shaving*

A case study in Korea regarding 20 residential units categorized as *Korean Passive House* (KPH) was investigated for their adaptation to the local construction market and culture. The results show that KPHs have met a variety of needs that have arisen from the typical local context. The problem of overheating caused by traditional water-based underfloor heating systems, can be prevented by adjusting the U-value (heating and cooling load) of the KPH prototype. KPH usually use local materials, products, and technologies that are readily available in the Korean construction market to reduce the energy content so as to achieve the desired efficiency level (Lee et al., 2020).

Theme-3: Spatial Adaptation Strategy and The Dynamic of Settlement Pattern
Sub-theme_3.1: *The Concentration – De-concentration Settlement Pattern of MC-Born in Australia*
Settlement relocation is related to residents' preferences to settle and live on customary lands through certain adaptation strategies. This kind of voluntary immobility can be an important

adaptation strategy that helps strengthen the cultural and spiritual resilience of a particular community, because of the possible loss of its preferred location due to relocation. Voluntary immobility decisions require ethically sound policies and practices (respect, protect, and fulfil the rights of ‘immobile’ persons and those on the move) culturally appropriate, especially when a site is deemed uninhabitable (Farbotko & McMichael, 2019). Through experimental studies, it was found that adaptation through active participation strategies includes: acting together (collective regeneration of urban space), living together (new welfare, health and well-being), growing together (collaborative space for work and innovative companies) (Boeri et al., 2017).

The sustainability of socio-physical heritage and cultural legitimacy, in the case of Emirate villas, is maintained by the residents through a historical approach that is linked to spatial change. Corrective and regenerative designs and policies are possible if they are assembled through an iterative design process. The designs and policies on the prototypes of villas in the Emirate of the past were studied by viewing the iterative process to accommodate user-driven spatial interventions (Rashid, Ara, and Abdalla 2022).

The dynamics of changes in Chinese settlements in Australia from a geographical perspective shows the phenomenon of concentration and de-concentration of Chinese immigrants’ settlements in urban areas, focuses in small, medium, and large scale cities (Wang et al. 2018). Population of this study is those whose place of birth is recorded in Mainland China (MC-born). The data do not include ethnic Chinese born in Australia, but ethnic Chinese residents who are categorized as temporary residents from Mainland China living in Australia.

The concept of research framework based on the theory that spatial grouping reflects the role of social networks in maintaining and strengthening social integration, and their formation is influenced by the practice of various cultures and languages (Edgar, 2014). Traditional layouts are formed through assimilation (straight-line model), in which minority groups leave their ethnic communities as their socioeconomic status increases and moves to higher adapted housing locations (Alba & Nee, 2009). The result of traditional spatial assimilation is ethnic enclaves that may disappear over time. In contrary, they use a model of ethnic loss, often called ‘place stratification’ (Edgar, 2014, p.365). Prejudice and discrimination by the dominant group hinder the assimilation process (Charles, 2003). As a result, ethnic enclaves are often stigmatized as ghettos and are negatively associated with social segregation, crime, and socioeconomic disadvantage (Powell, 2013).

The dynamics of Chinese settlement in Australia, geographically shows the phenomenon of concentration and de-concentration. Socio-economic characteristics determine the differentiation of MC-born job categories and are also determined by the qualification of educational level. Language skills and personal income reflect the diversity in cities of different scales (small, medium, and large cities). Different concentration patterns dictate spatial and temporal variations based on migrant group sizes and different spatial scales. The bigger the city, the greater the opportunities for cultural diversity; the wider the job market, the wider the social network and the greater the presence of MC-born migrants. The spatial concentration of MC-born as migrants is related to household prices and the needs of the labour market, along with the government’s policy impetus regarding the opportunity to increase the number of migrant workers with the aim of improving the local government’s economy. The concentration of MC-born migrants related to education generally occurs in medium and small cities. The phenomenon of decentralization and stratified concentration of MC-born migrants occurs in big cities (Melburne and Sydney), where the next emerging MC-born migrants follow the settlement pattern of migrants who came earlies and spread to the surrounding areas along with the formation of wider ethnic clusters. Currently, the inner city of Chinatown in Australia has lost its function as a residence and has turned into a symbol of cultural and architectural heritage so that it has an impact on the tourism icon. With such conditions as suburbanization, urban growth, and differences in socio-demographic groups play an important role in segmented assimilation.

