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The sustainability awareness of banking institutions in Indonesia, its implication on profitability by the mediating role of operational efficiency

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Abstract

Purpose – This study aims to propose a solution to accelerate financing support low carbon (circular economy) transition. The authors developed a sustainability governance (SGOV) model and a sustainability governance (SGOV) index as a proxy for the diffusion of sustainability innovation. This study investigates the effect of SGOV practices on profitability with the mediating role of operational efficiency.

Design/methodology/approach – The SGOV index consists of 32 and 122 sub-items, constructed using content analysis of annual and sustainability reports published by banks listed on the Indonesia Stock Exchange (IDX) from 2010 to 2020 (404 bank-year observations).

Findings – Banks are at a moderate level of sustainability innovation. They are prioritizing the balance aspects of financial, social and environmental. SGOV practice negatively affects profitability. However, operational efficiency plays a positive mediating role that is robust.

Research limitations/implications – The measurement of the SGOV index uses criteria that have not been tested in previous studies. There is the potential subjectivity in interpreting qualitative data, although this has been minimized by cross-checking the analysis of five raters.

Practical implications – This study gives feedback for the Indonesia sustainable finance (SF) journey phase I to proceed into SF journey phase II.

Social implications – The SGOV model can be applied in other industry sectors to know the readiness for entering low carbon (circular economy) transition.

Originality/value – The uniqueness of the scoring technique assuming a step-by-step innovation model to sustainable finance.

Keywords Sustainability governance, Sustainability intention, Integration, Implementation, Operational efficiency, Profitability

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1. Introduction

Indonesia's G20 Presidency in Bali 2022 is a platform that strengthened the commitment of G20 countries to achieve a target of Net Zero Emission (NZE) in 2060. The decarbonization industry is the path businesses and industries must choose to reduce their carbon footprint significantly. Therefore they must build synergy in mobilizing local, national and transnational funding to accelerate green structural change. In the last decade, the banking business paradigm is shifting from finance as usual to sustainable finance (SF) (Schoenmaker, 2017).

In the first stage, banks refine values by avoiding loan allocation to carbon-intensive industries. At this stage, the weighting of the financial risk is still higher than the social and environmental (F > S + E/SF1.0). In the second stage, banks consider balancing the financial, social and environmental risks (Total Value = F + S + E/SF2.0) by applying environmental, social and governance (ESG) screening. Then in the third stage, banks consider social and environmental risks higher than financial (S + E > F/SF3.0). Banks begin directly financing renewable energy and positive impact investing in the highest transition stage. In this stage, banks' operation shifts from risk-based to value-based orientation as banks' time horizon shifts from medium to long-term (Schoenmaker, 2017).

The nudging theory of change recommends that banks lead the transition by giving base lending rates to companies/projects with low ESG risks, whereas premium rates for companies/projects with high ESG risks. Although there has been a positive trend of increasing sustainable finance in recent years (Buchner *et al.*, 2017), the flow of funds is insufficient to achieve the target of a 1.5 °C risk mitigation scenario (Krogstrup and Oman, 2019).

Previous studies showed that sustainable companies could make a large-scale change from transitional to transformational (Eccles *et al.*, 2012). However, banks' adaptability is low due to higher weighting on the financial risks (Agirre-Aramburu and Gómez-Prescador, 2019). These phenomena are supported by the market power hypothesis, which facilitates banks to charge higher interest rates and gain windfall profits (Berger, 1995).

Furthermore, the literature acknowledges that institutional risk is the leading cause of the global crisis. An inappropriate top management teams (TMTs) compensation system is considered a trigger for excessive risk-taking, which causes banks to be included in the group that received the bailout from the central bank during the global crisis (Bolton, 2013) (Fahlenbrach and Stulz, 2011). For these reasons, Doppelt (2003) reminds TMTs that patriarchal thinking is the cause of failure to adopt sustainability. In addition, large financial institutions tend to be CSR minded, but there is no effect on performance (Chih *et al.*, 2010). The profitability of conventional banks is determined by market concentration (market power), but this is not the case for sustainable banks (Olmo *et al.*, 2021). CSR philanthropy gave a false sense of security and caused the collapse of large banks during the global crisis of 2009 (Siguthorson, 2010). Strategic CSR positively affects profitability and firm value (Bolton, 2013). Therefore global regulatory reforms highlight strengthening governance with risk oversight (Karyani *et al.*, 2020).

Previous studies commonly analyze using the corporate governance (CG) index, with a simple scoring technique using a dummy variable to distinguish between a bank with strict and weak CG (Andries *et al.*, 2018; Ellul and Yerramilli, 2013). Karyani *et al.* (2019) used the risk governance (RGOV) index with an interval scoring technique but did not consider sustainability. Chih *et al.* (2010) used the KLD rating that was criticized do not reflex the bank's governance system (Bolton, 2013), and Olmo *et al.* (2021) used a dummy variable to distinguish sustainable and conventional banks based on membership in UNEP FIs. With

these measurements, the result is still limited in explaining the effect of sustainable banking on banks' profitability.

The multifaceted definition of sustainability directs scholars to prove efficiency hypotheses. They investigate the effect of sustainable banking on operational efficiency. Scholars highlight changes in technical efficiency using nonparametric data envelopment analysis (DEA) (Belastri *et al.*, 2020). Other scholars use technology change-stochastic frontier analysis (SFA), which considers managerial inefficiency using proxy the distance between the meta frontier to the cost frontier (Bos *et al.*, 2013; Pampurini and Quaranta, 2018).

The Indonesian government has committed to supporting the transition to low carbon (circular economy) as part of the long-term development plan for 2005–2025. The roadmap for SF journey phase I (2015–2019) has launched to focus on enhancing awareness, capacity building and laying out the regulatory foundation of sustainable finance. Several milestones have been achieved, expected to change business actors' mindsets by introducing SF principles (OJK, 2014). Subsequently, the Indonesian Financial Services Authority obliged FIs to report the action plan for sustainable finance following a green taxonomy for SF journey phase II (2021–2025), which will focus on building corporate sustainability systems in Indonesia (OJK, 2021).

However, there are concerns about less optimal bank intermediary function because the financial stability study showed that the operational efficiency of banking institutions is still low compared to banks in the Southeast Asian region (Bank Indonesia, 2017). From the indicator of the net interest margin (NIM) and return on assets (ROA), banks are in the highest rank. However, from the nonperforming loans (NPL) and cost-to-income ratio (CIR), they are the second-lowest after the Philippines. These findings indicated problems in defining sustainability that focus on corporate philanthropy, low awareness of sustainability risk, and corporate sustainability performance which is symbolic rather than substantive (Schaltegger, 2012). A recent study shows increasing SR publications from 2006 to 2019 (Gunawan *et al.*, 2022), although the readability level of SR published is still low (Adhariani and du Toit, 2020).

