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**Research Paper**

# Risk governance, market competition and operational risk disclosure quality: a study of the ASEAN-5 banking sector

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## ABSTRACT

This paper investigates the impact of risk governance and market competition on banks' operational risk disclosure (ORD) quality (total and voluntary) in the Association of Southeast Asian Nations (ASEAN-5) banking sector. Using 285 firm-year observations encompassing the period 2010–14 for risk governance indexes, we investigate the moderating effects of market competition, relative to total risk governance practices, on banks' ORD quality. The results of our panel data analysis show that there is a substitution effect of competition, which could reduce the adverse consequences of weak risk governance practices. However, governance factors – such as the chief risk officer's (CRO's) role and independence, and the risk communication system – decrease voluntary ORD quality. These findings have implications for the role of the financial regulator in using market competition as an effective mechanism to replace banks' weak risk governance, thus encouraging banks to improve their

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ORD quality. This study contributes to existing knowledge by providing new empirical insights into ongoing debates about the complementary or substitutionary role of competition policies and corporate governance practices.

**Keywords:** risk governance; market competition; operational risk disclosure; substitute; chief risk officer.

## 1 INTRODUCTION

The failure of a number of banks has encouraged shareholders and stakeholders to pay more attention to risk-related information. Consequently, there is pressure on banks in certain countries to improve risk management and disclosure. Further research on the risk transparency and disclosure of banks (compared with nonfinancial companies) is of great importance (Linsley and Shrives 2005). This relates to banks being risk-oriented financial institutions and their obligation to report risks, especially to the central bank and financial regulators. Under the Basel II Accord (Pillar 3) rules, banks are required to disclose market, credit and operational risks. This research focuses on operational risk, as it has been one of the most-debated issues among researchers and financial experts since the global crisis (Barakat and Hussainey 2013). The issue is growing in line with the emergence of operational risk as one of the fundamental sources of banks' bankruptcy (Ford *et al* 2009).

Risk disclosure can be influenced by both external and internal factors. Birt *et al* (2006) examined the combined effects of the internal environment (measured by insider ownership) and the external environment (measured by industry competition). Their study indicates the ability of competition to better explain the effect of the competition on corporate disclosure in Australia. Departing from previous studies, our study empirically investigates the influence of risk governance (an internal factor) and market competition (an external factor) on the quality of operational risk disclosure (ORD). We also investigate whether competition could act as a substitute for risk governance or whether it is complementary to it by incorporating market competition as a moderating variable.

The present study addresses some gaps in the extant literature by interrogating the interactions between governance and market factors, rather than looking at them as separate variables that influence ORD quality. To operationalize this, our study uses the risk governance index; this is based on newly revised governance guidelines published by the Basel Committee on Banking Supervision (BCBS) in 2015. According to Battaglia and Gallo (2015), the business of banking is riskier than other forms of business, so risk governance is a more relevant measure than general governance in this sector. This study also investigates the role of competition, as measured by the Panzar–Rosse (P-R) method, in moderating the impact of risk governance practices

on ORD quality. The the best of our knowledge, no prior research has investigated the interaction between bank competition and risk governance. Although competition is widely perceived as a good thing (external governance structures), the results of previous studies have still been inconclusive regarding the association between competition and internal governance as well as ORD. Competitive firms have greater incentives for more effective management (Li *et al* 2018) and risk disclosure (Barakat and Hussainey 2013), while other research findings suggest substitutional relationships between competition and governance (Bushman *et al* 2017; Mokhtar and Mellett 2013).

Finally, previous studies on risk disclosure have been more prevalent in Anglo-American and European countries, where high and complete levels of transparency are underpinned by generally stronger institutional frameworks (see Helbok and Wagner 2006; Oliveira *et al* 2011; Barakat and Hussainey 2013). Conversely, there are few empirical studies that focus on Asian contexts, which present a unique set of contextual characteristics (see, for example, Amran *et al* (2009), which looks at Malaysian companies, and Kongprajya (2010), which looks at Thai banks). This paucity of data could be associated with difficulties in obtaining data related to governance factors such as ownership type. In addition, the banking business in Asia is influenced by relatively underdeveloped, but rapidly changing, capital markets. This study investigates the banking sector in the Association of Southeast Asian Nations (ASEAN-5) countries (Indonesia, Singapore, Malaysia, Thailand and the Philippines). These countries were selected due to the significant economic growth rates they achieved and their concurrent role as the main driving forces of growth in Asia. Further, they have all progressed up the ranking of the top 10 most competitive economies in the Asia-Pacific region. We argue that governance practices have not kept up with the pace of market changes and are therefore likely to have different, arguably weak, impacts on ORD quality. In other words, the rapidly expanding market environments in the ASEAN-5 countries present an auspicious empirical context via which we can interrogate the potential moderating effects of market competition, relative to governance practices, on ORD quality.

The rest of this paper is organized as follows. The next section provides a review of the extant literature, including an outline of the theoretical basis of this paper. This is followed by our research methodology, the presentation of our findings and discussions. The paper concludes with a summary of implications for regulatory and risk governance practices.

## 2 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

This study synthesizes ideas from three theoretical strands to examine the determinants of ORD. These are the agency theory, the stakeholder theory and the propri-

etary cost theory. The agency theory describes agency relationships and problems that can be reduced by market discipline. The stakeholder theory explains that companies need to show greater accountability, responsibility and transparency that are not limited toward shareholders. The proprietary cost theory explains that firms limit the voluntary disclosure of information to financial markets because of cost-related disclosures (proprietary costs). The higher the proprietary costs associated with disclosure, the less negative investors' reaction to the reduction in relevant information. This in turn results in situations where companies are less likely to voluntarily disclose information. These theories have often been applied in previous studies, particularly because of their ability to explain the motivation of firms with regard to risk disclosure (Birt *et al* 2006; Helbok and Wagner 2006; Mokhtar and Mellett 2013). The theories are also used as a framework for research related to governance or risk governance (International Finance Corporation 2012; Battaglia and Gallo 2015) and market competition (Birt *et al* 2006; Huang and Li 2014; Mokhtar and Mellett 2013; Lang and Sul 2014).