Theme-4: The impact of accessibility, tradition, and investment on settlement spatial pattern

Sub-theme_4.1: *Strategic location, guaranteed livelihood opportunities, and investment climate*

Based on qualitative research in the pilgrimage city village, Kampung Luar Batang in North Jakarta, Indonesia, it was found that high accessibility to major ports and urban economic centers coupled with the phenomenon of the pilgrimage of *wali* tradition, has increased urbanization. The urbanization process that does not stop all the time causes an adaptation process over time until the housing conditions become stable or the pattern of living has been passed down from generation to generation. (Puspitasari, Djunaedi, & Shri Ahimsa Putra, 2012) (Puspitasari et al., 2011b) (Puspitasari, Djunaedi, & Putra, 2012). The development of the physical morphology of the village takes place organically and is increasingly widespread, horizontally reaching its maximum limit when potentially livable land is no longer available. The next impact is the construction of residential houses in an intensive and uncontrollable vertical direction, high building density, decreased environmental quality, intervention in the occupancy of public spaces and increased commercialization of underhanded space. Spatial adaptation techniques are carried out by immigrants in several ways: 1) living with relatives who have lived previously and have been accepted by the local community, occupying illegal spaces (for example making temporary residences on the banks or above water areas), or working facilities as a place to work. stay; 2) take turns doing informal work in public spaces with other migrants who have the same fate as nomads; 3) receive the inheritance of the place of work after a relatively long stay; 4) renting or buying occupancy space in certain areas which are recognized by the predecessors as their own; 5) renting out space in their residence to increase their income. Overall spatial adaptation strategies include: adaptation of social relations, recognition of kinship with predecessor occupants and sacred guardians, use of reasons related to length of stay, motivation of togetherness in maintaining religious values, conventions with conditions in the use of public space to maintain stability in daily life. The high rental market is used as an investment opportunity by previous residents who think they have settled. They leave the village and buy a house in another location, while renting a house in the village as a guarantee of lifelong income. Those who have lived in the village feel reluctant to move on the grounds that the source of income in the village caused by pilgrimage activities is a guarantee as long as they are willing to try.

Spatial adaptation for Madurese migrants in the Old City of Malang, Indonesia is a necessity so that they can survive in a certain place in a micro or mezzo scale urban area. (Asikin et al., 2017). Adaptation needs to be seen as a social process, product and strategy for survival when a person/group responds to external demands. In the adaptation process there is a phenomenon of change that requires changes in humans both in their interactions with the social environment and the physical environment of their settlements. Through a qualitative descriptive method accompanied by a discourse analysis approach, observation and in-depth interviews of key persons, it was found that the adaptation process on a meso scale shows the occurrence of privatization of public space, clustering, inclusion-exclusion processes, categorization and classification.

Efforts to maintain the homogeneity of 'social identity' are accompanied by heterogeneity which has an impact on the emergence of perceptions of differences in the power of beneficial spatial control. On a micro scale, residents make adaptations through structuring and making boundaries between spaces and flexibility in the use of space according to time.

Sub-theme_4.2: *Limitations of habitable space, adaptation behaviour and space modification*

The area and layout of a typical mass housing unit has an impact on the problem of not meeting the needs and aspirations of its residents (Kurniati & Kusuma, 2014). Through qualitative research, it was found that the limitations on housing encourage the emergence of forms of behavioural adaptation, which are carried out in stages, and modifications made by residents to achieve a pattern of living in accordance with expectations. Behavioural adaptations that are most often carried out are sharing space and doubling space functions that do not require high privacy. While the most frequent form modifications are building expansion, increasing the number of spaces (insulated) and reorganizing space based on private and public zones. Research with a quantitative -QUALITATIVE approach is able to reveal that in order to survive in limited housing, residents have the concept of 'nearly adequate' adaptation with three principal concepts of flexible, economic and sincerity manifestation (Olivia Yuni Rahayu; Popi Puspitasari; Indartoyo Indartoyo, 2016).

Sub-theme_4.3: *Transformation of the commercial structure policy, new social lifestyle and losing identity*

One of the public policies regarding the resilience and sustainability of the city is determined by the transformation of the commercial structure. This was identified through research in Central Lisbon complemented by evidence of fieldwork. Changes in the commercial structure are compensated for by the evolution of space into consumption space, cultural and entertainment polarization which in turn has a tendency to give birth to new lifestyles. These developments have an impact on the emergence of new social and economic challenges related to rising house prices, changes in retail supply, over-reliance on tourism, and the danger of losing some of the city’s identity (Barata-Salgueiro & Guimarães, 2020).

In the perspective of capitalist world system, China is being considered after the world’s superpowers. The Silk Road is a trace of the spread of Chinese ethnicity in the world through both land and sea trade activities. Mainland China first relied on its comparative advantage (cheap labor) to develop its export processing industry, targeting most mature markets in the

United States. In doing so, China took over the low valued-added, labour-intensive, export-oriented industries of the major manufacturing countries in the previous round of industrialization. One of the impacts is the phenomenon of migration from Mainland China to other countries (Zhang, 2017).

