

# RISK REPORTING PRACTICES BY THE AVIATION INDUSTRY

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## Abstract

This study analyses the extent of voluntary business risk disclosure from airlines-aviation companies in Asia-Pacific Economic Cooperation (APEC) countries over the period of three years (2009-2011). The results of this study indicate that level of business risk disclosure is relatively consistent high level in 62.71%-64.71%. Multiple regression analysis provides evidence that country cluster, size, leverage and load factor are positively significantly associated with business risk disclosure while government ownership impact negatively. Further ANOVA analysis showed that the highest business disclosure are from Anglo-Saxon airlines/aviation companies and the lowest voluntary business risk disclosure shown by those of emerging markets.

**Keywords:** Risk, Reporting, Aviation Industry, Disclosure

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## 1 Introduction

Corporate voluntary disclosure has long captured significant attention in the accounting literature. Prior studies indicate that increased disclosure can reduce transaction costs, increase demand for a firm's stock and, eventually, improve market liquidity. Healy and Palepu (2001) note that high levels of information disclosure can reduce the uncertainty surrounding a particular firm, thereby allowing investors/potential investors to obtain more accurate and less volatile earnings forecasts. Schuster and O'Connell (2006 7) maintain that "improved disclosure is likely to lead to improvements in shareholders' capital-allocation decisions as well as their assessment of risk-adjusted return. Hence, from a macroeconomics perspective, increased disclosure should lead to improvements in the market's role as a capital allocation mechanism". Haddad et al. (2009) find that enhanced voluntary disclosure helps to reduce bid-ask spreads, which lowers the cost of capital and thereby improves market liquidity.

Due to recent widespread financial crises, such as the global financial crisis and dramatic corporate collapses, regulators and investors around the globe have increasingly demanded that corporate disclosure extend beyond mere financial information. Barako (2004) states that voluntary disclosure of non-financial information helps to enhance a firm's share value as well as its social reputation. One aspect of non-financial disclosure relates to the communication of risk information (Linsley and Shrivess, 2006). Probohudono et al. (2013) state that risk reporting

represents an extension of corporate disclosure into non-traditional areas in response to increased demand for corporate accountability and ethical behavior. Beretta and Bozzolani (2004) argue that continuous changes and uncertainties relating to business regulations, operations and strategies have made it challenging for investors to fully comprehend corporate disclosures. A lack of sufficient risk information may lead to several problems in the market, including high transaction costs, thin markets, low liquidity, decreased gains from trades and unprofitable investments (Miihkinen, 2013). To improve the market, it is imperative that all companies engage in additional risk reporting.

There have been calls from around the globe for increased regulations of risk disclosure. For instance, the Institute of Chartered Accountants in England and Wales (ICAEW) urges that risk information be made available in the annual reports of UK firms (Cabedo and Tirado, 2004). The International Accounting Standards Board (IASB) also suggests that risk information be disclosed in firms' annual reports (IASB, 2008). Specifically, IAS 1—*Presentation of Financial Statements* requires a company to disclose its financial risk management objectives and policies as well as management's assessment of essentially all risks faced by the company. Moreover, IAS 32—*Financial Instruments: Presentation* requires that firms provide additional information about major uncertainties and certain specific risks (Probohudono et al., 2013).

Within the existing literature, many studies of risk disclosures have been conducted. Linsley and

Shrives (2006) investigate risk disclosures in the annual reports of UK companies. Hassan (2009) examines the level of risk disclosure by firms in the United Arab Emirates, whereas Hassan et al. (2011) study the risk reporting practices of listed firms in Egypt. More recently, Probahudono et al. (2013) explore the extent of risk disclosure by Australian, Indonesian, Malaysian, and Singaporean firms during the global financial crisis period. Although the number of recent studies reflects an increasing trend in risk-reporting research, additional research is needed. Linsley and Shrives (2006) state that in order to develop a better understanding of the motivations for corporate risk disclosure, more risk disclosure studies should be encouraged, including studies in a cross-country setting and industry-specific studies. This study reflects an attempt to respond to this call for additional research. By examining the effects of variables such as country cluster, company size, government ownership, managerial ownership, board independence and auditor type, this study enables stakeholders to gain a deeper understanding of corporate risk disclosure practices as well as providing the extension to the existing voluntary disclosure literature.

The objectives of this study are twofold: a) to investigate the extent of risk disclosure by airlines/aviation companies in the Asia-Pacific region and b) to explore potential determinants of such disclosures.

The focus on airlines/aviation companies is based on several reasons. First, previous studies provide evidence that variations in corporate risk disclosure can be explained by differences between specific industries (Hassan, 2009). Beretta and Bozzolani (2004) state that the types of risk that a firm must address depend on the nature of the industry in which it operates. Consequently, previous studies have investigated risk reporting practices in specific industries, including the manufacturing industry (Probahudono et al., 2013; Dobler et al., 2011), the mining/resources industry (Taylor et al., 2010), the food industry (Abraham and Cox, 2007) and the banking industry (Barakat and Hussainey, 2013). However, no risk disclosure study to date has investigated the airlines/aviation industry. Financial reporting and disclosure by the airlines/aviation industry is quite different from that of other industries (Tan et al., 2002). Thus, this study of risk reporting in the airlines/aviation industry adds to the extant literature.

