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# Do sustainability ethics explain the impact of country-level corporate governance on financial stability in developing economies?

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**ABSTRACT**

The study presents an empirical evidence on how sustainability ethics affect the relationship between country-level corporate governance and financial stability in developing countries. Employing the dynamic system Generalized Method of Moments on a panel dataset of 137 developing countries over the period, 2006–2019, the study found that the positive effect of country-level corporate governance framework on financial stability is not instantaneous. We find that internal and external corporate governance frameworks have a strong positive synergistic effect on financial stability. We confirm that corporate governance measures substitute sustainability ethics to yield a desirable outcome of financial stability. Finally, the study finds evidence to support that sustainability ethics reduce the negative impact of country-level corporate governance on financial stability. The study recommends that the build-up of quality sustainability ethics can help tame the reductive effect of the country-level corporate governance framework on financial stability in developing countries.

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## 1. Introduction

It has become a common concern worldwide that corporate governance and sustainability ethics are important pillars for achieving a sound business environment and sustainable economic growth (Gerwing, Kajüter, and Wirth 2022; Fahad and Rahman 2020; Sharma, Panday, and Dangwal 2020; Shakil et al. 2019). On the one hand, country-level governance is defined as the 'favourable governmental or institutional conditions for maintaining ecological, social and market-oriented development, which are hinged on the rational use of public resources and political power by the state' (Al Maqtari et al. 2020; Bundschuh-Rieseneder 2008). On the other hand, sustainability ethics, relates to how governance systems are designed to preserve the status or to sustain the standards of conduct and moral judgments of corporate activities (Uyar et al. 2022; Stabell and Carson 2019) in order to create value for companies. In view of that, a good country-level corporate governance (World Bank 2019; 2017; Avram, Grosanu,

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and Rachisan 2015) and appropriate sustainability ethics (Gerwing, Kajüter, and Wirth 2022; Githaiga and Kosgei 2022; Mahmood et al. 2018; 2017) serve as 'promoters of fair legitimacy, justice and market openness, transparent and accountable policy, and sovereignty of law – which do not only lead to a sound business environment and transparency in the economy' – but they are important for improving firm-level stability (Nguyen et al. 2022). Given the important roles of corporate governance and sustainability ethics to a country's corporate environment, it will be interesting to investigate how these two concepts, from country-level perspective, impact financial stability. While much has been documented on these concepts, little is known about their dynamic relationships. For instance, is there a synergistic effect of different measures of corporate governance framework on financial stability? Do country-level corporate governance and sustainability ethics independently influence financial stability? Do sustainability ethics affect the relationship between country-level corporate governance and financial stability?

This study stems from an interest in exploring the elements of country-level corporate governance framework and sustainability ethics, and how they affect financial stability. Given that, these concepts are essentially exogenous inputs to corporate decision-making, understanding the extent to which they affect financial stability is valuable for policymakers and regulators seeking to achieve economic and financial stability goals in a developing economy. The motivation of the study is in several folds: First, from the perspective of institutional theory, it is argued that a healthy governance system instills discipline through acceptable norms and suppresses the behaviors that affect the society, environment and the economy (Campbell 2007; Doh and Guay 2006; Zucker 1987). This theory explains an indirect positive impact of governance on financial stability. However, institutional theory may induce an adverse outcome from the nexus between corporate governance and financial stability due to differences in macro-level institutional framework, as well as differences in governance practices among economies (Eldomiaty, Hammam, and El Bakry 2020; Majumder, Akter, and Li 2017). For instance, while studies have found a positive relationship between country-level governance and financial stability (Appiah-Kubi et al. 2020; Shapiro et al. 2015), others have shown a negative relationship between country-level governance and financial stability (Li et al. 2020; Karkowska and Acedański 2020). Based on this, we argue that the impact of individual components of corporate governance on financial stability alone may not be sufficient to yield a desirable outcome, unless a complementary association between the governance structures is established through a mechanism of synergistic effect. For this reason, the current study finds out whether a synergy exists between alternative measures of corporate governance framework and financial stability.

Second, sustainability standards, which provide an important framework to guide governance practices, are crucial for augmenting the relationship between country-level corporate governance and financial stability (Almaqtari et al. 2022; Ogundajo et al. 2022; Nguyen et al. 2022; Jan, Lai, and Tahir 2021; Abdelbadie and Salama 2019). Many companies around the world have long recognized the importance of sustainability in governance principles and have provided inspiring models to understand them. In recent decades, a growing number of researchers have argued that both corporate governance and sustainability ethics are essential to a company's stability and that great attention must be paid to these concepts and their applications to the

financial sector (Bose and Khan 2022; Dicuonzo et al. 2022; Uyar et al. 2022; Gerwing, Kajüter, and Wirth 2022; Githaiga and Kosgei 2022; Shwairef et al. 2021; Naciti, Cesaroni, and Pulejo 2021; Erin, Adegboye, and Bamigboye 2021; Hamad, Draz, and Lai 2020; Aras and Crowther 2008). In addition, corporate governance has been well established in the literature (see, Abdelbadie and Salama 2019; Anginer et al. 2018; Kusi et al. 2018; Akbar et al. 2016). Lupu 2015), however, the independent and joint impacts of alternative measures of 'country-level corporate governance' and sustainability ethics on the stability of the financial sector are less clear (Nguyen et al. 2022; Jan, Lai, and Tahir 2021; Mahmood et al. 2018; Aras and Crowther 2008). Following Dicuonzo et al. (2022), Salehi, Ajel, and Zimon (2022), Uyar et al. (2022), Shwairef et al. (2021), Correa-Garcia, Garcia-Benau, and Garcia-Meca (2020), and Aras and Crowther (2008), the current study argues that the concept of corporate governance and sustainability ethics are related to each other (Mahmood et al. 2018), and that both are important in affecting financial stability. Specifically, country-level corporate governance elements enhance financial stability when conditioned on sustainability ethics.

Consistent with the literature, Agyemang et al. (2019) show that corporate governance structures at the country level (e.g. factors such as the effectiveness of corporate boards, the strength of investor confidence, the regulation of stock exchanges and the operation of Big 4 accounting firms) have a significant positive impact on the level of protection of minority shareholders' right in Africa (see Appiah-Kubi et al. 2020; Agyemang et al. 2019; Ernstberger and Grüning 2013). However, other studies have shown a negative impact of corporate governance on financial stability in emerging countries due to the nature of governance mechanism and contextual differences (Li et al. 2020; Karkowska and Acedański 2020; Kusi, Gyeke-Dako, and Agbloyor 2017).

Given that, country-level governance framework and sustainability ethics are instituted to help protect the interest of the public, maximize shareholders' wealth, generate economic value and promote financial stability (see Nguyen et al. 2022; Dicuonzo et al. 2022; Shwairef et al. 2021; Correa-Garcia, Garcia-Benau, and Garcia-Meca 2020; Mahmood et al. 2018; Aras and Crowther 2008), policymakers and practitioners may find it instructive and useful to understand the independent and the synergistic effects of different measures of country-level governance and sustainability on financial stability. Although various countries and policymakers have started promoting the concepts of corporate governance and sustainability issues together (Dicuonzo et al. 2022; Salehi, Ajel, and Zimon 2022; Erin, Adegboye, and Bamigboye 2021; Correa-Garcia, Garcia-Benau, and Garcia-Meca 2020; Hamad, Draz, and Lai 2020; Gul, Muhammad, and Rashid 2017; Mitra, Dhar, and Agrawal 2008; Elkington 2006), less studies have empirically tested the independent effect of country-level corporate governance systems and sustainability ethics on financial stability.

Finally, the issue of whether corporate governance substitutes for or complements sustainability ethics remains an open question (see e.g. Adams and Ferreira 2008); however, empirical research provides no evidence. The current study fills this gap by analyzing the independent impact of country-level corporate governance and sustainability ethics on financial stability and shows how sustainability ethics moderate the effect of country-level corporate governance on financial stability in developing countries. Again the economic and corporate finance literature so far provides only relatively weak evidence on the role of corporate governance and sustainability ethics in promoting financial

**Table 1.** Corporate Governance, Sustainability ethics and Financial Stability

| Year | Financial Stability | Governance characteristics | Ease of Shareholder Suit | Extent of Corporate Transparency | Extent of Director Liability | Extent of Disclosure | Extent of Ownership and Control | Strength of Investor Protection | Sustainability Reporting Standard |
|---|---|---|---|---|---|---|---|---|---|
| 2006 | 13.33 | 3.84 | 5.75 | 2.84 | 4.38 | 5.17 | 2.52 | 2.70 | 0.07 |
| 2007 | 13.31 | 1.98 | 5.40 | 2.99 | 4.26 | 5.03 | 2.64 | 2.94 | 0.07 |
| 2008 | 12.71 | 3.56 | 5.55 | 2.83 | 4.33 | 5.10 | 2.62 | 2.74 | 0.08 |
| 2009 | 13.31 | 2.30 | 5.52 | 2.89 | 4.28 | 4.99 | 2.58 | 2.90 | 0.08 |
| 2010 | 13.69 | 2.49 | 5.39 | 2.88 | 4.37 | 5.06 | 2.62 | 2.87 | 0.07 |
| 2011 | 13.93 | 3.42 | 5.50 | 2.82 | 4.28 | 5.15 | 2.44 | 2.59 | 0.07 |
| 2012 | 14.06 | 3.34 | 5.37 | 3.00 | 4.30 | 5.08 | 2.59 | 2.94 | 0.06 |
| 2013 | 13.98 | 2.51 | 5.84 | 2.84 | 4.37 | 5.10 | 2.51 | 2.66 | 0.07 |
| 2014 | 13.77 | 3.01 | 5.32 | 2.90 | 4.28 | 5.01 | 2.57 | 2.92 | 0.07 |
| 2015 | 14.10 | 2.75 | 5.80 | 2.82 | 4.35 | 5.15 | 2.59 | 2.78 | 0.08 |
| 2016 | 14.27 | 3.49 | 5.28 | 2.88 | 4.26 | 5.06 | 2.55 | 2.86 | 0.08 |
| 2017 | 14.50 | 3.13 | 5.45 | 2.84 | 4.28 | 5.01 | 2.68 | 2.81 | 0.08 |
| 2018 | 14.44 | 2.30 | 5.55 | 2.78 | 4.32 | 5.06 | 2.48 | 2.75 | 0.08 |
| 2019 | 14.54 | 3.01 | 5.41 | 2.93 | 4.32 | 4.99 | 2.60 | 2.89 | 0.08 |
| Average | 13.85 | 2.94 | 5.51 | 2.87 | 4.31 | 5.07 | 2.57 | 2.81 | 0.07 |

Note: Authors' computation is based on data from Enterprise Survey (governance characteristics), World Bank Doing Business database (country-level corporate governance), World Development Indicator (financial stability (*z*-score) and Global Reporting Initiative database (sustainable reporting standard).