## 2.1 Risk governance practices and ORD quality

From an agency theory perspective, governance mechanisms (for instance, board independence and audit committees) supervise management and support risk reporting on external interests (Linsley and Shrives 2005). From a stakeholder theory perspective, risk governance is the responsibility of the board and senior management (International Finance Corporation 2012; Financial Stability Board 2013; Basel Committee on Banking Supervision 2015), who assist shareholders, depositors and other market participants in monitoring risk conditions and ensuring banks' management disclose risk information (Basel Committee on Banking Supervision 2015). Hence, risk governance is an effective monitoring tool that protects stakeholders' interests and will affect ORD quality. From a proprietary cost theory perspective, the disclosure of effective operational risk management increases the risk of the proprietary costs associated with sensitive information being disseminated to external parties. If disclosure is voluntary, banks may forgo disclosing such information to protect proprietary information. However, risk governance structures can shape discretionary management decisions concerning ORD quality.

A number of studies have highlighted different aspects of banks' governance mechanisms that exert influence on ORD quality (Lajili 2009; Barakat and Hussainey 2013; Ghosh 2018). These include ownership structure and board independence (Barakat and Hussainey 2013; Ghosh 2018); presence of monitoring bodies, external auditor type and separation of executive powers (Neifar and Jarboui 2018); and bank size and board size (Nahar *et al* 2016; Elgammal *et al* 2018). Other studies have shown that, in addition to banks' internal risk governance arrangements,

country-level governance factors can also have a significant impact on banks' ORD behavior. For example, a study of 14 Middle Eastern and North African countries indicates that country-level control of corruption has significant positive impacts on banks' ORD quality (Elamer *et al* 2019).

The risk governance mechanism consists of seven criteria, namely responsibility, qualifications and board composition; role of senior management; governance of group structure; independence of risk management function; risk communication system; independence and competence of compliance and internal audit function; and risk-based compensation. The senior management (agent) has a contract to perform a service on behalf of and make the best decision for the principal by managing, monitoring and reporting risks associated with all the activities of a company. The independence of the risk management function and the role it plays will also affect risk management and its oversight to the benefit of external parties. Further, effective risk communication and the expertise of internal auditors may reduce agency problems (information asymmetry issues) because principals often lack skills (Institute of Chartered Accountants in England and Wales 2005). According to García-Sánchez *et al* (2017), audit committees with financial and risk management expertise lower banks' insolvency and potential risks. Given this, we raise the following hypothesis.

$H_1$: risk governance practices exert a positive influence on ORD quality.

## 2.2 Market competition and ORD quality

Most research has been conducted from the perspective of proprietary costs when dealing with market competition and corporate disclosure (Lang and Sul 2014). Previous studies have examined the impact of market competition on ORD quality based on two key considerations. First, competition has the potential to squeeze bank margins, which can hamper access to capital and lead to higher ORD. According to Mokhtar and Mellett (2013), banks in more competitive environments have lower proprietary costs due to being potentially less profitable. Second, market competition encourages managers to take bigger risks, so the quality of operational risk information will be more valuable in the capital market. This tighter competition will raise bank risk, as increased competition erodes margins and makes it difficult for banks to access external financing, which also increases the potential for managers to take risks (Maudos and Fernandez de Guevara 2004) or engage in moral hazards (Freixas and Rochet 2008). One way to reduce moral hazard and overcome the difficulties associated with accessing capital is for banks to disclose risk information (Freixas and Rochet 2008, p. 335; Huang and Li 2014), particularly ORD quality (Barakat and Hussainey 2013). In addition, banks facing more competitive markets will be under more pressure from stakeholders (such as regulators, depositors and bondholders) to improve ORD quality. For example, there are regulatory demands on banks

for greater risk disclosure, as competition exacerbates all types of risk (Freixas and Rochet 2008, p. 335). Conversely, as increased competition exacerbates the level of risk, firms may be disincentivized from disseminating information that can threaten their competitive advantage (Verrecchia 2001). In response to this apparent contradiction, it has recently been observed that a firm's competitive position, rather than product market competition itself, will have a decisive impact on its ORD quality. In other words, firms that fare well in the product market signal their strength through enhanced risk disclosure and greater transparency (Shivaani and Agarwal 2020).

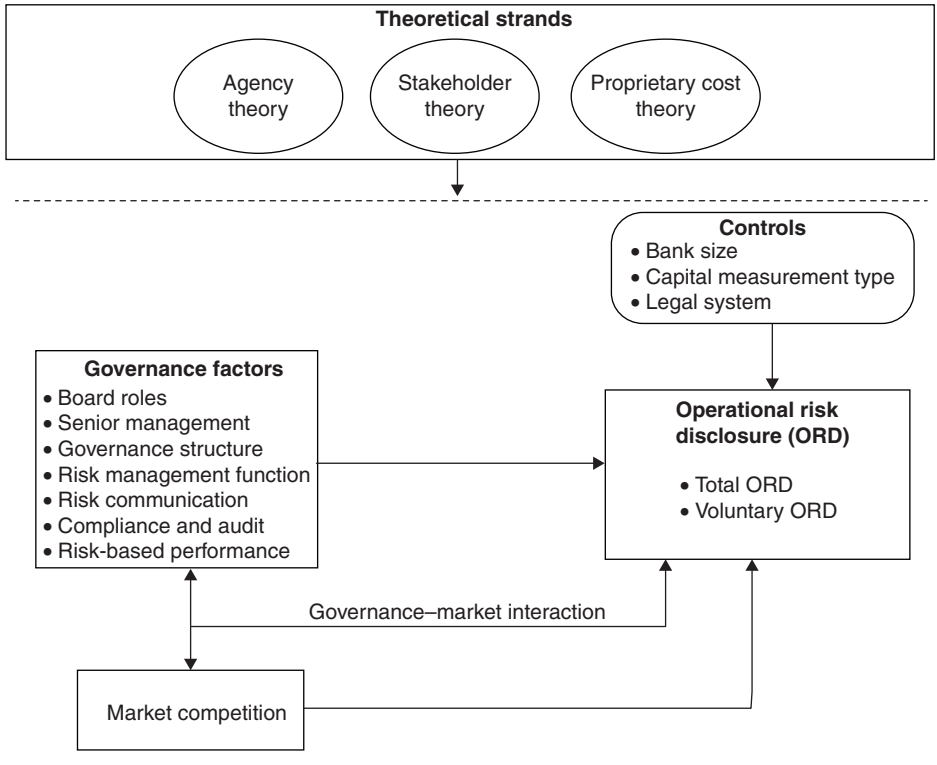
Important inputs in managerial decision making can be drawn from internal and external factors. Barakat and Hussainey (2013) found that ORD quality is influenced by the joint effect of stock ownership (an internal factor) and regulation related to entry barriers (an external factor). This study investigates the combination of risk governance practice (as the internal factor) and market competition (as the external factor) to observe the impact on banks' ORD quality. While previous studies have also examined the impact of risk governance practice and market competition on ORD quality, little is known about how these factors interact with each other to hinder or foster ORD quality. Our study bridges this knowledge gap. We suggest that the role of market competition may replace (weaken) or complement (strengthen) the influence of risk governance on ORD quality. If its role is complementary, the effect will be greater in banks with effective risk governance; as a substitute, however, we will expect it to replace any role of risk governance that is not sufficient to discipline management or to ensure that management is acting in the best interests of the principals. Based on the foregoing, we propose the following hypotheses.

