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Special Issue

Economic and Financial Markets in China: Asian Perspectives

Guest Editor: Chan Sok Gee

International Journal of China Studies

Notes for Contributors

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Economic and Financial Markets in China: Asian Perspectives

Guest Editor

Chan Sok Gee

UNIVERSITY OF MALAYA

Institute of China Studies

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Foreword

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The financial market in China is emerging as one of the hot spots of interest for institutional and individual investors for future investment because of its low cost and vast potential. This offers business expansion opportunities for firms in the ASEAN region. The former Prime Minister of Malaysia visited China in November 2016 and this has further strengthened bilateral ties which in his words, is "set to reach new highs" after the two countries signed a series of agreements on energy, infrastructure and defence.

The Malaysia-China bilateral ties will enhance the economic and financial cooperation to create more business and investment opportunities between the two countries. Therefore, the understanding of the financial system and institutions will help investors to make the first move to tap into the opportunities of this fast-growing emerging market. I am delighted to be the Guest Editor for this special issue of *International Journal of China Studies*, "Economic and Financial Markets in China: Asian Perspectives".

This special issue focuses on financial literacy, exchange rates movement and the Chinese Diaspora which received considerable attention from the major trading partners of China especially the emerging economies. We hope this special issue can provide some insights to policy makers and academicians that would like to further research on the Chinese financial market. Hence, the ultimate goal of this special issue is to provide knowledge sharing among policy makers, industry players and academics on developments pertaining to China's financial markets.

It is my pleasure to serve as the Guest Editor for this special issue and I hope that this special issue can provide fruitful insights for further research.

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Financial Statement Literacy of Individual Investors in China

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Abstract

Financial statement literacy is vital in helping individuals make good long-term stock investment decisions and is especially relevant in China where individual investors account for 85 per cent of stock market activity. To delve more into this issue, we examine relevant literature on individual investor behaviour, financial literacy and investment analysis respectively. We note an overall lack of financial literacy studies in China. Furthermore, financial statement literacy has received limited attention in all three streams of literature. This is possibly due to the lack of a systematic model for measuring financial statement literacy. Indeed, current studies tend to rely on secondary data and financial statement literacy is measured in a limited manner. We therefore propose a model in which financial statement literacy is evaluated through three dimensions, namely knowledge, attitudes and behaviour. The model can be extended to examine the influence of financial statement literacy on stock investment decision-making.

Keywords: *financial literacy, investment decision-making, financial statements, investor education*

1. Introduction

High financial literacy is useful for stock investors. It is especially important in China for the following reasons. Firstly, China has the largest population of individual investors in the world with 200 million people trading in its stock markets[1] (Fahey & Chemi, 2015). Secondly, unlike stock markets in other countries which are largely driven by institutional investors, 85 per cent of stock trades in China are by individual investors (Shen & Goh, 2015). Therefore, in light of the great significance of individual investors in China's stock markets, it is vital that these investors possess sufficient knowledge and skills to make effective stock investment decisions.

Although joint-stock companies shares were traded in Shanghai as early as the 1870s (Chen, 2013), it was only in 1990 that the modern stock exchanges in Shanghai[2] and Shenzhen[3] were formally established (Cai & Chen, 2015). Hence, the equity markets in China are relatively new. Nonetheless, these markets registered phenomenal growth and by 2012, market capitalization had increased to almost RMB21 trillion (Chen, 2013). A notable development was that from 2010, a change in policy by the China Securities Regulatory Commission (CSRC) reversed longstanding prohibitions on short-selling and margin-trading which increased the volume of short-selling and debt funded trades (Chang, Lou, & Ren, 2014). Further impetus came in the form of a state-media drive to encourage stock investing (Li & Zhou, 2016).

The influx of capital and trading led to a stock market bubble and consequent stock market turbulence in mid-2015 (Shen & Goh, 2015) and early 2016 (Bradsher & Tsang, 2016), causing numerous investors to incur substantial losses. Upon closer inspection, ignorance stemming from financial illiteracy led many novices to have a distorted view of stocks. Instead of investing for the long term, equity investing was treated as a type of gambling. Overtrading was rampant with a reported 81 per cent of individuals trading on a monthly basis and many invested with borrowed money with the naïve belief that stock prices would rise indefinitely (Fahey & Chemi, 2015).

Overtrading and poor stock picking decisions among individual investors are commonplace in stock markets worldwide, and have some impact on stock prices (Barber, Odean, & Zhu, 2009). However, because individual investors constitute the bulk of stock activities in China's stock markets, their actions profoundly influence these markets. Indeed, Ying, Kong and Luo (2015) reported that stock prices in China are largely driven by the emotional behaviour of individual investors instead of fundamental values, thus contributing to market inefficiency. It is possible that having a significant proportion of investors who have a long-term orientation towards stock investing would have a stabilizing effect on the stock market.

Yet, long-term stock investing requires a different approach from trading. This includes the ability to utilize financial statements to identify investment prospects with sound long-term fundamentals, or what is termed financial statement literacy, which is the ability of investors to "make judicious use of financial statement for their investment decisions" (Callen, Lai, & Wei, 2016, p. 573). Studies indicate that financial statements contain useful information for investment decision-making (Brimble & Hodgson, 2007; Francis & Schipper, 1999) that should be heeded by investors.

This paper has two main objectives. Firstly, it seeks to examine existing literature relevant to financial statement literacy and secondly it aims to

develop a model for evaluating financial statement literacy based on the previous literature.

From the literature review, we note an overall lack of financial literacy studies on China. More importantly, considering the significance of well-informed and sophisticated individual investors for China's stock markets, there is unfortunately a paucity of research on financial statement literacy. Therefore, this study is intended to partially fill this gap. Moreover, existing studies make inferences from secondary stock trading data (Callen et al., 2016), rather than assessments through surveys, hence actual financial statement literacy levels of individual investors in China are unknown. Furthermore, the effects of financial statement literacy on stock investment decision-making and investor portfolio returns are unexamined.

This study contributes to the literature by providing a model for evaluating financial statement literacy of investors that encompasses three dimensions – knowledge, attitudes and behaviour. The model can be used as an end in itself to measure financial statement literacy levels or extended to examine how it functions as part of the stock investment decision-making process. It differs from existing financial literacy models by specifically evaluating financial statement literacy instead of general financial literacy[4], or stock market literacy[5]. It is also more holistic insofar that attitudes relating to financial statement usage as well as usage behaviour are incorporated into the model, as many financial literacy models are confined to assessing financial knowledge alone. While the model is intended for a study in China, we believe that the three elements are universal and therefore applicable in other countries as well. However, some modifications may be warranted in the wording of research instruments, specifically in assessing financial statement knowledge and behaviour owing to differences in financial statement nomenclature across different financial reporting jurisdictions.

The rest of the paper is organized as follows. Section 2 outlines the methodology while Section 3 comprises the literature review. This is followed by the findings in Section 4 and the proposed model in Section 5. The managerial implication and policy implications are discussed in Sections 6 and 7 respectively while Section 8 concludes.

2. Methodology

We reviewed relevant literature to fulfil the first research objective. Initially, studies published from December 2010 to August 2016 were reviewed. This starting date was selected because it marked the 20th anniversary of the establishment of China's stock exchanges. However, the scope was expanded to include selected scholarly articles published before December 2010 owing to their significance to the research objectives. The review was then extended

to include research papers by reputable institutions such as the World Bank and Organisation for Economic Co-Operation and Development (OECD). Furthermore, while the focus is on China, studies in other countries were reviewed to examine worldwide trends. ABI/INFORM Complete, EBSCO Discovery Service, JSTOR, Emerald and ScienceDirect electronic databases were accessed for screening and selecting appropriate research articles. Keywords used in the search were: *financial literacy*, *financial statement usage*, *individual investor behaviour*, and *financial statement literacy*. Additional keywords used were *technical analysis* and *fundamental analysis*.

We reviewed 88 articles for this study. Table 1 provides a summary of the scope of articles reviewed. Studies are classified based on country with China forming one category and those from other countries another category.

Table 1 Summary of Articles Reviewed

Scope of Article	*China*	*Other Countries*	*Total*
Individual investor behaviour	17*	20	37
Financial literacy	4**	32	36
Investment analysis	1	14	15
Total	22	66	88

Notes: * In accordance with the One China policy, the study on Taiwan is included as part of China.