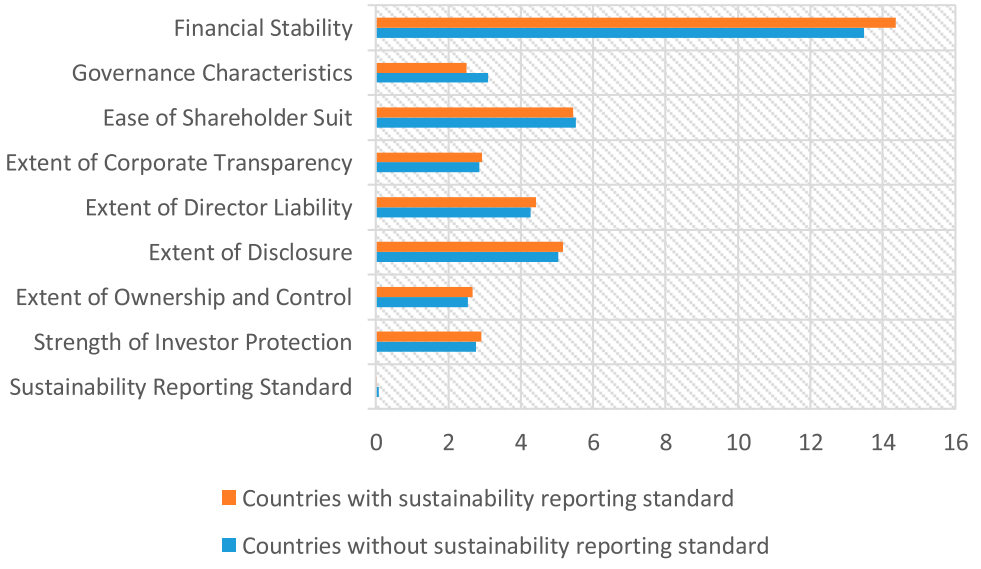


**Figure 1.** Corporate governance framework in countries with sustainable ethical environment and those without sustainable ethical environment *Source: Authors' computation based on data from Enterprise Survey (governance characteristics), World Bank Doing Business database (country level corporate governance), World Development Indicator (financial stability (z-score) and Global Reporting Initiative database (sustainable reporting standard)*

stability. Most of the corporate finance literature so far has focused on individual characteristics of internal governance structures and sustainability reporting at the firm level, as respective measures of corporate governance and sustainability. Although a number of studies have examined how individual corporate governance affects financial stability (see Abdelbadie and Salama 2019; Anginer et al. 2018; Kusi et al. 2018), very little is known about how sustainability ethics affect the impact of alternative measures of governance at country level on financial stability from the context of developing economies. The study fills the gap by employing country-level corporate governance framework and sustainability ethic indices constructed at the country level and shows how they jointly determine financial stability. In addition, the existing empirical literature has shown that corporate governance does not always lead to a desirable outcome for the achievement of financial stability (Nguyen et al. 2022; Puni and Anlesinya 2020; Allen and Gu 2018; Armitage et al. 2017; Akbar et al. 2016; Hakenes and Schnabel 2011; Uhde and Heimeshoff 2009; Hosono, Iwaki, and Tsuru 2004), unless the synergistic effects or coordinated impacts of alternative measures of country-level corporate governance and sustainability ethics on financial stability is established.

The aforementioned studies have the advantage of using different methods to explore these concepts; however, most studies applied firm-level corporate governance measures, and those that employed country-level corporate governance were based in single countries and in advanced economies while neglecting the context of developing economies.

By seeking an empirical evidence, our study makes novel contributions to the literature. First, it employs a country-level dataset from the World Bank Governance

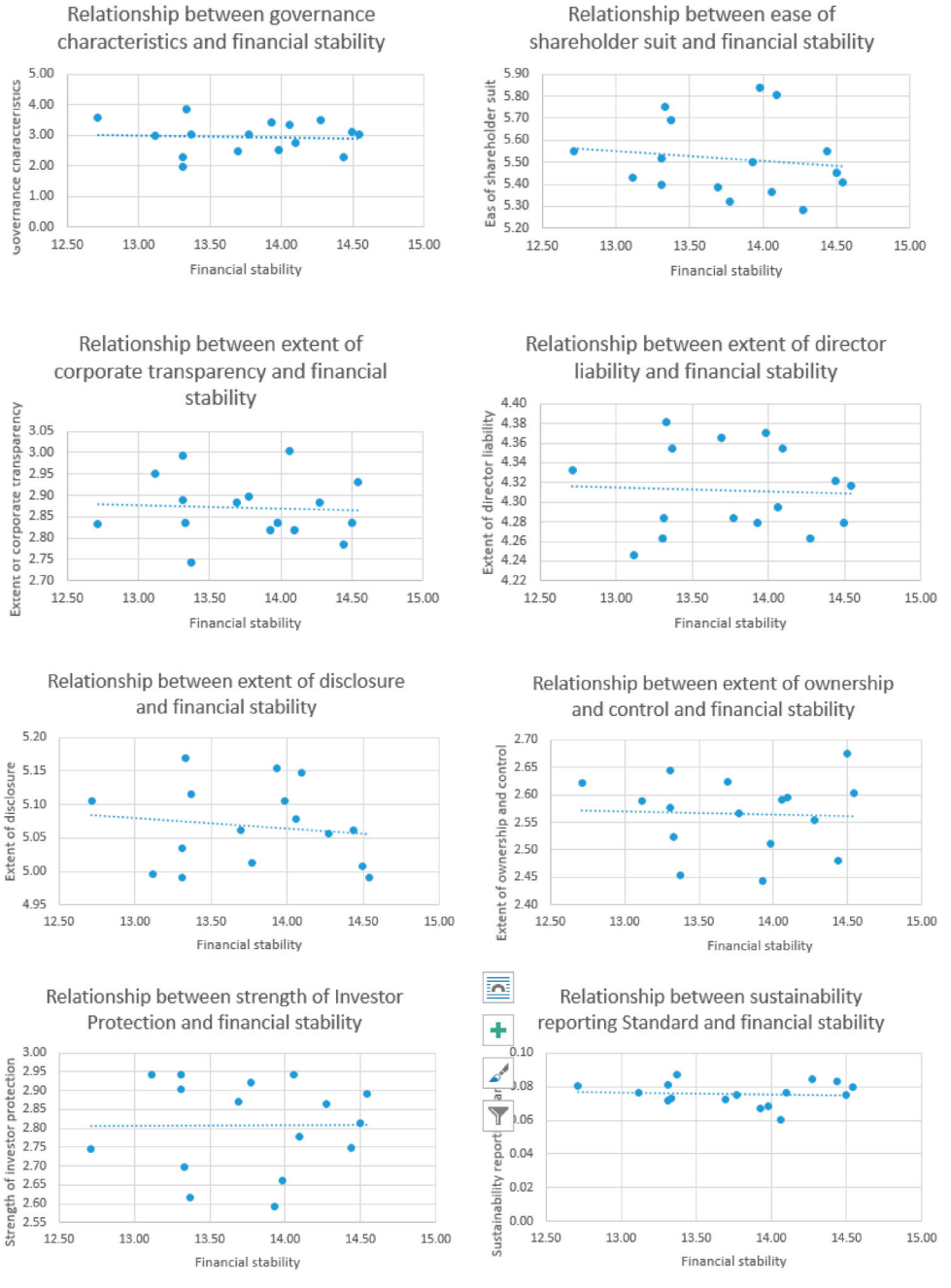


**Figure 2.** Relationship between corporate governance framework, sustainable (ethics) reporting standard and financial stability *Source: Authors' computation based on data from Enterprise Survey (governance characteristics), World Bank Doing Business database (country level corporate governance), World Development Indicator (financial stability (z-score) and Global Reporting Initiative database (sustainable reporting standard)*

Indicators and also constructs an aggregated country-level composite measure of internal governance characteristics to test how alternative measures of country-level governance framework affect financial stability in developing countries. Second, it makes an important contribution to the debate in the literature by applying the dynamic system Generalized Method of Moments (SGMM) to examine the synergistic effect of the alternative measures of country-level corporate governance framework on financial stability in developing countries. Third, it lends support to the empirical literature about how country-level corporate governance framework and sustainability ethics can independently affect financial stability. Finally, it examines how country-level corporate governance framework and sustainability ethics interact through a substitutability effect or a complementarity effect in determining financial stability in developing countries. Policymakers and corporate managers may find it informative to understand whether these concepts are complements or substitutes to each other in achieving a desirable outcome of financial stability. Hence, this research fills up this gap and provides evidence to support the assertion that corporate governance greatly impacts financial stability when conditioned on sustainability ethics. Moreover, the study shows that these measures are better coordinated, either as complements or substitutes, to affect financial stability.

## 2. Corporate governance, sustainability ethics and financial stability in developing countries: an overview

This section presents the trends in corporate governance and financial stability over the period 2004–2019. In Table 1[1], the average financial stability for the period is 13.85, meaning financial institutions are about 14 points away from financial distress over the period 2006–2019. A trend towards financial stability became apparent during the reporting period. Therefore, financial stability in developing countries is low during the period.

In terms of corporate governance measures, an average governance characteristic index of 2.94 was reported with stable and steady trend of the indicators over the period 2006–2019 are observed. Specifically, the 'ease of shareholder suit index, the extent of corporate transparency, the extent of director liability index, the extent of disclosure index and strength of investor protection' recorded averages of 5.51, 2.87, 4.31, 5.07, 2.57, and 2.81, respectively. Given a range between 1 and 10, corresponding to respective levels between weak and strong governance system, it can be said that the governance characteristics index and individual 'country-level corporate governance indicators in developing countries were fairly weak over the same period, except for ease of shareholder suit and extent of disclosure that had a moderate average level of corporate governance index.'

Next, we provide a comparison of the corporate governance framework between countries' whose companies employ the sustainable reporting standards developed by the Global Reporting Initiatives, as against those who do not. Figure 1 shows the average financial stability and each governance measure over the 2006–2019 period for countries whose financial system employ the sustainable reporting standard and those who do not.

From Figure 2, it is observed that the average financial stability and each of the measures of the corporate governance framework for countries that disclose sustainability standards over the 2006–2019 period, are greater compared to those that do not.

Finally, we present the relationship between the measures of corporate governance, sustainable reporting standards and financial stability.

From Figure 2, it is observed that the relationship between the measures of corporate governance and financial stability is a direct relationship. This shows that the measures of corporate governance and sustainable reporting standards in the financial sector negatively correlate with financial stability. In general, corporate governance and sustainable reporting standards have a negative association with financial stability from developing countries perspective.

## 3. Literature review: theories, empirics and hypotheses development

In recent times, the corporate governance and sustainable governance systems, have become a special interest to policymakers because of the central role they play in maintaining a stable economic and financial system. This is because the 2007/2008 Global Financial Crisis (GFC) and the recent pandemic evolved with such an immense shock that the financial system was greatly affected. Specifically, financial markets and institutions that were the main vehicle through which financial and economic systems became resilient and globally integrated before these crises, were the ones greatly affected (Risi et al. 2023; Raffer, Scheller, and Peters 2022; Erkens, Hung, and Matos 2012; Francis, Hasan, and Wu 2012).

This study is inspired by institutional theory. Zucker (1987) points out that institutional theory focuses on the role of social, political and economic systems in which companies operate and gain legitimacy. It is argued that institutions establish the rules of the game and define the appropriate course of action by discouraging, restricting or encouraging acceptable behavior (Peters 2000). Scott (2005) points out that institutions influence the decision-making process by specifying what is and is not acceptable. Corporate governance, which sets the framework for corporate action and protects the interests of investors and the public, therefore falls under institutional theory. In addition, the theory has been used to examine the activities of the firm in relation to society, environment, economy, governance, among others. It is a process by which structures, involving schemes, rules, norms and routines are established as guidelines for social behavior (Struckell et al. 2022; Raffer, Scheller, and Peters 2022; Campbell 2007; Doh and Guay 2006). From the perspective of sustainable practices, institutional theory provides a theoretical lens through which stakeholders can identify and examine influences that promote the survival of organizational practices. In view of that, governments, through their institutions, have been able to develop and implement governance and sustainable policies to control the economy. Also, any policies, laws and regulations enacted by the government directly affect the financial sector. The institutional theory advances that good governance practices instil discipline through acceptable norms and suppress the behaviors that affect the society, environment and the economy. However, corporate governance may not always yield a desirable outcome (see Majumder, Akter, and Li 2017; Jagannathan, Kapoor, and Schaumburg 2013; Crotty 2009; Carmassi, Gros, and Micossi 2009) due to differences in institutional arrangements across different context (Struckell et al. 2022; Raffer, Scheller, and Peters 2022), as well as the differences in individual measures of country-level governance practices across different economies. Given the diverse effects of corporate governance on financial stability, policymakers, researchers

and practitioners may want to understand how individual measures of country-level governance can jointly affect financial stability. Despite the theoretical debate on the individual effects of country-level corporate governance on financial stability (Eldomiaty, Hammam, and El Bakry 2020; Puni and Anlesinya 2020; Armitage et al. 2017; Glover et al. 2014; Abor 2007), little or no study has been done on the synergy effects of individual components of country-level governance on financial stability. Based on this, the current study tests the hypothesis below:

> $H_1$: Country-level corporate governance framework has a synergy effect on financial stability.