Urban spatial changes are influenced by government policies in dealing with the migration process, as is the case with Chinese immigrants in Spain (Zhou, 2017). The arrival of Chinese immigrants (mainly from the Philippines indirectly from Mainland China) to Spain before the 20^{th} century was driven by trade activities and Chinese servants. The port of Barcelona was the first target location for these immigrants. Chinese immigrants who came directly from Mainland China began in the early 20^{th} century, one of which was immigrants who acted as circus performers from Shandog (North China through Russia around 1910). The first recorded Chinese (1914) were Chen Xianting and Wang Tingxiang, who came from Qingtian in Zhejiang. In the process of its development, it was identified that the aspects that drove the chain of migration in Spain and affected spatial changes are as follows:

1) *Migration chains -1 : Immigration Policy and Economic Development*

The growth of the Chinese ethnic migration chain was driven by: 1) Changes in Spanish government policies were in line with the improvement in the country's economic conditions, especially after the Era of World War II (1980s—before the 2008 global financial crisis); 2) Improved economic conditions promoted the development of a number of construction projects in Spain. At the same time, the government implemented a liberal immigration policy to attract unskilled cheap-paid laborers in a number of construction projects. This provides opportunities for Chinese immigrants in Spain and the surrounding countries to legalize their status so that they can work as laborers.

2) *Migration chains -2 : amnesties for illegal immigrants*

Another government policy that foster the activities of Chinese immigrants in Spain offers that foreigners who live in Spain for more than three years and have a contract of more than one year can obtain resident status and get a working permit. This condition stimulates the sale and the purchase of working contracts from Chinese citizens who have settled and have business in Spain, and strengthens cooperation with the official migrant community who can provide important information and documents, especially for those who do not obtain official channels.

3) *Migration chains -3 : "Family Reunion" and work contracts*

The second type of migration chain is that it occurs through reunions of Chinese families in Western Europe. A close kinship system between family members and their descendants is characterized by the use of the same family name. In developing this type of migration chain a large family with the same surname closes the opportunity to adopt children from families with other surnames who already live abroad, but provides opportunities for more family members whether the purpose is to work or to study. A person or a family who has settled abroad first thus becomes the forerunner to the formation of a new migration chain. 'Being channelled to another country' is not a crime but a worthwhile undertaking by people who want to make a fortune abroad but lack the legal entitlement to try. The new immigrants from China are not only looking for a way out of poverty but also as a trading business strategy, one of which is by importing cheap merchandise from their own country

Theme-5: Spatial Adaptation, Collaborative Action, and Public Awareness and Skill

Sub-theme_5.1: *Natural Disaster, multi-level institutional structures and collaborative action*

Spatial adaptation in an effort to adapt to social, ecological, and cultural changes can adopt lessons from research conducted in Vedic SriLanka with research subjects of coastal indigenous fishing communities (Galappaththi et al., 2020). Adaptation challenges are changes as a result of disruption from Sri Lanka's ethnic conflicts, climate change and the frequency and severity of natural disasters, increasing frequency of human-elephant conflicts, increasingly unpredictable weather patterns, and the Coastal-Vedda transformation as it moves towards social modernization. The research findings suggest that the fishing communities studied used three adaptive strategies: adaptive institutions with multi-level institutional structures that facilitate collective action and collaboration, use of culture-based fisheries (CBF), and livelihood diversification. Four site-specific attributes make up community adaptation: cultural identity, co-management of CBF, flexibility in choosing adaptation options, and local knowledge systems.

