Determinants and impacts of risk disclosure quality: Evidence from China

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1. Introduction

Although the effects of financial disclosure have been widely discussed in relation to developed countries, few studies (Abraham *et al.*, 2015) have focused on emerging markets, owing to difficulties identifying the real effect of disclosures, as many institutional variables influence the growth of capital markets. This paper fills this gap by focusing on China, one of the so-called "BRIC" countries (Brazil, Russia, India, and China), that is at an advanced stage of economic development, and has had relatively greater influence on the global economy in recent years (Chen and Wang, 2004).

According to Li *et al.* (2013), the securities market in China has become a major global stock exchange in terms of total capitalisation, trading volume and the rapid growth in both the number and size of public companies. There are two official national exchanges in China: the Shanghai Stock Exchange (SSE), established in 1990, and the Shenzhen Stock Exchange (SZSE), founded in 1991. A-shares and B-shares can be issued by both exchange markets; A-shares are issued for domestic investors, denominated in renminbi (RMB), and B-shares are issued for foreign investors, predominantly in foreign currency. Chinese listed firms apply different accounting regulations depending on the type of security issued, whether A- or B-shares, or both (Elshandidy, 2014).

The Chinese regulatory system arguably acknowledges the important role played by the financial reporting system in progressing economic development. The Chinese Ministry of Finance (MOF) has set itself the objectives of fostering investors' confidence in financial information, increasing the transparency of financial reporting, and harmonising Chinese national accounting standards with IFRS (Deloitte, 2015). Although the China Securities Regulatory Commission (CSRC) has continuously improved its laws and regulations, by introducing many reforms to financial reporting disclosure, the effectiveness of the information disclosure system remains underplayed (Zhang and Zhang, 2014). Crucially,

despite promoting private ownership, international investment and entrepreneurial ventures, the Chinese government retains tight control of entrepreneurial activities (Elshandidy, 2014). The fact that the state still plays a significant, or even dominant, role in many financial companies, generates unique characteristics in terms of disclosure, given the structure of the Chinese financial market.

Despite the many actions taken in the last decade in China to ensure risk disclosure, the quality of risk reporting by financial firms continues to be empirically debatable (Wang *et al.*, 2008). Regarding risk reporting in other contexts; over the last decade a wealth of literature has emerged concerning investors' risk perceptions of capital markets, observing the effects of risk disclosure (Elshandidy and Shrives, 2016). These studies share a recognition that the motivations for risk related information can be explained by agency theory, when evaluating the capacity of risk disclosure to decrease information asymmetries (Elshandidy and Neri, 2015). The effects of disclosure on market liquidity are well documented in developed countries (Miihkinen, 2013; Campbell *et al.*, 2014; Elshandidy and Neri, 2015); however, as mentioned above, less attention has been given to emerging markets. This is especially important if we consider the situational context of the financial companies listed in the Chinese market: factors like the high percentage of state ownership and the low percentage of negotiable securities (OECD, 2011) render the risk disclosure of financial companies in the Chinese context fundamental to investors and analysts.

Our paper addresses this gap by answering the following two questions: (1) Whether, and if so how, did companies' characteristics influence risk disclosure quality in China for financial listed companies for the years 2013, 2014 and 2015?; and (2) To what extent did the quality of risk information reduce information asymmetry, by improving market liquidity between market participants in China for financial listed companies during the period 2013-2015?

Our findings suggest that firm characteristics (especially size) influence risk disclosure practices of Chinese financial companies. Furthermore, we found that risk disclosure quality has an impact on market liquidity, and when we analysed each year we noticed that the results were driven by the year 2013; moreover, we noticed no or little significance from the period of the emerging financial crisis in 2014.

This paper contributes to the existing literature in several ways. Firstly, it draws on previous studies (Elshandidy *et al.*, 2013; Miihkinen, 2012) to identify the influence of firm characteristics and risk disclosure quality, to understand how such disclosure might impact the market liquidity of an emerging market such as China. This will be of interest to

investors, since there has been no significant previous research into the quality of risk disclosure practices in China. The time span of three years will be helpful in trying to identify patterns of behaviour in the years before, during and after the crisis. The importance of this paper resides in its provision of evidence concerning several reporting incentives detailing not only the quantity, but also the quality of firms' risk reporting. This will function as a set of guidelines for investors' decision making, and may also motivate reforms and the enhancement of regulations in China, in order to make the market more efficient.

Section 2 sets out the background to Chinese market regulation. Section 3 reviews previous literature and develops our hypotheses. In Section 4, we introduce our methodology and describe our sample. Section 5 discusses the empirical findings and provides further analysis, and Section 6 draws conclusions, discusses the limitations of the study, and suggests future research areas.

2. Background and regulation of the Chinese market

In 2015 the Shanghai stock market faced a crisis that led to a reassessment of the market. In the previous 12 months, it had registered a 150 per cent increase in stock value, but this rise had not been accompanied by a similar growth in earnings (Deloitte, 2015). Even with this rise, Shanghai's market index has experienced poor performance since 2012, compared with other stock indexes (UK stocks moved up by 5.8 per cent for instance). This is mostly due to the specific characteristics of the Chinese stock market; not only is it still underdeveloped (Luo *et al.*, 2009), but the government has made use of it as a fundraising tool for funding state-owned and state-controlled companies (which account for a high percentage of the listed companies). Furthermore, China's stock market developed under a repressed financial market and in a weak legal environment, which has offered little protection to shareholders.

Although La Porta *et al.* (2008) identify China's legal system as originating from German civil law, a unique characteristic of China's legal tradition is that the judicial system is not independent of the government's administrative system (Zhang and Zhang, 2014). Concentrated state ownership, unclear laws governing private property rights, and a lack of judicial independence therefore characterise China's market, as the government protects state interests over the rights of individuals.