The debate on the relationship between corporate governance and financial stability shows that corporate governance of the board of directors, both at the firm and country levels, promotes the protection and interests of investors, manages the efficient use of resources and maintains bank stability (Appiah-Kubi et al. 2020; Shapiro et al. 2015). Therefore, the importance of corporate governance, particularly at the country level, cannot be overstated, although few empirical studies have examined the impact of corporate governance mechanisms at the country level in general (see Appiah-Kubi et al. 2020; Sayılır, Doğan, and Soud 2018), and in the African context (Agyemang et al. 2019; Agyemang et al. 2019). For instance, studies have shown that the business and corporate environment in any country could be influenced by different factors of country-level corporate governance such as control of corruption (Jimenez and Alon 2018; Shagbazian and Aistov 2017), voice and accountability (Guerber and Anand 2019; Kamarudin, Sufian, and Md. Nassir 2016), rule of law (Shagbazian and Aistov 2017), political stability (Tong, Singh, and Li 2018; Chambers and Munemo 2017; Kamarudin, Sufian, and Md. Nassir 2016), regulatory quality (Tong, Singh, and Li 2018; Kamarudin, Sufian, and Md. Nassir 2016) and government effectiveness (Chambers and Munemo 2017) are important determinants of corporate performance. Lack of high-quality institutions has a negative effect on the corporate organization (Fredström, Peltonen, and Wincent 2021), while country-level corporate governance structures positively impact the level of investor protection (Agyemang et al. 2019). A recent study by Gerwing, Kajüter, and Wirth (2022) reveals an important role of sustainable corporate governance in ensuring mandatory sustainability reporting quality among 220 firms in European countries. Their study supports Uyar et al. (2022), who provide evidence, based on a dataset from World Governance Indicators, that governance quality is associated with sustainability reporting practices of public firms. Buallay (2022) applied data from 11 countries in the Middle East and North African region and found that the impact of sustainability reporting on financial performance differs among the sectors of those economies. There is also some evidence that strong sustainability ethics aims to promote financial stability (Nguyen et al. 2022; Mahmood et al. 2018). For instance, Mahmood et al. (2018) show that organizations are able to demonstrate sustainability governance and performance through sustainability disclosures. Moreover, good governance enforces better sustainability disclosure through director ownership (see Dicuonzo et al. 2022; Salehi, Ajel, and Zimon 2022; Naciti, Cesaroni, and Pulejo 2021; Erin, Adegboye, and Bamigboye 2021; Hamad, Draz, and Lai 2020; and Correa-Garcia, Garcia-Benau, and Garcia-Meca 2020). Sayılır, Doğan, and Soud (2018) examine the significant positive impact of governance quality on a country's

financial development. They claim that financial development improves efficiency and effectiveness in the financial market and helps achieve financial stability. Furthermore, good governance greatly facilitates development in the banking sector (Eldomiaty, Hammam, and El Bakry 2020; Law and Azman-Saini 2012). However, other research suggests that the lack of good governance, such as the presence of corruption, affects financial stability (Hoinaru et al. 2020). Therefore, country-level corporate governance structures, such as creditor rights and the rule of law, mitigate the positive impact of regulation and supervision on bank stability, especially when strong institutions induce loan repayments (Thenmozhi and Narayanan 2016). In fact, the existence of weak corporate governance can suppress the pursuit of shareholders' interests and serve as an agency problem that creates a negative relationship between the governance system and financial stability. Thus, institutional theory which identifies factors such as culture, social environment, regulation and legal environment is needed to reverse the adverse effect of governance on financial stability through sustainability ethics – which the current study seeks to investigate.

The theoretical and empirical studies show that financial stability can be influenced by the independent and synergetic effect of the corporate governance structure at country-level and sustainability ethics. However, empirical studies in this sense are lacking. It is noteworthy that there are studies examining the individual effects of corporate governance on bank stability. Interestingly, corporate governance, sustainability ethics and stability can be implemented through the financial institution. However, existing literature is silent on how internal and external country-level corporate governance indicators and sustainability ethics independently affect financial stability. Thus, the study fills the gap in the literature by formulating the hypothesis below:

> $H_2$: Country-level corporate governance framework and sustainability ethics have an independent effect on financial stability.

From an empirical perspective, no studies seem to have examined how country-level corporate governance and sustainability ethics jointly affect financial stability in developing countries. The experience of developed countries show that good corporate governance system increases the value of corporations, however, in developing economies, issues such as the lack of property rights, the abuse of minority shareholders or contract violations – dampen the achievement of financial stability (Puni and Anlesinya 2020; Armitage et al. 2017; Okpara 2011; Giurca Vasilescu 2008). A number of studies have documented that capital structure is a moderating variable that can alter the direction and strength of the causal relationship between corporate governance quality and firm performance (Mansour et al. 2022; Cuomo, Mallin, and Zattoni 2016). For instance, Mansour et al. (2022) provide evidence to support that capital structure strengthens the relationship between corporate governance quality and firm performance. However, the role of sustainability ethics in shaping the relationship between corporate governance and financial stability has not been investigated in developing economies. Given that stakeholders (e.g. institutions, regulators, owners, internal and external governance structure, society etc.) may not have the same interests as some may focus on safety and soundness rather than wealth maximization, it will be informative to policymakers to understand whether country-level governance measures and sustainability ethics can act as a complement or substitute in the determination of financial stability.

Furthermore, the existing literature on governance has focused largely on the independent effects of corporate governance and sustainability at the firm level on financial stability but has not considered how sustainability ethics interact with country-level corporate governance to affect financial stability in developing economies. In view of that, the study formulates the following hypothesis:

$H_3$: Sustainability ethics shapes the relationship between country-level corporate governance framework and financial stability.

## 4. Data and methods

We construct a panel dataset of 137 developing economies. The sample covers 16 years from 2006 to 2019, a period spanning different economic and governance systems. Data were selected based on the availability of data. This is because the variables of interest at the country-level (e.g. sustainability reporting indicators and indicators of corporate governance measures) that were obtained from the respective databases (i.e. collection of datasets from the Global Reporting Initiative (GRI) database, World Bank Enterprise Survey (2019), and World Bank Governance indicators) – captured 137 countries from developing economies and covered the period 2006–2019). For consistency, we match the country-level information from the various databases based on the start of data and data availability.

### 4.1 Model specifications and measurements

In this study, we argue that the impact of country-level corporate governance on financial stability may not be direct but conditioned on sustainability ethics. First, we argue that country-level corporate governance and sustainability ethics have a direct impact on financial stability. In view of that the study presents the SGMM that allows for the simultaneous determination of corporate governance, sustainability ethics and financial stability.

$$\begin{aligned} \textit{Financial stability}_{jt} = {} & \beta_l \textit{Financial stability}_{jt-1} \\ & + \sum_{p=1}^{2} \beta_p \textit{Corporate governance framework}_{jt,t-1} \\ & + \beta_3 \textit{Sustainable ethics}_{jt,t-1} + \sum_{k=1}^{N} C_k V_{jt} + \theta_t + \varnothing_j + \gamma_{jt} \frac{1}{2} \quad (1) \end{aligned}$$

where subscript $j$ denotes cross-sectional dimension (country specifics), $j = 1, \ldots, M$; $t$ denotes the time series dimension (time), $t = 1, \ldots, T$. $t - 1$, denotes the lags of the variables to capture the persistency of the effect. $\beta_l$ is the coefficient of the lag of the dependent variable (financial stability); $\beta_p$: $p = 1,2$ – represents the coefficients of the vector of country-level corporate governance measures; $\beta_3$ represents the coefficient of vector of sustainability ethics variable; $C_k : k = 1, \ldots, N$, represent the regression coefficient parameters for vector V to be estimated. $V$ is a vector of control variables that explains the model. $\theta_t$ is the time fixed effect $t$; $\varnothing_j$ is the country fixed effect; and $\gamma_{jt}$ is idiosyncratic

error term, which controls for unit-specific residual in the model for the *j*th *country* at *period t*.

The study primarily measures financial stability (the dependent variable) using the *z*-score. This is selected based on the assumption of the 'Altman *z*-score that tests the output of a credit strength and gauges whether a company (i.e. a publicly traded manufacturing company), is headed for bankruptcy' (see Altman et al. 2014). 'An Altman z-score that has a value close to 0 suggests a company might be headed for bankruptcy, while a score away from 0, probably closer to 3 suggests a company is in solid financial position.' The z-score has become a popular measure of financial stability (Otero, Alaraj, and Lado-Sestayo 2020; Čihák and Hesse 2007; Laeven and Levine 2008). This is estimated as:

$$Z = \frac{(\mu + k)}{\sigma} \tag{2}$$

where $\mu$ is the return on average assets of banks, $k$ is the balance of capital relative to the total assets of the entity and $\sigma$ is the standard deviation (volatility) of the return on assets.

Following Saghi-Zedek and Tarazi (2015) and the World Bank (2019) measure of the *z*-score, it is computed as 'the return on assets plus the capital asset ratio divided by the standard deviation of asset returns.' Data on *z*-score is a country-level measure and was obtained from the Global Financial Development database of the World Bank.

> The popularity of the z-score stems from the fact that it has a clear (negative) relationship to the probability of a financial institution's insolvency, that is, the probability that the value of its asset becomes lower than the value of its debt. A higher z-score therefore implies a lower probability of insolvency – and hence a more stable financial system.

In equation (1), financial stability is a function of the past year's financial stability, corporate governance, sustainability ethics and other controls.

Equation (1) enables an analysis of the impact of country-level corporate governance and sustainability ethics on financial stability. As noted, there are two composite measures of corporate governance framework: governance characteristic index and country-level governance indicators.

We decompose the country-level governance framework into two indexes: (1) internal governance (characteristics) index (2) external governance mechanisms. The two country-level governance measures are essentially exogenous inputs to corporate decision-making.

**Internal governance index:** Following the World Bank Enterprise Survey (2019) and Sayılır, Doğan, and Soud (2018), we rely on the World Bank Governance indicators to construct a composite index of six internal governance characteristics at country-level. Thus, the internal governance index includes an aggregate measure of

> senior management time spent dealing with the requirements of government regulation; years of the top manager's experience working in the firm's sector; percent of firms with at least 10% of government/state ownership; percent of firms with female participation in ownership; percent of firms with at least 10% of foreign ownership; and percent of firms with an annual financial statement reviewed by external auditors.

Data on each internal characteristic of country-level governance was obtained from the Enterprise Survey database of the World Bank. The values range between 0 and 1 (100%) with higher values corresponding to strong governance characteristics in a given country.