Accordingly, this study uses the term "sustainability awareness," defined as a governance system that adopts sustainability in the operational activity and links to banking business strategy, financial system and capital market. The sustainability awareness level can be measured by the realization of knowledge and facts and various ways to identify how, why and how far banks understand sustainability principles and their dimensions (Garbie, 2015). This study proposed a sustainability governance (SGOV) model to investigate three areas; (1) Why do banks manage sustainability, (2) How far is sustainability embedded in core banking strategy and (3) How sustainability is operationalized (Schaltegger *et al.*, 2014).

Specifically, the SGOV model was developed by combining a "strategic performance measuring system balanced scorecard" (SPMS_BSC) with the "Triple I framework," namely sustainability intention, integration and implementation (Kaplan and Norton, 2008; Hristov *et al.*, 2019). This framework has been adopted by 468 global organizations from various industries covering small, medium to large in 12 countries (Schaltegger *et al.*, 2014). Therefore, we expanded the SGOV index for banking following global regulatory reforms for sustainable finance, including the GRI standard, financial services sector supplement, UNEP FIs, the equator principle FIs, CG principles for banks (BCBS, 2015) and IT governance.

The development of the SGOV index uses a scoring technique based on a framework for sustainable finance that assumes a step-by-step innovation model (Rogers, 2004; Schoenmaker, 2017). This study examines the effect of the SGOV index on banks' profitability and the mediating role of operational efficiency. This study uses 404 bank-year

observations of banks listed on the Indonesia stock exchange from 2010 to 2020. The results show that SGOV practice negatively affects banks' profitability. However, operational efficiency positively mediates the relationship between SGOV practice and banks' profitability.

Accordingly, this study is expected to contribute novel contributions to the existing literature. First, the SGOV model provides a comprehensive measurement of SGOV practice. Second, it provides empirical evidence on the mediating role of operational efficiency using technology change proxy I/O intermediation approach – stochastic frontier analysis (SFA). This study also highlights policy direction for regulators and standard-setters.

The remainder of the paper is organized as follows. Section 2 is the literature review and hypothesis, Section 3 is the methodology, Section 4 is the result and Section 5 is the conclusion.

2. Literature review and hypotheses

2.1 Conceptual framework of sustainability governance model

The first step to becoming sustainable banking is to define "Sustainability Intention," It consists of two components that require TMTs to define: (1) Sustainability motivation and ( ) Sustainability strategy formulation to engage stakeholders. The stakeholder theory suggests that TMTs identify relevant stakeholders (Freeman, 1984) based on political, economic, social, technological, environmental and legal analysis (external condition). Then TMTs should continue the analysis of human capital, operations, innovation and technology deployment (internal condition) and the progress of the current strategy (Li, 2011). Both analyses will ensure that TMTs comprehend the strategy and management capability gaps, which several strategic expenditures and budgeting should be filled. At this stage, banks should establish key performance indicators (KPIs) to reduce their negative direct and indirect impact of greenhouse gas emissions, paper consumption and savings, business process improvement and financing/investing for identified thematic issues (FSB, 2013).

Sustainability intention should be continued with **"Sustainability Integration"** to make sustainability embedded in (2) Organizational units for (3) The discovery of sustainable business cases. TMTs should engage employees by communicating the strategy and linking the target KPIs of strategic initiatives and programs. The strategy communication will enhance managers' strategic judgment on sustainable finance (Hristov *et al.*, 2019).

The committee report on the corporate governance lesson from crises 2009 (OECD, 2014) stated that effective risk governance practices would determine the adequacy of **sustainability implementation**. The implementation consists of (4) A risk management process based on the "Thematic Review on Risk Governance" (FSB, 2013) as well as (5) Accountability and communication of sustainability performance with SMART – specific, measurable, achievable, reasonable and time-based indicators (Schaltegger, 2012; Zuo *et al.*, 2021).

The board of directors (BOD) determines risk appetite, and the board risk management committee (BRMC) is responsible for regularly reporting risk exposure, profiles, concentrations and risk trends to BOD and senior management. The chief risk officer (CRO) leads the risk management process in the daily business routine. In addition, a formal environment, social and governance (ESG) unit needs to be formed (Weber *et al.*, 2010) to conduct a preliminary analysis of sustainable finance projects (Mostovicz *et al.*, 2009).

The first focus of SGOV practice is compliance with regulations to achieve operational efficiency by managing sustainability costs, energy consumption and savings, human rights,

product responsibility and SF innovation (Aras *et al.*, 2018). The risk committee and the board of audit committee (BAC) actively oversee the independence of internal audit (IA), annual audit activities and credit and liquidity risk management plans. Minutes of the meeting will be reported to BOD and BRMC to ensure the exchange of risk typology information (FSB, 2013).

Based on the description, SGOV practices can be defined as transforming the "Input-Process-Output-Outcomes." The input is what issues are responded to by banks. The process is a bank's perspective on how to solve the problem. The output is the short-term or medium-term stakeholders' reaction to determine the outcomes. It is the culture for long-term value creation with a true passion for sustainability (Schoenmaker, 2017). Based on the description of the SGOV model, the research framework (Figure 1) was developed to test the hypotheses as follows.

2.2 Sustainability governance and banks' operational efficiency

Sustainability is a complex multidimensional concept and would be better analyzed from a governance and capability perspective (Williamson, 1999). There are several reasons why SGOV practice can affect banks' operational efficiency. On the one hand, sustainability practices are expensive and can lead to operational inefficiencies (Nidomulu *et al.*, 2009). On the other hand, sustainability initiatives can improve reputation, lower funding costs and provide more access to investment (Bassen *et al.*, 2007). Therefore it will strengthen standards best-practice (Branco and Rodrigues, 2006), then the positive impact will offset the negative of SGOV practice.

A sustainability strategy should positively impact cost efficiency by reducing deposit rates, better human capital management and increasing the capabilities to retain talent and attract customer loyalty (Branco and Rodrigues, 2006). SGOV practice also increases output through ESG screening (Weber *et al.*, 2010). Companies are willing to accept lower interest rates for deposits in banks with SGOV solid practices. Lower deposit costs are similar to reducing input costs, and the ESG screening ensures adequate risk-adjusted returns (Aras *et al.*, 2018) to manage potential decreasing impacts (Husted, 2005). In addition, the SGOV practices also increase banks' capability to create non-interest income (Belastri *et al.*, 2020). Based on the argument, the first hypothesis is derived as follows:

H1. Sustainability governance practices have a positive effect on operational efficiency.