Second, the airlines/aviation industry is considered a risky industry because it is susceptible to economic conditions and global recessions. Fernando (2006) points out that during periods of recession, many airlines report lower earnings or even substantial losses. Heavy fare discounting, high and volatile fuel costs, intense competition and other disadvantageous environmental pressures are among the challenges continuously faced by the airlines/aviation industry

(Berghofer and Lucey, 2014). Furthermore, it is also vulnerable to security failures and other unexpected events, such as the hijacking of airplanes on September 11<sup>th</sup> 2001 in the United States, the air mishaps experienced by Malaysia Airlines and Taiwan's TransAsia Airways in 2014, and human and drug smuggling. According to Miihkinen (2013), investors require more risk information from risky firms. Thus, the dynamics of this risky industry and its public perception make it a very interesting field for the study of risk disclosure practices.

Third, the Asia-Pacific Economic Cooperation (APEC) region is chosen for this study because of its growing importance in the world economy. Currently, APEC countries account for approximately 40% of the global population, approximately 55% of global GDP and approximately 44% of global trade (APEC, 2014). As the region with the most dynamic economies in the world, the Asia-Pacific area has become the center of gravity of the world economy (Weixing, 2009). Given the growing attention focused on risk disclosure and the uniqueness of the airlines/aviation industry, this study provides an important extension to the current literature on risk disclosure.

The remainder of the study proceeds as follows. Section 2 provides a review of the literature regarding theoretical framework and hypotheses development. Section 3 describes the research design and methodology, and Section 4 presents the findings. Finally, Section 5 concludes.

## 2 Theoretical framework and hypothesis development

Studies on risk reporting have adopted various theories. This study develops risk disclosure hypotheses based on agency theory because this theory is most often employed by accounting researchers (Abraham and Cox, 2007; Taylor et al., 2010; Probahudono et al., 2013; Dobler et al., 2011). According to agency theory, information asymmetry is a central issue in the relationship between the principals of a firm (shareholders) and their agents (managers). Information asymmetry exists because managers have information advantages over shareholders (Su et al., 2010; Colgan, 2001; Ahmed, 2009). Agency theorists argue that due to the separation of ownership and control, managers are motivated to disclose more information to reduce the information asymmetry gap (Chau and Gray, 2002). Risk disclosure is one facet that a company can use to minimize this gap (Cabedo and Tirado, 2004; Linsley and Shrives, 2006; Hassan, 2009).

According to Cabedo and Tirado (2004), there are three types of risk associated with a company: business risk, strategic risk, and financial risk. Business risk relates to possible changes in a company's competitive advantages, including advantages related to product design, technological innovation, marketing strategies and other company

characteristics that add value for shareholders. Strategic risk relates to major fluctuations in the economic and political environments in which the company operates, and financial risk relates to the possibility of losses in financial markets (Cabedo and Tirado, 2004). This paper focuses solely on the disclosure of business risk by airlines/aviation companies.

## 2.1 Country cluster

According to Nobes (1998), a country cluster is a group of countries with similar cultures and environments. Nobes (1998) argues that countries in a particular cluster adopt similar accounting practices because of similarities in their backgrounds, legal environments and business structures. Prior studies suggest that the country cluster in which a firm operates is a potentially important determinant of the extent and type of voluntary corporate disclosure. Tan et al. (2002) report a significant difference in terms of accounting disclosure practices between airlines in strong equity markets and airlines in weak equity markets. Garcia-Meca and Sánchez-Ballesta (2010) and Boolaky (2011) both maintain that a country's legal and institutional structures are key factors in the

variation of corporate reporting practices. Millar et al. (2005) group global business systems into three categories—Anglo-Saxon, Communitarian and Emerging Market—and find that a country's business system is an important determinant of strategic transparency. Using the categories identified by Millar et al. (2005), Faisal et al. (2012) find that firms operating in emerging markets provide more sustainability information than firms in other regions do. By contrast, Boolaky (2011) reports that firms in communitarian countries disclose more human resources information than firms in other countries do. In line with the studies of Millar et al. (2005) and Faisal et al. (2012), the 16 APEC countries included in this study are grouped into three clusters: Anglo-Saxon (for example, Australia, New Zealand and the US), communitarian (for example, Russia) and emerging markets (for example, Indonesia, Malaysia, China, Chile and Thailand). (Detailed measurements of all variables are presented in Table 1.) The following hypothesis is proposed:

*H<sub>1</sub>: There is an association between country cluster and the level of business risk disclosure by airlines/aviation firms in the APEC region.*