**External governance mechanisms**, comprising the individual governance indicators at the country-level, are obtained from the World Bank Doing Business data. We employ six measures of governance indicators at the country-level (see Appiah-Kubi et al. 2020; Sayılır, Doğan, and Soud 2018; Hillier et al. 2011). This includes the ease of shareholder suit index, the extent of the corporate transparency index, the extent of director liability index, the extent of disclosure index, the extent of ownership control index, and the strength of investor protection index. The external governance index ranges from 1 to 10 (where 1 represents a weak external governance mechanism and 10 represents a strong governance mechanism). Thus, higher values correspond to a measure of a better governance mechanism. An increasing value of the two indexes denotes an increasing level of governance framework at the country-level.

These measures of governance framework are expected to affect financial stability positively or negatively. For instance, a positive relationship suggests that countries with good governance framework increase financial stability. A positive impact is expected based on the principle of institutional theory, which explains that institutions have the capacity to improve governance mechanisms that promote financial stability (Eldomiaty, Hammam, and El Bakry 2020; Glover et al. 2014; Abor 2007). This supports the works of Malik et al. (2021) and Sayılır, Doğan, and Soud (2018) who explored a significantly positive impact of governance quality on a country's financial development and growth. The expectation is that corporate governance, a reflection of good institutional quality, promotes financial stability. However, a negative relationship suggests that the initial country-level governance system induces complexities that reduce financial stability (Struckell et al. 2022; Raffer, Scheller, and Peters 2022). This supports the works of Cieślik and Goczek (2018) who show that countries with weak institutional arrangement induce a negative effect of corporate governance on financial stability.

**Sustainability ethics** in equation (1) is constructed as "an index based on the indicators provided by the GRI on sustainability reporting. GRI was used in this study as it is considered as global benchmark for sustainability reporting at the country level." It includes countries following the GRI guidelines. Based on the GRI index, the measure for sustainability ethics was constructed to capture the extent of disclosure of a country adopting the sustainability reporting standard. Thus, the values range between 0 and 1. This is expected to positively affect financial stability. A positive relationship suggests that countries with good sustainability ethics increase the level of financial stability. This agrees with the findings of Tarquinio, Raucci, and Benedetti (2018) who found a positive effect of sustainable ethics on financial stability and explained that a country with sustainable ethic disclosures has the incentive to improve financial stability. In addition, we argue that the effect of the corporate governance framework and sustainability ethics on financial stability may not be instantaneous, and therefore we introduce a year lag of these variables to capture the instantaneity effects on financial stability. We expect the lag of corporate governance variables to positively affect financial stability. This is because good corporate governance mechanisms may take time to yield a desirable outcome of financial stability.

#### *4.1.1. Interactive effects*

Prior to examining the combined effect of the corporate governance framework and sustainability ethics, the study tests the synergetic effect of the corporate governance

framework on financial stability. This is expressed by extending equation (1) as:

$$Financial\ stability_{jt} = \lambda_l External\ governance\ mechanism_{jt} + \lambda_4 \tag{3}$$

From equation (3), the synergy effect of the corporate governance framework is computed using the net effect, expressed below:

$$\begin{aligned} Net\ Effect => & \frac{\partial Financial\ stability_{j,t}}{\partial\ External\ governance\ mechanism_{jt}} \\ & = \lambda_2 + \lambda_3 Internal\ governance\ index_{jt} \end{aligned} \tag{4}$$

where $\lambda_2$ is the coefficient of the external governance mechanism and $\lambda_3$ is the coefficient of the interaction term.

Following Asongu and Nwachukwu (2017), the study interprets the results based on the net effects. Consistent with Brambor, Clark, and Golder (2006) on the pitfalls surrounding interactive regressions, the impacts of the corporate governance framework are interpreted as a conditional marginal impact.

Next, the study argues that country-level corporate governance framework impacts financial stability when conditioned on sustainability ethics. Based on this, we introduce an interaction term between country-level corporate governance measures (comprising of internal governance index and external governance index) and the sustainability ethics to capture the joint effect and heterogeneity in the model. We expand equation (1) and specify the model as follows:

$$\begin{aligned} Financial\ stability_{jt} = & \alpha_1 Financial\ stability_{jt-1} \\ & + \sum_{l=2}^{8} \alpha_l Corporate\ governance\ framework_{jt} \\ & + \alpha_9 Sustainable\ ethics_{jt} \\ & + \sum_{p=1}^{7} \Omega_p (Corporate\ governance\ framework_{jt} * Sustainable\ ethics_{jt}) \\ & + \sum_{k=1}^{N} \beta_k X_{jt} + \gamma_j + \mu_t + \varepsilon_{jt} \end{aligned} \tag{5}$$

where $\alpha_1$ is the coefficient of the lag of dependent variable (financial stability); $\alpha_l : l = 2, \ldots, 8,$ represent the regression coefficients of a vector of seven corporate governance variables, namely; governance characteristic index, ease of shareholder suit index, extent of corporate transparency index, extent of director liability index, extent of disclosure index, extent of ownership control index, and strength of investor protection index; $\alpha_9$ represents the coefficient of sustainability ethics; $\Omega_p$: $p = 1, \ldots, 3$ represents the coefficients of the interaction terms; $\beta_k$: $k = 1, \ldots, N$, are regression parameters for vector X (control variables) to be estimated; $\gamma_j$ is the country fixed effect; and $\mu_t$ is the time fixed effect; and $\varepsilon_{jt}$ is idiosyncratic error term, which controls for unit-specific residual in the model in the *j*th *country* at *period t*.

In this model (equation 5), we are interested in whether each of the country-level corporate governance measures complements or substitutes sustainability ethics to yield a desirable outcome of financial stability. We do this by observing the signs and level of significance attached to: (1) the coefficients of the variables and (2) the interaction terms. Following Al Maqtari et al. (2020), we interpret our results by considering the signs associated with the coefficient of the interaction terms. Given the nature of governance system in developing countries, we expect the signs associated with the coefficients of country-level corporate governance framework (internal and external) to be negative. Thus, a positive coefficient of the interaction terms between country-level corporate governance indicators and sustainability ethics suggests that the country-level corporate governance variables and sustainability ethics complement each other to produce a desirable outcome of financial stability. A negative coefficient of the interaction terms between the country-level corporate governance indicators and sustainability ethics suggests that country-level corporate governance variables and sustainability ethics are substitutes in explaining financial stability.

Following Brambor, Clark, and Golder (2006), we interpret our results by calculating the marginal impact of corporate governance at the country level. This interpretation makes economic sense because it tells us how country-level corporate governance measures affect financial stability when countries employ the sustainability reporting standards.

A summary of all the variables is reported in Appendix II.

### 4.2 Estimation technique

To enhance reliability, efficiency and accuracy of the result, the study employs a number of techniques. First, using the statistic table, the study screens for outliers in order to reduce the biases caused by outliers. Hence, no evidence of outliers was identified. Second, normality of each variable is assessed by using SWILK normality test. Third, the study employs the Pearson's correlation to screen for multicollinearity and realized the absence of multicollinearity (Allison 2012). Similarly, cross-sectional dependence is tested using the Pesaran (2015) approach because our panel is unbalanced. With a null hypothesis of weak cross-sectional dependence, the Pesaran (2015) results fail to reject the null hypothesis of weak cross-sectional dependence, implying that the severity of and presence of cross-sectional dependence can be ignored for the models.

We begin our empirical analysis by considering the number of lags of the variables which are adequate for capturing the dynamic completeness of our model. We use a year lag for our variables in the model because introducing more lags produce insignificant estimates. We treat all variables except the year dummies as endogenous to make room for instruments for all those explanatory variables which are not strictly endogenous. This allows us the use of an additional lag at year 1 of all such variables as an instrument. It has been argued that the selection of instruments is based on unrealistic assumptions of data, leading to the use of instruments that are not totally exogenous (see Aggarwal et al. 2009). A potential problem that may arise from the model specified above is the problem of endogeneity. Based on the dynamic term and bi-causal relationship, we employ the dynamic SGMM Two-Step estimator with small sample size adjustments, forward orthogonal deviations and robust standard errors.

This allows for the use of past values of the governance and sustainability ethic indexes as instruments and thus, improving efficiency and reduces finite sample bias (see Blundell and Bond 1998; Arellano and Bover 1995). The GMM resolves issues of unobserved heterogeneity that may arise between countries and endogeneity that may exist from bi-causality and mismeasurements. The use of system GMM helps to generate its own instruments from the data. The Hansen test is distributed as chi-square under the null that the instruments are valid. We apply Windmeijer (2005) correction to produce robust standard errors because the two-step estimator has been shown to be biased without this correction. The error term of the model was tested for its assumptions of normality, autocorrelation and homoscedasticity.

## 5. Empirical results

From the summary statistics in Table 2, we found no evidence of outliers. Applying Pearson's correlation matrix (Table 3), we found no evidence of multicollinearity since the threshold is set at 0.5 (see York 2012; Wichers 1975). Furthermore, using the variance inflation factor (VIF) (see Table 3) to justify which variable is not accepted and should be discarded, the VIF confirms that all variables have a VIF value less than the threshold of 10. Therefore, the variables used were appropriate to be included in the models.

Following our previous assumptions, we present several relationships to improve robustness and sensitivity analysis (Vo 2020). First, we show the independent impact of country-level corporate governance framework and sustainability ethics on financial

**Table 2.** Descriptive Statistics

| Variables | Obs. | Mean | Std. Dev. | Min | Max | Unit |
|---|---|---|---|---|---|---|
| Financial stability | 2466 | 13.675 | 8.732 | 0.017 | 31.71 | Numbers |
| Internal Governance Index | 2698 | 2.951 | 6.958 | 0 | 36.8 | Percentage/ratio |
| Ease of Shareholder Suits | 2057 | 5.514 | 2.084 | 0 | 10 | 1 (weak) to 10 (strong) |
| Extent of Corporate Transparency | 3079 | 2.87 | 1.756 | 0 | 7 | 1 (weak) to 10 (strong) |
| Extent of Director Liability | 2960 | 4.312 | 2.633 | 0 | 10 | 1 (weak) to 10 (strong) |
| Extent of Disclosure | 2960 | 5.068 | 2.53 | 0 | 10 | 1 (weak) to 10 (strong) |
| Extent of Ownership Control | 2781 | 2.565 | 1.518 | 0 | 7 | 1 (weak) to 10 (strong) |
| Strength of Investor Protection | 2781 | 2.807 | 1.485 | 0 | 6 | 1 (weak) to 10 (strong) |
| Sustainability Ethics (S-Ethics) | 2173 | 0.076 | 0.178 | 0 | 1 | Probability |
| Net Interest Margin | 2450 | 4.873 | 4.265 | 0 | 11.42 | Ratio |
| Bank Concentration | 2151 | 68.519 | 19.652 | 17.164 | 100 | Ratio |
| Gross Domestic Product | 3091 | 11.61 | 13.53 | 0.001 | 16.21 | Numbers |
| Inflation | 3086 | 25.54 | 28.19 | 14.55 | 31.17 | Ratio |
| Banking Crisis | 2244 | 0.079 | 0.27 | 0 | 1 | Probability |

**Financial stability** is measured with the z-score at the country-level; **Internal Governance Index** is an index including an aggregate measure of senior management time spent dealing with the requirements of government regulation, years of the top manager's experience working in the firm's sector, percent of firms with at least 10% of government/state ownership, percent of firms with female participation in ownership, percent of firms with at least 10% of foreign ownership, and percent of firms with an annual financial statement reviewed by external auditors; **External governance index** is the country-level corporate governance indicators including (Ease of Shareholder Suits Index, Extent of Corporate Transparency Index, Extent of Ownership Control Index, Extent of Director Liability Index, Extent of Disclosure Index, Strength of Investor Protection) are Index constructed by the World Bank Doing Business; **Sustainability ethics** (**S-Ethics**) is proxy with Sustainable Reporting Standard, which is a dummy variable equal 1 if a country's company disclosed sustainable reporting standard in a particular year, and 0 otherwise; **Net Interest Margin is** Measured as the natural log of net interest income; **Bank Concentration** is the ratio of asset of the three largest commercial banks to total commercial banking assets in a country; **Gross Domestic Product** is measured as the Gross domestic product per capita; **Inflation** is measured using consumer price index and measures economic stability and **Banking Crisis** is a dummy variable equal 1 if a country recorded financial distress in a particular year, and 0 otherwise.