$H_2$: market competition has a positive impact on ORD quality.

$H_3$: market competition moderates the influence of risk governance on ORD quality.

In effect, this study proposes that the relationship between market competition and risk governance functions on a substitution basis because market competition is one way of establishing a culture of effective risk governance. Banks operating in less competitive environments generally have considerable market forces that enable them to generate excess profit and, potentially, to reduce their accountability to stakeholders (Huang and Li 2014; Barakat and Hussainey 2013). Conversely, a tight level of competition could reduce margins, increase investment risk, create accountability and transparency, and encourage better risk governance. In accordance with agency theory, weak risk governance is vulnerable to the emergence of moral hazards (risk-taking by agents), which could harm the principal and benefit the agent. When the board and senior management (those responsible for risk governance effectiveness) do not sufficiently discipline management, market competition could substitute for

**FIGURE 1** Conceptual framework.




disciplinary tools to ensure that managers disclose operational risks. The conceptual framework for the paper is presented in Figure 1.

## 3 THE EMPIRICAL CONTEXT: ORD AND RISK GOVERNANCE PRACTICES IN THE ASEAN-5 BANKING INDUSTRY

This study uses ASEAN-5 banking data, which is becoming increasingly important because of the unique characteristics that distinguish it from the banking data of European and American markets. This data includes the varied financial markets in the Asia-Pacific region and encompasses different levels of economic development. These differences have the potential to affect the level of Basel II adoption (Deloitte 2005). ASEAN banks encountered their worst economic crisis in 1997, partly as a result of institutional and country-level factors that limited or hindered the consistent implementation of good corporate governance practices. We argue

that these deficiencies in ASEAN corporate governance can be better interrogated within the context of a region that is developing, especially with respect to its institutional and governance practices, as well as a region that is undergoing hypergrowth in terms of the rapid expansion of its economies and market. In addition, ASEAN banks are more likely to face an increasingly complex and competitive financial system as a consequence of the globalization and integration processes that are being promoted through the ASEAN economic community. These have the potential to increase operational risk (Deloitte 2005).

Basel II defines operational risk as:

> The risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk but excludes strategic and reputational risks.
>
> Basel Committee on Banking Supervision (2006, p. 144)

ORD, specifically for the banking industry, is governed by Pillar 3 of the 2006 Basel II Committee Framework on Market Discipline. It establishes the disclosure requirements for risk exposure and the risk and capital adequacy measurement processes that enable market participants to assess banks' condition. In general, bank regulators in the ASEAN-5 countries partially adopted Basel II in 2008, with full adoption varying over time and by country. The measurement of operational risk capital is also still restricted by the obligatory use of the basic indicator approach (BIA) or the standard approach (TSA). Based on the results of a 2014 survey by the Financial Stability Institute (FSI) on the Basel II implementation program, Bank Indonesia (BI) partly adopted Basel II in 2010, with full adoption in 2012 bringing it in line with the six pillars of the Indonesian Banking Architecture. Further, Bank Negara Malaysia (BNM), the Monetary Authority of Singapore (MAS) and the Bank of Thailand (BoT) partially adopted Basel II in 2008, with full adoption in 2010, while Bangko Sentral ng Pilipinas (BSP) partially adopted Basel II in 2007, with full adoption in 2011.

Risk governance is part of corporate governance decisions and actions, ensuring effective risk management; it includes policies, guidelines, processes and decisions made in relation to risk areas (International Finance Corporation 2012). The rules relating to risk governance for banks are based on the Corporate Governance (CG) Principles for Banks issued by the Basel Committee in July 2015. However, some banks in the ASEAN-5 region, namely in Malaysia and Singapore, began implementing risk governance practices before the year of enactment. Bank Negara Malaysia fully adopted these rules with the release of Risk Governance (BNM/RH/GL013-5) in March 2013. In addition, the CG Council (CGC) of Singapore supervisor released Risk Governance Guidance for Listed Boards on May 10, 2012, which focused on boards' roles in the risk governance of listed companies. The Monetary Authority

of Singapore (MAS) issued Guidelines on Risk Management Practices: Board and Senior Management in March 2013. The bank regulators in Indonesia and Thailand have not fully adopted these rules, but BSP adopted the guidelines in August 2017 through the publication of Circular 971.

## 4 METHODOLOGY

This study has applied a purposeful sampling method, resulting in 285 final observations or 57 samples of commercial banks listed on the 5 ASEAN countries' stock exchanges: these are, namely, 29 Indonesian, 8 Malaysian, 3 Singaporean, 8 Thai and 9 Filipino banks. The study focuses on commercial banks because ASEAN banking sectors are dominated by retail-oriented banks (commercial banks). Commercial banks are major players in the banking system because they are the largest and most important suppliers of funds in the banking system (Jus 2013). The selection of other types of banks in the Bankscope database is limited. This database also does not include cooperative banks in the Philippines or rural banks (regional banks) in Indonesia and the Philippines (Sudrajad and Hübner 2019).

Our information sources on risk governance practices and ORD quality were manually collected from annual reports (2010–14). Market competition and control variables were obtained from the Bankscope database issued by Bureau van Dijk. We used annual reports (2010–14) to investigate the level of ORD and risk governance, quarterly reports (2010–14) to investigate the level of market competition and a sample of commercial banks listed on the ASEAN-5 countries.