**Table 1.** Measurements of dependent, independent and control variables

Dependent variables	Measurements
Business Risk Disclosure Index	Percentage result of total score to the total of item index (28 items) of business risk disclosure
Independent variables	
Country	Code (1) for countries that belong to Emerging market category Code (2) for Communitarian countries Code (3) for Anglo -Saxon countries
The Firm Size	The log of total asset
The Proportion of Independent Board	The percentage of independent directors to total directors on boards.
The Proportion of Government Ownership	The percentage of government shares in the company over the total shares.
The Proportion of Managerial Ownership	The percentage of managers' shares in the company over the total shares.
Control variables	
Auditor	Code (1) (for auditors, who are the Big4) and 0 (for auditors, who are non-the Big4).
Profitability	ROA = after taxes income/ total asset
Leverage	Leverage = total debt/ total asset
The proportion of load factor	Load Factor = RPK/ ASK

## 2.2 Size

Firm size is often reported as a significant explanatory variable in existing voluntary disclosure studies. According to Hossain et al. (1995), agency costs increase with firm size. Thus, it is expected that larger firms will have greater incentives to provide information to reduce their agency costs. Previous studies (Vu et al., 2011; Chu et al., 2013; Akrouf and Othman, 2013; Cahaya et al., 2012; Rouf, 2011; Xiao and Yuan, 2007) report that firm size is positively

correlated with voluntary information disclosure. Larger firms are likely to have a wider variety of investors; therefore, the demand for information disclosure is greater for larger firms than it is for smaller firms (Hassan, 2009). Thus, the managers of larger firms tend to disclose more information to satisfy a greater variety of stakeholders. The empirical research of Elzahar and Hussainey (2012) shows that larger firms are more likely to provide risk information in the narrative sections of interim reports. Probohudono et al. (2013) report that firm size

is a significant positive correlate of business risk disclosure by manufacturing firms in Australia, Indonesia, Malaysia and Singapore. In the same vein, Ekramy and Howard (2013) find that firm size is positively related to risk reporting by Egyptian companies. In line with agency theory and the above-referenced studies, this study proposes the following hypothesis:

*H<sub>2</sub>: There is a positive association between firm size and the level of business risk disclosure by airlines/aviation firms in the APEC region.*

### **2.3 Corporate governance**

Healy and Palepu (2001) argue that the agency problem can be mitigated by having an effective board of directors that includes a high number of independent directors. A higher number of independent directors facilitates monitoring activities and provides more discipline for management on behalf of shareholders (Cormier *et al.*, 2010). The empirical evidence relating to the relationship between the proportion of independent directors and the extent of voluntary disclosure is inconclusive. The studies of Baek, Johnson and Kim (2009) and Lim, Matolcsy and Chow (2007) of firms in the US and Australia, respectively, report significant positive associations between the proportion of independent directors and the extent of information disclosure. Beretta and Bozzoland (2004) find that the number of independent directors on a board is positively associated with the level of corporate risk reporting. Taylor *et al.* (2010) find that a stronger corporate governance mechanism (as measured by an index of corporate governance structure) positively affects the extent of financial risk management disclosure by Australian listed resources firms. However, the studies of Al-shammari and Al-sultan (2010), Aripin *et al.* (2011), Rouf (2011) and Vu *et al.* (2011) find that the proportion of independent directors on a corporate board is not associated with the level of voluntary disclosure. This study posits the following hypothesis:

*H<sub>3</sub>: There is a positive association between corporate governance mechanisms and the level of business risk disclosure by airlines/aviation firms in the APEC region.*

### **2.4 Government ownership**

Airlines/aviation companies in most developing countries are still susceptible to government intervention, especially as it relates to the impact of economic liberalization on the ownership of airlines/aviation companies (Chang *et al.*, 2004). Being the dominant shareholder, the government can also control the firms through their influential legal power. Firms with higher government ownership face fewer information asymmetry problems because

government generally has better access to a firm's internal information than other stakeholders (Naser *et al.*, 2002; Xiao and Yuan, 2007). Vu *et al.* (2011) note that being the sole authority may give a government enough power to obtain firm information through unconventional channels; thus, the demand for information from government-owned firms is generally lower, which results in a lower level of information disclosure by government-owned firms. Accordingly, the following hypothesis is proposed:

*H<sub>4</sub>: There is a negative association between government ownership and the level of business risk disclosure by airlines/aviation firms in the APEC region.*

### **2.5 Managerial ownership**

Agency theory posits that managerial ownership can eliminate agency costs because a manager who owns company shares will bear the company's losses and share in the company's profits. Thus, a higher level of managerial ownership helps to align the interests of managers and stockholders, which may motivate managers to disclose additional information on a voluntary basis. Empirically, the results are somewhat mixed. Nagar *et al.* (2003) find a positive relationship between disclosure and long-term managerial wealth tied to share price. This evidence is augmented by empirical evidence from Jiang and Habib's (2009) study of New Zealand listed firms and Vu *et al.*'s (2011) study of Vietnamese listed firms. These studies report that higher managerial ownership leads to increased voluntary disclosure. However, Akhtaruddin and Haron (2010) and Samaha and Dahawy (2011) each report a negative relationship between managerial ownership and firm disclosure, and neither Xiao and Yuan (2007) nor Guan *et al.* (2007) find any relationship between them. Based on agency theory, the following hypothesis is advanced:

*H<sub>5</sub>: There is a positive association between managerial ownership and the level of business risk disclosure by airlines/aviation firms in the APEC region.*

## **3 Research design**

In total, there are 2,424 flight companies owned by entities in APEC member countries and are registered as members of the International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO). This study randomly selects a sample of 50 firms and assesses their disclosure practices over the period 2009-2011. The final observation sample comprises 150 firm-years. (Table 2 lists the 50 airlines/aviation companies included in the sample.)