** The study by Klapper, Lusardi and van Oudheusden (2015) includes China.

To fulfill the second research objective, a conceptual model was then developed based on the extant literature and research gaps.

3. Literature Review

This section reviews literature relevant to financial statement literacy. Three streams of literature were examined, namely on individual investor behaviour, financial literacy and investment analysis. The papers reviewed are summarized in Tables 2 to 4.

As evident in the tables, while there are many studies on individual investor behaviour in China, particularly on their behavioural limitations, there are few papers on financial literacy there and a lack of research on the extent to which individual investors in China rely on fundamental analysis when making stock investment decisions. A detailed discussion on the articles reviewed is given in the following subsections.

Table 2 Articles on Individual Investor Behaviour

Author(s)	*Year*	*Country*	*Methodology*	*Scope*
Abreu and Mendes	2012	Portugal	Secondary data analysis	Information and trading frequency
Barber, Lee, et al.	2009	Taiwan	Trading data analysis	Overtrading
Barber and Odean	2000	USA	Analysis of trading data	Overtrading
Barber and Odean	2013	USA	Literature review	Individual investor weaknesses
Barber et al.	2009	USA	Trading data analysis	Effects of small traders on stock prices
Cai and Chen	2015	China	Secondary data analysis	Individual investors following analysts' recommendations
Chandra and Kumar	2012	India	Survey	Psychological biases
Chang et al.	2014	China	Secondary data analysis	Short-selling
Chang et al.	2016	USA	Trading data analysis	Disposition effect
Chen	2013	China	Commentary	China's stock market evolution
Clark-Murphy and Soutar	2004	Australia	Survey	Stock investing behaviour
Dichev et al.	2014	USA	Experiment	Effects of overtrading on the economy
Drake et al.	2016	USA	Secondary data analysis	Investors' usage of historical annual reports
Fama	1970	USA	Secondary data analysis	Efficient market hypothesis
Feng and Hu	2014	China	Secondary data analysis	Attention span
Feng et al.	2014	China	Secondary data analysis	Mutual fund picking skills
Garling et al.	2009	USA	Literature review	Psychological biases
Hu et al.	2013	China	Secondary data analysis	Influence of blogs on individual investor behaviour
Johansen and Plenborg	2013	Denmark	Survey	Examine user satisfaction of annual report items
Kahneman and Tversky	1979	USA	Mathematical modelling	Prospect theory
Kong et al.	2015	China	Secondary data analysis	Disposition effect
Kumar	2009	USA	Secondary data analysis	Gambling tendencies of individual investors
Kumar et al.	2013	India	Survey	Usage of technical and fundamental analysis for different user groups
Kumar and Goyal	2015	India	Literature review	Behavioural biases of individual investors
Law	2010	Macau, China	Survey	Gambling tendencies of professional accountants
Li and Zhou	2016	China	Secondary data analysis	Politicization of China's stock markets

Table 2 (continued)

Author(s)	*Year*	*Country*	*Methodology*	*Scope*
Li et al.	2014	China	Secondary data analysis	Effects of attention-grabbing stocks on investors
Li et al.	2016	China	Secondary data analysis	IPO investors
Ng and Wu	2010	China	Secondary data analysis	Peer effects of individual investors' trading decisions
Pandit and Yeoh	2014	India	Survey	Psychological tendencies of individual investors
Prosad et al.	2015	India	Survey	Behavioural biases of individual investors
Sahi and Arora	2012	India	Interviews	Individual investor biases
Tversky and Kahneman	1992	USA	Experiment	Prospect theory
Wang et al.	2011	China	Experiment	CSR and individual investors
Wang et al.	2006	China	Survey	Psychological tendencies of individual investors
Ying et al.	2015	China	Secondary data analysis	Individual investors' attention
Yu et al.	2013	China	Secondary data analysis	Aggressive reporting and stock prices

Table 3 Articles on Financial Literacy

Author(s)	*Year*	*Country*	*Methodology*	*Scope*
Abreu and Mendes	2010	Portugal	Survey	Financial literacy and portfolio diversification of individual investors
Agarwalla et al.	2013	India	Survey	Financial literacy of urban working youths
Alessie et al.	2011	Nether-lands	Survey	Financial literacy and retirement preparedness of adults
Ali et al.	2015	Malaysia	Survey	Financial literacy and financial satisfaction of adults
Arora and Marwaha	2013	India	Survey	Financial literacy and stock market awareness among investors
Asaad	2015	USA	Survey	Financial knowledge and confidence
Atkinson and Messy	2012	14 coun-tries	Survey	Financial knowledge, attitudes and behaviour
Babiarz and Robb	2014	USA	Survey	Financial literacy and emergency savings
Behrman et al.	2012	Chile	Survey	Financial literacy and household wealth accumulation
Callen et al.	2016	China	Secondary data analysis	Financial statement literacy and return revisions

Table 3 (continued)

Author(s)	*Year*	*Country*	*Methodology*	*Scope*
Clark et al.	2014	USA	Survey and secondary data analysis	Retirement fund investment performance
Delavande et al.	2008	USA	Secondary data analysis	Financial literacy and retirement preparedness
Gallery et al.	2011	Australia	Conceptual paper	Financial literacy and superannuation investing
Hüsser	2015	Switzerland	Experiment	Financial literacy and assessment of risk disclosure in mutual fund advertisements
Hung et al.	2009	USA	Survey	Measuring financial literacy
Huston	2010	USA	Literature review	Measuring financial literacy
Ibrahim et al.	2009	Malaysia	Survey	Financial literacy of degree students
Jappelli and Padula	2011	14 countries in Europe	Econometric modelling and secondary data analysis	Financial literacy and savings decisions
Klapper et al.	2015	140 countries	Surveys	Financial literacy levels
Landerretche and Martinez	2013	Chile	Survey	Pension financial literacy
Loke	2016	Malaysia	Survey	Financial literacy and living beyond one's means
Lusardi and Mitchell	2011	8 countries	Surveys	Financial literacy levels
Lusardi and Mitchell	2014	USA	Econometric modelling and secondary data analysis	Human capital theory in the context of financial literacy
Lusardi et al.	2014	USA	Survey	Financial literacy among the older population
Messy and Monticone	2016	Multinational	Literature review	Financial education policies in Asia and the Pacific
Mouna and Jarboui	2015	Tunisia	Survey	Financial literacy and portfolio diversification
Robb	2011	USA	Survey	Financial knowledge and credit card behaviour of college students
Sabri and MacDonald	2010	Malaysia	Survey	Effects of financial literacy on savings behaviour and financial problems among college students
Santos and Abreu	2013	Portugal	Secondary data analysis	Influence of financial literacy on financial behaviour and indebtedness
Spataro and Corsini	2013	Italy	Mathematical modelling	Effects of financial literacy on savings and stock market participation

Table 3 (continued)

Author(s)	*Year*	*Country*	*Methodology*	*Scope*
Tan et al.	2011	Malaysia	Survey	Financial literacy and personal financial planning
van Rooij et al.	2007	Nether-lands	Secondary data analysis	Financial literacy and stock market participation
Wang	2009	USA	Survey	Financial knowledge and risk taking
Xia et al.	2014	China	Secondary data analysis	Financial literacy and stock market participation
Xu and Zia	2012	Multi-national	Literature review	Financial literacy levels
Yao and Xu	2015	China	Survey	Investment knowledge and stock market participation

Table 4 Articles on Investment Analysis

Author(s)	*Year*	*Country*	*Methodology*	*Scope*
Abarbanell and Bushee	1998	USA	Secondary data analysis	Fundamental analysis signals and strategy
Al-Ajmi	2009	Bahrain	Survey	Individual investors' financial statements usage
Brimble and Hodgson	2007	Australia	Secondary data analysis	Value relevance of financial statement information
Balsara et al.	2007	China	Secondary data analysis	Random walk and technical analysis
Cohen et al.	2011	Israel	Survey	Fundamental and technical analysis among users
De Zoysa and Rudkin	2010	Sri Lanka	Survey	Annual report usage among different user groups
Drake et al.	2016	USA	Secondary data analysis	Individual investors' reliance on historical financial statements
Francis and Schipper	1999	USA	Secondary data analysis	Value relevance of financial statements
Irwin and Park	2007	USA	Literature review	Technical analysis
Lo et al.	2000	USA	Secondary data analysis	Technical analysis computa-tions inferences
Markowitz	1952	USA	Secondary data analysis	Portfolio selection
Nagy and Obenberger	1994	USA	Survey	Individual investors' investment decision-making behaviour
Piotroski	2000	USA	Secondary data analysis	Value investing
Richardson et al.	2012	USA	Secondary data analysis	Fundamental analysis and stock price movements
Seng and Hancock	2012	USA	Secondary data analysis	Fundamental analysis and earnings predictions