Additionally, given the stock segmentation, China's stock market is not immediately accessible to foreign investors (even though the picture has changed rapidly in the last years) and this affects China's stock market integration. As stated above, on the SSE, A-shares and

B-shares are listed, with A-shares priced in the local RMB currency and intended for domestic investors only, and B-shares listed in US dollars and distributable to overseas investors. However, since 2002, China has permitted foreign institutional investors to purchase bonds or stocks listed in the Chinese A-share market, explaining why A-shares are the most important segment of China's stock market (Deloitte, 2015).

Chinese regulators have closely followed the development of the Basel Accords and have shown a strong willingness to integrate international regulatory rules into Chinese regulatory practices, with some adaptations for market features. In 2008, the China Banking Regulatory Commission (CBRC) finalised Basel II implementation in China through the publication of five sets of guidance. In 2010, the CBRC released the Implementation of Four New Supervisory Instruments (Draft Discussion) to merge Basel III's new tools for capital adequacy, anti-cyclical capital charge, liquidity and bank regulation into the Chinese regulatory framework. In 2013, China adopted reforms regarding corporate disclosure rules, which modified the landscape considerably, and in December 2015 the CSRC rolled out a series of money market funds provisions to strike a balance between the need for innovation and risk minimisation in capital markets, with the main aims being to improve disclosure and transparency.

3. Literature review and research hypotheses

3.1 Literature review

Previous studies have confirmed that firm characteristics relate to corporate risk disclosure. When testing associations between firm characteristics and risk information disclosed, Linsley and Shrives (2006) found that firm size and level of environmental risk are passively associated with the amount of risk disclosure. Abraham and Cox (2007) also suggest that corporate governance is an important factor to consider when studying risk disclosure drivers. Elshandidy *et al.* (2013) examine the relationship between risk disclosures and firm risk levels. Consistent with managers' incentive (agency and signalling) theories, their results confirm that risky firms are likely to significantly disclose risk information, suggesting managers are motivated to provide higher levels of information to reduce information asymmetry (Ball *et al.*, 2003; Leuz *et al.*, 2003; Ball and Shivakumar, 2005). According to a study by Miihkinen (2012), in the presence of detailed risk disclosure standards and guidelines, firms disclose more qualitative risk information and action plans relating to economic impacts, thereby improving the quality of firms' overall risk reviews.

In terms of the impact of risk disclosure, information asymmetry is a long-standing concern for both investors and regulators. The results of research by Verrecchia (2001) show that, in imperfectly competitive markets, the degree of information asymmetry is related to market illiquidity and the cost of capital. Jorgensen and Kirschenheiter (2003) theorise that firms with valid risk disclosures have lower risk premiums. When risk disclosures are voluntary, as opposed to mandatory, risk premiums also tend to be lower. In addition, improved information disclosure increases market liquidity, because investors are less likely to feel uninformed and artificially raise prices. These arguments are empirically supported by Elshandidy and Neri's (2015) findings. Consistent with these results, Campbell *et al.* (2014) conclude that, when the bid-ask price is used as a proxy for market liquidity, the risk factor is positively related to a reduction in information asymmetry.

3.2 Research hypotheses: Main determinants and impacts on market liquidity

3.2.1 Firm size

According to agency theory, larger firms tend to incur lower disclosure costs than smaller firms, as agency theory argues that larger firms need to disclose more information to different user groups leading to a decline in agency costs and reducing information asymmetries (Watts and Zimmerman, 1983). However, in prior studies, the association between firm size and level of disclosure has proven to be either negative or positive. Kou and Hussain (2007) observe a negative relationship between firm size and disclosures, whereas Linsley and Shrives' (2006) work supports a positive relationship between the two.

Risk reporting literature highlights no significant influence from firm size on the quantity and/or quality of risk disclosure (Beretta and Bozzolan, 2004), on negative relations, (Campbell *et al.*, 2014) or positive influences on aggregated disclosure (Linsley and Shrives, 2006; Abraham and Cox, 2007). In a study of 559 Chinese firms in 2002, Huafang and Jianguo (2007) find that larger firms offer greater disclosure, while Li *et al.*'s (2013) study of all Chinese listed firms with A-shares in the China Stock Market and Accounting Research database identifies a positive relationship between size and disclosure. Therefore, the first hypothesis is:

> *Hypothesis 1:* Larger Chinese firms in the financial sector tend to deliver more and higher-quality risk disclosure information to the market.

3.2.2 Risk

Based on signalling theory, as managers disclose more risk-related information investor uncertainty reduces. Disclosure can decrease the perceived risk associated with a firm

because an open disclosure strategy should result in a better assessment of the firm's future performance (Jorgensen and Kirscenheiter, 2003). Firms also benefit from this practice, because it helps them to avoid unnecessary losses, especially for high-risk firms. According to Elshandidy and Neri (2015), firms with higher risks usually disclose more information in order to avoid misunderstandings among investors, and this is consistent with Elshandidy *et al.* (2013). Firth *et al.* (2007) find a positive relationship between risk profile and the level of earnings disclosure in the Chinese market. Finally, investors also require high-risk firms to present the methods they have employed to evaluate risk drivers to gain deeper insights before making decisions. Given the above considerations, we formulate the following hypothesis:

> *Hypothesis 2:* Chinese financial firms with higher risks are more likely to provide high-quality risk disclosures.

3.2.3 Capital structure

According to signalling theory, managers in firms heavily financed by debt tend to disclose more information, so as to satisfy the needs of creditors (Elshandidy *et al.,* 2013). Considering the agency theory perspective, creditors of high leveraged companies should have greater incentives to recommend that management disclose more information. This is supported by Elshandidy *et al.* (2013), who find a positive relationship between risk level and risk disclosure. They also confirm that risky firms are likely to disclose more information than less risky firms, to avoid market misinterpretations. However, previous studies of the possible association between level of risk and the amount of risk disclosure have discovered an insignificant association (Abraham and Cox, 2007). In the Chinese context Ferguson *et al.* (2002) highlighted a positive relationship between leverage and disclosures by Chinese listed companies. This knowledge leads us to formulate the following hypothesis:

> *Hypothesis 3*: The capital structure of Chinese financial firms is positively associated with risk disclosure quality.