**Table 3.** Pairwise correlations

| Variables | VIF | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Internal Governance Index | 1.016 | 1.000 | | | | | | | | | | | | |
| (2) Ease of Shareholder Suits | 1.09 | 0.018 | 1.000 | | | | | | | | | | | |
| | | (0.446) | | | | | | | | | | | | |
| (3) Extent of Corporate Transparency | 1.831 | 0.004 | 0.097 | 1.000 | | | | | | | | | | |
| | | (0.856) | (0.000) | | | | | | | | | | | |
| (4) Extent of Director Liability | 1.132 | −0.024 | 0.282 | 0.220 | 1.000 | | | | | | | | | |
| | | (0.221) | (0.000) | (0.000) | | | | | | | | | | |
| (5) Extent of Disclosure | 1.133 | −0.020 | 0.095 | 0.312 | 0.179 | 1.000 | | | | | | | | |
| | | (0.308) | (0.000) | (0.000) | (0.000) | | | | | | | | | |
| (6) Extent of Ownership Control | 3.396 | 0.019 | 0.090 | 0.773 | 0.257 | 0.251 | 1.000 | | | | | | | |
| | | (0.360) | (0.000) | (0.000) | (0.000) | (0.000) | | | | | | | | |
| (7) Strength of Investor Protection | 3.156 | 0.017 | 0.106 | 0.726 | 0.175 | 0.243 | 0.779 | 1.000 | | | | | | |
| | | (0.406) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | | | | | | | |
| (8) Sustainability Ethics (S-Ethics) | 1.074 | −0.036 | −0.007 | 0.019 | 0.025 | 0.023 | 0.041 | 0.043 | 1.000 | | | | | |
| | | (0.061) | (0.749) | (0.292) | (0.178) | (0.220) | (0.032) | (0.024) | | | | | | |
| (9) Net Interest Margin | 1.164 | 0.017 | −0.022 | 0.036 | 0.008 | 0.026 | 0.048 | 0.029 | −0.056 | 1.000 | | | | |
| | | (0.454) | (0.380) | (0.080) | (0.699) | (0.210) | (0.028) | (0.178) | (0.005) | | | | | |
| (10) bank concentration | 1.104 | −0.018 | 0.046 | 0.033 | 0.039 | −0.018 | 0.016 | 0.009 | −0.136 | 0.041 | 1.000 | | | |
| | | (0.435) | (0.083) | (0.134) | (0.084) | (0.434) | (0.499) | (0.690) | (0.000) | (0.058) | | | | |
| (11) gross domestic product | 1.064 | 0.018 | 0.003 | 0.010 | 0.013 | 0.019 | 0.010 | 0.004 | 0.107 | −0.001 | −0.154 | 1.000 | | |
| | | (0.356) | (0.890) | (0.583) | (0.494) | (0.314) | (0.590) | (0.831) | (0.000) | (0.967) | (0.000) | | | |
| (12) Inflation | 1.112 | 0.005 | 0.007 | −0.016 | −0.021 | −0.009 | −0.003 | −0.003 | 0.061 | 0.018 | −0.038 | −0.010 | 1.000 | |
| | | (0.782) | (0.760) | (0.396) | (0.262) | (0.647) | (0.866) | (0.864) | (0.001) | (0.373) | (0.078) | (0.575) | | |
| (13) banking crisis | 1.028 | 0.055 | −0.011 | 0.043 | 0.027 | 0.055 | 0.012 | 0.025 | 0.072 | −0.030 | −0.040 | −0.021 | 0.031 | 1.000 |
| | | (0.016) | (0.672) | (0.049) | (0.214) | (0.012) | (0.595) | (0.281) | (0.001) | (0.214) | (0.122) | (0.328) | (0.148) | |

Mean VIF = 1.484

**Internal Governance Index** is an index including an aggregate measure of senior management time spent dealing with the requirements of government regulation, years of the top manager's experience working in the firm's sector, percent of firms with at least 10% of government/state ownership, percent of firms with female participation in ownership, percent of firms with at least 10% of foreign ownership, and percent of firms with an annual financial statement reviewed by external auditors; **External governance index** is the country-level corporate governance indicators including (Ease of Shareholder Suits Index, Extent of Corporate Transparency Index, Extent of Ownership Control Index, Extent of Director Liability Index, Extent of Disclosure Index, Strength of Investor Protection) are Index constructed by the World Bank Doing Business; **Sustainability ethics** (**S-Ethics**) is proxy with Sustainable Reporting Standard, which is a dummy variable equal 1 if a country's company disclosed sustainable reporting standard in a particular year, and 0 otherwise; **Net Interest Margin is** Measured as the natural log of net interest income; **Bank Concentration** is the ratio of asset of the three largest commercial banks to total commercial banking assets in a country; **Gross Domestic Product** is measured as the Gross domestic product per capita; **Inflation** is measured using consumer price index and measures economic stability and **Banking Crisis** is a dummy variable equal 1 if a country recorded financial distress in a particular year, and 0 otherwise.

stability. Next, we find the synergetic effect of country-level corporate governance structure on financial stability. Finally, we examine the impact of country-level corporate governance structures on financial stability when made conditional on sustainability ethics.

### 5.1. Independent effect of the corporate governance framework and sustainability ethics on financial stability

In Table 4, we present the results showing the independent effects of country-level corporate governance framework and sustainable governance on financial stability. Based on the dynamic system GMM estimations, the lag of the dependent variable (financial stability) is positive – indicating that the positive effect is persistent over time. The results show that each country-level corporate governance framework has a negative relationship with financial stability (see models 1–7). This means that an increase in a country's corporate governance leads to a reduction in financial stability. Thus, our results imply that institutional theory, which is based on coercive strategies, induces a negative impact of corporate governance on financial stability. This is possible when a country's corporate governance is weak. Our results contradict earlier findings that show a positive nexus between country-level governance and financial stability. For instance, the works of Malik et al. (2021) reveal that the quality of governance makes a positive contribution to development and financial stability, which further promotes the financial intermediation process and, in turn, increases financial stability (Sayılır, Doğan, and Soud 2018). However, poor governance reduces the return on capital, causing investors to shift their investments to other countries, triggering capital flight (Cieślik and Goczek (2018)) and destabilizing the financial system. Our results are consistent with Cieślik and Goczek (2018) who found that corporate governance reduces financial stability and economic growth in countries whose institutions are characterized with corruption experiences. Based on the institutional theory, Kilbourne, Beckmann, and Thelen 2002 explained that coercive occurs from influences exerted by those in powerful positions and therefore may influence decision-making of an organization. Thus, coercive, which reflects the abuse of power and the use of force and threats in corporate governance practices, induces an adverse effect of corporate governance on financial stability (Johnson et al. (2000). Consistent with the works of Brandao-Marques, Correa, and Sapriza (2013) and Johnson et al. (2000), weak corporate governance frameworks and lack of corporate transparency at the country level were associated with more expropriation by directors during crisis. Our negative governance-stability nexus can be explained that because of the lack of control and design of a better governance framework from developing countries' context, investors withdraw their investments and move to countries with good governance, hence, adversely affecting the stability of the financial system. Therefore, weak country-level corporate governance frameworks (internal governance characteristics and external governance mechanisms (i.e. ease of shareholder suit, the extent of director liability, the extent of disclosure, the extent of ownership control, the strength of investor protection and extent of corporate transparency) reduce financial stability in developing countries.

However, sustainability ethics (i.e. sustainable reporting standards) has a direct positive impact on financial stability in developing countries. Institutional theory, which provides a theoretical lens through which stakeholders can identify and examine influences

that promote the survival of organizational practices induces a positive sustainability ethics-stability nexus. This implies that countries that apply more sustainable reporting standards induce a positive impact on financial stability. This agrees with the findings of Tariq and Nobanee (2021), who show that sustainability standards enhance financial management performance.

### 5.2. Robustness checks

For robustness checks, we observe that after introducing the first and second lags of the individual corporate governance indicators, the impacts turned out to be positive (see Table 4). This implies that the effects of governance framework on financial stability are not instantaneous, but they take time to yield a desirable outcome. Thus, an increase in the level of corporate governance increases financial stability in the long-term. This also means that when institutions change, its ramifications take at least a year to pan out. From the sustainability ethics front, its first-year lag remained positive (see Table 4). This implies that the positive impact of sustainability ethics on financial stability is persistent over time. Further, the relationship between the corporate governance measures, sustainability ethics and financial stability was consistent across the models, as found earlier. Moreover, after introducing the institutional variables, we observe that countries that promote strong institutional framework have the capacity to provide governance, control and regulate the financial sector in order to improve the stability of the financial system (see Appendix I, Models 21–27).

### 5.3. Synergy effect of corporate governance framework

Here, we discuss the synergy effects of interactions between the internal governance characteristics and external governance mechanisms. Consistent with Brambor, Clark, and Golder (2006) on pitfalls of interactive regressions, we cannot establish policy implications exclusively on synergy effects. Hence, there is a need to compute the net effects. For instance, in model 8, the net effect from external governance mechanism (e.g. ease of shareholder suit) is 0.0589 [−0.0825 + (0.0479*2.951)]. In the computation, the mean value of the internal governance index is 2.951, the marginal effects of ease of shareholder suite is 0.0479, while the unconditional effect of ease of shareholder suit is – 0.0825. Similarly, the net effects of the individual external governance variables (extent of corporate transparency index, extent of director liability index, extent of disclosure index, extent of ownership control index, and strength of investor protection index) are positive and reduce the negative unconditional effects of the variables (see models 8–13). Thus, the net effects neutralizes the negative unconditional effect of the country-level governance framework on financial stability. This means that the complementary association between the individual measures of the corporate governance framework is confirmed through the synergistic effects of the interactions between them. Intuitively, countries that offer a mixed framework of individual measures of corporate governance are able to yield a desirable positive outcome of financial stability, especially when the measures are allowed to complement each other. This agrees with the work of Mansour et al. (2022), who demonstrate that a composite measure of corporate governance and capital structure has the potential to decrease the conflict of interest between