3.1. Individual Investor Behaviour

Of interest in this study is how individuals make investment decisions based on financial statements usage. Therefore, a brief general explanation of individual investor behaviour is needed. Numerous theories have been devised to explain investor decision-making behaviour. They can be classified based on the assumption of investor rationality or irrationality. The first group of theories assumes that investors are rational insofar they invest in a systematic manner based on expected risks and returns to maximize wealth. Such investors would therefore be more reliant on financial statement usage when making investment decisions. These theories include utility theory (Clark-Murphy & Soutar, 2004; Kahneman, 2012; Kumar & Goyal, 2015), portfolio theory (Markowitz, 1952) and the efficient market hypothesis (EMH) (Fama, 1970).

In contrast, the second group of theories assumes that investors are irrational and make investment decisions based on behavioural considerations. The most well-known among these theories is prospect theory (Kahneman, 2012; Kahneman & Tversky, 1979; Tversky & Kahneman, 1992). Additionally, researchers examine cognitive factors that influence decision-making, such as heuristics and biases (Kumar & Goyal, 2015; Pandit & Yeoh, 2014; Sahi & Arora, 2012). The second group of theories emerged to explain types of investor behaviour that do not seem to conform to the assumptions of rationality. In fact, scholars find empirical evidence of significant behavioural shortcomings among individual investors. These include overtrading, overconfidence and others which are summarized as follows.

Overtrading stems from investors' belief that they can successfully beat the market through active trading. Overtrading is prevalent among individual investors even though studies demonstrate that it generally leads to wealth destruction (Barber, Lee, Liu, & Odean, 2009; Barber & Odean, 2000). Notably, overtrading in China is significantly higher than in the United States (Fahey & Chemi, 2015) which should be cause for concern because studies show that it increases stock market volatility and is detrimental to the economy (Dichev, Huang, & Zhou, 2014; Garling, Kirchler, Lewis, & van Raaij, 2009). Researchers find that overtrading among individual investors is closely associated with overconfidence (Abreu & Mendes, 2012), which is another common behavioural shortcoming (Barber & Odean, 2000).

The disposition effect (tendency to sell winning investments but holding on to losers) is also present among individual investors (Barber & Odean, 2013; Chang, Solomon, & Westerfield, 2016; Prosad, Kapoor, & Sengupta, 2015). However, Kong, Bai and Wang (2015) found no evidence of the disposition effect among individual investors in China, though they concede that this is partly because short selling was prohibited during the period of study.

Individual investors generally have limited attention (Barber & Odean, 2013), even in China (Feng & Hu, 2014). Consequently, Chinese investors are drawn to stocks that attract their attention (Ying et al., 2015), are influenced by blog coverage (Hu, Dong, Liu, & Yao, 2013) as well as their peers (Ng & Wu, 2010). Unsophisticated small investors in China are more inclined to chase after attention-grabbing stocks (Li, Shi, Chen, & Kargbo, 2014). Issues like corporate social responsibility do not attract their attention (Wang, Qiu, & Kong, 2011) and they are less reliant on corporate governance information (Li, Wang, & Dong, 2016) and accounting information (Callen et al., 2016). Instead, individual investors in China are sensitive to market sentiments and have herding tendencies (Li, Wang and Rhee (2015), cited in Li et al., 2016), even though some tend to follow analysts' recommendations (Cai & Chen, 2015). Hence, in China's stock market, over-reaction and under-reaction based on market sentiment is evident (You (2010), cited in Li et al., 2016).

The Chinese believe that good luck leads to business success and enables them to win when gambling (Law, 2010). Individual investors who display gambling traits are more inclined to place a great store on luck when trading stocks (Chandra & Kumar, 2012; Kumar, 2009). A study by Wang, Shi and Fan (2006) revealed that individual investors in China have speculative tendencies and low levels of risk perception. Furthermore, the researchers found that individual investors lack investment knowledge and skills. According to Feng, Zhou and Chan (2014), individual investors have no ability to select mutual funds, suggesting that financial illiteracy is widespread among investors in China. Indeed, individual investors' reliance on heuristics and biases and the poor investment decisions they make spring partly from lack of knowledge and limited information processing skills (Barber & Odean, 2013), which can be mitigated by higher financial literacy. Financial literacy will be further discussed in the next section.

3.2. Financial Literacy

Generally, there are various definitions of financial literacy, though financial knowledge and application are emphasized (Huston, 2010). A few of these definitions are discussed as follows. According to Xu and Zia (2012, p. 2), financial literacy is a broad term that comprises "concepts ranging from financial awareness and knowledge, including of financial products, institutions and concepts, financial skills such as the ability to calculate compound interest payments; and financial capability more generally, in terms of money management and financial planning". Lusardi and Mitchell (2014, p. 6) described it as "peoples' ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pensions". A more comprehensive definition is provided by the Organisation

for Economic Co-operation and Development (OECD) whereby financial literacy is "a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing" (Atkinson & Messy, 2012, p. 14). Here, apart from financial knowledge and behaviour, attitude is also considered.

Much research has been done assessing financial literacy levels worldwide. According to Xu and Zia (2012), low financial literacy is prevalent even in high income countries, though it is significantly lower in low income countries. Research by Atkinson and Messy (2012) revealed similar findings. Klapper et al. (2015) found that only 28 percent of adults in China are financially literate.

Low levels of financial literacy should be of great concern because studies reveal that financial literacy is correlated with numerous financial outcomes throughout our life-cycle. For example, college students with low financial literacy typically experience money management and credit card problems (Ibrahim, Harun, & Isa, 2009; Robb, 2011; Sabri & MacDonald, 2010). Financial exclusion in the adult population is partly due to low financial knowledge (Messy & Monticone, 2016). Adults with low financial literacy have a higher risk of experiencing financial distress (Santos & Abreu, 2013), tend to engage in risky and costly financial behaviour (Asaad, 2015) and lack emergency savings (Babiarz & Robb, 2014). Poor financial decisions among senior citizens is also due to low financial literacy (Lusardi, Mitchell, & Curto, 2014). Several researchers find a link between financial literacy and wealth accumulation (Behrman, Mitchell, Soo, & Bravo, 2012; Jappelli & Padula, 2011) while others demonstrate that financial literacy is an important antecedent to financial planning (Ali, Rahman, & Bakar, 2015; Hung, Parker, & Yoong, 2009; Tan, Hoe, & Hung, 2011).

3.3. Financial Literacy and Stock Investing

Since financial literacy is associated with numerous types of financial behaviour and outcomes as discussed in the preceding section, it is unsurprising that it impacts stock investing. Unfortunately, there are comparatively few financial literacy studies that focus on stock investing. In an exploratory study, Arora and Marwaha (2013) examined financial literacy levels of individual investors in Punjab, India. While they reported that individual investors have high financial knowledge, the effects of financial literacy on stock investing behaviour and returns are not examined. Nonetheless, van Rooij, Lusardi and Rob (2007) provided survey evidence that stock market participation is influenced by financial literacy, though instrument used merely assesses basic financial knowledge. They reported that individuals with higher financial literacy have a significantly higher

likelihood of investing in stocks compared to those with low financial literacy. This position is supported in a mathematical model by Spataro and Corsini (2013). Financial literacy is also found to influence portfolio diversification (Abreu & Mendes, 2010; Mouna & Jarboui, 2015; Xia, Wang, & Li, 2014; Yao & Xu, 2015). Therefore, these studies indicate that financial literacy not only influences individuals to invest in stocks but also enables them to be better at risk diversification.