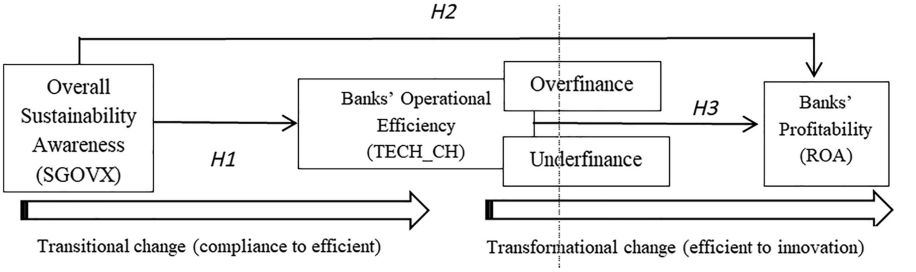

Figure 1.
Research framework

Sources(s): The author's work based on the literature review

2.3 Sustainability governance and banks' profitability

With the increasing importance of sustainability risk, companies manage it integrated with enterprise-wide risk governance (Eccles *et al.*, 2012). Empirical evidence by Ellul and Yerramilli (2013) shows that risk governance positively affects bank profitability during a global crisis. In banks where the CRO reports directly to the board, it was found that the risk management committee's independence positively affects profitability and firm value (Aebi *et al.*, 2012).

These arguments align with dynamic capability (Teece, 2007) and diffusion of innovation theory. How far institutions are communicated within the organization will affect the speed of the organization's adaptation (Rogers, 2004). Sustainability strategy increases banks' capability to sense threats, take opportunities and seize financing/investment, likewise the capability of coordinating and reconfiguring business processes (Branco and Rodrigues, 2006). The consistency in scanning environmental conditions will enhance banks' capability to make transformational changes. Based on the argument, the second hypothesis is derived.

H2. Sustainability governance practices have a positive effect on banks' profitability.

2.4 Sustainability governance, operational efficiency and banks' profitability

In the conventional bank paradigm, the market power hypothesis assumes that market concentration facilitates banks in obtaining high-interest income from loan allocations (Berger, 1995). This paradigm is supported by the relative market power (RMP) and structure conduct performance (SCP) hypotheses that create barriers to entry (Demsetz, 1982). However, this hypothesis does not apply to sustainable banks, whose competitive advantage lies in the priority of non-financial aspects (emotional and cultural attachments) that maximize long-term stakeholder value (Agirre-Aramburu and Gómez-Pescador, 2019).

The more efficient banks' operations are, the lower unit costs so that they can attract customers through lower loan interest rates and higher deposit rates (Pelzman, 1977). Therefore, higher operational efficiency will be obtained due to management capabilities and strategic alignment of technology adoption (Bos *et al.*, 2013). In addition, customer loyalty is essential in a competitive environment where bank-business relationships are close (Agirre-Aramburu and Gómez-Pescador, 2019). Strong business relationships will make customers willing to pay premium rates for sustainable products and services. So that the bank will get indirect benefits, interactive communication between banks and customers will reduce the possibility of credit allocation mismatch and increase cost efficiency (Gloukoviezoff, 2007).

According to the new institutional economics theory, the social and environmental problems can be analyzed from four-level institutional; (1) the embeddedness of informal institutions, (2) institutional environment, e.g. formal rules of the game, property rights, political, legal, (3) institution of governance, e.g. the contract that was aligning governance with the transaction and (4) resource allocation and employment, e.g. price, incentive and reward. Changes at a lower institutional level will stimulate changes at a higher institutional level (Williamson, 2000). The new institutionalist argues that the globalization of financial markets and products encourage "de jure" and "de facto" convergence (Salvioni *et al.*, 2016).

Based on the argument, SGOV practice will enhance the speed of organizational adaptation through causal effect relationships between institutional levels. Solid SGOV practices will stimulate transformational change by mediating the role of operational efficiency within 1–10 years (Williamson, 2000). Then the third hypothesis is derived:

H3. Operational efficiency mediates the relationship between sustainability governance practices and banks' profitability.

3. Methodology

3.1 Sample selection and data sources

The sample of this research is banks listed on the Indonesia Stock Exchange (IDX) for 11 years (2010–2020). During the global crisis in 2008/2009, three state-owned banks received a bailout amount of IDR 15 trillion, while private and other small banks experienced very tight liquidity. Subsequently, a financial stability study revealed that banks began to recover in the second quarter of 2010 (Bank Indonesia, 2010). So 2010 is the baseline for observing the journey to sustainable finance, where there were 32 banks listed on IDX. During the observation period, there were additional 12 (twelve) banks listed, resulting in 44 (forty-four) banks listed on BEI in 2020. We exclude 2 (two) banks registered for less than 5 (five) years. Furthermore, the SGOV index was developed for 10 (ten) years, from 2011–2019. Data for 2010 and 2020 are used to test the time-lag effect. The total observation is 404 bank years.

3.2 Research design and regression model

The SGOV index was developed using content analysis of annual and sustainability reports published by banks during the observation period. We conduct validity and reliability testing using Cronbach's α value of 0.60–0.70 as "good" or "adequate" (Clark and Watson, 1995). We developed four regression models to prove the hypothesis as follows:

$$\mathrm{LnTCOST}_{it} = \alpha_{0+}\alpha_1\mathrm{SGOVX}_{it} + \alpha_k\mathrm{Control} + \varepsilon_{it} \quad (1)$$

$$\mathrm{OPEREFF\_TCH}_{it} = \varphi_0 + \varphi_1\mathrm{SGOVX}_{it} + \varphi_k\mathrm{Control} + \varepsilon_{it} \quad (2)$$

$$\mathrm{ROA}_{it} = \beta_0 + \beta_1\mathrm{SGOVX}_{it} + \beta_k\mathrm{Control} + \varepsilon_{it} \quad (3)$$

$$\mathrm{ROA}_{it} = \lambda_0 + +\lambda_1\widehat{\mathrm{OPEREFF}}\_\mathrm{TCH}_{it} + \lambda_2\mathrm{SGOVX}_{it} + \lambda_k\mathrm{Control} + \varepsilon_{it} \quad (4)$$

Research hypothesis presented in the form of statistics: H1: $\alpha_1, \varphi_1 > 0$; H2: $\beta_1 > 0$; H3: $\lambda_1 \# 0$.