Content analysis was used to modify the risk governance indexes constructed by Karyani *et al* (2020) to measure risk governance practices and modify the ORD quality index developed by Helbok and Wagner (2006) and Barakat and Hussainey (2013). The following panel regression model was employed to investigate the effect of risk governance practices (RGOV) (total and criteria-based), market competition (COMPET), and the interaction between RGOV and COMPET (RGOV $\times$ COMPET) on ORD quality (total and voluntary):

*Model 1.* Effect of RGOV, COMPET and RGOV $\times$ COMPET on total ORD (TORD):

$$\begin{aligned}\text{TORD}_{it} = {} & \alpha_0 + \alpha_1 \text{RGOV}_{it} + \alpha_2 \text{COMPET}_{it} + \alpha_3 \text{RGOV}_{it} \times \text{COMPET}_{it} \\ & + \alpha_4 \text{SIZE}_{it} + \alpha_5 \text{TSA}_{it} + \alpha_6 \text{CAR}_{it} + \alpha_7 \text{LAW}_i + \varepsilon_{ijct}. \quad (4.1)\end{aligned}$$

*Model 2.* Effect of RGOV (criteria-based), COMPET and RGOV (criteria-based) on total ORD (TORD):

$$\begin{aligned}\text{TORD}_{it} = {} & \beta_0 + \beta_{1a}\text{BOARD}_{it} + \beta_{1b}\text{SMGR}_{it} + \beta_{1c}\text{GROUP}_{it} + \beta_{1d}\text{RMF}_{it} \\ & + \beta_{1e}\text{RCOM}_{it} + \beta_{1f}\text{AUDIT}_{it} + \beta_{1g}\text{RBP}_{it} + \beta_2\text{COMPET}_{it} \\ & + \beta_{3a}\text{BOARD}_{it} \times \text{COMPET}_{it} + \beta_{3b}\text{SMGR}_{it} \times \text{COMPET}_{it} \\ & + \beta_{3c}\text{GROUP}_{it} \times \text{COMPET}_{it} + \beta_{3d}\text{RMF}_{it} \times \text{COMPET}_{it} \\ & + \beta_{3e}\text{RCOM}_{it} \times \text{COMPET}_{it} + \beta_{3f}\text{AUDIT}_{it} \times \text{COMPET}_{it} \\ & + \beta_{3g}\text{RBP}_{it} \times \text{COMPET}_{it} + \beta_4\text{SIZE}_{it} + \beta_5\text{TSA}_{it} \\ & + \beta_6\text{CAR}_{it} + \beta_7\text{LAW}_i + \eta_{ijct}. \end{aligned} \tag{4.2}$$

This study also investigates the effect of independent and control variables on voluntary operational risk disclosure (VORD) using modified versions of models 1 and 2:

$$\begin{aligned}\text{VORD}_{it} = {} & \gamma_0\gamma_1\text{RGOV}_{it}\gamma_2\text{COMPET}_{it}\gamma_3\text{RGOV}_{it} \times \text{COMPET}_{it} \\ & + \text{control variables} + \nu_{ijct}, \end{aligned} \tag{4.3}$$

$$\begin{aligned}\text{VORD}_{it} = {} & \delta_0 + \delta_{1a}\text{BOARD}_{it} + \delta_{1b}\text{SMGR}_{it} + \delta_{1c}\text{GROUP}_{it} + \cdots \\ & + \text{control variables} + \nu_{ijct}. \end{aligned} \tag{4.4}$$

Table 1 presents a definition of the variables in the empirical analysis.

## 5 OPERATIONAL RISK DISCLOSURE INDEX

The TORD and VORD indexes are based on Pillar 3 of the Basel II Capital Accord of Risk Disclosure Requirements, including ORD, released by the Basel Committee on Banking Supervision and enacted in 2008. Helbok and Wagner (2006) and Barakat and Hussainey (2013) divide ORD into two classifications, with six items consisting of one quantitative disclosure item (capital adequacy) and five general qualitative disclosure items. The details of ORD items in accordance with the requirements of Basel Committee on Banking Supervision (2006) and voluntary items, namely forward-looking information, are described in table/graphic form, along with additional information outside the regulatory provisions. The total number of ORD items is 26, that is, 10 mandatory items and 16 voluntary items. The 26 items were not allocated a weighting in order to avoid researcher subjectivity, with each being treated as a binary variable by assigning a value of 1 in the case where the bank discloses the item required, and a value of 0 if the item is not disclosed.

**TABLE 1** Research variables and measurements.

| Variables | Definition | Prediction |
|---|---|---|
| *Dependent* | | |
| TORD (index) | Total operational risk disclosure, based on the ORD index constructed by Helbok and Wagner (2006) and Barakat and Hussainey (2013) | |
| VORD (index) | Voluntary operational risk disclosure, based on the ORD index developed by Helbok and Wagner (2006) and Barakat and Hussainey (2013) | |
| *Independent* | | |
| RGOV | Total risk governance | + |
| | Criteria-based risk governance index | + |
| BOARD | Board roles, responsibilities, composition | + |
| SMGR | Senior management responsibilities | + |
| GROUP | Governance of group structure | + |
| RMF | Risk management function | + |
| RCOM | Effective risk communication | + |
| AUDIT | Independence and composition of the compliance and audit functions | + |
| RBP | Compensation for risk-based performance | + |
| Modification of risk governance index constructed by Karyani *et al* (2018), based on the governance guidelines released by BCBS (2015) and IFC (2012), as well as the risk governance or corporate governance guidelines of ASEAN-5 banks (those of Indonesia, Malaysia, Singapore, Thailand and the Philippines) as of 2017 | | |
| COMPET | Market competition, the measurement method of Panzar–Rosse (1987) modified by Bikker *et al* (2012) | + |
| *Control* | | |
| lnSIZE | Bank size proxied by the natural logarithm of total assets | + |
| TSA | Dummy variable with the value "1" if the bank uses TSA and "0" otherwise (BIA) | +/− |
| CAR | $\text{CAR} = \dfrac{\text{tier 1 capital} + \text{tier 2 capital}}{\text{risk-weighted assets}}$ | + |
| LAW | Dummy variable with the value "1" if the country uses common-law and "0" otherwise | +/− |

The data source for the risk governance, ORD and type of capital measurement (TSA) variables are accessed through annual reports. The competition, bank size and capital adequacy ratio (CAR) variables are from Bankscope, while the law variable can be accessed at www.cia.gov.

## 6 RISK GOVERNANCE INDEX

The indexes of total risk governance practices and criteria-based risk governance practices are based on the incorporation of the Basel Committee on Banking Supervision's CG Principles for Banks; of risk governance issued by the International Financial Council (IFC) in 2012; and of risk governance, CG or risk management guidelines from the five sample countries. Our study applied 12 principles, removing the thirteenth principle (the role of the supervisor/regulator) due to an external party evaluating the internal risk governance process. The risk governance practice index produced 17 items with three benchmarks: low level (score 1), medium level (score 2) and high level (score 3). The validity test results, using a 5% significance level and an R table of 0.113 (285 observations), show 15 valid items with a Cronbach's alpha value of 0.665 ($> 0.60$). Further, risk governance practices were divided into seven criteria, namely

(1) board responsibilities, qualifications and compositions;

(2) role of senior risk management;

(3) governance of group structure;

(4) independence of risk management function;

(5) risk communication system;

(6) independence and competence of compliance and internal audit function; and

(7) risk-based compensation.