While there is limited research on how financial literacy impacts stock investing returns, there are studies that examine the importance of financial literacy when making pension plan and mutual fund decisions and returns. High financial literacy enables employees to earn as much as 130 basis points more per year in their retirement accounts than their contemporaries (Clark, Lusardi, & Mitchell, 2014), while inertia in making employment retirement plan decisions is attributed to low financial literacy (Gallery, Newton, & Palm, 2011). As for investing in mutual funds, Wang (2009) demonstrated that financial risk taking is influenced by financial literacy. According to Feng et al. (2014), Chinese investors lack mutual fund selection ability (along with what they describe as the "dumb money effect" – the inability to transfer funds to winner or out of losers), which can be attributed to lack of financial literacy. Since financial literacy is evidently so important even for investment decisions in which the investor abrogates responsibility to third parties consisting of financial professionals (such as retirement funds or mutual funds), it should be even more so for stock investing where the onus on portfolio management rests entirely with the individual himself. Therefore, the paucity of research on how financial literacy impacts stock investment decisions is regrettable.

From these discussions, it is apparent that the influence of financial literacy on stock investing strategy is significant; thus it is crucial that this aspect is examined further. Before that, a distinction must be made between investing in stocks for the long-term and trading, because different approaches are required. For stock trading or speculating, technical analysis is widely used (Cohen, Kudryavtsev, & Hon-Snir, 2011; Kumar, Mohapatra, & Sandhu, 2013). The goal of technical analysis is "to identify regularities in the time series of prices by extracting nonlinear patterns from noisy data" (Lo, Mamaysky, & Wang, 2000, p. 1708). However, there is still inconclusive evidence whether technical analysis is a good investment strategy. Advocates such as Lo et al. (2000) and Balsara, Chen and Lin (2007) stressed that technical analysis is effective. Yet, a review paper by Irwin and Park (2007) reported that while many studies find empirical evidence on the predictive ability of technical analysis, they are subjective and context specific.

Stock investing for the long-term entails different strategies. One approach, popularized by Benjamin Graham (Graham & Dodd, 2009; Graham

& Zweig, 2006), is referred to as value investing. Essentially, it entails identifying and investing in underpriced stocks for the long term. Value investing has been demonstrated to deliver superior returns (Piotroski, 2000). A central feature of value investing is fundamental analysis, which is defined by Abarbanell and Bushee (1998, p. 20) as "a practice that relies heavily on the analysis of current and past financial statement data to identify when underlying firm value differs from prevailing market prices." The principle underlying fundamental analysis is that the intrinsic value of a security equals the discounted values of its expected future cash flows (Richardson, Sloan, & You, 2012). Fundamental analysis is favoured by institutional investors (Cohen et al., 2011; Kumar et al., 2013). Empirical findings show that financial statements provide very useful information about future earnings changes and returns (Seng & Hancock, 2012) which is why they form the bedrock of fundamental analysis. Hence, it is essential that investors who adopt value investing have the ability to analyse financial statements for investment decision-making purposes. In other words, they require financial statement literacy.

3.4. Financial Statement Literacy

In the US, individual investors regard financial statements as important sources of information (Nagy & Obenberger, 1994) and rely on historical accounting reports for investment decision-making (Drake, Roulstone, & Thornock, 2016). Reliance on financial statements among individual investors is reported in other Asian countries such as Bahrain (Al-Ajmi, 2009) and Sri Lanka (De Zoysa & Rudkin, 2010). However, comparable research on Chinese individual investors appears to be lacking.

Studies show that financial statements contain value relevant information that is useful for investment decision-making (Brimble & Hodgson, 2007; Francis & Schipper, 1999). To be successful at financial statement analysis for investment decision-making, financial statement literacy is needed. Callen et al. (2016, p. 573) define financial statement literate investors as "investors who make judicious use of financial statement for their investment decisions". In their pioneering paper, Callen et al. (2016) compared how financial statement literacy influences return expectations of investors, though the scope is on cash flow statements and it makes inferences from secondary accounting data and stock market information of firms listed on China's stock exchanges from 1995 to 2006. They found that foreign investors with higher financial statement literacy tend to make revisions to their returns expectations compared to Chinese investors who had lower financial statement literacy. This indicates that high financial statement literacy enables investors to revise their estimates of firm returns and therefore valuation, thus influencing their

investing strategy. A few other papers, while not explicitly examining financial statement literacy, explored related areas. For instance, using trading data of all listed Chinese firms from 2000 to 2009, Yu, Li, Tian and Zhang (2013) documented how aggressive financial reporting increases the "noise" of small traders who are less knowledgeable than professional and institutional investors. Findings suggest that investors who lack sufficient financial statement knowledge are more easily swayed by good news reported in firms' financial statements.

Yet, on the whole, financial statement literacy remains a new field of study. Indeed, issues such as whether individual investors have sufficient knowledge to understand financial statements, the relationship between financial statement knowledge and financial statement usage, the extent to which financial statement literacy influences portfolio decisions and returns remain unanswered. Addressing them would provide richer insights into individual investor behaviour in relation to financial statements usage. The next section discusses the key findings of this review.

4. Findings

From the preceding literature review, four main points are noted. Firstly, there is a lack of studies documenting financial statements usage for investment decision-making among individual investors in China. Callen et al. (2016) implied it is low but further investigation is needed for verification. By way of contrast, in Western countries, numerous studies have been conducted on financial statements usage among individual investors (for example, Drake et al., 2016; Johansen & Plenborg, 2013). Financial statements usage is an indicator of investor sophistication which is why ascertaining current levels in China matters.

Secondly, individual investors in China share with their international counterparts several behavioural shortcomings such as limited awareness of investing risk and a reliance on luck. However, a tendency towards overtrading is more pronounced. It also appears that generally, individual investors in China lack investment knowledge and skills, preferring instead to trade based on their emotions. Hence, they are unfamiliar with more sophisticated long-term investment strategies and have a misplaced view of the stock market. This also relates to the first point of an apparent lack of financial statements usage for investment decision-making.

Thirdly, studies demonstrate that financial literacy is important in our daily lives especially when making major investment decisions. While there are few studies on the implications of high financial literacy on stock investing, researchers document how it translates into superior retirement plans and mutual fund investment decisions. Therefore, inferences can be

made that high financial literacy is as equally important when making stock investment decisions. Unfortunately, research shows that financial literacy is generally low in China, and presumably among its individual investors, judging from the studies that find them lacking in knowledge and skills.

Fourthly, financial statement literacy is relatively unexplored in the literature, which is unfortunate considering its relevance when analyzing a firm's fundamentals to make long-term stock investment decisions. Out of the 88 studies reviewed only one makes explicit reference to the term "financial statement literacy". Considering that its stock markets are dominated by individuals, a higher level of sophistication among its investors, including the ability to understand and analyze financial statements is particularly significant in China. The implications of low investor sophistication are individual wealth destruction and increased stock market volatility.

It must be noted that while immensely useful, financial statements are technical documents that require specialized knowledge to understand and utilize effectively. Yet, little research is done on ascertaining the current level of financial statement literacy among individual investors in China, though it must be conceded that the literature is also silent on financial statement literacy in other countries. Furthermore, existing studies (such as Callen et al., 2016) relied on secondary data instead of surveys, which more accurately appraise financial literacy levels and are the preferred choice in numerous financial literacy studies as shown in Table 3. Therefore, evaluating current financial statement literacy levels is a crucial first step in formulating policies for elevating investor sophistication and for addressing the issues raised in the previous section. This move should be aligned with China's aspirations to increase the wealth of its citizens via stock market participation.

Due to it being a nascent field of study, an appropriate research instrument to evaluate financial statement literacy is apparently lacking. In light of this matter, a conceptual model is therefore developed to construct a comprehensive instrument to assess financial statement literacy among individual investors in China.