3.3 Independent variable: sustainability governance (SGOV) index

SGOV model was developed based on the argument that mandatory SR publication will drive organizational change (Aras *et al.*, 2018). The SGOV index was developed systematically in three phases. Phase I, mapping the 80 items proposed comprehensive economic, environmental, social, governance and financial stability (EESG&F) SR disclosure for banking (Aras *et al.*, 2018) into SPMS_BSC and the Triple I framework. Phase II developed several questions for SGOV model criteria consisting of 32 items and 122 sub-items based on global SF regulations. Phase III, conduct content analysis and score the SGOV practice from banks' annual and sustainability reports. The scoring technique uses an interval scale of 1–4 points, assuming a step-by-step innovation model (Schoenmaker, 2017). We also consider the potential subjectivity associated with accuracy, inconsistency and ambiguity of interpretation of content analysis by using cross-evaluation of the result of scoring from five raters (Krippendorff, 1980).

3.4 Dependent and mediating variables: profitability and operational efficiency

The dependent variable is profitability with a proxy return on assets (ROA). The mediating variable operational efficiency is proxied by technical and managerial efficiency. Technical efficiency is how banks adjust their input mix and reduce waste using the best technology set (Pampurini and Quaranta, 2018).

Technology change is measured as the distance from the meta frontier to the cost frontier. The stochastic frontier analysis (SFA) estimates the overall operational inefficiency that is

ignored in the traditional total factor productivity (Bos *et al.*, 2013). This study uses the SFA method to capture managerial incapability, agency conflict and moral hazard. The operational efficiency is calculated in two stages; (1) by modeling the annual cost frontier as the natural logarithm of the total cost, and (2) by estimating the meta frontier as technology gap estimation to the minimum cost meta frontier (f_{meta}) as presented in equations (2a)–(2e) as follows.

$$TCOST_{it} = f^{*}(w_{it}, y_{it}, z_{it})e^{v_{it}+u_{it}} \tag{2a}$$

$$LnTCOST_{i,t} = \zeta_0 + \zeta_1 LnFIXASSET_{I,t-1} + \zeta_2 LnHRD_{i,t-1} + \zeta_3 LnDEPOSIT_{i,t-1} + \zeta_k Control + \varepsilon_{it} \tag{2b}$$

$$\widehat{OPEREFF\_TCH}_{it} = \left[exp\left(-\widehat{u_{it}}\right)\right] \tag{2c}$$

$$Min.Distance = \sum_{t=1}^{T}\sum_{i=1}^{T} |inf^{*}(w_{it}, y_{it}, z_{it}) - inf_{meta}(w_{it}, y_{it}, z_{it})| s.t.\, inf_{meta}(\bullet) \leq inf^{*} \tag{2d}$$

Where, w: vector of input prices; investment in fixed assets and technology, human resources, deposits and third party funds; y: vector output, namely the amount of financing and investment allocated; z: vector of control variables including banks' risk profile such as financial condition. To distinguish the effect of globalization, such as foreign-owned banks, bank mergers and acquisitions, we used dummy variables (Bos *et al.*, 2013); v: random noise iid N (0, v); inefficiency term N|(v). The error term eit = mit + uit describes the specific banks' inefficiency obtained from the expected value uit, namely the total error eit of the intermediary I/O model 2b. The value (OPEREF_TCH) is equal to one (=1) for banks operating on the annual frontier (no inefficiency). Inefficient banks operate above or below the annual cost frontier; the efficiency score is less than one (<1).

$$GAP_{it} = \frac{f_{meta}(w_{it}, y_{it}, z_{it})}{f*_{meta}(w_{it}, y_{it}, z_{it})} \tag{2e}$$

The technology gap is calculated using equation (2e), where bank innovation will increase the technology set with a decrease in GAP_{it} (meta frontier). The increase in GAP_{it} is limited between values 0 and 1, where 1 indicates banks' operation at a meta frontier. The value of GAP_{it} is multiplied by minus 1 to get a positive value of the estimator.

3.5 Control variable

For equations (1) and (2), we controlled the natural logarithm of total assets (LnSIZE) to avoid extreme values (Beccalli *et al.*, 2015), capital adequacy ratio (CAR) (Karyani *et al.*, 2019) and banks' competitiveness using the Lerner Index (CMPNESS) (Bos *et al.*, 2013), the natural logarithm of banks' age (LnAGE), growth opportunity (PSGRO) and the enactment of SF regulation. For equations (3) and (4), we control lagged ROA_{t-1} and banks that published SR using a dummy variable to see the market impact of SGOV practice.

3.6 Endogeneity issues

This study considered the endogeneity issues as severe sustainability and governance research problems. Some researchers argue that past performance determines the board structure, but most argue that corporate governance structure and performance are

determined endogenously (Wintoki *et al.*, 2012). We consider dynamic endogeneity using a two-stage least square.

3.7 Sensitivity analysis

This study conducted two sensitivity analyses; First, the probit model test investigates how the SGOV component of the Triple I framework reduces operational inefficiency for sub-sample banks that identified suffer over/under financing/investing. Second, the time lag effect test investigates how SGOV practice affects profitability at t+1 and t+2.

4. Result

This study tested the validity and reliability of the SGOV index using data from 2011 to 2019 (360 observations). By using a significance level of 5%, r-table 0.098, and Cronbach's value criteria of 0.60–0.70 as "good" or "adequate" (Clark and Watson, 1995). All components of the SGOV model are valid, and the coefficient of Cronbach's (α) is 0.915. Thus SGOV index can be used as a proxy for SGOV practices. Due to the journal's paging policy, this study provides supplementary material about the development of the SGOV model and SGOV index, the validity and reliability test of the instrument, I/O model intermediation – stochastic frontier analysis, and the configuration of banks in transition to sustainable finance via link: https://drive.google.com/file/d/1o80BaH4YVd4duQEbv6nO_-wL7YyOhOam/view?usp=sharing

Table 1 present the mean, standard deviation and correlations between variables.

The mean of the SGOV index is 0.701, and the standard deviation is 0.122. This value shows that banks are at a moderate level of innovation. They are transitioning from SF1.0 to 2.0. The research variable shows a positive and significant correlation between SGOV practice and operational efficiency, banks' size, capital adequacy ratio, bank age, growth opportunities, period of enactment of SF regulation and banks publishing SR. On the other hand, ROA has a negative and significant correlation and an insignificant correlation with competitiveness.