3.2.4 Growth

High-growth firms are likely to experience greater information asymmetry and higher agency costs (Gaver and Gaver, 1993). Gul and Leung (2004) claim that companies with a high growth potential need to disclose superior information to the market to signal that their stock is not overvalued. Considering risk disclosure, Elshandidy *et al.* (2013) hypothesize a positive relationship, but their findings do not confirm this expectation. Herein we use the book-to-market ratio (BTM), which represents a measure of a firm's opportunities for

growth (Elshandidy and Neri, 2015). Investors prefer firms with a high market value in relation to the book value of their equity. Campbell *et al.*'s (2014) study of BTM value suggests BTM and future growth can have a direct positive or negative impact on a firm's stock return. Cheng and Courtenay (2006) find evidence of a positive relationship between BTM ratio and risk disclosure, while Liu (2015) shows a negative relationship between BTM and forward-looking information in the Chinese market context. This knowledge leads us to formulate the following hypothesis:

> *Hypothesis 4*: There is no association between BTM ratio and the quality of risk disclosure by Chinese financial firms.

3.2.5 Market liquidity and quality of risk disclosure

The market-efficiency coefficient (MEC) expresses a market's price fluidity. Markets with high liquidity are better equipped to support changes in price (Welker, 1995). Therefore, a price-based measurement is used in this paper to determine market liquidity. Higher levels of disclosure are expected to diminish any information asymmetry between current and prospective shareholders, as disclosure can increase the liquidity of a security (Easley and O'Hara, 2004).

Lang and Lundholm (1993) find that performance variability affects disclosure levels negatively, recognising an association between the volatility of market returns and disclosure levels. Furthermore, investors and analysts could include risk information in their price choices and recommendations and increase market liquidity by working on information asymmetry (Campbell *et al.*, 2014). Elshandidy and Neri (2015) find that risk disclosure practices (mandatory and voluntary) provided by UK firms significantly and negatively influence the bid-ask spread, suggesting this information reduces information asymmetry between market participants improving market liquidity. Furthermore, Elshandidy and Neri (2015) find that voluntary, rather than mandatory, risk disclosure provided by Italian firms improves market liquidity by reducing information asymmetry. No significant research has shown that this finding is also true in the Chinese market. This knowledge leads us to formulate the following hypothesis:

> *Hypothesis 5*: There is an association between market liquidity and risk disclosure quality for Chinese financial firms.

4. Sample and methodology

4.1 Sample selection and data collection

Our sample is based on financial firms listed in the A-shares market of the SSE for the period 2013-2015, as the market became more mature during this period, which makes it is possible to effectively evaluate risk regulation implementation in the Chinese market. Additionally, by covering this period we can observe any potential impact from the most recent (2014) financial crisis in the Chinese market. Based on a list generated by Thomson One, 102 financial firms were listed on the SSE in the period to 2015. Therefore, the sample features 102 financial firms. Firms publish their annual reports according to PRC GAAP. Two organisations were omitted because they were not listed during the entirety of the period of observation, so the final sample comprises 100 firms. All included organisations have a fiscal year end of 31 December, and measurements of market liquidity and observations were pooled for the whole period.

Annual reports for the above firms were collected from Thomson One and from the companies' websites. Data collection for risk disclosure quality focused on annual reports, since these are the primary source of information for investors (Miihkinen, 2013). Corporate governance data were collected from Orbis and manually from annual reports, while financial data for each firm (such as share price and market value) were collected from Datastream.

4.2 Identification of variables

In measuring the quality of risk disclosure and consistent with Miihkinen (2012), four measurement indicators are considered in this paper: quantity of disclosures, coverage of disclosures, and the semantic properties, depth and outlook.

4.2.1 Risk disclosure quantity

This paper uses the number of sentences concerning risk disclosure that appear in the annual report as a proxy for risk disclosure quantity. Thus, it is measured as:

$$QUANTITY_i = \ln (\text{total number of sentences containing risk disclosure})$$

4.2.2 Risk disclosure coverage

The topics identified in the annual reports are financial risks, damage risks and risk management (Linsley and Shrives, 2006). As suggested by Miihkinen (2012), this paper uses the Herfindahl index to identify the concentration of risk topics within corporate disclosures.

$$COVERAGE_i = [(1/H)/\text{Number of main risk topics}]$$

where $H = \sum_i^n P_i^2$ measures the concentration of risk topics, and P_i represents the proportion of risk disclosure sentences on topic *i*. In order to increase the Herfindahl index value, so that it displays comprehensive coverage of the information, this paper uses the inverse of H.

4.2.3 Risk disclosure depth

The semantic properties of the information disclosed in corporate communications include depth and the outlook profile. Depth concerns the content of disclosed risk information, which predicts any economic impact on future performance. Disclosure depth gives users a better understanding of firms. The empirical indicators are as follows:

$$\text{DEPTH\_QUALITATIVEi} = ln \sum_{j=1}^{kj} \text{qualitative } j$$

where k_j is the number of risk information sentences in the annual report, and qualitative_j equals 1 if the risk information sentence *j* in the annual report of firm *i* contains qualitative information about expected future performance, and otherwise is represented by 0.

$$\text{DEPTH\_QUANTITATIVEi} = ln \sum_{j=1}^{kj} \text{quantitative } j$$

where k_j equals the total number of sentences containing risk-related information in the annual report, and quantitative_j equals 1 if the risk information sentence *j* in the annual report of firm *i* contains quantitative information about expected future performance, and otherwise is represented by 0.

4.2.4 Outlook profile

As one of the semantic properties of risk disclosure, the outlook profile expresses how firms disclose their planned approach to risk (Beretta and Bozzolan, 2004). Risk disclosures explain the presence of risks, the future expectations of a firm and its risk management approach. The empirical indicators are as follows:

$$\text{OUTLOOK\_PROFILEi} = ln \sum_{j=1}^{kj} \text{acp } j$$

where k_j equals the number of sentences referring to risk in the annual report, and acp_j equals 1 if the risk information sentence *j* in the annual report of firm *i* contains information about the risk management approach, and otherwise is represented by 0.