**Table 2.** List of airlines/aviation companies included in this study

Country cluster	Country	airlines-aviation companies	Country Cluster	Country	airlines-aviation companies
Emerging market	Indonesia	Garuda Indonesia	Anglo-Saxons	U.S	American Airlines
Emerging market	Malaysia	Air Asia	Anglo-Saxons	U.S	Alaska Airlines
Emerging market	Malaysia	Malaysian Airlines	Anglo-Saxons	U.S	Atlas Airlines
Emerging market	Malaysia	Transmile Air Services	Anglo-Saxons	U.S	Delta Airlines
Emerging market	China	China Airlines	Anglo-Saxons	U.S	Federal Express
Emerging market	China	Eva Air	Anglo-Saxons	U.S	Hawaiian Airlines
Emerging market	Hongkong	Cathy Pacific	Anglo-Saxons	U.S	Jetblue Airways
Emerging market	China	Air China	Anglo-Saxons	U.S	Pinnacle Air Group
Emerging market	China	China Eastern Airlines	Anglo-Saxons	U.S	Republic Airlines
Emerging market	China	China Southern Airlines	Anglo-Saxons	U.S	Southwest Airlines
Emerging market	Papua New Guinea	Airlines PNG	Anglo-Saxons	U.S	Skywest Airlines
Emerging market	Chile	LAN Airlines	Anglo-Saxons	U.S	United Airlines
Emerging market	Thailand	Thai Airways International	Anglo-Saxons	U.S	United Parcel Services
Commutarian	Singapore	Singapore Airlines	Anglo-Saxons	U.S	US Airways
Commutarian	Singapore	Skywest Airlines	Anglo-Saxons	Canada	Discovery Air
Commutarian	Japan	All Nippon Airways	Anglo-Saxons	Canada	West Jet
Commutarian	Korea	Korean Air	Anglo-Saxons	New Zealand	Air New Zealand
Commutarian	Russia	Aeroflot Russian Airlines	Anglo-Saxons	New Zealand	Airways Corporation of New Zealand
Commutarian	Russia	Transaero Airlines	Anglo-Saxons	U.S	Aircastle
Commutarian	Russia	UTair Airlines	Anglo-Saxons	U.S	Air Transport International
Anglo-Saxons	Australia	Air Services Australia	Anglo-Saxons	U.S	Allegiant Air
Anglo-Saxons	Australia	Aircruising Australia	Anglo-Saxons	Canada	Air Canada
Anglo-Saxons	Australia	Care Flight	Anglo-Saxons	Canada	Cargo Airways
Anglo-Saxons	Australia	Qantas			
Anglo-Saxons	Australia	Regional Express			
Anglo-Saxons	Australia	Royal Australian Air Force			
Anglo-Saxons	Australia	Virgin Australia			

Note: The table above lists the companies in the sample

### 3.1 Dependent variable

To measure the extent of risk disclosure, this study adopts the index used in the study of Probohudono et al. (2013) and employs the risk factors identified by KPMG (2006). Consistent with past disclosure studies (Probohudono et al., 2013; Taylor et al., 2010; Vu et al., 2011; Akhtaruddin and Haron, 2010), this study uses an unweighted approach to measure the level of risk disclosure. This type of approach is based on the assumption that each disclosed item is an important

factor in the decision-making processes of the users of the information (Chau and Gray, 2002). A score of one (1) is given for each business risk item disclosed by a company, and a score of zero (0) is given otherwise. The total business risk disclosure index (BRDI) for each company is the percentage obtained by dividing the company's total score by the total number of items in the disclosure index (28). The list of disclosure items is presented in Table 3.