4.1 Multivariate analysis

The regression estimation result for H1, H2 and H3 are presented in Table 2, and the sensitivity test is in Table 3.

4.2 Analysis of the effect of sustainability governance on operational efficiency

Based on models 1 and 2 in Table 2, the coefficient of SGOV (H1) is positive and significant (0.765 at $p = 0.000$ and 1.145 at $p = 0.000$). These findings mean that SGOV practice encourages banks to take the opportunity and seize financing to improve operational efficiency.

The positive effect is supported by the result of sensitivity test 1 (Table 3), which shows that Sustainability motivation increases operational inefficiency due to increasing total cost (0.148, $p = 0.040$). At the same time, Stakeholder engagement has an opportunity to reduce operational inefficiency (−0.930, $p = 0.020$). The opposite direction of SGOV components results in a significant effect of Sustainability Intention in reducing bank operational inefficiency (−0.259, $p = 0.094$). This result is consistent with Andries *et al.* (2018) that strict corporate governance (CG) increases operational inefficiency at the early stage. However, signing a contract with stakeholders defined based on risk appetite can reduce operational inefficiencies (Pampurini and Quaranta, 2018; Belastri *et al.*, 2020).

The results support the stakeholder theory (Freeman, 1984) that managing good stakeholder relations will increase banks' competitiveness (Branco and Rodrigues, 2006). The SGOV practice improves reputation and employee loyalty. It positively affects efficiency by reducing the cost of inputs, e.g. lower deposit rates, better human capital management and additional non-interest income (Branco and Rodrigues, 2006). The ESG screening can

Table 1. Mean, standard deviations, and correlations

Corr/Prob	Mean	St-dev	SGOVX	$\widehat{OPEREFF}$_TCH	ROA	LnSIZE	CMPNESS	CAR	LnAGE	PSGRO
SGOVX	0.701	0.122	1							
$\widehat{OPEREFF}$_TCH	0.002	0.294	0.02**	1						
ROA	0.020	0.020	−0.20**	0.06	1					
LnSIZE	13.378	0.808	0.29**	0.03	0.09***	1				
CMPNESS	0.852	0.249	−0.09	0.07**	−0.07	−0.24**	1			
CAR	0.194	0.096	0.14**	0.05	0.046	−0.17**	0.16*	1		
LnAGE	2.637	2.208	0.37**	−0.08**	0.083**	0.62**	−0.21**	−0.19**	1	
PSGRO	0.132	0.361	0.21**	0.03*	−0.12*	0.56**	−0.20**	−0.15**	0.57**	1

Note(s): N = 392 *** Significant at 1%; ** 5%; and * 10%
Source(s): Published Annual Report and the Sustainability Report of each bank listed on the Indonesia Stock Exchange (IDX) are analyzed

Variables	Pred sign	Model 1 (H1) Coef (prob)	Model 2 (H1) Coef (prob)	Model 3 (H2) Coef (prob)	Model 4 (H3) Coef (prob)
SGOVX	+	*0.765 (0.000***)*	*1.145 (0.000***)*	−0.010 (0.037)	−0.056 (0.092)
$\widehat{\text{OPEREFF}}$_TCH	+				*0.031 (0.030**)*
LnSIZE	+/−	0.220 (0.000***)	0.208 (0.152)	0.011 (0.000)***	0.220 (0.000***)
CMPNESS	+/−	−0.042 (0.020**)	1.037 (0.021**)	−0.004 (0.324)	−0.004 (0.324)
CAR	+/−	0.112 (0.071*)	−0.198 (0.342)	0.007 (0.211)	0.007 (0.211)
LnAGE	+/−	−0.012 (0.204)	−0.035 (0.023**)	0.043 (0.025**)	0.043 (0.025**)
PSGROW	+/−	0.024 (0.171)	0.197 (0.101*)		
DSFREG	+/−	0.321 (0.043**)	−0.076 (0.131)		
ROA_{t-1}	+/−			0.043 (0.101*)	0.026 (0.195)
DSR	+/−			0.006 (0.023**)	0.006 (0.023**)
N		392	392	392	392
Adj R_Square		0.189	0.159	0.293	0.293
F-Statistic		4.220	4.982	14.247	14.247
Prob (F-Stat)		0.000	0.001	0.000	0.000

Note(s): Direct effect of SGOVX on ROA: $\pi_2 = -0.010$**
Indirect effect: λ_1* φ_1 = (0.031**) x (1.145***) = 0.035 *** (Z (π) > Z-table: 2. 810 > 0.998)
*** Significant at 1%; ** 5%; and * 10%
Source(s): Published Annual Report and the Sustainability Report of each bank listed on the Indonesia Stock Exchange (IDX) are analyzed

Table 2.
Regression results of models 1 and 2 (H1), model 3 (H2), and model 4 (H3)

increase the Output through higher interest charged to clients with higher ESG risk (Weber *et al.*, 2010).

4.3 Analysis of the effect of sustainability governance on banks' profitability

Based on model 3 in Table 2 (H2), the SGOV coefficient is negative and significant (−0.010 at $p = 0.037$). It means that SGOV practices reduce banks' profitability.

The negative effect is supported by the result of sensitivity test 1 (Table 3), which shows that Unit organization alignment reduces operational inefficiency (−0.416, $p = 0.035$). However, Sustainability business cases increase operational inefficiency (0.971, $p = 0.092$). The coefficient of Unit organization alignment is more significant, implying the significant effect of Sustainability Integration in reducing operational inefficiency (−0.273, $p = 0.061$).

This finding is consistent with Andrieş *et al.* (2018) and Olmo *et al.* (2021) that banks bear a high burden of complying with regulations. However, cost efficiency will strengthen the risk governance structure (Karyani *et al.*, 2019). This situation was found in banking in emerging economies with weak governance structures. These results confirm that SGOV practice was expensive (Nidomolu *et al.*, 2009) because there is a need to establish a strategic management office (ESG unit) to discover sustainability business cases and reconfigure operations (Weber *et al.*, 2010). However, access to finance and investment is increasing (Bassen *et al.*, 2007), so the positive effects will gradually offset the adverse effects (Clarkson *et al.*, 2011).

The result supports dynamic capability and diffusion of innovation theory that how far institutions are communicated within the organization will affect the organization to adopt a new method or technology that is perceived as something new (Rogers, 2004). Banks' capability increase from "zero" to "first order" (Pavlou and El Sawy, 2011).