Since the principles issued by the Basel Committee of Banking Supervision are aimed at a one-tier system, this study defines the board as one of the commissioners, as in the two-tier system used for Indonesia banks.

## 7 CONTROL VARIABLES

The control variables are bank size, capital measurement type, CAR and legal type. First, bank size (lnSIZE): as stated by Barakat and Hussainey (2013), large companies are generally more complex and have higher political costs than small companies, so they place greater demands on the regulator. Second, capital measurement type (TSA): this controls the type of capital measurement used for operational risk. Due to the ASEAN-5 banks having not adopted the advanced measurement approach (AMA), this variable is measured using a binary variable. The value of "1" is given if a bank uses TSA, and the value of "0" is given otherwise (ie, if the BIA is used instead). According to Basel Committee on Banking Supervision (2006), the level of

bank risk disclosure can be influenced by the approach used for measuring capital. Third, the level of CAR is intended to control the ability to manage all types of bank risk. Finally, the type of state legal law (LAW) is used to control the legal organization of the origin country by using binary variables. Countries with code law systems have relatively little legal control or secrecy affecting the level of risk disclosure.

## 8 POTENTIAL ENDOGENEITY CONCERNS

A major concern in the empirical literature attempting to explain the causes and effects of financial decisions is endogeneity. Two sources of endogeneity bias are variations in the correlated omitted variable and dynamic problems. In this paper, we follow Barros *et al* (2020) and Bellemare *et al* (2017, p. 960). Barros *et al* (2020) uses additional control variables because control variables are intrinsically measurable (or researchers have enough information to measure them reliably). We add control variables such as bank size, capital measurement type, firm CAR and country legal type, possibly correlated with $y$ (operational risk disclosure) and $x$ (risk governance). While Bellemare *et al* (2017, p. 960) explain that lagged independent variables can help get rid of endogeneity problems caused by unobserved variables, our analysis is consistent with the test results without lagged independent variables.[1]

## 9 RESULTS AND DISCUSSION

The validity test results of the 26 ORD items included 21 valid items; the reliability test results show that the values of Cronbach's alpha coefficient for both total and voluntary disclosure were high (0.718 and 0.624, respectively). The quality of total and voluntary ORD in ASEAN-5 banks shows an upward trend, with the highest rates (78% and 64%) for Singaporean banks, followed by banks in Malaysia (64% and 45%), Thailand (56% and 33%), Indonesia (52% and 40%) and the Philippines (44% and 38%). Although ORD quality in the Philippines is the lowest for our five observation years, this country experienced the fastest rising trend. The high level of ORD quality in Singaporean banks is due to the advanced capital market and superior market share of nondomestic banking, so the protection of stakeholders is higher via

[1] We also regressed robustness using Huber's $M$-estimator and the MM estimator introduced by Rousseeuw and Yohai (1984). The results from the $M$-estimator and the MM estimator show that the coefficients are even closer with ordinary least squares (OLS). Robust estimation tests using the MM estimator for models 2 and 4 were not carried out because we got an error: "maximum number of singular subsamples reached". The robust regression cannot reduce the errors generated by OLS with outliers, and the overall goodness-of-fit measures are lower than for the R2N statistic. This means the previous regression results are better than those of the robust regression model. The robust regression method also cannot be a solution to OLS problems with observational data that contains outliers.

**TABLE 2** Average of RGOV practices index in the ASEAN-5 banks by criterion.

| | Average of RGOV index | | | | | |
|---|---|---|---|---|---|---|
| **Criterion** | **Indonesia** | **Malaysia** | **Singapore** | **Thailand** | **Philippines** | **Avg/ year** |
| BOARD | 0.845 | 0.868 | 0.937 | 0.789 | 0.602 | 0.808 |
| SMGR | 0.515 | 0.983 | 1.000 | 0.733 | 0.810 | 0.808 |
| GROUP | 0.715 | 0.858 | 0.778 | 0.873 | 0.524 | 0.750 |
| RMF | 0.698 | 0.933 | 0.944 | 0.807 | 0.857 | 0.848 |
| RCOM | 0.922 | 0.858 | 0.889 | 0.840 | 0.776 | 0.857 |
| AUDIT | 0.799 | 0.725 | 0.789 | 0.700 | 0.705 | 0.744 |
| RBP | 0.605 | 0.733 | 0.933 | 0.867 | 0.571 | 0.742 |
| Avg/ year | 0.783 | 0.854 | 0.905 | 0.793 | 0.679 | 0.788 |

BOARD: board's roles, responsibilities and composition. SMGR: senior management's responsibilities. GROUP: governance of group structure. RMF: risk management function. RCOM: effective risk communication. AUDIT: independence and composition of compliance and audit functions. RBP: compensation for risk-based performance. *Sources*: annual reports and footnotes of each ASEAN-5 bank, processed.

law enforcement related to more stringent transparency. Singapore's capital market also has the highest market capitalization and the highest law enforcement of the ASEAN countries.

The descriptive statistics of the risk governance index based on the seven criteria are shown in Table 2. Generally, ASEAN-5 banks are concerned about effective risk communication (85.7%), with less attention being paid to the structure of risk-based remuneration (74.2%). These findings may demonstrate that there is a commitment to effective risk communication in the form of regular meetings being conducted by boards' risk management committees and senior management as well as risk profiles being routinely reported to management. This implies that banks need to maintain activities to help organizational members to understand risk management processes to accelerate decision making and improve decision outcome quality. At the same time, commitment to implementing risk-based remuneration remains low, which might be caused by there being a low level of law enforcement (as in the case of Indonesian banks) or banks facing difficulties with their measurements.

The risk governance practices of Singaporean banks primarily excel in BOARD (93.7%), while Thai banks are leaders in disclosing integrated risk governance practices, or GROUP (87.3%). Indonesian banks disclose more effective risk communication practices, RCOM (92.2%), and rank highly in terms of the independence and composition of compliance and audit functions (AUDIT). As per Asian Development Bank (2014), a few Indonesian listed organizations have accomplished high-quality annual reporting because of compliance with the CG guidelines in terms of having

regular meetings conducted by directors and regular risk disclosure. Audit committee practices are also very well demonstrated by the Indonesian Financial Services Authority (OJK), which requires the audit committee chairman and all committee members to be independent. Further, the results of our collinearity test are shown in Table 3, and empirical testing was conducted to analyze the variables, as shown in Table 4.