Sub-theme_5.2: *Adaptation process and awareness for responses*

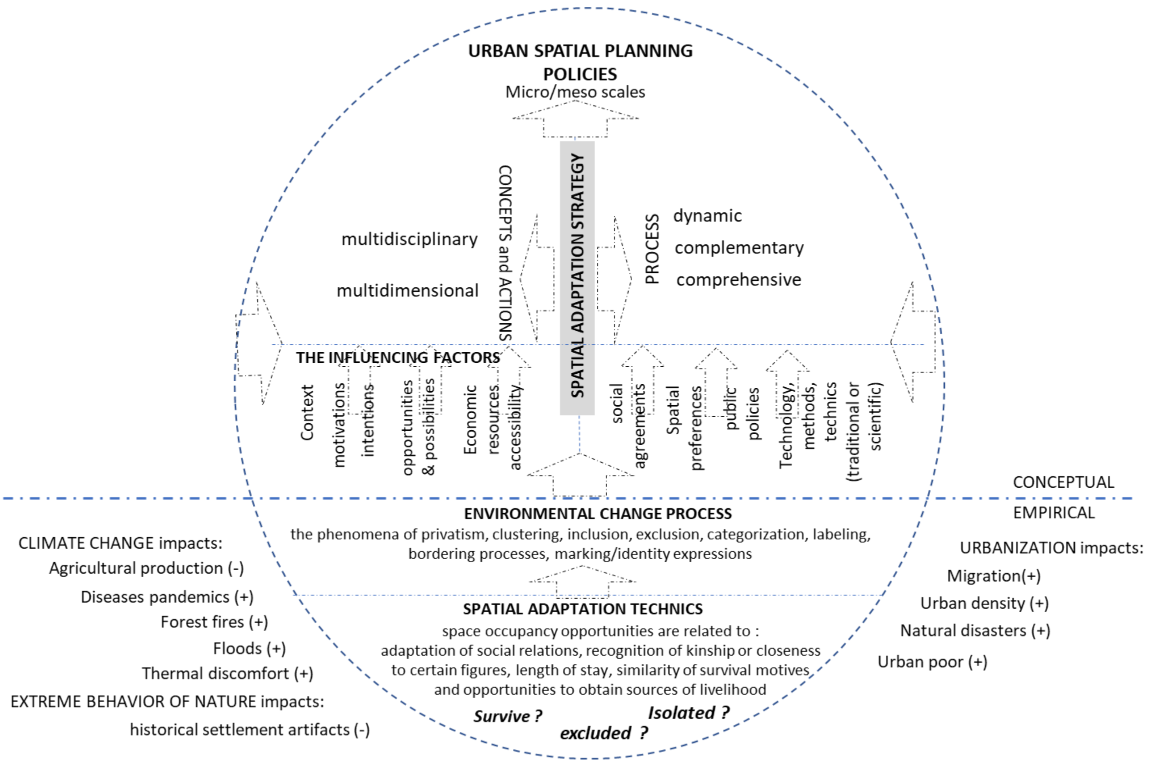
Cultural factors in the organization have an important role in the adaptation process for the sustainability of the company's management. Culture in this case is defined as a shared belief (culture is considered an investment), which on the basis of communication/access to information is assumed to be able to provide awareness for responses to issues related to established policies. Facilitative leadership competences can support a learning climate and develop mechanism to transfer learning from individuals and teams into organizational knowledge and experience. There is also the effect of organizational learning on company innovation and company performance (Lawanda, 2019).

Sub-theme_5.3: *Language Skill and Opportunity*

The case in Canada shows that the survival of immigrants abroad is influenced by economic integration and the quality of skilled immigrants (Kaushik and Drolet 2018). The ability to speak the language of the local country is one of the important factors that can provide opportunities for job opportunities and determine the work outcomes of the immigrants, in addition to understanding the culture and norms in the workplace. The case in Canada illustrates that the Immigrant Settlement and Adaptation Program (ISAP)(CIC 2011), is an institution that assists immigrants in adapting themselves to the settlement situation and integrating them into the local culture.

Conceptual Model of Spatial Adaptation Strategies

Figure 4 below is a formulation of conceptual model of Spatial Adaptation Strategies synthesized from



the above description.

Figure 4. Conceptual Model of Spatial Adaptation Strategies

CONCLUSION

Spatial adaptation strategies are comprehensive and complementary, multidisciplinary and multidimensional. Implementation in daily life, spatial adaptation strategy aims for humans to defend themselves/groups and continue their lives. Complementing the strategies carried out are motivation, opportunities, social agreements, policies, technology, both traditional and scientific. In practice, the factors that influence the spatial adaptation strategy are the characteristics of the local/environmental/city context, accessibility to economic resources, opportunities and possibilities for prior community acceptance, modification techniques, spatial preferences related to human resource investment or investment. economy, global climate change and policies that weaken or strengthen migration opportunities.

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CHAPTER 13

The Effect of Sustainability Report on Company Value Which is Moderate by Good Corporate Governance

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ABSTRACT

Enterprise value is a very important part of increasing investor interest, which is always linked to share prices. Many factors can influence investors' interest in buying a company, namely the company's financial and non-financial factors. An example of corporate finance is the profitability of a company, while non-financial can be seen from how a company discloses its social responsibility. A company's awareness in expressing corporate social responsibility and a high level of profitability in improving the company's image will be directly proportional to investors' interest in investing. Apart from that, investors also pay attention to companies that have a good reputation, which can be indicated by the large size of the company. However, a research gap was found in previous research. This research also empirically tests the relationship between sustainability reports (SR) and profitability on the value of companies listed on the Indonesia Stock Exchange. This research also tests the existence of the good corporate governance (GCG) variable as a variable that moderates SR and profitability on company value. ROA is used to measure profitability, total assets to measure company value, and Tobin's Q as a measuring tool for company value. The sample used in this research was 63 companies listed on the Indonesia Stock Exchange in 2018-2021 with the requirement to report a sustainability report, including the Asia Sustainability Report (SR), and fulfill all the requirements of the purposive sampling method. The results of this research are (1) sustainability reports have a positive effect on enterprise value (2) profitability has no effect on enterprise value (3) GCG in SR and profitability have no effect on enterprise value

Keywords: *Good Corporate Governance, Sustainability report, and Enterprise Value*.