4.4 Analysis of the mediating role of operational efficiency

Based on model 4 in Table 2, the coefficient of the direct effect of SGOV practice on profitability (H3) is negative (−0.056 at $p = 0.092$). However, using a two-stage least square, the indirect effect positively mediates operating efficiency (0.031, $p = 0.030$).

Variables	Pred sign	Sensitivity test 1 (probit model over/underfinance) Coef (prob) 1	Coef (prob) 2	Coef (prob) 3	Pred sign	Sensitivity test 2 (ROA t+1 & t+2) Coef (prob)	Coef (prob)
MOTV	–	0.148 (0.040)					
STAKE	–	*−0.930 (0.020**)*					
ALIGN	–	*−0.416 (0.035**)*					
SBCASE	–	*0.971 (0.092*)*					
SRMGT	–	1.296 (0.242)					
ACCOM	–	0.238 (0.421)					
INTNX	–		*−0.559 (0.094*)*				
INTGX	–		*−0.273 (0.061*)*				
IMPLX	–		2.712 (0.104)				
SGOVX	–			*−2.211 (0.043**)*	+	−0.036 (0.205)	*0.045 (0.098*)*
N		392	392	392		349	306
McFadden R^2		0.059	0.064	0.062			
LR Statistic		29.157	31.489	30.752			
Prob (LR Stat)		0.000	0.000	0.000			
Adj R^2						0.498	0.489
F-Statistic						88.874	29.890
Prob (F-Stat)						0.000	0.000

Note(s): Sustainability Intention (INTNX) with component Sustainability motivation (MOTV) and stakeholder engagement (STAKE); Sustainability Integration (INTGX) with components Unit organization alignment and sustainability business case (SBCASE); Sustainability Implementation (IMPLX) with components Risk management process (SRISKM) and Accountability and communication (ACCOM)
N399; *** Significant at 1%; ** 5%; and * 10%
Source(s): Published Annual Report and the Sustainability Report of each bank listed on the Indonesia Stock Exchange (IDX) are analyzed

Table 3.
Sensitivity test 1 & 2

The positive mediating role is supported by the result of sensitivity test 1 (Table 3), where the coefficient of the Risk management process (1.296, $p = 0.242$) and Accountability and communication (0.238, $p = 0.421$) are positive but insignificant. Both SGOV components implied that Sustainability Implementation increase operational inefficiency (2.71, $p = 0.034$). This finding is consistent with the argument that there is a potential conflict of interest that creates agency costs (e.g. monitoring, bonding and residual loss) (Kallman, 2008) and a potential mismatch in loan allocation (Gloukoviezoff, 2007).

Furthermore, the causal effect among Sustainability Intention, Integration and Implementation resulted in an opportunity to reduce operational inefficiency (−2.211, $p = 0.043$). These results are supported by sensitivity test 2 (Table 3), which shows the negative effect of SGOV on profitability at t0 changed to insignificant at t+1 (−0.036, $p = 0.205$) and positive and significant at t+2 (0.045, $p = 0.098$).

These results support the new institutional economic theory that the speed of organizational adaptation is stimulated by the causal effect relationship between institutional levels (Williamson, 2000). This finding confirms that sustainability management tools, standards and guidance are needed to direct the Risk management process (Zuo *et al.*, 2021). Strategy communication linked with KPIs will mobilize actions to ensure banks fulfill stakeholders' expectations. So SGOV practice allows the convergence of governance systems, which will become the basis of banks' future competitive advantage (Salvioni *et al.*, 2016).

4.5 Analysis of the effect of control variables on operational efficiency and profitability

Based on regression model 1 (Table 2), banks' size, CAR and periods of enactment of SF regulation positively affect operational efficiency. There is no effect of growth opportunity and banks' age on operational efficiency, while competitiveness has a negative effect.

Based on regression model 4, banks' size and the published SR positively affect profitability. There is no effect of banks' age, CAR and lagged ROAt−1 on profitability. The results align with Beccalli *et al.* (2015) and Olmo *et al.* (2021) that large banks are more capable of making wholesale funding and gaining benefits from economies of scale and economies of scope that allow non-interest income and higher leverage. Banks with a larger CAR will be able to finance their operation and manage sufficient capital to expand loans and cover risks, thereby increasing profitability (Olmo *et al.*, 2021).

5. Conclusion, implication, limitation and future research

This study proposes a solution to accelerate the transition to a low-carbon (circular economy) by promoting sustainable finance to support green structural changes. The study developed a sustainability governance (SGOV) model and a sustainability governance (SGOV) index as a proxy for sustainability innovation to investigate three areas; (1) Why do banks manage sustainability (Intention), (2) To what extent is sustainability embedded in organization units and core business strategy (integration). (3) How sustainability is operationalized (implementation). The SGOV model and SGOV index were developed based on global SF regulations, risk governance frameworks and other best practice standards. Finally, this study examines the effect of SGOV index on profitability by mediating the role of operational efficiency.

The results showed that the SGOV index increased during the observation period. Banks are at a lower level of innovation for the component of sustainability motivation, sustainability business cases, accountability and communication. However, banks are at a moderate level for stakeholder engagement, unit organization alignment and risk management processes. The SGOV index negatively affects bank profitability, but operational efficiency plays a positive mediating role. These findings support stakeholders, new institutional economics, dynamic capabilit, and diffusion of innovation theory.

The study results provide feedback for the SF journey phase I and recommendations for SF journey phase II. Indonesia's banking institutions should build a sense of urgency to manage a proactive strategy and align the governance structure. These findings recommend the regulators and standard setters for enhancing SGOV regulation. Because the banks market is concentrated in banks BUKU 4 (73.79%) and BUKU 3 (21.15%), regulators must stimulate banks BUKU2 (4.33%) and BUKU 1 (0.73%) by giving incentives for technical training for sustainable finance. Banks must also pay attention to risk-based remuneration systems for TMTs as material risk takers and enhance risk oversight and legal compliance function. These initiatives potentially increase operating costs and reduce profitability in the first stage. However, it is expected to increase awareness in the medium term. The sensitivity test shows that SGOV practice is expected to enhance awareness in the medium term. The sensitivity test also shows that SGOV practice increases the bank's capability to make transitional and transformational changes in the second year.

Some limitations of the study; First, the SGOV index was developed relying on the researcher's ability to investigate criteria that had not been tested in previous studies. Second is the possibility of subjectivity in interpreting qualitative data, although already minimized. Future investigations should consider data triangulation using interviews and examine the effect on market performance indicators, risk-taking, and bank resilience. Furthermore, adjusting regulations can also examine the SGOV practice model in other industry sectors.