**Table 3.** List of items in BRDI

<b>Business Risk Disclosure Index</b>	
	<b>Items</b>
1	Identification , evaluation and management of significant risks *
2	Effect of the application of the strategy in the current year *
3	Influence the strategy for the future *
4	Qualitative disclosure at the discretion of the acquisition for the current year *
5	Qualitative disclosure at the discretion of disposals for the year *
6	Qualitative disclosures with respect to the future prospects of the business *
7	Explanations related to major projects being handled by the company in the current year the company *
8	The company's commitment in regards to the cost of capital *
9	Security policy *
10	Data related accidents that occur *
11	Costs associated with safety measures *
12	Safety of the products *
13	Changes in fuel prices and its impact on the company **
14	Risk factors associated with terrorism and international hostilities **
15	Competitive environment and competitors analysis**
16	Impacts of changes in international, regional and local significant on the airline industry **
17	Effects of economic conditions beyond the airlines control**
18	Obligations ( debt and bonds ) and risks that may be encountered with regard to the liabilities held **
19	Trade union disputes , employee strikes and disorders associated with other labor airline business **
20	Government or government actions beyond the control of the airline ( regulatory risk ) such as foreign exchange risk **
21	Effects related to changes in interest rates and hedging activities used by the airline **
22	Risks associated with communication and technology used by the airline **
23	Significant losses faced by the airline **
24	Restructuring or bankruptcy risk faced by the aviation industry which could affect other related airline **
25	Personnel issues ( management ) that significantly affect the success of the airline *
26	Risks associated with dependence on suppliers in the provision of services such as fuel technology , and other services are important for the airline industry **
27	Interruption in services by airports to airlines **
28	Employee pension costs in particular are filed early retirement **

Note: \* Items adopted from 12 business risk disclosure items (Probohudono et al., 2013). \*\* Items adopted from 21 airline risk factors of KPMG's Disclosures Handbook (KPMG, 2006)

### 3.2 Independent variables

As mentioned above, the independent variables in this study are country cluster, firm size, corporate governance mechanism, state ownership and managerial ownership. Table 1 describes the measurement of each of these variables.

### 3.3 Control Variables

#### 3.3.1 Auditor type

It is assumed that large auditing firms are more concerned about their reputations; thus, they are more likely either to associate with companies that disclose adequate information or to encourage their clients to disclose additional information. Past studies indicate that firms with high agency costs tend to choose high-quality auditors to reduce those costs (Lopes and Rodrigues, 2007).

#### 3.3.2 Profitability

Extant studies often report a significant positive relationship between the level of voluntary disclosure and firm profitability (Ghazali and Weetman, 2006; Mangena and Taurigana, 2007). Agency theory posits that highly profitable companies tend to disclose more risk information in interim reports to justify their performance to shareholders (Elzahar and Hussainey, 2012).

#### 3.3.3 Leverage

The leverage ratio is widely used as the measurement proxy in disclosure studies (Xiao *et al.*, 2004; Hossain *et al.*, 1994; Barako *et al.*, 2006). To reduce agency costs and improve information asymmetry, the managers of a firm with higher leverage may disclose more information to creditors, suppliers and investors to assure them that the firm is capable of meeting its financial obligations (Al-shammari and Al-sultan, 2010).

### 3.3.4 Load factor

Load factor can be a key determinant of disclosure in the airline industry. Load factor is an indicator of an airline's passenger-carrying capacity; it is also known as a measure of airline efficiency. Load factor in this study is calculated by dividing revenue passenger kilometer (RPK, the number of passengers multiplied by distance flown) by available seat kilometer (ASK, the number of available seats or the amount of available room multiplied by distance flown) (Jenatabadi and Ismail, 2007). Because this study addresses not only the passenger aviation industry but also the cargo aviation industry, the calculation of load factor is adjusted based on the available data.

## 4 Findings

### 4.1 Descriptive results

Table 4 presents a summary of the voluntary business risk disclosure scores over three years for the 50

airlines/aviation firms included in the sample. In 2009, the average business risk disclosure score is 62.71%. This disclosure increases slightly to 64.79% in 2010 and then decreases to 63.14% in 2011. The lowest business risk disclosure score (14.29%) is obtained by the Royal Australian Air Force (Australia), whereas the highest business risk disclosure score (85.71%) is obtained by US Airways (US) in 2009, All Nippon Airways (Japan) in 2010, and American Airlines (US) in 2011. As suggested by Babbie (2010), to reduce any subjectivity in the calculation of business risk disclosure scores and to better ensure the reliability of the scores, a second, independent researcher also assessed the disclosure of business risk items by each airline/aviation company in the sample. The results obtained by the independent researcher reveal no significant differences between the scores reported by each of the two researchers ( $p > 0.050$ ). Hence, the potential subjectivity problem arising from the scoring procedure of the business risk disclosure instrument is not considered an issue in this study.

**Table 4.** Descriptive statistics of dependent variable BRDI

Dependent variable (BRDI)	Mean	Minimum	Maximum	Standard deviation
2009	62.71	14.29	85.71	14.38
2010	64.79	21.43	85.71	13.80
2011	63.14	25.00	85.71	15.86
Pooled	63.55	14.29	85.71	14.63

Table 5 provides additional descriptive statistics for the firms in this study. The mean company size in the average year is \$8,232,406,951 (total assets in US dollars). Overall, company size increases during the sample period, whereas government ownership decreases slightly (17.14% in 2009, 16.76% in 2010 and 16.17% in 2011). The lowest level of managerial ownership occurs in 2010 (9.30%), and the highest proportion of independent directors on corporate boards occurs in 2011 (43.95%). The proportion of independent directors seems to be low (44.13% in 2009, 43.50% in 2010 and 43.95% in 2011). In most of these countries, it is required that independent directors account for at least two-thirds of total directors. Thus, these figures show that most firms in the sample do not meet the minimum required number of independent directors. The control variables also change over time. The financial leverage of these 50 airlines/aviation firms decreases from 71.36% in 2009 to 70.27% in 2010 and then increases slightly to 72.63% in 2011. The profitability ratios of these firms also exhibits some variance, increasing from 0.14% in

2009 to 2.09% in 2010 and then decreasing to 1.15% in 2011. Load factor increases over the three-year period, moving from 57.95% in 2009 to 58.85% in 2010 and to 59.40% in 2011.