4.2.5 Composite quality of risk disclosure

Applying the factor analysis method, the composite quality of risk disclosure is used to examine the relationships between multiple variables by combining data into a smaller set. This measure is used to summarise the five previously-mentioned individual quality indicators as follows:

QUALITY = the score of the principal component with the highest eigenvalue

This paper uses the manual content analysis method to measure the quality of any risk disclosure, also applied in Elshandidy *et al.* (2013). This is preferred due to its precision when compared with the automated method adopted in Linsley and Shrives (2006).

To test the reliability and validity of risk disclosure quality scores, this paper uses the Cronbach's Alpha to measure how well a dataset captures an underlying construct (Elshandidy *et al.*, 2013). The Cronbach's Alpha is 94 per cent for the risk disclosure quality scores in this paper. Therefore, it can be concluded that the risk disclosure score computed using manual content analysis is internally consistent and acceptable.

4.2.6 Firm characteristics

This includes firm size, risk, capital structure, and growth. Definitions and measures for these variables are detailed in Appendix 1.

4.2.7 Corporate governance

This includes board size, board independence, Chief Executive Officer (CEO) duality, state ownership and audit quality. Definitions and measures of these variables are detailed in Appendix 1. Here we control for these variables because prior research finds evidence of their effects on firm (risk) disclosure.

Regarding board size, some researchers (i.e. Elshandidy and Neri, 2015) suggest that larger boards could be more likely to decrease actual agency costs by aligning different potential conflicts of interest. In the Chinese context, Firth *et al.* (2007) find that larger boards are associated with a greater level of earnings disclosure information.

Board independence has been highlighted in previous research (Gul and Leung, 2004) as a possible significant variable. In the Chinese context, Huafang and Jianguo (2007) find that disclosure increases the more independent directors on a board.

The positions of CEO and chairman should ideally be kept separate, as doing so should lower agency costs and improve corporate governance (Elshandidy and Neri, 2015). The findings of earlier studies highlighting a negative or positive impact arising from CEO duality on level of disclosure are mixed (i.e. Huafang and Jianguo, 2007).

We include State ownership as a variable, dues to the fact that many companies on the SSE are partially or ultimately owned by central or local governments. Wang *et al.* (2008) find the level of disclosure is positively related to the proportion of state ownership.

Finally, regarding audit quality, it has been argued that when financial reports are audited by highly-reputable external audit firms, this increases the confidence of investors (Elshandidy and Neri, 2015). Wang *et al.* (2008) illustrate that the use of large auditors does relate to increased levels of disclosure in the Chinese context.

4.2.8 Market liquidity

Under the requirement of the Chinese GAAP (PRC GAAP), audited annual reports from listed firms in China must be made available to public users by 30 April, four months after the end of the fiscal year. Consistent with Miihkinen (2013) and Elshandidy and Neri (2015), this paper calculates the average relative spread over a three-month period, from the beginning of May to the end of July, by calculating the difference between daily ask and bid prices. This total is then divided by the average of the daily ask and bid prices. Share price volatility and trading volume are used as controls, while observing the impact of risk disclosure on market liquidity.

4.3 Empirical model development

This paper measures the impact of firm characteristics on risk disclosure quality and the influence of risk disclosure quality on market liquidity, through the use of ordinary least squares (OLS) regression. The estimation model is represented as:

$$\text{Equation 1: } (QAL)_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 RS_{it} + \beta_3 CS_{it} + \beta_4 BTM_{it} + \beta_5 BS_{it} + \beta_6 BI_{it} + \beta_7 CD_{it} + \beta_8 AQ_{it} + \beta_9 ST_{it} + \varepsilon_i$$

where $(QAL)_{it}$ is the score for the principal component with the highest eigenvalue for the five main risk disclosure indicators (quantity, depth_qualitative, depth_quantitative, outlook_profile and coverage) of firm *i* at time *t*.

The variables in Equation 1 include firm size (FS), risk (RS), capital structure (CS) and growth (BTM). The control variables were selected based on previous studies

(Elshandidy *et al.*, 2013). This paper uses board size (BS), board independence (BI), CEO duality (CD), audit quality (AQ) and state ownership (ST) as control variables.

$$\text{Equation 2: } (ML)_{it+1} = \beta_0 + \beta_1 QAL_{it} + \beta_2 FS_{it} + \beta_3 RS_{it} + \beta_4 CS_{it} + \beta_5 BTM_{it} + \beta_6 SPV_{it} + \beta_7 TV_{it}$$
$$+ \beta_8 BS_{it} + \beta_9 BI_{it} + \beta_{10} CD_{it} + \beta_{11} AQ_{it} + \beta_{12} ST_{it} + \varepsilon_i$$

where $(ML)_{it+1}$ is the three-month average of relative spreads from the beginning of May to the end of July for firm *i*. $(QAL)_{it}$ is the score of the principal component with the highest eigenvalue for the five main risk disclosure indicators (quantity, depth_qualitative, depth_quantitative, outlook_profile and coverage) of firm *i* at time *t*. Firm characteristic variables (FS, RS, CS and BTM), corporate governance variables (BS, BI, CD, AQ and ST), share price volatility (SPV) and trading value (TV) are used as control variables. Appendix 1 explains the definitions of these variables, their sources and their codes.[1]

5. Empirical results

5.1 Descriptive statistics

Panel A of Table I provides descriptive statistics for the continuous variables mentioned in Section 3. These include risk disclosure, market indicators, firm characteristics and corporate governance. This paper winsorises the variables at the first and 99th percentiles. Table I gives the number of observations, the mean, standard deviation, lower quartile, median and upper quartile. The three dummy variables are CEO duality, audit quality and state ownership. Panel B displays their frequencies.