5. Proposed Conceptual Model

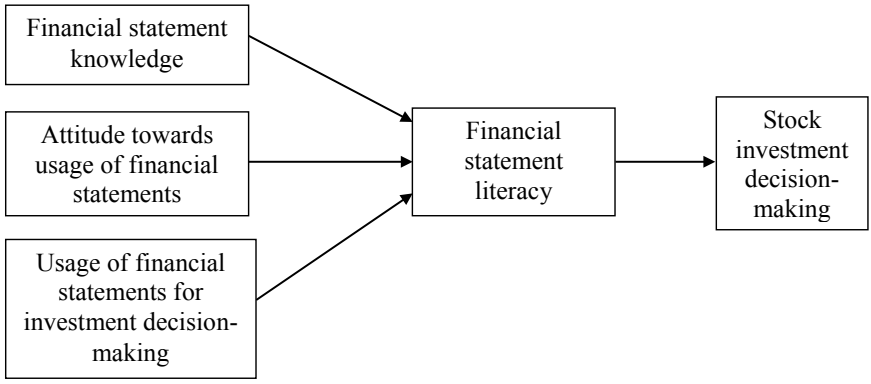
In this conceptual model, we define financial statement literacy as the combination of knowledge, attitudes and usage of financial statements for investment decision-making. The conceptual model suggests that financial statement literacy, which is the dependent variable, is measured by the following independent variables, namely, (1) financial statement knowledge, (2) attitude towards financial statement usage and (3) usage of financial statements for investment decision-making. The model is adapted from Atkinson and Messy (2012). While the latter examine general financial

literacy, we differ by contextualizing the variables specifically in the context of financial statement literacy. These three independent variables can also be viewed as a variation of the knowledge, attitudes and practice model (Chatterjee, Bhanot, Frank, Murphy, & Power, 2009; Lund & Aarø, 2004) or the information-motivation-behavioural skills model (Fisher, Fisher, Bryan, & Misovich, 2002). Financial statement literacy can be evaluated as an end in itself as per the numerous studies that assess financial literacy shown in Table 3.

Nonetheless, the model can be extended to examine its influence of stock investment decision-making behaviour. It is anticipated that high financial statement literacy will have a positive effect on investment decision-making that leads to superior portfolio returns, since the literature indicates that financial statements contain value relevant information and reliance on them leads to better portfolio performance. In the extended model, financial statement literacy can be regarded as one of several factors that influence stock investment decision-making. For example, among China's individual investors, risk tolerance and speculative tendencies are high. These factors can be examined together with financial statement literacy to ascertain which predictor variables have greater influence on stock investment decision-making. The proposed extended conceptual model is outlined in Figure 1.

We suggest measuring financial statement literacy based on the weighted scores of financial statement knowledge, attitude towards financial statement usage and usage of financial statements for investment decision-making, consistent with the method used by Atkinson and Messy (2012) and adopted by others (such as Agarwalla, Barua, Jacob, & Varma, 2013). Each of these shall be explained in the subsequent paragraphs.

Figure 1 Conceptual Model for Measuring Financial Statement Literacy and Its Influence on Stock Investment Decision-making



5.1. Financial Statement Knowledge

Financial knowledge is defined as "some basic knowledge of key financial concepts and the ability to apply numeracy skills in financial situations" (Atkinson & Messy, 2012, p. 16). Huston (2010) described financial knowledge as the "stock of knowledge acquired through education and/or experience specifically related to essential personal finance concepts and products" and stressed that it is not equivalent to financial literacy.

However, there are more context specific definitions of financial knowledge depending on financial outcomes. For instance, Landerretche and Martinez (2013) examined pension financial knowledge (despite being dubbed "literacy") which is knowledge regarding pension (such as contribution rate, how funds are invested and pension account balance). Similarly, Hüsser (2015) cast financial knowledge in terms of investors' knowledge of stocks, bonds and mutual funds as the focus of his study was on mutual funds.

Accordingly, Delavande, Rohwedder, and Willis (2008) regarded financial knowledge as a finite resource and that the cost of acquiring financial information would be lower for individuals with high financial knowledge compared to individuals with low financial knowledge. In addition, individuals with low financial knowledge have to spend more effort to learn or to gain advice from others. An example is financial statement knowledge, which those outside the sphere of accounting and finance do not possess, which novice investors must acquire it through learning or by seeking professional advice.

In the context of this research model, financial statement knowledge is defined as the actual knowledge level of individual investors of three main financial statements. These are the statement of financial position, income statement and cash flow statement. Knowledge of key terms, concepts and the ability to calculate financial ratios from information contained in these financial statements constitute financial statement knowledge.

5.2. Attitude towards Usage of Financial Statements

Apart from financial statement knowledge, in accordance with the proposed conceptual model, another important variable that may influence financial statement literacy is attitude towards usage of financial statements.

Several studies documented the influence of attitudes on financial literacy (Alessie, van Rooij, & Lusardi, 2011; Atkinson & Messy, 2012; Loke, 2016; Lusardi et al., 2014). What constitutes these attitudes depends on the nature of the study. For instance, Ali et al. (2015) examined attitudes towards money. Besides attitudes towards money, Atkinson and Messy (2012) also studied planning for the future in their research for the OECD. Agarwalla et al. (2013)

adopted the OECD measures when examining financial attitudes in their study on financial literacy among working urban youths in India. Ibrahim et al. (2009) explored financial attitudes in the context of college students because some items in their scale apply specifically to them (for example, one item is on whether the student will consider dropping out of college). Hence, investor attitude towards the importance of using financial statements for investment decision-making purposes constitutes an element of measuring financial statement literacy.

5.3. Usage of Financial Statements for Investment Decision-making

The third variable specified in the proposed conceptual model is usage of financial statements for investment decision-making, which is a type of financial behaviour. Financial behaviour is a broad spectrum of actions ranging from making loan payments to saving for retirement. Atkinson and Messy (2012) contextualized financial behaviour in terms of financial well-being which encompasses saving, budgeting, borrowing to make ends meet and paying bills on time, among others.

Similar to financial knowledge and financial attitudes, the term "financial behaviour" is sometimes defined in a context specific way depending on the nature of the study. For instance, a study by Robb (2011) on credit card usage defined financial behaviour in this context while another by Santos and Abreu (2013) on indebtedness examined financial behaviour in terms of financial distress, arrears and foreclosure.

We define financial behaviour as the extent to which the individual investor uses financial statements as a source of information when making decisions whether to buy, hold or sell particular stocks.

As mentioned earlier, a model comprising the abovementioned three elements is sufficient to evaluate financial statement literacy. Such information is useful for determining demographic differences among individual investors and to gauge overall levels in China. However, researchers can extend the model to examine the influence of financial statement literacy on individual investor behaviour, such as portfolio choice and returns.

Having discussed the proposed conceptual model in ascertaining financial statement literacy, the following section discusses the managerial implications of the study.

6. Managerial Implications

Greater awareness of the importance of financial statement literacy in stock investing would benefit the financial services sector in several ways. For investors who find acquiring financial statement literacy challenging, the

alternatives would be investing in mutual funds or engaging the services of financial planners. This presents numerous opportunities for financial service professionals. Even investors with some financial statement knowledge stand to benefit from the advice of financial experts. For example, research shows that individual investors who follow analysts' recommendations tend to profit more in the mid- to long-term (Cai & Chen, 2015). Financial professionals can also capitalize on the surge in the demand for reading material and courses related to financial statement literacy for individual investors who would like to increase their store of knowledge in the field. In addition to the managerial implications, this study also has some policy implications, which will be discussed in the next section.

7. Policy Implications

Ascertaining the current level of financial statement literacy among individual investors will help facilitate more effective investor education programmes by agencies such as the China Securities Investor Protection Fund (SIPF). These programmes should not only endow investors with greater financial knowledge but also shape attitudes that elicit positive stock investing behaviour. Educating individuals to make good stock investment decisions is beneficial at the individual and national level. Investors would be less inclined to speculate in the stock market and view equity investments as a form of long-term savings, thereby minimizing the risk of losses due to speculations. Financial statement literacy helps investors evaluate the financial fundamentals of companies thereby enabling them to make better long-term investments. Aggregated at the national level, investors with better financial statement literacy contribute to greater stock market stability because they are less swayed by short-term noise and focus more on long-term fundamentals. This is especially crucial in China which not only has the largest population of individual investors in the world but also in the light of the growing international importance of China's stock markets.

8. Conclusion

This paper has two main objectives. The first is to examine existing literature relevant to financial statement literacy. We find few studies on financial literacy in China. Furthermore, while financial literacy is a growing field of study internationally, research on financial literacy vis-à-vis stock investing is lacking, despite of its potential to offer many rich insights on how financial literacy impacts portfolio choice and returns. Financial statement literacy is an even more niche area of study and there is an absence of primary research on the subject. The second objective of this study is to propose a model for

evaluating financial statement literacy. In our model which is derived from the literature, financial statement literacy comprises three elements, which are financial statement knowledge, attitude towards usage of financial statements and usage of financial statements for investment decision-making. This model can be employed to assess financial statement literacy alone or it can be extended to examine the influence of financial statement literacy on stock investment decision-making. Hence, we hope the model can be a starting point for future research in the area.