To enable a better understanding of the sample, Table 6 presents the business risk disclosure levels of the sample firms grouped by country cluster. The country cluster data show that the highest business risk disclosure scores are earned by firms in communitarian countries, with a mean value of 71.43% in 2009 and 2010 and a mean value of 67.85% in 2011. Airlines/aviation firms in emerging markets earn the lowest business risk disclosure scores in each year (53.87% in 2009, 54.76% in 2010 and 50.89% in 2011). The differences between the business risk disclosure scores of the three country clusters are each significant ( $p < 0.050$ ). These findings contradict the findings of Faisal et al. (2012) but are consistent with many other studies (Vu *et al.*, 2011; Barako *et al.*, 2006) that find that the level of corporate disclosure in emerging countries is generally low.

**Table 5.** Descriptive statistics of independent variables

Independent variables	Mean	Minimum	Maximum	St.Deviation
<b>Panel A 2009 (n=50)</b>				
Size (US\$)	7.318.317.176	5.231.232	43.539.000.000	9.393.599.821
Size (Log)	9.25	6.72	10.64	1.03
GO (%)	17.14	0.00	86.00	26.97
MO (%)	9.84	0.00	54.00	11.76
BI (%)	44.13	0.00	90.00	23.77
LEV (%)	71.36	0.52	114.00	22.53
PROF (%)	0.14	-50.00	15.28	10.59
LF (%)	57.95	0.00	87.00	33.20
<b>Panel B 2010 (n=50)</b>				
Size (US\$)	8.386.968.432	4.374.096	43.188.000.000	10.736.726.311.03
Size (Log)	9.30	6.64	10.64	26.24
GO (%)	16.76	0.00	86.00	11.34
MO (%)	9.30	0.00	53.00	24.91
BI (%)	43.50	0.00	90.00	26.08
LEV (%)	70.27	0.56	174.00	12.63
PROF (%)	2.09	-80.40	13.00	33.77
LF (%)	58.85	0.00	88.00	
<b>Panel C 2011 (n=50)</b>				
Size (US\$)	8.991.935.246	5.753.617	43.499.000.000	11.238.973.72
Size (Log)	9.35	6.76	10.64	1.01
GO (%)	16.17	0.00	75.00	25.69
MO (%)	9.33	0.00	47.00	10.79
BI (%)	43.95	0.00	91.00	26.16
LEV (%)	72.63	0.48	194.00	29.31
PROF (%)	1.15	-20.00	11.00	5.48
LF (%)	59.40	0.00	88.63	34.06
<b>Panel D Pooled (n=150)</b>				
Size (US\$)	8.232.406.951	4.374.096	43.539.000.000	10.437.915.55
Size (Log)	9.30	6.64	10.64	1.09
GO (%)	16.67	0.00	86.00	26.11
MO (%)	9.49	0.00	54.00	11.23
BI (%)	43.87	0.00	91.00	24.84
LEV (%)	71.42	0.48	194.00	25.97
PROF (%)	1.12	-80.40	15.00	99.97
LF (%)	58.73	0.00	88.63	33.45

Note: Size = company size; MO = managerial ownership; GO = government ownership; BI = corporate governance; LEV = leverage ratio; PRO = profitability and LF = load factor

#### 4.2 Multiple regression results

This study explores the relationships between independent variables (country cluster, firm size, corporate governance mechanism, government ownership and managerial ownership), control variables (auditor type, profitability, leverage and load factor) and business risk disclosure by the airlines/aviation industry. The results of the regression analysis are reported in Table 7.

The results in Table 7 indicate that the country cluster variable is also a significant determinant ( $p =$

0.001) of business risk disclosure for the entire period (pooled) from 2009 to 2011. The findings of this study are consistent with the findings of earlier studies that country cluster/origin/group are significant determinants that explain the variations in voluntary risk disclosure (Marshall and Weetman, 2002; Probohudono *et al.*, 2013). Differences among country clusters relating to market structures and stakeholder expectations are possible explanations for the different risk reporting practices in each cluster.