The mean and median statistics for QAN and DQAL are relatively close in value, showing a symmetrical distribution.

[Insert Table I]

5.2 Regression results

Tables II displays the OLS regression results based on the dependent variables of risk disclosure quality and its five quality dimensions. With the exception of COV, firm size is

[1] The unreported (for brevity, but they are available on request from the authors) correlation coefficient indicates that firms with higher-quality risk disclosures also release more comprehensive risk information. This suggests, consistent with Miihkinen (2012), that quantity is a good proxy for quality when assessing narrative disclosures in annual reports. It worth considering that all quality indicators have high positive factor loadings, as the loadings of QUANTITY, COVERAGE, DEPTH_QUANTITATIVE, DEPTH_QUALITATIVE, and OUTLOOK_PROFILE are 0.983, -0.111, 0.853, 0.979 and 0.616, respectively. The first factor accounts for 76.7 per cent of the total variance in the quality indicator of risk disclosure.

significantly and positively associated with all the other dimensions of risk disclosure quality (.222, .130, .223 and 0.41 respectively, at 1% level).

These findings are consistent with empirical research on risk disclosure (Beretta and Bozzolan, 2004; Linsley and Shrives, 2006; Miihkinen, 2012; Elshandidy *et al.*, 2015) and suggest that large firms have incentives to signal their ability to provide high quality information about their risks, differing from smaller firms. This is consistent with this paper's expectation and therefore supports H1.

While the results suggest that firm risk does not significantly influence the majority of risk reporting quality dimensions, it is significantly and positively associated with quantitative information contained in risk disclosures (.308 at 1% level). This significant impact is consistent with signalling theory; high-risk firms are more likely to disclose more risk information to avoid market misinterpretation as illustrated by some previous empirical findings (Elshandidy *et al.,* 2013). The non-significant impact is consistent with the theoretical argument put forward by Linsley and Shrives (2006), that risky firms might be more sensitive to revealing more risk information in order to avoid market attention. Overall, and based on this discussion, our findings do not fully support H2.

Capital structure is significantly and negatively related to quantitative risk information (-.019 at 1% level). The increased risk of bankruptcy and the behaviour of managers that tend to avoid transparency possibly explain this result. The negative relationship derived from these results concurs with previous studies (Miihkinen, 2012). Examining the other dimensions of risk quality more generally, there is no significant relationship between leverage and the quality (quantity) of risk disclosure, implying that in the Chinese financial market, capital structure is not an influential factor in revealing quality risk information. This does not support our H3.

The BTM ratio is positively correlated with QAN (.044 at 1% level) and risk disclosure depth, both in terms of the quantitative and qualitative nature of risk information (.036 and .043, respectively, at the 1% level). These results suggest that the high-growth Chinese financial firms listed in A-shares are considerably motivated to release high quality risk information. While this finding does not support H4, it is still consistent with Cheng *et al.* (2006) `s findings.

Regarding the control variables, we find that the size of the board of directors (BS) seems to affect risk disclosure quantity and quality, while the coefficients for board independence (BI) are negative in all the models illustrated in Table II, showing significant findings for the majority (-1.21 for QAN, -1.18 for DQAL and -1.38 for OUL at 5% level).

Although previous studies have reported a positive relationship between board independence and risk disclosure (Abraham and Cox, 2007), these findings provide no evidence of this, confirming what is highlighted in the background section in terms of the governance mechanisms in the Chinese market. Audit Quality seems to have a significant impact on QAN (.218 at 1% level), risk disclosure depth, both in terms of the quantitative and qualitative nature of risk information (.264 and .213 respectively, at 1% level) and COV (-.018 at 5% level) while CEO duality and State Ownership are not significant over the period of analysis, and are also consistent with the period of transition the Chinese economy is experiencing.

The aggregate level of quality of risk disclosure (QAL) shows the patterns previously highlighted: general positive associations with size, BTM and board size (.229, .049 and .547 respectively, at the 1% level) and a negative relationship with the presence of independent board directors (-1.52 at the 5% level).

In summary, the previous results confirm that firms' characteristics can largely explain the incentives for providing high quality risk information in regard to Chinese financial firms. Those results indicate, to a large extent, that corporate governance factors have a limited influence on firms' willingness to share risk information.

[Insert Table II]

Table III, in Model 1 and Model 2, shows how the quality and quantity of risk disclosure affect market liquidity. Our results highlight a negative association between bid-ask spread and risk disclosure quantity and quality (-.019 and -.024 respectively, at 1% level), suggesting this information is useful, as investors are likely to consider it when making pricing decisions, given that it contributes to reducing information asymmetry among market participants. At the same time, risk disclosure is significantly and negatively associated with trading volume (-.006 for both QAN and QAL at 1% level). This could have been driven by trading activity on the market, which has shown an increasing pattern over the years and a consequent readjustment during and since the financial crisis. These results support H5.

[Insert Table III]

5.3 Further analysis: Subsample analysis and robustness checks

Tables IV and V report the results of the subsample analysis for each of the three years considered, in order to verify behaviour in the cut-off year (2014), in the year before (2013) and in the year after (2015).

QAL still shows a positive association with size in each year (.207 for 2013, .210 for 2014 and .269 for 2015 respectively, at 1% level), and BTM in 2015 and in 2013 (.060 and .043 respectively, at the 1% and 5% levels), while a marked negative relationship with the presence of board independent directors is confirmed only for the year 2015 (-3.43 at the 1% level). QAN shows similar results to QAL in terms of: associations with size (.201 for 2013, .208 for 2014 and .255 for 2015 respectively, at the 1% level), BTM (.39 at the 5% level in 2013 and .520 at the 1% level in 2015), and board independence (-3.43 at the 1% level in 2015).