Trading in the stock market is inherently exciting with its allure of instant riches. However, empirical evidence shows that investors, no matter how successful initially, can never outperform the market in the long-term. Therefore, it would be more prudent for individuals to invest in a diversified portfolio of stocks for the long-term, and profit through dividends and stock price appreciations. Given China's ability to excel at various fields within a short period, creating a large pool of sophisticated investors can be achieved through education. Hence, research on financial statement literacy of individual investors in China is a crucial first step to ascertain current levels and to formulate more effective investor education programmes.

Notes

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1. China has two stock markets, namely the Shanghai Stock Exchange and the Shenzhen Stock Exchange.
2. On 26 November 1990.
3. On 1 December 1990.
4. Knowledge of interest compounding, inflation and risk diversification (Lusardi & Mitchell, 2011) as well as financial attitudes and behaviour associated with it (Atkinson & Messy, 2012).

5. Familiarity with concepts such as transaction costs, settlements and stock splits (Arora & Marwaha, 2013).

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The Great Wall for ASEAN Foreign Exchange Risk Premium

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Abstract

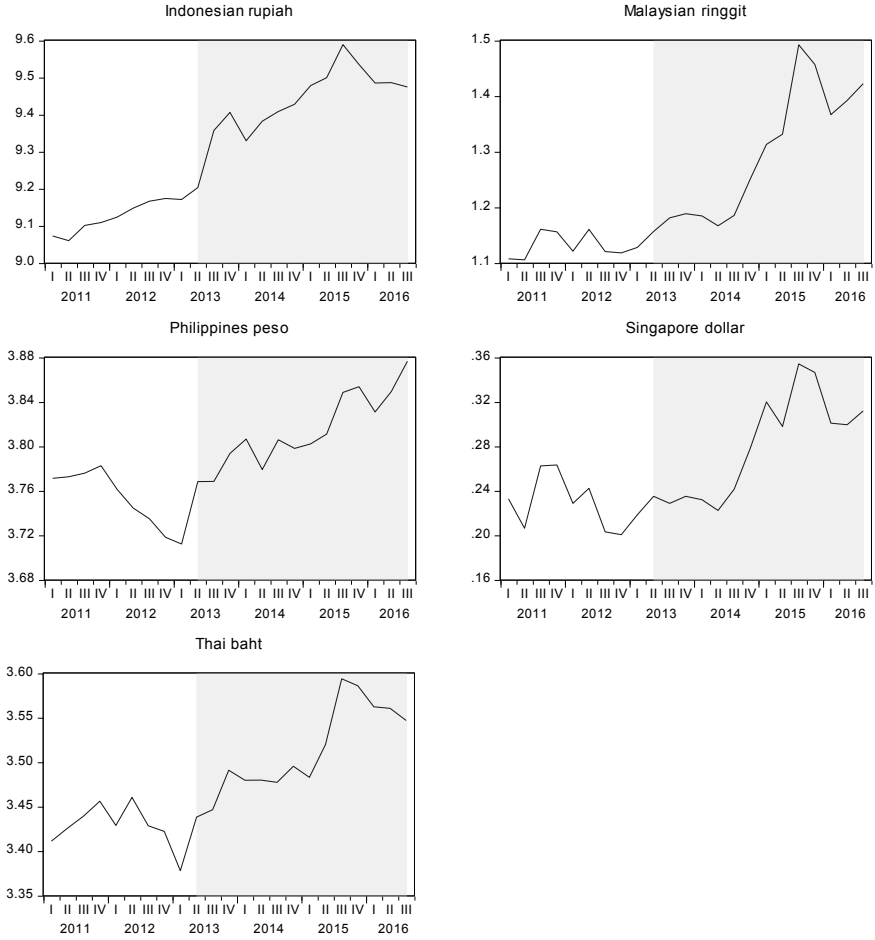
Southeast Asian currencies have been losing ground since the taper tantrum in May 2013 to an extent that goes beyond the standard explanation in yield differentials. This paper modifies the otherwise standard uncovered interest parity (UIP) relation to shed light on two mechanisms: delayed adjustment to expectation error and a risk wedge that shapes the slope of UIP. The wedge is alternatively proxied by global uncertainty, domestic fundamentals, and China's factors. Drawn on a panel sample of the five largest ASEAN economies over the period 1982Q1 to 2016Q3, we find the presence of forward discount puzzle in ASEAN-5 exchange rates against the US dollar, which cannot be explained by global uncertainty and domestic attitudes toward capital flows and exchange rate flexibility. It is China's exchange rate policy that matters, in the sense that greater flexibility in yuan-dollar exchange rates and greater US dollar weight in the renminbi's currency basket amplify regional currencies fluctuations. In view of this, any effort to stabilize regional currencies cannot afford to ignore what's going on behind the Great Wall.

Keywords: *forward discount puzzle, uncovered interest parity, China, renminbi, Southeast Asia*

1. Introduction

Currencies in developing countries have been weakening against the US dollar ever since the taper tantrum on 22 May 2013. Being one of the most open regions in the world in terms of trade and capital flows, Southeast Asia is no exception. Figure 1 vividly illustrates such seemingly unstoppable depreciation for the five largest Southeast Asian economies (ASEAN-5 hereafter). Till the announcement of the second raise in the US interest rate on 16 December 2016, the US dollar has been gaining against these regional currencies at a rate that ranges from 13 per cent (Singapore dollar) to 39

Figure 1 The "Great Depreciation" in Selected ASEAN Currencies since Taper Tantrum in May 2013



Note: The shaded area ranges from second quarter 2013 to third quarter 2016, indicating the period when the reversal in US monetary stance was first mentioned in May 2013, first US interest hike since 2009 in December 2015, and the likelihood of a second interest hike in December 2016.

per cent (Malaysian ringgit). Following signals of more tightening moves in the subsequent year, ASEAN-5 currencies are expected to get weaker for an extended period.

While it is intuitively straightforward to observe contemporaneous depreciation on impact in regional currencies against the US dollar in responding to the announcement of US interest hikes, it is unclear if the US dollar

should have been appreciating over such a lengthy period. This is another demonstration against the uncovered interest rate parity (UIP) condition, which states that countries with high interest rates (or rising interest rate in the U.S context) should have *depreciating* currencies relative to currencies of countries with low interest rates (see Engel, 2014 & 2016 for a detailed discussion on this "forward premium puzzle"). It also seems hard to make sense of the magnitude of ASEAN currencies depreciation with the change in interest rate differentials when one thinks of the Malaysian ringgit depreciation by 39 per cent over the period of twice US interest hikes by merely 0.5 percentage point in total. Can the depreciating regional currencies really be accounted for by the unfavourable interest rate differentials? Is there a risk factor that constitutes wedge between domestic and foreign assets? If yes, what form the risk?

This paper addresses these questions by using the UIP framework. Through a simple rearrangement, we are able to quantify the responses of exchange rates to interest rate differentials on top of the speed of adjustment to expectation error. At the same time, in the spirit of the solution to forward premium puzzle available in the literature that pays attention to the presence of risk premium in UIP relation, we model risk not as an independent variable in the model but as a wedge that shapes the slope of UIP. We alternatively consider if global uncertainty, domestic fundamentals in terms of regional central banks' preference to intervene in foreign exchange market and capital account openness, and China's exchange rate policies, which we focus on the de facto flexibility in the renminbi and the U.S dollar weight (the dollar weight hereafter) in the renminbi's currency basket, play the role as risk wedge. The model is taken to a panel data of ASEAN-5 over the period 1982Q1 to 20116Q3.