**Table 6.** Compare means of business risk disclosures between three country clusters

<b>Panel A 2009</b>					
<b>Dependent variable</b>	<b>Country</b>	<b>n</b>	<b>Mean</b>	<b>F</b>	<b>Sig.</b>
<b>BRDI 2009</b>	Emerging Market	13	0.5387	4.036	0.024
	Communitarian	7	0.7143		
	Anglo-Saxon	30	0.6440		
	Total	50	0.6271		
<b>Panel B 2010</b>					
<b>Dependent variable</b>	<b>Country</b>	<b>N</b>	<b>Mean</b>	<b>F</b>	<b>Sig.</b>
<b>BRDI 2010</b>	Emerging Market	13	0.5476	5.129	0.010
	Communitarian	7	0.7143		
	Anglo-Saxon	30	0.6730		
	Total	50	0.6479		
<b>Panel C 2011</b>					
<b>Dependent variable</b>	<b>Country</b>	<b>N</b>	<b>Mean</b>	<b>F</b>	<b>Sig.</b>
<b>BRDI 2011</b>	Emerging Market	13	0.5089	5.604	0.007
	Communitarian	7	0.6786		
	Anglo-Saxon	30	0.6685		
	Total	50	0.6314		
<b>Panel D Pooled</b>					
<b>Dependent variable</b>	<b>Country</b>	<b>N</b>	<b>Mean</b>	<b>F</b>	<b>Sig.</b>
<b>BRDI Pooled</b>	Emerging Market	36	0.5371	5.011	0.008
	Communitarian	21	0.6837		
	Anglo-Saxon	90	0.6618		
	Total	150	0.6355		

**Table 7.** Multiple regression results

$$BRD = \beta_0 + \beta_1 \text{Country} + \beta_2 \text{BSIZE} + \beta_3 \text{MO} + \beta_4 \text{GO} + \beta_5 \text{BI} + \beta_6 \text{AUD} + \beta_7 \text{LEV} + \beta_8 \text{PROF} + \beta_9 \text{LF} + e$$

	<b>Sign Prediction</b>	<b>p-value pooled</b>	<b>p-value 2009</b>	<b>p-value 2010</b>	<b>p-value 2011</b>
<b>Country</b>	(+)	(+) 0.001*	(+) 0.027**	(+) 0.291	(+) 0.024**
<b>Size</b>	(+)	(+) 0.001*	(+) 0.430	(+) 0.175	(+) 0.042**
<b>MO</b>	(+)	(+) 0.722	(-) 0.893	(+) 0.484	(-) 0.865
<b>GO</b>	(-)	(-) 0.061***	(-) 0.669	(-) 0.749	(-) 0.958
<b>BI</b>	(+)	(+) 0.228	(+) 0.140	(+) 0.487	(+) 0.941
<b>Auditor</b>	(+)	(+) 0.508	(+) 0.341	(+) 0.355	(-) 0.689
<b>LEV</b>	(+)	(+) 0.015**	(+) 0.121	(+) 0.140	(+) 0.082***
<b>PROF</b>	(+)	(+) 0.233	(+) 0.415	(+) 0.409	(+) 0.128
<b>LF</b>	(+)	(+) 0.016**	(+) 0.184	(+) 0.152	(+) 0.047**
<b>Sample(n)</b>		150	50	50	50
<b>Sig. (ANOVA)</b>		0.000	0.000	0.21	0.006
<b>Adj.R<sup>2</sup></b>		0.354	0.412	0.220	0.207
<b>F</b>		9.985	4.816	2.533	3.170

Note: \*. Correlation is highly significant at the 0.01 level (1-tailed). \*\*. Correlation is significant at the 0.05 level (1-tailed) and \*\*\*. Correlation is moderately significant at the 0.1 level (1-tailed); number of firms = 150. Country = country cluster; Size = company size; MO = managerial ownership; GO = government ownership; BI = corporate governance; AUD = auditor type; LEV = leverage ratio; PRO = profitability = LF = load factor

Firm size (measured by the natural logarithm of total assets, or log assets) is found to have a positive association with business risk disclosure by airlines/aviation firms during the three-year sample period ( $p = 0.001$ ). This finding is consistent with agency theory and is similar to the findings of earlier

risk disclosure studies (Probohudono *et al.*, 2013; Taylor *et al.*, 2010; Dobler *et al.*, 2011; Linsley and Shrivs, 2006). The significance of this result implies that larger airlines/aviation firms are associated with higher levels of voluntary risk disclosure.

The corporate governance mechanism variable has no significant effect on the level of business risk disclosure ( $p > 0.100$ ). The evidence in this study is consistent with that in the previous studies of Al-shammari and Al-sultan (2010), Aripin et al. (2011), Rouf (2011) and Vu et al. (2011), each of which find no association between the proportion of independent directors on a corporate board and the voluntary disclosure of information. Similarly, Probodudono (2012) finds that risk reporting practices are not affected by the proportion of independent directors.

Government ownership has a significant negative association with voluntary business risk disclosure during the three-year period ( $p = 0.061$ ). This result is similar to the result reported by Vu et al. (2011), who find that a higher level of government ownership reduces the level of voluntary disclosure.