Table 3 gives the results of the collinearity test by generally showing low correlation so that there is no potential for multicollinearity. Significant correlations indicate the effect of independent variables (including control variables) on the dependent variable. These reveal that all explanatory variables have a positive correlation with the dependent variable except for COMPET (at a significance level of 10%), which shows a negative correlation. This correlation implies that operational risk disclosures (both TORD and VORD) increase along with all risk governance mechanisms, bank size, TSA measurements and common law systems. However, as ORD increases, market competition (COMPET) decreases.

## 10 RISK GOVERNANCE PRACTICES AND ORD

Table 4 shows a positive effect on ORD quality for total risk governance practices with four criteria (BOARD – the board's role and composition; SMGR – senior management's responsibilities relating to risk; GROUP – group structure governance; and AUDIT – independence and composition of compliance and audit functions). There are two arguments that explain this finding. First, in accordance with previous research (Barakat and Hussainey 2013; Battaglia and Gallo 2015) and agency literature, effective risk governance practices may be used as a monitoring mechanism to decrease asymmetric information. Without appropriate monitoring mechanisms, managers have an incentive to hide or manipulate information by submitting misleading disclosures. Second, total risk governance practices and the four corresponding criteria represent a method by which to maintain relationships with stakeholders (creditors, debtors, regulators and employees), by accommodating their wants and needs through ORD quality. Integrated risk governance as well as the independence and composition of compliance and audit functions should encourage risk disclosure, because these aim to protect the interests of shareholders and stakeholders. The role of the board of commissioners and senior management could also ensure effective oversight of risk management.

Meanwhile, the chief risk officer's (CRO's) role and independence as well as the communication systems, in the form of risk meetings and reporting, have an adverse effect, particularly on voluntary ORD. This study suggests that banks with a CRO and risk communication system are effective, so their risks can be substantially mitigated, which will benefit the company (Eckles *et al* 2014). Consistent with the pro-

**TABLE 3** Correlation matrix.

| | Correlation probability | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TORD** | **VORD** | **RGOV** | **BOARD** | **SMGR** | **GROUP** | **RMF** | **RCOM** | **AUDIT** | **RBP** | **COMPET** | **LOG (SIZE)** | **TSA** | **CAR** |
| **VORD** | 0.791*** | | | | | | | | | | | | | |
| **RGOV** | 0.503*** | 0.388*** | | | | | | | | | | | | |
| **BOARD** | 0.344*** | 0.323*** | 0.715*** | | | | | | | | | | | |
| **SMGR** | 0.311*** | 0.183*** | 0.408*** | −0.007 | | | | | | | | | | |
| **GROUP** | 0.269*** | 0.126** | 0.516*** | 0.238*** | 0.134** | | | | | | | | | |
| **RMF** | 0.269*** | 0.123** | 0.457*** | −0.075 | 0.432*** | 0.225*** | | | | | | | | |
| **RCOM** | 0.172*** | 0.182*** | 0.423*** | 0.324*** | −0.143** | 0.051 | 0.002 | | | | | | | |
| **AUDIT** | 0.148** | 0.212*** | 0.520*** | 0.314*** | −0.008 | 0.098* | 0.072 | 0.299*** | | | | | | |
| **RBP** | 0.262*** | 0.141** | 0.445*** | 0.171*** | 0.262*** | 0.292*** | 0.255*** | 0.043 | −0.018 | | | | | |
| **COMPET** | 0.143** | −0.101* | 0.176*** | 0.034 | 0.224*** | 0.314*** | 0.180*** | −0.164*** | −0.198*** | 0.442*** | | | | |
| **LOG (SIZE)** | 0.458*** | 0.426 | 0.474*** | 0.217*** | 0.452*** | 0.267*** | 0.375*** | −0.100* | 0.128** | 0.458*** | 0.350*** | | | |
| **TSA** | 0.235*** | 0.086*** | 0.177*** | 0.053 | 0.220*** | 0.125** | 0.116** | −0.081 | −0.045 | 0.407*** | 0.400*** | 0.496*** | | |
| **CAR** | −0.047 | −0.043 | −0.154*** | −0.074 | −0.106* | −0.126** | −0.151** | 0.025 | −0.019 | −0.126** | −0.194*** | −0.136** | 0.012 | |
| **LAW** | 0.459*** | 0.352 | 0.449*** | 0.319*** | 0.469*** | 0.167*** | 0.417*** | −0.063 | −0.056 | 0.260*** | 0.180*** | 0.518*** | 0.152** | −0.120** |

Covariance analysis: ordinary, sample: 2010–14. Included observations: 285. Description: TORD is total operational risk disclosure; VORD is voluntary operational risk disclosure; RGOV is risk governance; BOARD is the responsibilities, composition, qualifications and structure of the board; SMGR is the responsibilities of senior management related to risk; GROUP is group structure governance; RMF is the risk management function; RCOM is risk communication; AUDIT is the independence and composition of the compliance and audit functions; RBP is compensation for risk-based performance; lnSIZE is bank size; TSA is the CAR measurement approach; CAR is the capital adequacy ratio; and LAW is the country's legal system. *Source*: results of data processing.

**TABLE 4** Regression results.

| Independent variable | Prediction | Dependent variable: TORD | | Dependent variable: VORD | |
|---|---|---|---|---|---|
| | | Model 1 | Model 2 | Model 3 | Model 4 |
| RGOV | + | 1.123*** | | 0.821*** | |
| BOARD | + | | 0.377** | | 0.525*** |
| SMGR | + | | 0.256*** | | 0.156*** |
| GROUP | + | | 0.207*** | | 0.138** |
| RMF | + | | −0.151 | | −0.352*** |
| RCOM | + | | 0.168 | | −0.311*** |
| AUDIT | + | | 0.265*** | | 0.246** |
| RBP | + | | −0.029 | | 0.432 |
| COMPET | + | 1.038*** | 0.259 | 0.665** | 0.433 |
| RGOV × COMPET | − | −1.350*** | | −1.238*** | |
| BOARD × COMPET | − | | −0.588 | | −1.506*** |
| SMGR × COMPET | − | | −0.514*** | | −0.354*** |
| GROUP × COMPET | − | | −0.451*** | | −0.233* |
| RMF × COMPET | − | | 0.488** | | 0.639** |
| RCOM × COMPET | − | | 0.915*** | | 1.300*** |
| AUDIT × COMPET | − | | −0.434** | | −0.365 |
| RBASED × COMPET | − | | 0.102 | | −0.493 |
| lnSIZE | + | 0.008** | 0.008** | 0.030*** | 0.032*** |
| TSA | +/− | 0.015* | 0.035*** | 0.014* | −0.019 |
| CAR | + | 0.013 | 0.016 | 0.153 | −0.211 |
| LAW | +/− | 0.085*** | 0.107*** | 0.058*** | 0.106*** |
| $N$ | | 285 | 285 | 282 | 283 |
| Adjusted $R^2$ | | 0.732 | 0.691 | 0.542 | 0.519 |
| $F$-stat | | 111.94** | 34.44*** | 48.49*** | 34.77*** |

*, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively. TORD is total operational risk disclosure; VORD is voluntary operational risk disclosure; RGOV is risk governance; BOARD is the responsibilities, composition, qualifications and structure of the board; SMGR is the responsibilities of senior management related to risk; GROUP is group structure governance; RMF is the risk management function; RCOM is risk communication; AUDIT is the independence and composition of the compliance and audit functions; RBP is compensation for risk-based performance; lnSIZE is bank size; TSA is the CAR measurement approach; CAR is the capital adequacy ratio; and LAW is the country's legal system.

prietary cost theory, there is a potential for banks to experience competitive losses if the information on effective and sensitive risk management is used by competitors. Thus, banks will choose to reduce the quality of voluntary ORD. A broader CRO role and greater independence, together with an effective risk communication system, are therefore the factors driving operational risk information, which is hidden to maximize the flexibility of their actions (Ashcraft 2008).

In addition, this study suggests that the CRO's role and the risk communication system are more or less limited to the obligations of controlling, mitigating and communicating internally to the board and senior management. Ultimately, the information submitted externally is the responsibility of the board and audit committee. Further, the effect of RBP practices, whether they are mandatory or voluntary, on ORD quality is not significant. In reality, this practice is still ineffectively undertaken by the banking industry in the ASEAN-5 countries because of a lack of regulation and difficulties in measuring the compensation component. When enforcement of this risk governance practice is low, management does not have an incentive to perform ORD.

## 11 MARKET COMPETITION AND ORD

Table 4 shows the positive effect of market competition on ORD quality (total and voluntary). This is consistent with previous research that demonstrates competition encourages banks to disclose risks (Maudos and Fernandez de Guevara 2004; Barakat and Hussainey 2013; Mokhtar and Mellett 2013). This study suggests that tight competition could exacerbate bank risks due to competition in lending, declines in lending rates and narrower margins, difficulty in accessing external financing and potential risk taking (moral hazard) by management, which could be detrimental to the principal (Maudos and Fernandez de Guevara 2004). In accordance with proprietary cost, agency and stakeholder theory, as markets become more competitive, management is motivated to disclose operational risk. This could be due to market competition, which has the potential to create risks and reduce proprietary costs, or the confidence level of investors/prospective investors and that of other stakeholders, so the demand for ORD quality becomes greater.

The regression results show that the coefficient values of the RGOV, BOARD, SMGR, GROUP and AUDIT variables with the interaction of the COMPET variable are significant and negative. This implies that market competition weakens the effect of internal factors (total risk governance practices and the four criteria-based risk governance practices) on total and voluntary ORD. The four criteria include the board member independence and the competence of the audit and risk committees; senior management responsibilities related to risk; group structure governance; and independence and composition of the compliance and audit functions. In line with our prediction and the findings of Barakat and Hussainey (2013) and Bushman *et al* (2017), the relationship between risk governance and competition represents a substitution (ie, it is not complementary). This means that when a bank's internal factors are weak, external factors (market competition) act as a disciplinary tool that forces managers to disclose operational risk in order to decrease agency problems.

Moreover, the interaction between market competition and the CRO's role and the risk communication system shows significant and positive coefficients. Consistent with the other four criteria, which imply a substitution effect, the external factors (market competition) weaken the negative influence of internal factors (the CRO's role and independence, and the risk communication system) on voluntary ORD. This means that there are two ineffective risk governance practices that encourage effective ORD with increasingly tight market competition.

In general, the investigation results of the control variable effect on total ORD are consistent with those for voluntary ORD. The bank size, TSA and legal systems have a significant and positive effect on ORD, while the CAR does not affect ORD (total and voluntary). In line with the finding of Amran *et al* (2009), Linsley *et al* (2006) and Barakat and Hussainey (2013), great companies can hire skilled and well-informed employees, thereby lowering the preparation burden, which encourages greater risk disclosure. Larger banks also have higher agency costs, known by the concept too big to fail (TBTF). Therefore, the obligation to disclose risks becomes very important to avoid this potential risk and to protect the investors (Barakat and Hussainey 2013).

Banks using TSA, which is more complicated, have better ORD quality than banks using the BIA. This study also finds that banks operating under common law systems have higher qualities of total and voluntary ORD. Meanwhile, CAR has no significant effect on the quality of total or voluntary ORD. This suggests that the average CAR of ASEAN-5 banks (15.85%) complies with or even exceeds the Basel II requirement (8–9%). This finding supports Klepczarek (2016), who stated that CAR does not influence European bank risk disclosure due to compliance by maintaining its capital ratio, resulting in low regulatory oversight and pressure costs.

## 12 ROBUSTNESS CHECKS

Robustness was tested by regressing the whole model without the Singaporean samples. This is because the Singaporean samples were characterized by a more advanced capital market, above-average real gross domestic product per capita and the highest total assets of all the research samples.[2] The testing also replaced the market competition proxy with different measurements using the Lerner index (LI). The results of these tests generally demonstrated robustness (see Tables 5 and 6).

[2] Please note that the variables for the country level, namely competition (COMPET) and legal system (LAW), have the same data for our observation period. Therefore, if we re-estimate the model per country, it will cause a near-singular matrix. A near-singular matrix is an error mentioned in e-views software. One way to avoid this is to remove these variables. However, if we remove this data, we will end up with meaningless results.