The findings can be wrapped up as four takeaways:

i) Adjustment to expectation error is slow. Although it is statistically significant, it is by itself insufficient to explain the puzzling UIP relation.
ii) Global uncertainty, measured by VIX index and the US economic policy uncertainty index, is not always statistically significant with meaningful magnitude, and is thus unable to account for the orderly depreciating ASEAN-5 currencies given the yield differentials.
iii) Although regional central banks' willingness to let their respective currencies float instead of being intervened through the sales of international reserves does cause exchange rates to fluctuate more than what can be accounted by yield differentials, a piece of evidence in line with Aizenman and Hutchison (2012), and it is statistically significant, it fails to rationalise the UIP relation.
iv) By incorporating China's exchange rate policy as the risk wedge, the model successfully delivers a statistically and economically sensible

UIP relation in that higher (or rising)-yielding currency is appreciating. More interesting, it also demonstrates how China's policy has amplified ASEAN-5 currencies variations in the sense that greater yuan-dollar exchange rate flexibility and rising dollar weight make ASEAN-5 riskier.

The last finding is especially instrumental to point out a fact that any effort by the regional central banks to soothe exchange rate fluctuations in the face of US interest hike cannot ignore exchange rate policy implemented by the People's Bank of China (PBOC). Given the heavy dependence of ASEAN trade dynamics on China, not to speak of the growingly gaining currency investment flows, PBOC's exchange rate reform that allows the renminbi to be more flexible with market-determined central parity resembles massive waves that lift and sink all neighbouring boats along.

This paper can be positioned in two important yet independent literatures, and sows the seeds that could link both literatures fruitfully. On one spectrum, this paper contributes to the "forward discount puzzle" literature by proposing an innovatively simple way to restructure UIP relation for estimation. On another spectrum, this paper enriches the empirical literature with respect to the macroeconomic impact of Chinese economy on the world economy. Instead of focusing on international trade linkages (see, for instance, Eichengreen, Rhee, & Tong, 2007; Greenaway, Mahabir, & Milner, 2008; Wong, Eng, & Habibullah, 2014), we shed light on the impact of China's exchange rate policy on the UIP relation in ASEAN-5. By doing so, this paper links the latter literature to the former by suggesting the importance of exchange rate policy or reform in a large open economy like China as the source of excess risk premium for currencies in small open economies like ASEAN-5.

The paper is organised as follows. We present a framework for empirical investigation in Section 2, and from there we lay out the expectation adjustment term and risk wedge that shapes the slope of UIP relation. In Section 3, we discuss the data used for estimation. Findings are discussed in Section 4, in which we show the role of China's exchange rate policy as a source of risk wedge. We conclude in Section 5.

2. Framing the Empirical Investigation

We start the discussion by resorting to the standard empirical uncovered interest parity (UIP) relation as what follows:

$$\mathbb{E}_t LS_{it+1} - LS_{it} = \alpha_i + \beta(r_{it} - r_t^*) + u_{it} \quad (1)$$

where r_{it} and r_t^* denotes country i and US interest rate, respectively, LS_{it} is the logarithmic form of nominal exchange rate between country i and the US,

defined as country *i*'s currency value for the unit of the US dollar (higher LS_{it} thus implies depreciation in country *i*'s currency), $\mathbb{E}_t$ is expectation operator, and u is error term.

According to Equation (1), while higher-yielding currency should have appreciated on impact, it also means expected depreciation over time. In a perfectly rational asset market with perfect information, *ex post* exchange rates movement shall reflect accurately *ex ante* expectation. In other words, higher-yielding currency should be associated with depreciating currencies. In the context of estimation, one should empirically obtain $\beta = 1$ and $\alpha_i = 0$.

However, like other puzzles in international macroeconomics, we do not always get what we hope for. Years of empirical findings have pointed to a puzzling negative β (see, for instance, surveys by Engel, 2014). Despite the fact that UIP relation remains one of the most widely used exchange rate determination model in international macroeconomics, Chinn and Meridith (2004) called it "at best useless – or at worst perverse – as a predictor of future exchange rate movements". Since then, literature that aims to resolve the puzzle has been blossoming (see, for instance, Froot & Thaler, 1990, Eichenbaum & Evans, 1995 and Bacchetta & van Winchoop, 2010 for the idea of "delayed overshooting"; and Frankel & Meese, 1987, Engel & West, 2004, Evans, 2012 for "exchange rate risk premium"; and Lothian, 2016).

To deal with the potential issue of puzzle, we make two small innovations. First, we rewrite Equation (1) so that

$$\mathbb{E}_t LS_{it+1} - LS_{it-1} - (LS_{it} - LS_{it-1}) = \alpha_i + \beta(r_{it} - r_t^*) + u_{it}$$

to get

$$\Delta S_{it} (\equiv LS_{it} - LS_{it-1}) = -\alpha_i + \mathbb{E}_t LS_{it+1} - LS_{it-1} - \beta(r_{it} - r_t^*) + u_{it}$$

or in reduced form

$$\Delta S_{it} (\equiv LS_{it} - LS_{it-1}) = \rho_{i0} + \rho_1 ExpErrorAdj_{it} + \rho_2 (r_{it} - r_t^*) + u_{it} \quad (2)$$

where $ExpErrorAdj_{it} = \mathbb{E}_t LS_{it+1} - LS_{it-1}$, $\rho_{i0} = \alpha_i$, $\rho_1 = 1$, and $\rho_2 = -\beta$. We hypothesize that

i) With perfect-foresight agents and without government policy intervention, there is no rate of depreciation misaligned with *ex ante* expectation, $\rho_{i0} = 0$.
ii) For currency overvalued (undervalued) relative to long-run expected value, currency adjusts through depreciation (appreciation), $\rho_1 = 1$. For $0 < \rho_1 < 1$, it indicates "delayed adjustment" in the sense of Eichenbaum and Evans (1995) and Bacchetta and van Winchoop (2010).
iii) High interest rate currency relative to the US interest rate is associated with appreciation, $\rho_2 < 0$. This indicates the absence of forward discount

puzzle as $\rho_2 < 0$ implies $\beta > 0$. Purely fundamental-driven exchange rates with no excessive volatility will give us $\rho_2 = -1$.

What are the factors that shape the slope of UIP? Do reactions of exchange rates toward interest differentials depend on the reform in China's exchange rates? As the second innovation in estimation, which we draw upon the approach employed in Han and Wei (2016), we suppose the interaction between exchange rates movements and interest differentials is shaped by global uncertainty, domestic fundamentals, and China's factors as what follows

$$\rho_2 = \varphi_{i0} + \underbrace{\sum_{j=1}^{2} \phi_j X_{j,t}}_{\substack{Global \\ uncertainty}} + \underbrace{\sum_{k=1}^{K} \chi_k Y_{k,it}}_{\substack{Domestic \\ fundamentals}} + \underbrace{\sum_{l=1}^{2} \psi_l Z_{l,t}}_{\substack{China's \\ factors}}$$

Expanding Equation (2) together with these factors gives us

$$\Delta S_{it} = \rho_{i0} + \rho_1 ExpErrorAdj_{it} + \varphi_{i0}(r_{it} - r_t^*) + \sum_{j=1}^{2} \phi_j X_{j,t}(r_{it} - r_t^*) +$$

$$\sum_{k=1}^{K} \chi_k Y_{k,it}(r_{it} - r_t^*) + \sum_{l=1}^{2} \psi_l Z_{l,t}(r_{it} - r_t^*) + u_{it} \quad (3)$$

where we expect $\varphi_{i0} < 0$. Now, we have global uncertainty, domestic fundamentals, and China's exchange rate policy as the risk wedges that influence the ASEAN-5's UIP slope.

3. Data

In this section we briefly describe the data we use and construct for the estimation of Equation (3). Unless otherwise mentioned, the data are all sourced from the Oxford Economics via Thompson Reuter's Datastream, and range from year 1982 to 2016 on quarterly basis. We focus on the five most developed Southeast Asian economies, which happen to be the earliest members of the Association of Southeast Asian Nations (ASEAN), namely Indonesia, Malaysia, the Philippines, Singapore and Thailand (ASEAN-5). Being an open regionalism, China and the US have been among the top three (besides Japan) most important trading partners for decades. This goes without saying that the US dollar has long been an anchor currency for ASEAN-5 exchange rate management, with the Chinese renminbi joining the currency basket in recent years (Subramanian & Kessler, 2013; see Kawai & Pontines, 2016 for a sceptical view).