**Table 4.** Dynamic System GMM Estimations: Impact of corporate governance framework and sustainable governance ethics on financial stability

| VARIABLES | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| Financial stability$_{t-1}$ | 1.030*** | 0.897*** | 0.884*** | 0.911*** | 0.913*** | 1.062*** | 1.061*** |
| | (0.104) | (0.081) | (0.129) | (0.139) | (0.137) | (0.078) | (0.0759) |
| Net Interest Margin | 0.208** | 0.230** | 0.225*** | 0.225*** | 0.227*** | 0.230*** | 0.237*** |
| | (0.094) | (0.096) | (0.069) | (0.069) | (0.069) | (0.084) | (0.089) |
| Bank Concentration | −0.019 | −0.027* | −0.022** | −0.0224** | −0.0210** | −0.016 | −0.017 |
| | (0.0147) | (0.0143) | (0.0102) | (0.0105) | (0.0104) | (0.0132) | (0.0131) |
| Gross Domestic Product | −1.65e-06** | −1.98e-06 | −1.07e-06** | −1.16e-06** | −1.22e-06** | −1.57e-06*** | −1.58e-06*** |
| | (7.18e-07) | (2.40e-06) | (5.22e-07) | (5.46e-07) | (5.38e-07) | (3.94e-07) | (4.01e-07) |
| Inflation | −3.66e-09 | 7.93e-05*** | −2.25e-09 | −1.33e-10 | −7.20e-10 | 3.28e-09 | −2.06e-10 |
| | (8.88e-09) | (1.05e-05) | (8.47e-09) | (8.15e-09) | (8.01e-09) | (1.09e-08) | (1.12e-08) |
| Banking Crisis | 0.104 | −0.165 | −0.123 | −0.077 | −0.056 | −0.042 | −0.097 |
| | (0.233) | (0.343) | (0.259) | (0.258) | (0.252) | (0.257) | (0.274) |
| Internal Governance Index | **−0.283*** ** | | | | | | |
| | **(0.073)** | | | | | | |
| Internal Governance Index $_{t-1}$ | **0.0180*** ** | | | | | | |
| | **(0.002)** | | | | | | |
| Internal Governance Index $_{t-2}$ | **0.0103** ** | | | | | | |
| | **(0.005)** | | | | | | |
| Ease of Shareholder Suit | | **−0.080** ** | | | | | |
| | | **(0.038)** | | | | | |
| Ease of Shareholder Suit $_{t-1}$ | | **0.046*** ** | | | | | |
| | | **(0.007)** | | | | | |
| Ease of Shareholder Suit $_{t-2}$ | | **0.0099** ** | | | | | |
| | | **(0.0045)** | | | | | |
| Extent of Corporate Transparency | | | **−0.1030*** ** | | | | |
| | | | **(0.015)** | | | | |
| Extent of Corporate Transparency $_{t-1}$ | | | **0.045*** ** | | | | |
| | | | **(0.0061)** | | | | |
| Extent of Corporate Transparency $_{t-2}$ | | | **0.0098** ** | | | | |
| | | | **(0.0046)** | | | | |
| Extent of Director Liability | | | | **−0.087*** ** | | | |
| | | | | **(0.017)** | | | |
| Extent of Director Liability $_{t-1}$ | | | | **0.042*** ** | | | |
| | | | | **(0.007)** | | | |
| Extent of Corporate Transparency $_{t-2}$ | | | | **0.0204*** ** | | | |
| | | | | **(0.0056)** | | | |
| Extent of Disclosure | | | | | **−0.092*** ** | | |
| | | | | | **(0.013)** | | |
| Extent of Disclosure $_{t-1}$ | | | | | **0.0135*** ** | | |
| | | | | | **(0.0045)** | | |
| Extent of Disclosure $_{t-2}$ | | | | | **0.0011** ** | | |
| | | | | | **(0.0005)** | | |
| Extent of Ownership Control | | | | | | **−0.091** | |
| | | | | | | **(0.055)** | |
| Extent of Ownership Control $_{t-1}$ | | | | | | **0.092*** ** | |
| | | | | | | **(0.034)** | |
| Extent of Ownership Control $_{t-2}$ | | | | | | **0.0011** * | |
| | | | | | | **(0.0006)** | |
| Strength of Investor Protection | | | | | | | **−0.037*** ** |
| | | | | | | | **(0.009)** |
| Strength of Investor Protection $_{t-1}$ | | | | | | | **0.0180*** ** |
| | | | | | | | **(0.002)** |
| Strength of Investor Protection $_{t-2}$ | | | | | | | **0.0082** * |
| | | | | | | | **(0.0045)** |
| Sustainability Ethics (S-Ethics) | **1.213** * | **1.098** * | **0.311*** ** | **0.366*** ** | **0.277*** ** | **0.0649** | **0.324*** ** |
| | **(0.618)** | **(0.603)** | **(0.0901)** | **(0.125)** | **(0.0720)** | **(0.0502)** | **(0.0774)** |
| Sustainability Ethics (S-Ethics) $_{t-1}$ | **0.246*** ** | **0.001** | **0.463*** ** | **0.0073** ** | **0.0005*** ** | **0.0007*** ** | **0.00021** |
| | **(0.041)** | **(0.071)** | **(0.142)** | **(0.0031)** | **(0.0002)** | **(0.0002)** | **(0.0002)** |

(*Continued*)

**Table 4.** Continued.

| VARIABLES | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| Country Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 0.0567 | 1.896 | 2.123 | 2.021 | 1.888 | −0.382 | −0.557 |
| | (1.455) | (1.494) | (1.799) | (1.994) | (1.890) | (1.364) | (1.284) |
| Observations | 1519 | 1413 | 1591 | 1572 | 1572 | 1496 | 1496 |
| Number of groups | 45 | 65 | 68 | 45 | 45 | 45 | 45 |
| Number of Instruments | 19 | 19 | 19 | 20 | 19 | 20 | 19 |
| *F*-stats | 1808.65*** | 1156.63*** | 1160.99*** | 1048.91*** | 985.51*** | 1160.99*** | 1160.99*** |
| AR (1) | −1.69*** | −1.70*** | −1.61*** | −1.68*** | −1.82*** | −1.69*** | −1.69*** |
| | (0.09) | (0.09) | (0.09) | (0.092) | (0.069) | (0.09) | (0.09) |
| AR (2) | 0.76 | 0.79 | 0.77 | 0.77 | 3.4 | 0.77 | 0.76 |
| | (0.445) | (0.432) | (0.444) | (0.444) | (0.454) | (0.444) | (0.445) |
| Sargan Test | 2.55 | 2.34 | 2.52 | 2.74 | 3.40 | 2.52 | 2.55 |
| | (0.635) | (0.674) | (0.642) | (0.602) | (0.493) | (0.642) | (0.635) |
| Hansen | 5.15 | 4.07 | 5.18 | 5.74 | 7.32 | 5.18 | 5.15 |
| | (0.272) | (0.397) | (0.270) | (0.220) | (0.120) | (0.270) | (0.272) |

The independent effect of country-level corporate governance and sustainability ethics on financial stability using the dynamic system GMM two-step estimation. The dependent variable is financial stability, and the key explanatory variables are the corporate governance framework and the sustainable reporting standard at the country-level. The control variables in Table 6 are described under Table 4. Standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

management and shareholders, which in turn leads to greater firm performance. In our case, the composite measure of internal and external governance mechanisms has critical synergetic roles in strengthening institutional capacity in order to increase the level of financial stability.

Overall, the corresponding high net effects imply that the interactions between the internal and external corporate governance framework are stronger synergies in improving financial stability. As a policy implication, external governance mechanisms can consolidate the gains of financial stability from internal governance characteristics.

The results that follow demonstrate more broadly that to achieve financial stability, a corporate governance framework, alone may not be sufficient, unless it is developed along with sustainability ethics. In view of that, we test whether country-level corporate governance framework and sustainability ethics are complements or substitutes in determining financial stability.

### *5.4. Complementarity/Supplementarity effects of corporate governance and sustainability ethics*

In Tables 5–6, we introduced into our model the interaction between each of the measures of country-level corporate governance framework and sustainability ethics. We observe a positive coefficient associated with the interaction terms (see Models 14–20). These show how important sustainability ethics aids in shaping the negative relationship between the corporate governance framework and financial stability in developing countries.

Similarly, observing the signs of the coefficients of corporate governance measures and the coefficient of the interaction terms of the country-level corporate governance framework and sustainability ethics (i.e. sustainable reporting standards), opposite signs are

realized between them in each model. Given a negative coefficient of the governance indicators and a positive coefficient of the interaction terms, we confirm that corporate governance measures can substitute sustainability ethics to yield a desirable outcome of financial stability. This is possible because stakeholders seek different interests, and hence introducing sustainability ethics into the model has the ability to alleviate the adverse effect of country-level governance on financial stability, as confirmed by the positive interaction confidents. Our results agree with the theoretical argument of Adams and Ferreira (2008), who document that regulation substitutes for governance through a monitoring mechanism. It also agrees with the empirical results of Mansour et al. (2022), who find evidence to support that capital structure and the quality of corporate governance are substitutes in the determination of firm performance. In view of that, our results confirm that country-level corporate governance framework and sustainability ethics are substitutes for promoting financial stability, and one should be used in place of the other.

Following Brambor, Clark, and Golder (2006), we interpret our results by computing the net effects of the interaction terms. This interpretation makes economic sense since it tells us much about how measures of corporate governance framework affect financial stability when interacted with sustainability ethics. As found in Table 4, generally, the coefficients of the country-level governance framework are negative and significant. The coefficients of sustainability ethics are positive and significant, as found previously. However, the net effects of the measures of country-level corporate governance framework moderate the impacts when interacted with sustainability ethics (see Table 6). For example, using model 14, the net effects from the internal governance index is – 0.077 [−0.0777 + (0.000882*0.076). In the computation, the mean value of sustainability ethics is 0.076, the marginal effects of the internal governance index is 0.000882 while the unconditional effect of the internal governance index is – 0.0777. Similarly, the net effects from external governance mechanism (e.g. ease of shareholder suit) is 0.111 [−0.212 + (0.323*0.076)] (see model 15). In the computation, the mean value of sustainability ethics is 0.076, the marginal effects of the ease of shareholder suite index is 0.323 while the unconditional effect of ease of shareholder suit is –0.212. This is consistent with models 16-20.

Our findings support the argument from the lens of institutional theory, that factors such as culture, social environment, regulation and legal environment are needed to reverse the adverse effect of governance on financial stability through sustainability ethics. In line with Mansour et al. (2022), countries that utilize certain firm-characteristics of their capital structure enhance the relationship between corporate governance quality and firm performance. Our results confirm that countries that develop their sustainability standards have the institutional capacity to reduce the negative impact of country-level corporate governance framework on financial stability. This is because effective ethics of sustainable governance builds confidence in the governance system of developing countries, protect the interest of shareholders, attract more investors and therefore enhance the impact of country-level corporate governance framework on financial stability. In addition, the relationship between all the variables was found to be highly significant, which provides strong evidence that sustainability ethics has a mediating role in the relationship between country-level corporate governance measures and financial stability.