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References

Adhariani, D. and du Toit, E. (2020), "Readability of sustainability reports: evidence from Indonesia", *Journal of Accounting in Emerging Economies*, Vol. 10 No. 4, pp. 621-636, doi: 10.1108/JAEE-10-2019-0194.

Aebi, V., Sabato, G. and Schmid, M. (2012), "Risk management, corporate governance, and bank performance in the financial crisis", *Journal of Banking and Finance*, Vol. 36 No. 12, pp. 3213-3226.

Agirre-Aramburu, I. and Gómez-Pescador, I. (2019), "The effects of corporate social responsibility on customer loyalty: the mediating effect of reputation in the cooperative bank versus commercial banks in Basque countries", *Journal of Business Ethics*, Vol. 154, pp. 701-719.

Andrieş, A.M., Căpraru, B. and Nistor, S. (2018), "Corporate governance and efficiency in banking: evidence from emerging economies", *Applied Economics*, Vol. 50, pp. 34-35, doi: 10.1080/00036846.2018.1436144.

Aras, G., Tezcan, N. and Kutlu Furtuna, O. (2018), "The value relevance of banking sector multidimensional corporate sustainability performance", *Corporate Social Responsibility and Environmental Management*, Vol. 25 No. 6, pp. 1062-1073, doi: 10.1002/csr.1520.

Bank Indonesia (BI) (2010), "Kajian Stabilitas Keuangan", *Biro Stabilitas Sistem Keuangan, Direktorat Penelitian dan Pengaturan Perbankan*, Vol. 15 September 2010.

Bank Indonesia (BI) (2017), "Kajian Stabilitas Keuangan", *Biro Stabilitas Sistem Keuangan, Direktorat Penelitian dan Pengaturan Perbankan*. No. 16, Maret 2017.

Bassen, A., Meyer, K. and Schlange (2007), *The Influence of Corporate Social Responsibility on the Cost of Capital*, SSRN, available at: https://www.researchgate.net/profile/Joachim-Schlange-2/publication/228294188_The_Influence_of_Corporate_Responsibility_on_the_Cost_of_Capital/links/5f3e992d458515b729325642/The-Influence-of-Corporate-Responsibility-on-the-Cost-of-Capital.pdf.

Beccalli, E., Anolli, M. and Borello, G. (2015), "Are European banks too big? Evidence on economies of scale", *Journal of Banking and Finance*, Vol. 58, pp. 232-246.

Belastri, S., Gomes, M. and Pijourlet, G. (2020 In press), "Corporate social responsibility and bank efficiency", *Journal of Multinational Financial Management*, Vol. 54, pp. 1-26, doi: 10.1016/j.mulfin.2020.100612f.

Berger, A.N. (1995), "The profit-structure relationship in banking-tests of market-power and efficient-structure hypotheses", *Journal of Money Credit Bank*, Vol. 27, pp. 404-431.

Bolton, B.J. (2013), "Corporate social responsibility and bank performance", *SSRN Electronic Journal*, June, doi: 10.2139/ssrn.2277912, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2277912

Bos, J.W.B., Kolari, J.W. and van Lamoen, R.C.R. (2013), "Competition and innovation: evidence from financial services", *Journal of Banking and Finance*, Vol. 37 No. 5, pp. 1590-1601, doi: 10.1016/j.jbankfin.2012.12.015.

Branco, M.C. and Rodrigues, L.L. (2006), "Corporate social responsibility and resource-based perspectives", *Journal of Business Ethics*, Vol. 69, pp. 111-132.

Buchner, B.K., Oliver, P., Wang, X., Carswell, C., Meattle, C. and Mazza, F. (2017), "Global landscape of climate finance", *Technical Report*, Climate Policy Initiative.

Chih, H.L., Chih, H.H. and Chen, T.Y. (2010), "On the determinants of corporate social responsibility: international evidence on the financial industry", *Journal of Business Ethics*, Vol. 93 No. 1, pp. 115-135, doi: 10.1007/s10551-009-0186-x.

Clark, L.A. and Watson, D. (1995), "Constructing validity: basic issues in objective scale development", *Psychological Assessment*, Vol. 7 No. 3, pp. 309-319.

Clarkson, P.M., Li, Y., Richardson, G.D. and Vasvari, F.P. (2011), "Does it really pay to be green? Determinants and consequences of proactive environmental strategies", *Journal of Accounting and Public Policy*, Vol. 30 No. 2 (March-April), pp. 122-144.

Demsetz, H. (1982), "Barriers to entry", *American Economic Review*, Vol. 72, pp. 47-57.

Doppelt, B. (2003), *Leading Change Toward Sustainability: A Change Management for Business, Government and Society*, Greenleaf Publishing, Sheffield, UK.

Eccles, R., Perkin, M.K. and Serafeim, G. (2012), "How to become a sustainable companies", *MIT Sloan Management Review. Summer 2012*, Vol. 53 No. 54, pp. 1-10.

Ellul, A. and Yerramilli, V. (2013), "Stronger risk controls, lower risk: evidence from US bank holding companies", *Journal of Finance*, Vol. 68 No. 5, pp. 1757-1803.

Fahlenbrach, R. and Stulz, R. (2011), "Bank CEO incentives and the credit crisis", *Journal of Financial Economics*, Vol. 99 No. 1, pp. 11-26.

Freeman, R.E. (1984), *Strategic Management: A Stakeholder Approach*, Pittman, Boston, MA.

FSB (2013), "Thematic review on risk governance", *Financial Stability Board*, available at: www.fsb.org

Garbie, I.H. (2015), "Sustainability awareness in industrial organizations", *Procedia CIRP*, Vol. 26 No. May, pp. 64-69, doi: 10.1016/j.procir.2015.03.003.

Gloukoviezoff, G. (2007), *From Financial Exclusion to Overindebtedness: The Paradox of Difficulties for People on Low Incomes? New Frontiers in Banking Services*, Springer, Berlin-Heidelberg, pp. 213-245.

Gunawan, J., Permatasari, P. and Fauzi, H. (2022), "The evolution of sustainability reporting practices in Indonesia", *Journal of Cleaner Production*, Vol. 358, 131798, doi: 10.1016/j.jclepro.2022.131798.

Hristov, I., Chirico, A. and Appolloni, A. (2019), "Sustainability value creation, survival, and growth of the company: a critical perspective in the sustainability balanced scorecard (SBSC)", *Sustainability*, Vol. 11 No. 7, p. 2119, doi: 10.3390/su11072119.