INTRODUCTION

One of the foundations of a country's economy comes from level sustainability of a Company. The sustainability of a company can be seen from many
elements, one of which is company value. The value of the company itself can be increased from concern for the surrounding environment which is the impact of the company's operational activities. By disclosing information about social and environmental responsibility, it is a form of corporate concern take actions that can ensure each company remains sustainable without any complaints from local parties. The form of concern in question is through disclosing a sustainability report.

The profits of a company are also an element to see the level of sustainability of a company. The higher the profitability generated by a company obtained from its total assets, it indicates that there is interest from shareholders. Maximizing company value is very important for a company, because by maximizing company value it will maximize shareholder wealth, which is the company's main goal (Hirdinis, 2019). Company value can also be determined by investment decisions (Rajagukguk, Valencia and Yunus, 2019). Likewise, the larger a company is, the more easily the company can obtain funding sources. The existence of good company values can be proven through good internal management in the form of effective GCG components. This is also based on the idea that GCG is a system for managing and controlling a company which is expected to provide and increase company value to shareholders (Fatchan, Ilham, 2016).

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Stakeholder Theory

According to Ghazali and Chariri (2007), stakeholder theory is a theory which states that a company is not an entity that only operates for its own interests, but must provide benefits to all its stakeholders (shareholders, creditors, consumers, suppliers, government, society, analysts, and other parties). Through SR publications it can be seen how much the company has had an influence on the social conditions of society and the environment. With SR disclosure, it can attract stakeholders' interest in working with the company.

Signal Theory

Signal theory is an action where the company provides information to stakeholders.
When a company provides information, market players first interpret and analyze the information as good news or bad news (Rajagukguk, Valencia and Yunus, 2019). If the readers of the information, namely the signal recipients, catch the signal well, it will increase the attractiveness of investors in investing in a company, so that the market will react to increase the trading volume of a company.

Agency Theory

Agency theory discusses the existence of an agency relationship between the principal and the agent, which occurs because of differences in interests or roles. The assumption of basic human nature emphasizes that humans are often self-interested, humans have limited thinking

regarding perceptions of the future (bounded rationality), and humans always avoid risks (risk averters).
(Fatchan, Ilham, 2016).

Hyphothesis Development

The Effect of Sustainability Reports on Company Value

The sustainability report is a tool that is a source of information for shareholders regarding how much the company has demonstrated awareness of the responsibilities of its stakeholders. Building shareholder interest in a long-term vision and demonstrating increasing company value related to social and environmental sciences is one of the benefits of a sustainability report (Pujiningsih, Virgoria, 2020). A sustainability report is proof that a company has carried out its corporate responsibilities and long-term vision and mission related to the environment, social and economic aspects in meeting the interests of stakeholders . The existence of this disclosure shows that a company has accountability, responsibility and transparency criteria towards shareholders and other stakeholders .

So it can be concluded that the more disclosures a company makes in its sustainability report, it proves that the higher the company value. There are differences in previous research regarding the relationship between sustainability reports and company performance. Study Dewantari, Wayan and Gede, (2019) stated that the Sustainability Report significant effect on company value. Meanwhile, research by Febriyanti and Galuh (2021) states that the sustainability report variable does not have a significant effect on company value. So based on this research gap , researchers tested the hypothesis:

H1 = Sustainability reports have a positive effect on company value.

The Effect of Profitability on Company Value

Profitability can be said to be one way a company measures how much profit the company generates using assets. If a company can increase the company's profits through total assets, it indicates that investors' interest in investing shares in a company will be higher, so that the value of the company will increase. High profitability can enable a company to cover the costs and expenses incurred, both in operations and costs incurred for social activities in the community and the environment. There is disclosure of informationcompany in the form of profitability that is able to finance company activities, will enable investors to receive sufficient and transparent information about a company's performance. This is in line with signal theory which states the importance of company information in making investment decisions by outside parties.

This research is supported by research (Komarudin, Naufal, 2019) which explains that profitability has a significant positive effect on company value. However, previous research by Prasetyo, Dimas and Aditya (2023) states that profitability has no effect on company value because investors today are not only focused on the profits owned by the entity but also investors tend to look at other factors in the entity that are able to provide long-term effects length to the entity. So based on this research gap , researchers tested the hypothesis:

H2 = Profitability has a positive effect on company value.

The Influence of GCG in SR and Profitability on Company Value

From several different research results, it is possible that there are other factors that can influence sustainability reports, profitability and company size on company value, namely good corporate governance (GCG). This is because a company's value can be assessed to increase if the company can be managed efficiently by company management. Agency theory is one of the issues that occurs in corporate governance. Through the implementation of GCG, the Company strives to express better social responsibility which can be seen from the sustainability report published by the Company, thereby increasing investors' interest in buying Company shares.