The analysis provided annually seems to confirm the general picture of the Chinese market is as previously discussed. In the year 2013 the quantity and the quality of risk information significantly affected market liquidity, suggesting that this information is likely to be informative; indeed, investors have responded by incorporating such information into their decisions. In the years 2014 and 2015, we did not observe any significant impact from risk disclosure on market liquidity. Our findings for those two years suggest Chinese firms over the period of crisis are likely to provide non-relevant risk information to the market. Collectively, our results indicate that our conclusions, as discussed under Table III are attributable to, and driven by, risk disclosures made in 2013.

In reference to the other control variables for 2013, we find that SPV (-.412 and -.427 at the 1% level for quality and quantity), TV (-.008 and -.007 at the 1% level for QAL and QAN) and BZ (-.089 and -.083 at the 5% level for QAL and QAN) are significantly and negatively related to the ask-bid spread, suggesting these factors are improving market liquidity. For the years 2014 and 2015, our results suggest SPV (-.120 and .375 for QAL and -.201 and -.375 for QAN, at the 5% level in 2014 and at the 1% level in 2015) and AQ (-.037 and -.036 at the 5% level for QAL and QAN) impacted market liquidity during these years.

In general, this paper confirms previous findings about the Chinese market (Luo *et al.*, 2009); i.e. that, given a decreasing but still strong state presence, there is higher stock volatility and weak corporate governance.

[Insert Table IV]

[Insert Table V]

We also ran additional tests to ascertain whether our results were affected by endogeneity and structural change. An endogeneity problem can arise when omitting variables and/or from reverse causality. First, we replicated our main analyses under Tables II and III by running fixed effects regressions. Arguably, these can be considered a way to address omitted variables, since they eliminate any influence from time-invariant

unobservable variables (e.g. Brown *et al.*, 2011). The determinants of QAN and QAL risk disclosure under fixed effects models are broadly consistent with our general conclusions under Table II. Similarly, the conclusions regarding the impact of risk disclosure practices on market liquidity, based on the fixed effects models are consistent with those drawn based on Table III.

Second, to address reverse causality, we performed the lag approach (i.e. Hoitash *et al.,* 2009) to construct instrumental variables. Following prior research (Elshandidy *et al.*, 2015), we regressed the yearly risk by reporting quality as regards the previous year's firm characteristics (defined in Appendix 1). Consistent with the findings reported previously in Table II, our unreported results (for brevity) show the coefficients of the lagged values for variables of interest (FS, RS, CS, and BTM) have theoretically plausible signs and their sizes are similar. This consistency suggests our data set does not contain omitted time-varying variables or an unobserved heterogeneity.

6. Conclusion

This paper examined the main drivers for risk disclosure quality, and studied the impact of such disclosure on market liquidity for financial firms listed on the SSE A-shares market.

We found firm size to be the most significant factor influencing risk disclosure. Other firm characteristics (firm risk and capital structure), however, proved not significantly associated with risk disclosure quality, suggesting that these variables have no influence on the determination of risk disclosure. Furthermore, we found that risk disclosure quality has an impact on market liquidity, and when we analysed each year we noticed that the results were driven by the year 2013; moreover, we noticed no or little significance from the period of the emerging financial crisis. Our results suggest that Chinese banks provided the market with less informative risk information during the recent crisis of 2014, and the content of this information did not provide incremental value to the investors.

These findings have several implications for investors and regulators in China. For investors, the findings provide insights into how firm characteristics affect managers' propensity to reveal risk information. For regulators, such as the CBRC and CSRC, these results highlight the essential role of risk disclosure as a component of the capital market system. The influence of disclosure on liquidity in 2013 could be viewed as an important stimulus for regulators to maximise their efforts to improve reporting regulations.

This paper's methodology may have been limited due to its subjectivity, as there is inherent subjectivity when determining a coding scheme. Furthermore, the labour-intensive nature of the data analysis method limits scope, and as a result, only a small number of

companies are investigated. In order to overcome these limitations, the problems of subjectivity and labour-intensiveness could be resolved by adopting automated content analysis (e.g., Elshandidy *et al.*, 2013). Furthermore, taking into account the trend towards globalisation in the Chinese economy, further researchers might also investigate the impact of these variables on risk disclosure across different nations.

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Table I.

Descriptive Statistics: Dependent and Independent Variables

Panel A: Continuous Variables						
	Observations	Mean	Std. Dev.	25%	Median	75%
Risk Disclosure Indicators:						
Quantity (QAN)	300	3.974	0.872	3.401	3.663	4.905
Coverage (COV)	300	0.632	0.063	0.601	0.657	0.681
Depth_Quantitative (DQAN)	300	0.721	0.837	0.000	0.693	1.386
Depth_Qualitative (DQAL)	300	3.954	0.867	3.367	3.651	4.871
Outlook_Profile (OUL)	300	1.668	0.642	1.386	1.609	2.079
Quality (QAL)	300	0.002	0.993	-0.721	-0.390	1.180
Reporting Incentives:						
Firms Size (FS)	300	15.26	2.647	13.875	15.099	16.424
Risk (RS)	300	0.280	0.305	0.105	0.250	0.470
Capital Structure (CS)	300	1.928	1.902	0.494	1.419	2.663
Book-to-Market (BTM)	292	3.100	4.302	1.135	1.795	3.100
Board Size (BS)	300	2.375	0.276	2.303	2.303	2.485
Board Independence (BI)	300	0.373	0.052	0.333	0.364	0.400
Market Indicators:						
Market Liquidity (ML)	293	0.133	0.884	0.066	0.109	0.176
Trading Volume (TV)	300	3.661	3.169	1.535	2.844	4.483
Share Price Volatility (SPV)	300	0.415	0.098	0.355	0.417	0.480

Panel B: Dichotomous Variables		
	Yes (%)	No (%)
Ceo Duality (CD)	42 (14%)	258 (86%)
Audit Quality (AQ)	105 (35%)	195 (65%)
State Ownership (ST)	139 (47%)	161 (53%)

Panel A explains the descriptive statistics of all variables. These include risk disclosure, firm characteristics, corporate governance and market indicators. To mitigate the influence of outliers, all continuous variables are winsorised by eliminating observations at the 1st and 99th percentile. Panel B shows the frequencies of the three dummy variables, CEO duality (*CD*), audit quality (*AQ*) and state ownership (*ST*). Definitions of the above variables are identical to those given in Table I, and as detailed in Appendix 1. All statistics are based on a sample of all financial firms in the Shanghai A-shares market are listed only in China.