Husted, B.W. (2005), "Risk management, real options, and corporate social responsibility", *Journal of Business Ethics*, Vol. 60 No. 2, pp. 175-183, doi: 10.1007/sl0551-005-3777-l.

Kallman, J. (2008), "Risk management solutions", *Risk Management*, Vol. 55 No. 3, pp. 40-41.

Kaplan, R.S. and Norton, D. (2008), *The Execution Premium. Linking Strategy to Operation to Competitive Advantage*, Harvard Business School Press, Boston, MA.

Karyani, E., Dewo, S.A., Santoso, W. and Frensidy, B. (2019), "Risk governance and bank profitability in ASEAN-5: a comparative and empirical study", *International Journal of Emerging Markets*, Vol. 15 No. 5, pp. 949-969, doi: 10.1108/IJOEM-03-2018-0132.

Krippendorff, K. (1980), *Content Analysis: An Introduction to its Methodology*, Sage, Newbury Park, CA.

Krogstrup, S. and Oman, W. (2019), *Macroeconomic and Financial Policies for Climate Change Mitigation: A Review of the Literature*, International Monetary Fund, available at: https://books.google.co.kr/books?hl=id&lr=&id=YD-zDwAAQBAJ&oi=fnd&pg=PT8&dq=Krogstrup+and+Oman,+2019&ots=s0oiXOjDU3&sig=Po9daI9HKhwTCVneuTRY7eJ7tE8&redir_esc=y#v=onepage&q=Krogstrup%20and%20Oman%2C%202019&f=false

Li, J.W.M. (2011), "The big idea: creating shared value", *CFA Digest*, Vol. 41 No. 1, pp. 12-13, doi: 10.2469/dig.v41.n1.28.

Mostovicz, I., Kakabadse, N. and Kakabadse, A. (2009), "CSR: the role of leadership in driving ethical outcomes", *Corporate Governance*, Vol. 9, pp. 448-460.

Nidumolu, R., Prahalad, C.K. and Rangaswami, M.R. (2009), "Why sustainable is now the key driver of innovation?", *Harvard Business Review*, Vol. 87, pp. 56-64, 2009.

OECD (2014), "Risk management and corporate governance, corporate governance", *Organisation for Economic Co-operation and Development*, available at: www.oecd.org (accessed 8 March 2017).

OJK (2014), "Roadmap Keuangan Berkelanjutan di Indonesia 2015-2019", *Otoritas Jasa Keuangan*, pp. 1-40.

OJK (2021), "Roadmap Keuangan Berkelanjutan Tahap II (2021-2025)", *Otoritas Jasa Keuangan*, Vol. 2 No. 2, p. 21, available at: https://www.ojk.go.id/id/berita

Olmo, B.T., Saiz, M.C. and Azofra, S.S. (2021), "Sustainable banking, market power, and efficiency: effects on banks' profitability and risk", *Sustainability (Switzerland)*, Vol. 13 No. 3, pp. 1-23, doi: 10.3390/su13031298.

Pampurini, F. and Quaranta, A.G. (2018), "Sustainability and efficiency of the European Banking Market after the global crisis: the impact of some strategic choices", *Sustainability (Switzerland)*, Vol. 10 No. 7, doi: 10.3390/su10072237.

Pavlou, P.A. and El Sawy, O.A. (2011), "Understanding the elusive black box of dynamic capabilities", *Decision Sciences*, Vol. 42 No. 1, pp. 239-273, doi: 10.1111/J.1540-5915.2010.00287.X.

Peltzman, S. (1977), "The gains and losses from industrial concentration", *Journal of Law Economics*, Vol. 20, pp. 229-263.

Rogers, E.M. (2004), "A prospective and retrospective look at the diffusion model", *Journal of Health and Communication*, Vol. 9, pp. 13-19.

Salvioni, D.M., Gennari, F. and Bosetti, L. (2016), "Sustainability and convergence: the future of corporate governance systems?", *Sustainability (Switzerland)*, Vol. 8 No. 11, doi: 10.3390/su8111203.

Schaltegger, S. (2012), "Sustainability reporting in the light of business environments", Discussion Paper, Linking Business Environment, Strategy, Communication, and Accounting.

Schaltegger, S., Windolp, S., Harms, E. D. and Hörish, J. (2014), *Corporate Sustainability in International Comparison: State of Practice, Opportunities, and Challenges*, Centre of Sustainability Management (CSM). Springer, available at: http://link.springer.com/10.1007/978-3-319-06227-3

Schoenmaker, Dirk (2017), *From Risk to Opportunity: A Framework for Sustainable Finance*, Rotterdam School of Management Erasmus University, pp. 11-62.

Teece, D.J. (2007), "Explicating dynamic capabilities: the nature and micro-foundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319-1350, doi: 10.1002/smj.640.

Weber, O., Scholz, R.W. and Michalik, G. (2010), "Incorporating sustainability criteria into credit risk management", *Business Strategy and the Environment*, Vol. 19 No. 1, pp. 39-50, doi: 10.1002/bse.636.

Williamson, O.E. (1999), "Strategy research: governance and competence perspectives", *Strategic Management Journal*, Vol. 20 No. 12, pp. 1087-1108, doi: 10.1002/(SICI)1097-0266(199912)20:123.0.CO;2-Z.

Williamson, O.E. (2000), "The new institutional economics: taking stock, looking ahead", *Journal of Economic Literature*, Vol. 38 No. 3, pp. 595-613, doi: 10.1257/jel.38.3.595.

Wintoki, M.B., Linck, J.S. and Netter, J.M. (2012), "Endogeneity and the dynamics of internal corporate governance", *Journal of Financial Economics*, Vol. 105 No. 3, pp. 581-606.

Zuo, L., Strauss, J. and Zuo, L. (2021), "The digitalization transformation of commercial banks and its impact on sustainable efficiency improvements through investment in science and technology", *Sustainability (Switzerland)*, Vol. 13 No. 19, doi: 10.3390/su131911.

Further reading

Global Reporting Initiatives Standards (2016), Sustainability reporting guidelines, available at: https://www.globalreporting.org/

Sigurthorsson, D. (2012), "The Icelandic banking crisis: a reason to rethink CSR?", *Journal of Business Ethics*, Vol. 111 No. 2, pp. 147-156.

Thaler, R. and Sunstein, C.R. (2008), *Nudge: Improving Decision about Health, Wealth and Happiness*, Cambridge University Press, available at: https://www.proquest.com/docview/222075557?pq-origsite=gscholar&fromopenview=true

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