The implementation of company GCG can also show that there is good management in the company's internal management so that the company can increase the profits obtained from the company's total assets, and result in higher company value. Having good company GCG will also create a company that, even though it is large in size, will be rated as a company which has credible financial reports even though the size is large, so that it will also increase investor interest in buying company shares. So based on this research gap , researchers tested the hypothesis

H3 = GCG moderates SR and profitability on company value

Conceptual Framework

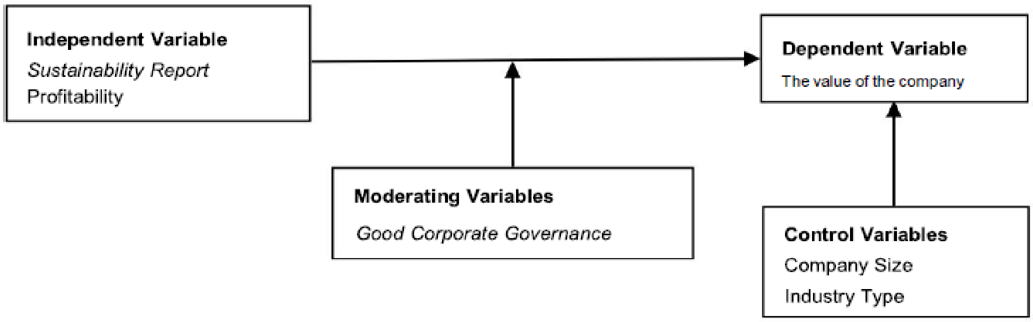

Figure 2.1 – Conceptual Framework

This research uses a method that is used with tools in the form of statistical software namely SPSS. The regression equation is as follows:

Y = ÿ + ÿ1X1 + ÿ2X2 + ÿ3X3 + ÿ4X1X2X3 + e.........................

Y = Company value
ÿ = Constant

ÿ1 – ÿ4 = Independent variable regression coefficient
X1 = Profitability

X2 = *Sustainability report*

X3 = *Good corporate governance*
e = Residual

DATA, TABLE, FIGURE

The population in this research are companies listed on the Indonesia Stock Exchange (BEI) index for 2018-2021. A total of 63 samples were taken from the BEI index using a purposive sampling technique, namely selection based on:

1. Companies listed on the Indonesian Stock Exchange in 2018-2021,
2. Companies that present periodic financial reports on the Indonesia Stock Exchange for 2018-2021,

Table

Tabel 3.1
Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Tobin's ratio	63	.00	1.92	54.59	.8665	.36755
ROA	63	.00	.29	2.76	.0438	.05534
Ln Asset	63	13.00	16.00	923.00	14.6508	.76535
GCG	63	.20	.70	29.18	.4632	.12394
CSR	63	.08	.89	22.69	.3602	.16573
SRxROAxGCG	63	.00	.08	.47	.0075	.01363
Dummy	63	.00	1.00	38.00	.6032	.49317
Valid N (listwise)	63					

Table 3.1 shows that the dependent variable, namely company value in the Tobin's ratio, has a minimum value of 0.00, meaning the lowest level of company value is 0.00 and the maximum value is 1.92. This shows the highest level of company value at 1.92. The independent variable profitability in ROA has a minimum value of 0.00 and a maximum value of 0.29, meaning that to be able to measure the company's ability with all the assets used to be able to generate profits or company profitability, the lowest is 0.00 and the maximum value is 0.29, this shows the company was able to produce the highest profitability of 0.29. For the control variable company size in ln assets has a minimum value of 13, meaning the lowest level of company size is 13 and a maximum value of 16, meaning the highest level of company size is 16. GCG has a minimum value of 0.20, meaning the lowest level of corporate governance is 0.20 and the maximum value is 0.70, meaning the highest level of corporate governance is 0.70. The independent variable Sustainability Report (SR) on CSR has a minimum value of 0.08 and a maximum value of 0.89, which means that corporate social responsibility disclosure is the lowest at 0.08 and the highest at 0.89. For the GCG moderation variable on SR and profitability, it has a minimum value of 0.00 and a maximum value of 0.08, which means that the level of GCG moderating SR and profitability is the lowest at 0.00 and the highest at 0.08.

Tabel 3.2
One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		63
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.30046606
Most Extreme Differences	Absolute	.103
	Positive	.103
	Negative	-.083
Test Statistic		.103
Asymp. Sig. (2-tailed)		.095[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Table 3.2 shows that the results have a statistical value of 0.103 and significance 0.095 > 0.05, it is concluded that the data is normally distributed.