Table II.

Regression Results for the Various Quality Dimensions of Risk Disclosure and for Quality of Risk Disclosure

		QAN		COV		DQAN		DQAL		OUL		QAL	
	Predicted	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat
FS	+	.222***	10.47	.003	1.24	.130***	5.31	.223***	10.53	.041**	1.72	.229***	9.02
RS	+	.134	1.23	.021*	1.66	.308***	2.45	.123	1.13	-.130	-1.04	.171	1.31
CS	+	-.010	-.57	.001	.31	-.019***	-.92	-.010	-.55	.033*	1.56	-.005	-.023
BTM	?	.044***	4.94	.001	.27	.036***	3.55	.043***	4.89	.008	.84	.049***	4.55
BS	+	.420***	2.47	-.052***	-2.67	.670***	3.41	.401***	2.37	.174	.90	.547***	.2.68
BI	+	-1.21**	-1.83	-.011	-.14	-.684	-.89	-1.18**	-1.79	-1.38**	-1.83	-1.52**	-1.90
CD	-	.008	.09	.002	.18	-.069	-.64	.013	.15	-.124	-1.18	-.041	-.037
AQ	+	.218***	2.50	-.018**	-1.81	.264***	2.63	.213***	2.46	-.035	.35	.246	2.35
ST	?	.009	.13	-.006	-.73	.128*	1.60	.000	.00	-.019	-.24	.030	.36
Intercept		-.189	-.40	.715***	13.20	-2.91***	-5.32	-.177	-.38	1.09**	2.02	-4.52***	-7.96
Adjusted R-squared		0.6033		0.0319		0.4320		0.6012		0.0688		0.5560	
F-statistics		50.17		2.07		25.60		49.74		3.39		41.49	
Observation		292		292		292		292		292		292	
Mean VIF		1.59		1.59		1.59		1.59		1.59		1.59	
Max VIF		3.22		3.22		3.22		3.22		3.22		3.22	

This table shows the impact of firm characteristics and control variables on risk disclosure quantity and quality. The R-squared value describes the model's ability to account for changes in each risk quality indicator. Variance Inflation Factors (VIF) quantifies the severity of multicollinearity in an ordinary least squares regression analysis. Definitions of the above variables are detailed in Appendix 1. *, ** and *** indicate significance for two-tailed tests at the 0.1, 0.05, and 0.01 significance levels respectively.

Table III.

OLS Regressions of the Impact of Risk Disclosure Quality and Quantity on Market Liquidity

		Market Liquidity			
		Model 1 QAL		Model 2 QAN	
	Predicted	Coef.	T-stat	Coef.	T-stat
QAL	?	-.019***	-2.39		
QAN	?			-.024***	-2.43
FS	+	.003	.71	.004	.87
RS	+	-.013	-.73	-.014	-.75
CS	+	.003	.93	.003	.87
BTM	?	-.000	-.27	-.000	-.20
SPV	-	-.049	-.72	-.048	-.71
TV	-	-.006***	-2.99	-.006***	-2.99
BS	+	.016	.56	.016	.56
BI	+	-.071	-.65	-.071	-.65
CD	-	-.017	-1.10	-.016	-1.04
AQ	+	-.013	-.90	-.012	-.87
ST	?	.004	.31	.003	.29
Intercept		.123	1.20	.205**	2.15
Adjusted R-squared		0.0535		0.0541	
F-statistics		2.34		2.35	
Observation		285		285	
Mean VIF		1.82		1.87	
Max VIF		4.65		4.97	

This table shows the results concerning the impact of risk disclosure quality and quantity on market liquidity for financial firms listed in the Shanghai A-shares market. Variance Inflation Factors (VIF) quantifies the severity of multicollinearity in an ordinary least squares regression analysis. Definitions of the above variables are detailed in Appendix 1. *, ** and *** indicate significance for two-tailed tests at the 0.1, 0.05, and 0.01 significance levels respectively.

Table IV.

Regression Results for the Quality and Quantity of Risk Disclosure spread by year

		The Quality and Quantity of Risk Disclosure											
		2013				2014				2015			
		Model 1 QAL		Model 2 QAN		Model 1 QAL		Model 2 QAN		Model 1 QAL		Model 2 QAN	
	Predicted	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat
FS	+	.207***	4.49	.201***	5.14	.210***	3.95	.208***	4.89	.269***	6.65	.255***	7.35
RS	+	.383	1.45	.304	1.36	.269	1.07	.202	1.00	.165	.76	.082	.44
CS	+	.009	.24	.008	.24	-.005	.13	-.015	-.45	-.022	-.60	-.026	-.84
BTM	?	.043**	2.08	.39**	2.20	.034	1.32	.035*	1.68	.060***	3.99	.520***	4.02
BS	+	.658*	1.86	.581	1.93	.795*	1.96	.535*	1.66	.144	.42	.108	.37
BI	+	.019	.01	.381	.32	-.469	-.30	-.598	-.47	-4.00***	-3.00	-3.43***	-3.00
CD	-	.007	.03	.90	.44	-.046	-.24	.012	.08	-.131	-.76	-.092	-.62
AQ	+	.208	1.06	.189	1.13	.200	1.05	.213	1.40	.262	1.51	.193	1.30
ST	?	.008	.05	.005	.04	-.0.41	.26	-.040	-.32	.124	.87	.614	.50
Intercept		-5.08***	-5.07	-910	-1.07	-5.04***	-4.82	-.399	-.48	-3.36***	-3.40	.845	1.00
Adjusted R-squared		0.5215		0.5745		0.5085		0.5732		0.5999		0.6250	
F-statistics		12.62		15.40		12.03		15.32		17.16		18.97	
Observation		97		97		97		97		98		98	
Mean VIF		1.62		1.62		1.76		1.76		1.66		1.66	
Max VIF		3.06		3.06		4.03		4.03		3.24		3.24	

This table displays the impact of firm characteristics and control variables on the quality and quantity of risk disclosure. Variance Inflation Factors (VIF) quantifies the severity of multicollinearity in an ordinary least squares regression analysis. Definitions of the above variables are detailed in Appendix 1. *, ** and *** indicate significance for two-tailed tests at the 0.1, 0.05, and 0.01 significance levels respectively.