As shown in Table 7, the managerial ownership variable does not have any influence on the level of business risk disclosure. This finding is in line with Probodudono (2013b), which reports that managerial ownership has no effect on a company's risk reporting practices.

With regard to the control variables, the regression results in Table 7 show no significant association between auditor type and the level of business risk disclosure (all  $p > 0.100$ ). The leverage variable has a significant impact on the level of business risk disclosure during the three-year sample period ( $p = 0.015$ ). This implies that airlines/aviation firms with high leverage tend to disclose more risk information (Suhardjanto, 2008). The results presented in Table 7 indicate that the profitability variable does not significantly affect the level of business risk disclosure ( $p > 0.100$ ). This finding is consistent with the finding of Vu et al. (2011). From 2009 to 2011, the load factor variable has a significant association with the level of business risk disclosure ( $p = 0.016$ ). Load factor, which is a measure of airline performance, affects the level of business risk disclosure by airlines/aviation firms in APEC countries because an increased load factor, which provides proof of corporate performance, motivates managers to increase the level of business risk disclosure.

## 5 Conclusion, implications and limitations

Intense competition, high and volatile fuel costs combined with terrorist attacks, plane hijackings and air mishaps have made the airlines/aviation industry a very risky industry across the globe. Recent mishaps or many airlines/aviation firms have increased public scrutiny of this industry. Additional reporting, especially risk reporting, helps to improve market confidence, which in turn encourages an increased flow of financial capital to the market.

This paper sheds some light on how the airlines/aviation industry report risk information. Specifically, it examines the extent and potential determinants of voluntary risk disclosure by the airlines/aviation industry in the APEC region. The results of this study contribute to the extant literature

in many ways. First, this study finds that the level of risk disclosure has increased in recent years. In 2009, the level of business risk disclosure was 62.71%, whereas it was 64.79% and 63.14% in 2010 and 2011, respectively. Moreover, the risk reporting practices of airlines/aviation firms are better than the practices of firms in other industries. For example, Probodudono et al. (2013) find that the average disclosure score in the manufacturing industry is 41.81%

Furthermore, regression analysis shows that country cluster, firm size, government ownership, leverage, and load factor are potential determinants of the level of business risk disclosure by airlines/aviation firms in APEC countries. This study provides evidence that supports the possibility that country cluster plays an important role in voluntary risk disclosure by the airlines/aviation industry. It also finds that airlines/aviation firms in communitarian countries provide the highest level of business risk disclosure. Boolaky (2011) explains that risk reporting in communitarian countries is higher than in other country clusters because firms in communitarian countries focus on the demands of all stakeholders whereas firms in Anglo-Saxon countries focus primarily on the demands of shareholders.

The second significant finding is that firm size is positively associated with the extent of voluntary risk disclosure. This result is similar to the results of many previous voluntary risk disclosure studies (Probodudono *et al.*, 2013; Taylor *et al.*, 2010; Dobler *et al.*, 2011; Linsley and Shrivies, 2006). Several reasons have been advanced to explain the positive relationship between firm size and voluntary risk disclosure. First, the cost of information is lower for larger firms; thus, it is relatively less expensive for larger firms to disclose greater amounts of information than it is for smaller firms. Second, larger airlines/aviation firms may be subject to more public scrutiny and even to 'political' attention. As such, they tend to publicly disclose more risk information to lessen such public and political scrutiny.

A significant negative association between state ownership and the level of voluntary business risk disclosure is found during 2009-2011. This finding adds a new perspective to the literature on corporate voluntary disclosure. Because airlines/aviation firms are often considered to be representatives of the countries in which they are based, government intervention may be inevitable. In cases of government intervention, the government acts like a majority shareholder, and this particular shareholder is so powerful that it may eliminate the agency problem. In firms with significant government ownership, even the appointment of independent directors to the board may not provide an effective monitoring mechanism, given this study's finding that the proportion of independent directors has no significant effect on business risk reporting practices. Thus, it can be argued that there is a lack of real "principals" in airlines/aviation firms with high government ownership and that the managers of such firms have

little incentive to publicly disclose information because these managers are not properly monitored.

As mentioned above, the proportion of independent directors on the boards of the sample firms seem to be relatively low (less than two-thirds of the total number of directors). The low proportion of independent directors may be the reason why corporate governance has no effect on the risk disclosure practices of the sample firms. If board independence is considered an effective firm monitoring mechanism, then airlines/aviation firms should ensure that there is an adequate number of independent directors on their respective company boards.

The airlines/aviation firms included this study may not necessarily be representative of all airlines/aviation firms. Nevertheless, this study provides several contributions to the literature on voluntary corporate disclosure, especially with respect to risk reporting practices. As a practical matter, this study suggests that regulators in APEC countries should increase enforcement of rules regarding the proportion of independent directors. Despite its contributions, this study is not without limitations. Future studies are encouraged to consider airlines/aviation firms in countries located across the globe. Additionally, perhaps future studies could conduct qualitative research to assess the usefulness of airlines' risk disclosures to various stakeholders.

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