Tabel 3.3
Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	2.603	.924		2.816	.007		
ROA	-.814	1.761	-.123	-.462	.646	.170	5.891
Ln Asset	-.067	.060	-.140	-1.122	.266	.764	1.308
GCG	-1.378	.460	-.465	-2.996	.004	.496	2.015
CSR	.812	.386	.366	2.104	.040	.394	2.539
SRxROAxGCG	-5.376	7.771	-.199	-.692	.492	.144	6.963
Dummy	-.545	.131	-.731	-4.157	.000	.386	2.593

a. Dependent Variable: Tobin's ratio

Table 3.3 shows that profitability on ROA has a tolerance value of 0.170 > 0.10 with a VIF of 5.891 < 10, GCG has a tolerance value of 0.496 > 0.10, a VIF value of 2.015 < 10, SR has a tolerance value of 0.394 > 0.10, a VIF value of 2.539 < 10, and GCG moderates SR and profitability has a tolerance value of 0.144 > 0.10, a VIF value of 6.963 < 10. All variables have a Tolerance value of more than 0.10 and the Variance inflation factor (VIF) is less than 10, so it can be concluded that the regression model free from multicollinearity between variables.

Tabel 3.4
Runs Test

	Unstandardized Residual
Test Value[a]	-.02724
Cases < Test Value	31
Cases >= Test Value	32
Total Cases	63
Number of Runs	25
Z	-1.904
Asymp. Sig. (2-tailed)	.057

a. Median

Table 3.4 shows the results of the autocorrelation test using the runs test method, showing a test value of 0.02724, a significance value of 0.057 > 0.05, it is concluded that there is no autocorrelation.

Tabel 4.5
Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.980	.593		1.654	.104
ROA	1.942	1.129	.515	1.720	.091
Ln Asset	-.070	.038	-.256	-1.816	.075
GCG	.286	.295	.170	.971	.336
CSR	.223	.247	.178	.903	.370
SRxROAxGCG	-7.379	4.981	-.482	-1.481	.144
Dummy	.024	.084	.057	.286	.776

a. Dependent Variable: RES2

In this test, if the result is sig > 0.05 then there are no symptoms of heteroscedasticity, a good model is that there is no heteroscedasticity. In the table above, it can be seen that the sig values for all variables are > 0.05, so it can be concluded that there are no symptoms of heteroscedasticity in this study.

Tabel 4.6
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.576[a]	.332	.260	.31615	1.482

a. Predictors: (Constant), Dummy , SRxROAxGCG , Ln Asset , CSR , GCG , ROA
b. Dependent Variable: Tobin's ratio

The R square test of 0.332 explains the company value of 0.332 or 33.2%. So the company value is only explained by 33.2% of the SR, profitability and GCG variables in SR and profitability.

Tabel 4.7

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.778	6	.463	4.633	.001[b]
	Residual	5.597	56	.100		
	Total	8.376	62			

a. Dependent Variable: Tobin's ratio

b. Predictors: (Constant), Dummy , SRxROAxGCG , Ln Asset , CSR , GCG , ROA

The F-test is 4.633 with a significance value of 0.001 < ÿ 0.05, so H0 is rejected, which means there is a joint influence between the variables SR, profitability, and GCG moderates SR and profitability on company value.

Tabel 3.8

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.603	.924		2.816	.007		
	ROA	-.814	1.761	-.123	-.462	.646	.170	5.891
	Ln Asset	-.067	.060	-.140	-1.122	.266	.764	1.308
	GCG	-1.378	.460	-.465	-2.996	.004	.496	2.015
	CSR	.812	.386	.366	2.104	.040	.394	2.539
	SRxROAxGCG	-5.376	7.771	-.199	-.692	.492	.144	6.963
	Dummy	-.545	.131	-.731	-4.157	.000	.386	2.593

a. Dependent Variable: Tobin's ratio

1. The first hypothesis is that SR has a positive effect on company value. Based on table 4.8, it can be seen that the SR variable has a positive beta coefficient of 0.366 on company value and has a significance value of 0.040, namely <0.05, so H2 is accepted which means SR has a positive effect on company value.
2. The second hypothesis is that profitability (ROA) has a positive effect on company value. Based on table 8, it can be seen that the profitability variable has a negative beta coefficient of 0.123 on company value and has a significance value of 0.462, namely > 0.05, so H1 is rejected which means profitability has no effect on company value.
3. The third hypothesis is that GCG moderates profitability and SR on company value. Based on table 8, it can be seen that the GCG variable in moderating profitability and SR has a negative beta coefficient of 0.199 on company value and has a significance value of 0.492, namely > 0.05, so H3 is rejected which means GCG cannot moderate profitability and SR on company value.