**Table 5.** Dynamic System GMM Estimations: Synergy effect of corporate governance framework on financial stability

| VARIABLES | Model 8 | Model 9 | Model 10 | Model 11 | Model 12 | Model 13 |
|---|---|---|---|---|---|---|
| Financial stability$_{t-1}$ | 0.597** | 0.900*** | 0.903*** | 0.877*** | 0.875*** | 0.895*** |
| | (0.280) | (0.0528) | (0.0530) | (0.0550) | (0.0547) | (0.0579) |
| Internal Governance Index | 0.275* | 0.0306* | 0.0222 | 0.0291 | 0.0425*** | 0.0340** |
| | (0.147) | (0.0176) | (0.0200) | (0.0253) | (0.0146) | (0.0170) |
| Ease of Shareholder Suit | −0.0825* | | | | | |
| | (0.0513) | | | | | |
| Ease of Shareholder Suit*Internal Governance Index | 0.0479** | | | | | |
| | (0.0230) | | | | | |
| Extent of Director Liability | | −0.123** | | | | |
| | | (0.0473) | | | | |
| Extent of Director Liability*Internal Governance Index | | 0.382*** | | | | |
| | | (0.00542) | | | | |
| Extent of Disclosure | | | −0.137** | | | |
| | | | (0.0574) | | | |
| Extent of Disclosure*Internal Governance Index | | | 0.400*** | | | |
| | | | (0.00666) | | | |
| Extent of Ownership Control | | | | −0.516** | | |
| | | | | (0.194) | | |
| Extent of Ownership Control*Internal Governance Index | | | | 0.684*** | | |
| | | | | (0.0172) | | |
| Strength of Investor Protection | | | | | −0.00826* | |
| | | | | | (0.00439) | |
| Strength of Investor Protection*Internal Governance Index | | | | | 0.691*** | |
| | | | | | (0.0155) | |
| Extent of Corporate Transparency | | | | | | 0.175** |
| | | | | | | (0.0652) |
| Extent of Corporate Transparency*Internal Governance Index | | | | | | 0.854*** |
| | | | | | | (0.0334) |
| Net Interest Margin | −0.188 | 0.117 | 0.129 | 0.0454 | 0.0510 | 0.129 |
| | (0.115) | (0.125) | (0.125) | (0.107) | (0.108) | (0.129) |
| Bank Concentration | −0.0519*** | −0.0180 | −0.0170 | −0.0132 | −0.0137 | −0.0173 |
| | (0.0168) | (0.0113) | (0.0116) | (0.0111) | (0.0112) | (0.0116) |
| Gross Domestic Product | −1.92e-06*** | −3.12e-08 | −1.09e-07 | −1.52e-08 | −8.63e-08 | −1.80e-07 |
| | (5.91e-07) | (6.83e-07) | (6.88e-07) | (5.86e-07) | (6.69e-07) | (7.69e-07) |
| Banking Crisis | 0.0368 | 0.0500 | 0.0499 | −0.0443 | −0.0977 | −0.0206 |
| | (1.073) | (0.212) | (0.216) | (0.237) | (0.243) | (0.217) |
| Constant | 18.30*** | 2.185* | 2.041 | 2.436** | 2.108* | 1.956 |
| | (1.485) | (1.200) | (1.270) | (1.148) | (1.118) | (1.252) |
| Observations | 1543 | 1519 | 1519 | 1574 | 1574 | 1544 |
| Number of groups | 104 | 104 | 104 | 91 | 91 | 104 |
| Number of Instruments | 18 | 18 | 18 | 18 | 18 | 18 |
| *F*-statistics | 1750.08*** | 1833.63*** | 1809.50*** | 1716.45*** | 1669.34*** | 1688*** |
| AR (1) | −0.677*** | −1.112*** | −1.297*** | −1.221*** | −0.682*** | −1.113*** |
| AR(2) | 3.4 | 0.65 | 0.68 | 0.63 | 0.65 | 0.61 |
| z(*p*-value) | (0.454) | (0.517) | (0.509) | (0.499) | (0.517) | (0.491) |
| Sargan Test (*p*-value) | 15.93 | 14.47 | 15.46 | 15.90 | 20.67 | 22.30 |
| | (0.145) | (0.208) | (0.162) | (0.145) | (0.393) | (0.542) |
| Hansen | 12.56 | 12.64 | 13.59 | 14.02 | 14.00 | 12.65 |
| **Net Effect** | **0.0589***** | **1.0043***** | **1.0434***** | **1.5025***** | **2.0309***** | **2.6952***** |

The synergy effect of country-level corporate governance on financial stability using the dynamic system GMM two-step estimation. The dependent variable is financial stability, and the key explanatory variables are the corporate governance framework indicators at the country-level. The control variables are described in Table 2. Standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

**Table 6.** Dynamic System GMM Estimations: Interaction Effect of Corporate Governance Framework and Sustainability ethics on Financial Stability

| VARIABLES | Model 14 | Model 15 | Model 16 | Model 17 | Model 18 | Model 19 | Model 20 |
|---|---|---|---|---|---|---|---|
| Financial stability$_{t-1}$ | 1.009*** | 1.003*** | 1.008*** | 1.007*** | 1.025*** | 1.008*** | 1.008*** |
| | (0.0760) | (0.0760) | (0.0754) | (0.0775) | (0.0911) | (0.0754) | (0.0754) |
| Internal Governance Index | **−0.0777*** ** | | | | | | |
| | **(0.00943)** | | | | | | |
| Internal Governance Index*S-Ethics | **0.000882*** ** | | | | | | |
| | **(0.000184)** | | | | | | |
| Ease of Shareholder Suit | | **−0.212*** | | | | | |
| | | **(0.111)** | | | | | |
| Ease of Shareholder Suit*S-Ethics | | **0.323**** | | | | | |
| | | **(0.146)** | | | | | |
| Extent of Corporate Transparency | | | **−0.170**** | | | | |
| | | | **(0.0690)** | | | | |
| Extent of Corporate Transparency*S-Ethics | | | **0.507**** | | | | |
| | | | **(0.250)** | | | | |
| Extent of Director Liability | | | | **−0.122**** | | | |
| | | | | **(0.0536)** | | | |
| Extent of Director Liability*S-Ethics | | | | **0.0204***** | | | |
| | | | | **(0.00558)** | | | |
| Extent of Disclosure | | | | | **−0.137**** | | |
| | | | | | **(0.0574)** | | |
| Extent of Disclosure*S-Ethics | | | | | **1.006**** | | |
| | | | | | **(0.436)** | | |
| Extent of Ownership Control | | | | | | **−0.525***** | |
| | | | | | | **(0.160)** | |
| Extent of Ownership Control*S-Ethics | | | | | | **0.565**** | |
| | | | | | | **(0.278)** | |
| Strength of Investor Protection | | | | | | | **0.472**** |
| | | | | | | | **(0.185)** |
| Strength of Investor Protection*S-Ethics | | | | | | | **0.000619**** |
| | | | | | | | **(0.000257)** |
| Sustainability Ethics (S-Ethics) | **1.596*** | **3.408***** | **0.0370***** | **0.0542***** | **4.367*** | **0.0486***** | **1.438**** |
| | **(0.808)** | **(1.005)** | **(0.00735)** | **(0.00683)** | **(2.349)** | **(0.00772)** | **(0.708)** |
| Net Interest Margin | 0.186 | 0.194 | 0.185 | 0.182 | 0.161 | 0.185 | 0.185 |
| | (0.132) | (0.132) | (0.132) | (0.136) | (0.139) | (0.132) | (0.132) |
| Bank Concentration | −0.0382 | −0.0409* | −0.0378 | −0.0356 | −0.0330 | −0.0378 | −0.0378 |
| | (0.0251) | (0.0225) | (0.0249) | (0.0268) | (0.0286) | (0.0249) | (0.0249) |
| Gross Domestic Product | −1.60e-06 | −1.47e-06 | −1.59e-06 | −1.48e-06 | −1.67e-06 | −1.59e-06 | −1.59e-06 |
| | (2.22e-06) | (2.14e-06) | (2.22e-06) | (2.29e-06) | (2.59e-06) | (2.22e-06) | (2.22e-06) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Inflation | −0.00171 | −0.00192 | −0.00165 | −0.00152 | −0.00132 | −0.00165 | −0.00165 |
| | (0.00248) | (0.00231) | (0.00242) | (0.00259) | (0.00259) | (0.00242) | (0.00242) |
| Banking Crisis | −0.00798 | −0.0943 | −0.00896 | 0.0283 | −0.258 | −0.00896 | −0.00896 |
| | (0.473) | (0.459) | (0.471) | (0.518) | (0.616) | (0.471) | (0.471) |
| Country Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 2.178 | 2.523 | 2.151 | 2.006 | 1.329 | 2.151 | 2.151 |
| | (1.773) | (1.675) | (1.767) | (1.898) | (2.075) | (1.767) | (1.767) |
| Observations | 1775 | 1631 | 1899 | 1866 | 1866 | 1785 | 1785 |
| Number of groups | 104 | 73 | 105 | 105 | 105 | 92 | 92 |
| Number of Instruments | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| *F*-statistics | 1872*** | 1161.51*** | 1318.62*** | 1515*** | 1547.05*** | 2542.25*** | 2479*** |
| AR (1) | −4.20*** | −4.12*** | −5.18*** | −4.90*** | −4.85*** | −4.88*** | −4.91*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| AR (2) | −0.42 | −0.53 | −1.03 | −0.85 | −0.92 | −0.45 | −0.38 |
| | (0.675) | (0.596) | (0.304) | (0.395) | (0.357) | (0.651) | (0.706) |
| Sargan Test | 3.42 | 4.75 | 5.42 | 1.77 | 1.56 | 2.84 | 2.83 |
| | (0.490) | (0.101) | (0.247) | (0.779) | (0.816) | (0.586) | (0.587) |
| Hansen | 1.98 | 6.95 | 1.93 | 0.70 | 0.63 | 1.01 | 1.08 |
| | (0.739) | (0.139) | (0.749) | (0.951) | (0.959) | (0.908) | (0.898) |
| **Net Effects** | **−0.077***** | **0.111***** | **0.337***** | **−0.1204***** | **0.869***** | **0.04***** | **0.473***** |

The interaction effect of country-level corporate governance and sustainability ethics on financial stability using the dynamic system GMM two-step estimation. The dependent variable is financial stability, and the key explanatory variables are the corporate governance framework and the sustainable reporting standard (SRS) at the country-level. The control variables in Table 6 are described under Table 4. Standard errors in parentheses. [*** $p<0.01$, ** $p<0.05$, * $p<0.1$].

## 6. Conclusion and policy implications

In spite of the existing ambiguity surrounding coordination issues between corporate governance and sustainability ethics, it is argued that country-level corporate governance alone is not sufficient to maintain financial stability in developing economies. The aim of the study is to present an empirical evidence on how sustainability ethics affect the relationship between country-level corporate governance and financial stability in developing countries. By employing the dynamic SGMM Two-Step estimator on a panel of 137 developing countries over 2006–2019 period, interesting results emerge. Overall, our results show that sustainability ethics is crucial in shaping how corporate governance at the country-level affect financial stability in developing countries. Specifically, countries with better corporate governance structures (such as ease of shareholder suit, extent of director liability, extent of disclosure, extent of ownership control, strength of investor protection and extent of corporate transparency) have the incentive to encourage financial institutions to preserve the standards, conducts and ethics of governance. Thus, the study found that country-level corporate governance framework has a negative relationship with financial stability. However, in the long run, corporate governance framework and sustainability ethics positively impact financial stability. We found that internal and external corporate governance framework have a strong positive synergistic effect on financial stability. We confirm that corporate governance measures substitute sustainability ethics (sustainable reporting standard) to yield a desirable outcome of financial stability. Thus, both are substitutes in promoting stability. Finally, the study finds evidence that sustainability ethics reduce the negative impact of country-level corporate governance on financial stability.

As a policy implication, external governance mechanisms can consolidate the financial stability gains derived from internal governance features. Moreover, financial institutions in developing countries should adopt effective governance strategies or policies that integrate the complementary association between internal and external corporate governance structures in order to enhance the level of financial stability in a country. In addition, institutions, national economies, policymakers, practitioners and researchers need to be selective in implementing, adopting and establishing ethical and sustainable policies that are consistent with the level of corporate governance structures that aid to improve the level of financial stability. Our results support that, country-level corporate governance structures alone, may not be sufficient for achieving a desirable level of financial stability – therefore, policymakers, researchers, and regulators should provide robust and comprehensive policy framework that capture the complementarity between corporate governance and sustainability ethics in order to maintain a sustainable level of financial stability. Furthermore, developing countries should provide reforms that provide a synergistic role of sustainability ethics that are consistent with expected corporate governance practices to stimulate financial stability. Finally, developing countries should continue to build quality sustainability ethics in order to tame the reductive effect of country-level corporate governance framework on financial stability.