**TABLE 5** Robustness test: non-Singaporean banks.

| Independent variable | Prediction | Dependent variable: TORD | | Dependent variable: VORD | |
|---|---|---|---|---|---|
| | | Model 1 | Model 2 | Model 3 | Model 4 |
| RGOV | + | 1.061*** | | 0.744*** | |
| BOARD | + | 0.389** | | 0.505*** | |
| SMGR | + | 0.218*** | | 0.112*** | |
| GROUP | + | 0.185*** | | 0.062 | |
| RMF | + | −0.111 | | −0.325*** | |
| RCOM | + | −0.168 | | −0.393*** | |
| AUDIT | + | 0.212** | | 0.179 | |
| RBP | + | 0.037 | | 0.296* | |
| COMPET | + | 1.004*** | 0.383 | 0.528 | 0.407 |
| RGOV × COMPET | − | −1.189*** | | −0.941 | |
| BOARD × COMPET | − | −0.603 | | −1.428*** | |
| SMGR × COMPET | − | −0.388** | | −0.207* | |
| GROUP × COMPET | − | −0.393*** | | −0.057 | |
| RMF × COMPET | − | 0.338 | | 0.508* | |
| RCOM × COMPET | − | 0.968*** | | 1.592*** | |
| AUDIT × COMPET | − | 0.324* | | −0.220 | |
| RBASED × COMPET | − | −0.093 | | −0.930** | |
| LnSIZE | + | 0.008* | 0.008** | 0.029*** | 0.035*** |
| TSA | +/− | 0.016 | −0.011 | −0.053*** | −0.105*** |
| CAR | + | −0.003 | 0.036 | −0.181 | −0.183 |
| LAW | +/− | 0.069*** | 0.081*** | 0.037*** | 0.055** |
| $N$ | | 270 | 270 | 270 | 267 |
| Adjusted $R^2$ | | 0.542 | 0.504 | 0.363 | 0.472 |
| $F$-stat | | 46.46*** | 15.39*** | 22.62*** | 13.52*** |

*, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively. TORD is total operational risk disclosure; VORD is voluntary operational risk disclosure; RGOV is risk governance; BOARD is the responsibilities, composition, qualifications and structure of the board; SMGR is the responsibilities of senior management related to risk; GROUP is group structure governance; RMF is the risk management function; RCOM is risk communication; AUDIT is the independence and composition of the compliance and audit functions; RBP is compensation for risk-based performance; lnSIZE is bank size; TSA is the CAR measurement approach; CAR is the capital adequacy ratio; and LAW is the country's legal system.

## 13 CONCLUDING REMARKS

This study investigated total risk governance practices, the seven criteria therein and the effect of market competition on bank ORD quality, both total and voluntary. It also investigated the role of market competition, which is either a substitute for or complementary to risk governance practices. The estimation results using panel

**TABLE 6** Robustness test: Lerner index.

| Independent variable | Prediction | Dependent variable: TORD | | Dependent variable: VORD | |
|---|---|---|---|---|---|
| | | Model 1 | Model 2 | Model 3 | Model 4 |
| RGOV | + | 0.532*** | | 0.320*** | |
| BOARD | + | 0.837*** | | 0.736*** | |
| SMGR | + | −0.020 | | −0.018 | |
| GROUP | + | 0.072* | | 0.043 | |
| RMF | + | −0.089 | | −0.179*** | |
| RCOM | + | −0.119 | | −0.085 | |
| AUDIT | + | 0.082 | | −0.007 | |
| RBP | + | −0.006 | | −0.084 | |
| LI | − | −0.126 | 0.608* | −0.393 | 0.512* |
| RGOV × LI | + | 0.034 | | 0.370 | |
| BOARD × LI | + | −2.240*** | | −2.450*** | |
| SMGR × LI | + | 0.021 | | 0.033 | |
| GROUP × LI | + | −0.073 | | −0.092 | |
| RMF × LI | + | 0.479** | | 0.242 | |
| RCOM × LI | + | 0.849*** | | 0.869*** | |
| AUDIT × LI | + | 0.035 | | 0.451* | |
| RBASED × LI | + | −0.016 | | 0.195 | |
| lnSIZE | + | 0.015*** | 0.022*** | 0.033*** | 0.047*** |
| TSA | +/− | 0.019** | 0.027** | −0.042*** | −0.041*** |
| CAR | + | −0.013 | −0.050 | 0.055 | 0.008 |
| LAW | +/− | 0.089*** | 0.103*** | 0.046*** | 0.123*** |
| $N$ | | 285 | 285 | 282 | 282 |
| Adjusted $R^2$ | | 0.718 | 0.743 | 0.455 | 0.599 |
| $F$-stat | | 104.27*** | 43.83*** | 34.62*** | 23.16*** |

*, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively. TORD is total operational risk disclosure; VORD is voluntary operational risk disclosure; RGOV is risk governance; BOARD is the responsibilities, composition, qualifications and structure of the board; SMGR is the responsibilities of senior management related to risk; GROUP is group structure governance; RMF is the risk management function; RCOM is risk communication; AUDIT is the independence and composition of the compliance and audit functions; RBP is compensation for risk based performance; lnSIZE is bank size; TSA is the CAR measurement approach; CAR is the capital adequacy ratio; and LAW is the country's legal system.

data indicated that total risk governance practices, four criteria-based risk governance practices (the board's role and composition; senior management responsibilities related to risk; group structure governance; and the independence and composition of compliance and audit functions) and market competition have significant and positive impacts on ORD quality (total and voluntary). Two other criteria, however – namely, the CRO's role and independence as well as the risk communication sys-

tem – have negative effects, especially on voluntary ORD. Further, the relationship between total risk governance practices (and the criteria therein) and market competition represents a substitution, with the effects indicated by market competition, which could alleviate the adverse consequences of weak risk governance practices.

These findings imply that regulators could apply whichever method is most efficient and effective based on internal factors (risk governance practices) or external factors (market competition) to improve market discipline. These findings are important, as the ASEAN Economic Community (AEC), the ASEAN Banking Integration Framework (ABIF) and the Qualified ASEAN Bank (QAB) agreements are about to be implemented. Nevertheless, this study encountered two limitations. First, assessment of the risk governance practices and ORD quality may be less precise when the evaluation depends just on what was disclosed in the yearly reports. Second, the sample data from the ASEAN-5 commercial banks revealed differences in the amount of data between countries, making them less comparable. We therefore suggest that further, related research should take different business lines (regional and investment banks) into account in the analyses. The findings might be different when using a sample of regional banks and investment banks.[3] Another suggestion is to investigate the implementation of the Basel Committee on Banking Supervision's guidelines across ASEAN-5 countries using a longer period to meet the criteria of equilibrium conditions related to the Panzar–Rosse method.[4]

## DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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[3] This is in accordance with the business model of a local or regional bank that serves certain market segments and does not operate widely in the national scope (see Umanto *et al* 2015; Fadloli and Chalid 2017; Noman *et al* 2017). A less competitive market will be an ineffective mechanism for regional banks to have good risk governance and, in turn, will not encourage ORD quality improvement. The level of business complexity in investment banks is closely related to tighter governance and competition level (see Mamatzakis and Bermpei 2015; Crotty 2007), which leads to a greater potential for operational and market risk as well as demands for greater transparency (Steinherr 2000; Berger *et al* 2014, p. 165).

[4] According to Panzar and Rosse (1987), one of the assumptions in measuring market competition is long-term equilibrium, so most previous studies use a period of at least 10 years to meet the requirements of the Panzar–Rosse model.

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