CONCLUSION

The results of the study prove that GCG cannot moderate SR and profitability on company value. This also shows that profitability has no influence on company value, but SR can have a positive influence on company value. The limitation of this research is that this research is limited to the sample of companies that publish SRs in the Asia Sustainability Report category, not for all companies. For further research, it is recommended that if you want to take samples with criteria in the Asia Sustainability Report category, you should choose a time period of more than 4 years.

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Co-Editor for 8th CEO (Communication Economics Organization) Abstract E-book

Co-Editor for Onomazein Journal as article title Exploring Socio-Economic and Political Discrimination Against Christian Community In Punjab, Pakistan: A Comprehensive Analysis

Hydroponic Sardar Farm (Agriculture (Drip, Sprinkler and Reel systems) in desert, Fish, Biodiesel, Algae, Import, Petrol Stations)

ST Adam College, Keyboard Concepts, Community College of Australia, Australian Information Technology College as Admin director

Australian Agri Resources Pty Ltd, Australian Green Environment Pty Ltd
Tomato grows in Hydroponic system and achieve 25-30 kg per plant in three months and set hydroponic fertilizer solutions formula and set formula according to plant growth, flowing time and harvesting time.
Changing household bulk to energy saving LEDs for two years, House roof Installation for saving energy heat and cooling of the house.
-
Coupar Angus Institute of Technology, Pioneer College, McCarthy Learning, Angel Institute, Linx Institute (Empower College), PSL Group, VCTD, International Institute for Professional Development, iVET Australia, Australian Tourism college, as assessor and trainer

Skilled Migration Services
Connect small Business, Analysis their Financials, establish their new branches in Regional Area, Recruit suitable employee, Establish 11 Salons, Six Restaurants, Three Bakeries, Three Auto Repairer Shops, Two Printing Press within a year

The Corporate Financial Centre Pty Ltd
Find International Project for international funding & onshore client with onshore funding, Govt. of Sri Lanka's Health project valued US$80 Millions, Complete Feasibility study of the information technology, Requirements and efficient courier mailing system, Design and implement the setup of mailing database for Education Board, Implementation of mail system in Bank Customer Confirmation Statements, Pak Telecom, Pak Northern Sui Gas

International Project Syndicate
Completed planning and organizational assessments for businesses.
Analyzed financial statements during business loan-seeking process, interviewed principals, conducted business research, and issued action plans and financial/business reports. Installed financial software and resolved systems problems for investment clients.

Lawrence Walambuka - Zimbabwe

P E R S O N A L A T R I B U T E S

- An analytically-minded international relations specialist who has a strong focus on strategic analysis of foreign markets to help realize company goals. Ability to accurately assess foreign laws, regulations, sociopolitical factors and their potential impact on company goals. Experience with designing public relations strategies in foreign markets for true global involvement.
- Experience in lecturing, business management, accounting and financial management in diverse sectors including construction, retail, agriculture, government parastatals, workforce solutions and education.

E M P L O Y M E N T H I S T O R Y

- Experience in lecturing, business management, accounting and financial management in diverse sectors including construction, retail, agriculture, government parastatals, workforce solutions and education.

E D U C A T I O N A N D Q U A L I F I C A T I O N S

University of South Africa
Masters in International Politics 2023 – 2024 (currently under study)
University of South Africa
BA (Hons) International Politics 2020 – 2022
University of South Africa
BA International Relations and Diplomacy 2015 – 2019
Department of Higher Education and Training (DHET) SA
Financial Management N6 Diploma (2012 – 2014)
Department of Higher Education and Training (DHET) SA
Public Management N6 Diploma (2014 – 2016)
Southern Africa Association of Accountants (SAAA)
Higher National Diploma in Accounting (2000 – 2003)

RESEARCH I N T E R E S T S

- International political economy
- Global governance and security
- Conflict and conflict resolution
- International political theory
- Democracy and other forms of regimes
- Decoloniality
- International Organizations

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T.C.
KÜLTÜR VE TURİZM BAKANLIĞI

SERTİFİKA

FİRMA ADI	: NCM MİMARLIK MÜHENDİSLİK İNŞ. SAN. TAAH. TİC. LTD. ŞTİ.
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VERGİ DAİRESİ	: NİLÜFER VERGİ DAİRESİ MÜD.
VERGİ NUMARASI	: 6270313993
FAALİYET ALANI	: DAĞITIM (KİTAP, MÜZİK VB), İTHALAT, SATIŞ, YAYINEVİ
VERİLİŞ NEDENİ - TARİHİ	: Yeni Sertifika Başvurusu - 30.07.2021

İş bu sertifika açık unvan ve adresi yazılı olan işyeri, 5846 sayılı Fikir ve Sanat Eserleri kanunu uyarınca yukarıda belirlenen alan/alanlara ilişkin faaliyet gösterir.

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