Table V.
OLS Regressions of the Impact of Risk Disclosure on Market Liquidity spread by year

		Market Liquidity											
		2013				2014				2015			
		Model 1 QAL		Model 2 QAN		Model 1 QAL		Model 2 QAN		Model 1 QAL		Model 2 QAN	
	Predicted	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat	Coef.	T-stat
QAL	?	-.044***	-3.08			.002	.28			-.011	-.84		
QAN	?			-.058***	-3.47			.000	.03			-.013	-.86
FS	+	-.001	-.08	.002	.25	-.003	-.59	-.002	-.47	-.002	-.40	-.002	-.32
RS		-.039	-1.13	-.039	-1.14	-.020	-.95	-.019	-.92	-.046**	-1.69	-.047**	-1.73
CS	+	.008*	1.54	.008*	1.61	.005	1.26	.005	1.26	.008*	1.91	.008**	1.88
BTM	?	.001	.25	.001	.39	-.000	-.16	-.000	-.12	-.002	-1.18	-.002	-1.17
SPV	-	-.412***	-3.34	-.427***	-3.50	-.120**	-1.94	-.201**	-1.95	-.375***	-3.57	-.375***	-3.59
TV	-	-.008***	-2.56	-.007***	-2.39	-.003	-1.23	-.003	-1.17	-.002	-.89	-.002	-.88
BS	+	-.089**	-1.85	-.083**	-1.74	.030	.88	.032	.94	.035	.80	.035	.81
BI	+	-.152	-.81	-.126	-.68	-.131	-1.02	-.132	-1.03	-.037	-.22	-.038	-.23
CD	-	.015	.47	.020	.64	-.008	-.47	-.008	-.49	-.002	-.11	-.002	-.11
AQ	+	.016	.62	.017	.70	-.024*	-1.45	-.023	-1.40	-.037**	-1.73	-.036**	-1.75
ST	?	.008	.43	.009	.45	.002	.14	.002	.14	.010	.55	.009	.52
Intercept		.660***	3.72	.833***	5.04	.199	1.51	.186	1.51	.271**	1.79	.316	2.22
Adjusted R-squared		0.2245		0.2459		0.0706		0.0697		0.1573		0.1577	
F-statistics		3.27		3.55		1.60		1.59		2.46		2.47	
Observation		95		95		95		95		95		95	
Mean VIF		1.90		1.96		2.09		2.16		1.98		2.03	
Max VIF		4.51		4.71		4.74		5.57		4.88		5.33	

This table shows the results concerning the impact of risk disclosure quality and quantity on market liquidity for financial firms listed in the Shanghai A-shares market on yearly basis. Variance Inflation Factors (VIF) quantifies the severity of multicollinearity in an ordinary least squares regression analysis. Definitions of the above variables are detailed in Appendix 1. *, ** and *** indicate significance for two-tailed tests at the 0.1, 0.05, and 0.01 significance levels respectively.

Appendix 1. Summary of variable definitions, measures and sources

Variable	Definition and measures	Source
Panel A: Continuous variables		
Risk disclosure incentives		
QAN	Quantity refers to the amount of sentences containing risk information and is calculated as the natural logarithm of the total number of sentences containing risk information in annual reports	Thomson One / Company website
COV	Coverage is the coverage of risk information contained in the annual reports and is calculated as the inverse of the Herfindahl index value divided by the number of risk topics	Thomson One / Company website
DQAN	Depth_Quantitative includes the quantity risk-related information about expected future performance and is measured as the natural logarithm of the number of risk information sentences containing quantitative information	Thomson One / Company website
DQAL	Depth_Qualitative includes the quality risk-related information about expected future performance and is the natural logarithm of the number of risk information sentences containing qualitative information	Thomson One / Company website
OUL	Outlook_Profile refers to information about the risk management approach and is measured as the natural logarithm of risk information sentences containing firms' future actions regarding the identified risk	Thomson One / Company website
QAL	Composite is the score of the principal component with the highest eigenvalue calculated from the above five indicators	Thomson One / Company website
Reporting incentives		
FS	Firm size is measured as the natural logarithm of total revenues	Datastream
RS	Risk is measured by the beta, which is the covariance expressing a firm's market return compared with a 23- to 25-month market index	Datastream
CS	Capital structure is measured as the log of leverage	Datastream
BTM	Book-to-market is measured as the ratio of the book value of equity divided by its market value	Datastream
BS	Board size is the total number of directors on the board	Orbis/Annual report
BI	Board independence is the ratio of independent NEDs to board size	Orbis/Annual report
Market indicators		
ML	Market liquidity, measured as the three-month average of relative spreads from beginning of May to end of July	Datastream
TV	Trading volume, measured as the daily trading volume divided by the number of outstanding shares	Datastream
SPV	Share price volatility, measured by the standard deviation of daily stock prices	Datastream
Panel B: Dicotomous variables		
CD	CEO duality is a dummy variable taking the value of 1 if an individual holds both the position of CEO and chairman	Orbis/Annual report/ Company website
AQ	Audit quality is a dummy variable taking the value 1 if the external auditor is one of the Big Four audit firms	Orbis/Annual report/ Company website
ST	State ownership is a dummy variable taking the value 1 if the company is ownded by the Chinese state	Orbis/Annual report/ Company website

This table provides the definition and measures of risk reporting, firm, market and corporate governance characteristics. It also provides the s
each variable.