## 7. Limitation and future recommendation

The study is limited to only developing economies. In addition, it was not able to collect data on various characteristics of corporate governance and measures of sustainability

ethics from a developing economies perspective. Acquiring these data were very difficult because some are not available publicly as a secondary source. Future research is required to explore this study (including data extension) to other regions in the world to reveal how applicable this model fits the other part of the world.

## Availability of data and materials

The datasets used and/or analysed during the current study are available (with corresponding author) upon reasonable request.

## Competing interests

The authors declare that they have no competing interests.

## Note

1. "The relationship between individual measures of corporate governance and financial stability are presented in Figure 2. Additionally, the average values of corporate governance measures and financial stability for countries with companies using sustainability reporting standard relative to those that do not use, are reported. Financial stability is measured using *z*-score, which indicates the distance a firm is away from financial distress. With regards to corporate governance measures like governance characteristics index, and country-level governance indicators (ease of shareholder suit index, extent of corporate transparency, extent of director liability index, and strength of investor protection) are obtained from Enterprise Survey and Doing Business database, respectively. These were employed following prior studies (Appiah-Kubi et al. 2020; Hillier et al. 2011). All the country-level corporate governance indices are scaled over 10. Also, the average corporate governance characteristics at country level is reported and computed as the year average of six internal characteristics of corporate governance indicators."

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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## Appendices

### *Appendix I Robustness Results: Effect of Corporate Governance Framework and Sustainability Ethics on Financial Stability across Different Institutional Levels*

| VARIABLES | model 21 | model 22 | model 23 | model 24 | model 25 | model 26 | model 27 |
|---|---|---|---|---|---|---|---|
| Financial stability$_{t-1}$ | 1.009*** | 1.003*** | 1.008*** | 1.007*** | 1.025*** | 1.008*** | 1.008*** |
| | (0.0760) | (0.0760) | (0.0754) | (0.0775) | (0.0911) | (0.0754) | (0.0754) |
| Governance Characteristics | 0.0127 | 0.0134 | 0.0137 | 0.0138 | 0.0306* | 0.0137 | 0.0137 |
| | (0.0191) | (0.0181) | (0.0186) | (0.0185) | (0.0176) | (0.0186) | (0.0186) |
| Sustainable Reporting Standard | −1.596* | −3.408*** | **−0.366*** | −0.907 | 4.367* | **−0.483**** | −1.438** |
| | (0.808) | (1.005) | **(0.194)** | (0.707) | (2.349) | **(0.194)** | (0.708) |
| Ease of Shareholder Suit Index | 0.0931 | 0.0720 | 0.0940 | 0.0906 | 0.103 | 0.0940 | 0.0940 |
| | (0.0630) | (0.0660) | (0.0632) | (0.0659) | (0.0727) | (0.0632) | (0.0632) |
| Extent of Corporate Transparency | 0.170** | 0.175** | 0.170** | 0.169** | 0.128* | 0.170** | 0.170** |
| | (0.0691) | (0.0652) | (0.0690) | (0.0731) | (0.0741) | (0.0690) | (0.0690) |
| Extent of Director Liability | −0.123** | −0.120** | −0.123** | −0.122** | −0.132** | −0.123** | −0.123** |
| | (0.0474) | (0.0456) | (0.0473) | (0.0536) | (0.0520) | (0.0473) | (0.0473) |
| Extent of Disclosure Index | −0.138** | −0.141*** | −0.137** | −0.137** | −0.0699 | −0.137** | −0.137** |
| | (0.0545) | (0.0515) | (0.0541) | (0.0574) | (0.0508) | (0.0541) | (0.0541) |
| Extent of Ownership Control | −0.525*** | −0.514*** | −0.525*** | −0.529*** | −0.516** | −0.525*** | −0.525*** |
| | (0.160) | (0.149) | (0.160) | (0.165) | (0.194) | (0.160) | (0.160) |
| Strength of Investor Protection | 0.473** | 0.469*** | 0.472** | 0.470** | 0.479** | 0.472** | 0.472** |
| | (0.184) | (0.172) | (0.185) | (0.189) | (0.222) | (0.185) | (0.185) |
| Net Interest Margin | −0.305 | −0.307 | −0.339* | −0.309 | −0.341* | −0.346* | −0.315 |
| | (0.190) | (0.190) | (0.186) | (0.191) | (0.186) | (0.187) | (0.191) |
| Bank Concentration | −0.0662** | −0.0706*** | −0.0735*** | −0.0710*** | −0.0672*** | −0.0661** | −0.0701*** |
| | (0.0257) | (0.0259) | (0.0257) | (0.0259) | (0.0255) | (0.0256) | (0.0260) |
| Gross Domestic Product | −4.73e-06** | −4.79e-06** | −4.94e-06** | −4.81e-06** | −4.87e-06** | −4.89e-06** | −4.85e-06** |
| | (2.31e-06) | (2.33e-06) | (2.31e-06) | (2.33e-06) | (2.31e-06) | (2.31e-06) | (2.33e-06) |
| Inflation | −0.00618*** | −0.00623*** | −0.00635*** | −0.00618*** | −0.00624*** | −0.00622*** | −0.00621*** |
| | (0.00197) | (0.00197) | (0.00192) | (0.00197) | (0.00192) | (0.00192) | (0.00197) |
| Banking Crisis | 0.0284 | 0.0603 | 0.0321 | 0.0698 | 0.0342 | −0.00556 | 0.0362 |
| | (1.475) | (1.491) | (1.478) | (1.492) | (1.466) | (1.466) | (1.493) |

(*Continued*)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Control of Corruption | **0.421*** | | | | | | |
| | **(0.226)** | | | | | | |
| Government Effectiveness | | **0.587***** | | | | | |
| | | **(0.227)** | | | | | |
| Political Stability | | | **0.739***** | | | | |
| | | | **(0.224)** | | | | |
| Regulatory Quality | | | | **0.783***** | | | |
| | | | | **(0.282)** | | | |
| Rule of Law | | | | | **0.479**** | | |
| | | | | | **(0.238)** | | |
| Voice and Accountability | | | | | | **0.628***** | |
| | | | | | | **(0.208)** | |
| Institution | | | | | | | **0.822***** |
| | | | | | | | **(0.269)** |
| Constant | 2.178 | 2.523 | 2.151 | 2.006 | 1.329 | 2.151 | 2.151 |
| | (1.773) | (1.675) | (1.767) | (1.898) | (2.075) | (1.767) | (1.767) |
| Observations | 1519 | 1413 | 1591 | 1572 | 1572 | 1496 | 1496 |
| Number of groups | 80 | 80 | 82 | 82 | 82 | 70 | 70 |
| Number of Instruments | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| *F*-statistics | 1161.62*** | 1534.34*** | 1423.17*** | 2052.52*** | 1693.14*** | 24.67*** | 2344.92*** |
| AR (1) | −2.87 | −2.56 | −3.28 | −2.89 | −2.87 | −3.11 | −3.12 |
| | (0.004) | (0.001) | (0.001) | (0.004) | (0.004) | (0.002) | (0.002) |
| AR (2) | 0.74 | −0.51 | −0.54 | −0.74 | −0.77 | 0.16 | 0.20 |
| | (0.458) | (0.608) | (0.587) | (0.459) | (0.443) | (0.873) | (0.845) |
| Sargan Test | 8.42 | 4.89 | 2.72 | 2.15 | 2.19 | 3.05 | 2.86 |
| | (0.077) | (0.299) | (0.606) | (0.709) | (0.701) | (0.550) | (0.581) |
| Hansen | 3.67 | 2.26 | 1.59 | 1.74 | 1.76 | 1.51 | 1.48 |
| | (0.452) | (0.687) | (0.811) | (0.783) | (0.780) | (0.824) | (0.830) |

## *Appendix II: summary of variables*

| Variable | Data Source | Measurement | Expected Sign |
|---|---|---|---|
| Governance Characteristics Index | Enterprise Survey | An index including an aggregate measure of senior management time spent dealing with the requirements of government regulation, years of the top manager's experience working in the firm's sector, percent of firms with at least 10% of government/state ownership, percent of firms with female participation in ownership, percent of firms with at least 10% of foreign ownership, and percent of firms with an annual financial statement reviewed by external auditors | ± |
| Ease of Shareholder Suits Index | World Bank Doing Business data | Index constructed by the World Bank Doing Business | ± |
| Extent of Corporate Transparency Index | | | ± |
| Extent of Ownership Control Index | | | ± |
| Extent of Director Liability Index | | | ± |
| Extent of Disclosure Index | | | ± |
| Strength of Investor Protection | | | ± |
| Sustainable Reporting Standard | Global Reporting Initiative database | a dummy variable equal 1 if a country's company disclosed sustainable reporting standard in a particular year, and 0 otherwise | ± |
| Net Interest Margin | World Development Indicator | Measured as the natural log of net interest income. | + |
| Bank Concentration | | ratio of asset of the three largest commercial banks to total commercial banking assets in a country | + |
| Gross Domestic Product | | Gross domestic product per capita | + |
| Inflation | | measured using consumer price index and measures economic stability | ± |
| Banking Crisis | | a dummy variable equal 1 if a country recorded financial distress in a particular year, and 0 otherwise | - |

## Appendix III: List of countries

| | | | | | | |
|---|---|---|---|---|---|---|
| Afghanistan | Cameroon | Ethiopia | Kiribati | Myanmar | South Sudan | Vietnam |
| Albania | Cape Verde | Fiji | Kyrgyz Republic | Namibia | Sri Lanka | West Bank and Gaza |
| Algeria | Cayman Islands | Gabon | Lao PDR | Nepal | St. Lucia | Yemen, Rep. |
| American Samoa | Central African Republic | Gambia, The | Lebanon | Nicaragua | St. Vincent and the Grenadines | Zambia |
| Angola | Chad | Georgia | Lesotho | Niger | Sudan | Zimbabwe |
| Armenia | China | Ghana | Liberia | Nigeria | Suriname | |
| Azerbaijan | Colombia | Grenada | Libya | Pakistan | Swaziland | |
| Bahamas, The | Comoros | Guam | Madagascar | Papua New Guinea | Syrian Arab Republic | |
| Bangladesh | Congo, Dem. Rep. | Guatemala | Malawi | Paraguay | Tajikistan | |
| Belarus | Congo, Rep. | Guinea | Malaysia | Peru | Tanzania | |
| Belize | Costa Rica | Guinea-Bissau | Maldives | Philippines | Thailand | |
| Benin | Côte d'Ivoire | Guyana | Mali | Romania | Timor-Leste | |
| Bermuda | Cuba | Haiti | Marshall Islands | Russian Federation | Togo | |
| Bhutan | Djibouti | Honduras | Mauritania | Rwanda | Tonga | |
| Bolivia | Dominica | India | Mauritius | Samoa | Tunisia | |
| Bosnia and Herzegovina | Dominican Republic | Indonesia | Mexico | Sao Tome and Principe | Turkey | |
| Botswana | Ecuador | Iran, Islamic Rep. | Micronesia, Fed. Sts. | Senegal | Turkmenistan | |
| Brazil | Egypt, Arab Rep. | Iraq | Moldova | Serbia, Rep. of | Uganda | |
| Bulgaria | El Salvador | Jamaica | Mongolia | Sierra Leone | Ukraine | |
| Burkina Faso | Equatorial Guinea | Jordan | Montenegro | Solomon Islands | Uzbekistan | |
| Burundi | Eritrea | Kazakhstan | Morocco | Somalia | Vanuatu | |
| Cambodia | Eswatini | Kenya | Mozambique | South Africa | Venezuela, RB | |