Changes in exchange rates are computed using the quarterly log differences. Money market rate is used as proxy for short-term interest rate with three-month treasury bill rate as substitute in the absence of money market rate. As in the literature, we use the popular VIX, a measure of the implied volatility of S&P 500 index options, as the indicator for global uncertainty. On top of this, we take Baker, Bloom and Davis' (2016) US economic policy uncertainty index as the proxy for policy uncertainty. Both series are extracted from the St. Louis Fred database.

We assume that expected exchange rates are aligned with the fundamental equilibrium exchange rates (FEER), which we estimate using the monetary approach to exchange rates. To be more specific, the monetary model of FEER can be presented as

$$LS_{it} = \gamma_{i0} + \gamma_1(Lm_{it} - Lm_t^*) + \gamma_2(Ly_{it} - Ly_t^*) + \varepsilon_{it} \quad (4)$$

where Lm_{it}, Ly_{it}, Lm_t^* and Ly_t^* denote log money supply and real gross domestic product in country i, and that of the US, respectively. In order to capture the potential impact of changes in velocity of circulation on prices and thus exchange rates due to the evolving landscape in the financial system, M3 is used as proxy for money supply. We expect that $\gamma_1 > 0$ and $\gamma_2 < 0$, as countries with greater money supply and lacklustre economic progress will be depreciating.

Table 1 reports the panel estimation using ASEAN-5 data. Once we take into account country effects as in the within estimator model, the

Table 1 Monetary Approach to ASEAN Fundamental Equilibrium Exchange Rates

	Pooled OLS	*Within Estimator*	*GLS*
*Lm – Lm**	-1.5021**	0.7561***	0.711***
	(0.0336)	(0.0029)	(0.0000)
*Ly – Ly**	1.6203**	-1.096***	-0.886***
	(0.0209)	(0.0029)	(0.0000)
Constant	2.8495*	4.5972***	4.029**
	(0.0671)	(0.0000)	(0.0055)
Observations	700	700	700
Poolability test		23869.48***	
BP LM test	13606.41***		
Hausman test			291.2***

Note: Local currency unit per US dollar is regressed, *m** and *y** stand for US M3 and real GDP, respectively. All variables are in natural logarithm. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Values in brackets are the estimated robust standard errors. Data are sourced from Oxford Economics.

results nicely fit with the theoretical motivation. Hausman test also confirms the superiority of within estimator model over the pooled OLS and GLS estimators. From within estimator, we then generate an estimated series of FEER that proxies the expected exchange rates, $\mathbb{E}_t LS_{it+1} = \widehat{LS}_{it}$, where

$$\widehat{LS}_{it} = \hat{\gamma}_{i0} + \hat{\gamma}_1(Lm_{it} - Lm_t^*) + \hat{\gamma}_2(Ly_{it} - Ly_t^*)$$

By doing so, we implicitly assume a perfectly rational foreign exchange market. Even so, the findings we discuss in the next section show there is a delay in adjustment to deviation from the fundamental equilibrium.

Turning to domestic fundamentals, we focus on two dimensions. First is the capital account openness. Whether changes in interest differentials instigate fluctuations in exchange rates relies on capital flows across borders as a response. The latter in turn depends on the openness of capital account. We resort to Chinn and Ito's (2006) widely used *de jure* measure of a country's degree of capital account openness (*KAOPEN*) as a proxy. *KAOPEN* is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*. The index is normalized to range between zero (closed capital account) and one (unrestricted capital account).

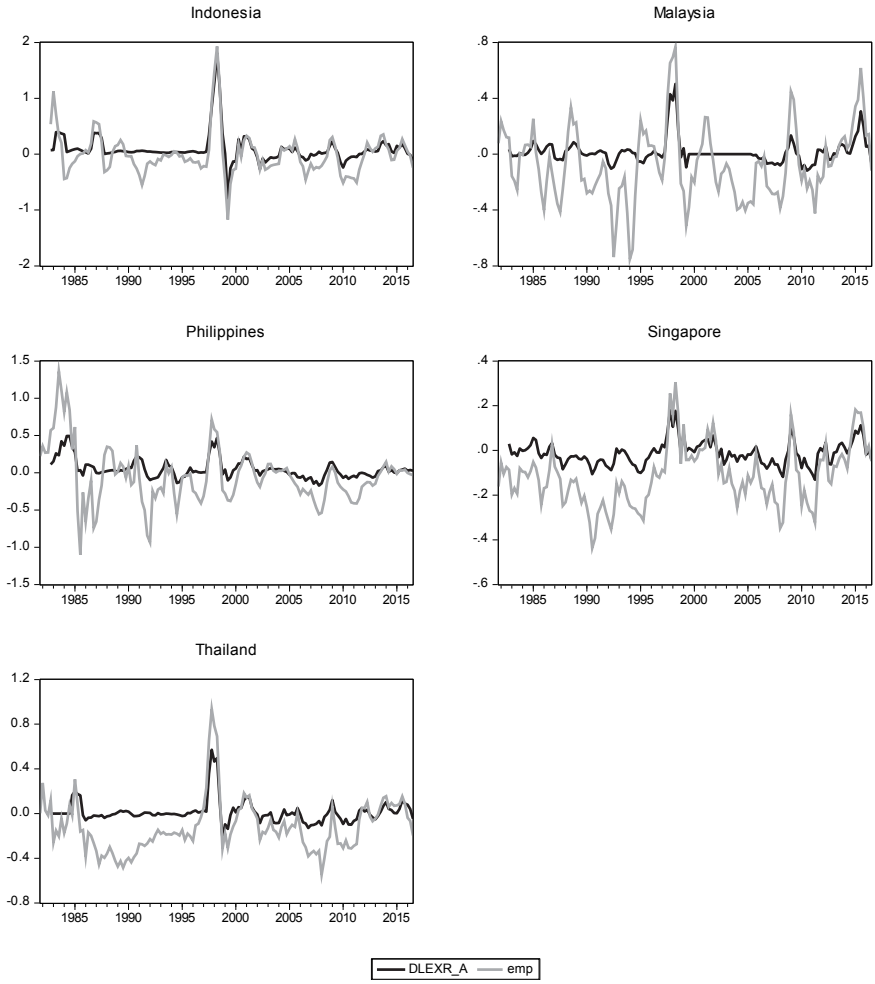
Another domestic fundamental which we think may alter directly the slope of UIP is the change in exchange market pressure Δ*EMP*. According to Frankel (2009), increase in international demand for the ASEAN-5 currencies may show up either in the price of the ASEAN-5 currencies or the quantity of the ASEAN-5 currencies. Δ*EMP* can be defined as

$$\Delta EMP_{it} \equiv \Delta LS_{it}^a + \Delta LIntRes_{it} \tag{5}$$

where ΔLS_{it}^a denotes year-to-year change in log exchange rates, whereas $\Delta LIntRes_{it}$ stands for year-to-year change in log international reserves of country *i*. Changes in exchange market pressure interestingly depend on the policies of the ASEAN-5 monetary authorities. If the authority chooses not to intervene in market transaction of ASEAN-5 currencies, Δ*EMP* largely reflects price pressure. Alternatively, the authority can alter quantity of international reserves by selling (buying) reserves to neutralise depreciation (appreciation), easing exchange market pressure.

Figure 2 illustrates the exchange market pressure alongside changes in exchange rates. Interestingly, it can be seen that price pressure during the 1997/98 Asian currency and financial crises was simply too huge to be moderated by changes in international reserves. In consequence, Δ*EMP* moves closely with ΔLS_{it}^a. Same phenomenon can be largely observed during the 2007/2008 global financial crisis, where ASEAN-5 monetary authorities

Figure 2 Exchange Market Pressure Facing the ASEAN-5



Note: dlexr_a = year-to-year changes in log exchange rates, emp = changes in exchange market pressure.

are more willing to let market pressure out through price changes. "Fear of floating" seems to give way to what Aizenman and Hutchison (2012) call "fear of reserve loss". Nonetheless, leaving aside these two unprecedented shocks, quantity intervention seems to remain as a popular tool to moderate fluctuations in exchange rates. By having more frequent episodes of negative ΔEMP alongside a relatively more stable exchange rate, in particular, this shows the tendency to stem depreciation while tolerating appreciation.

The last group of driving forces, which happens to be the focus of this paper, is China's exchange rate policy. We propose three measures with respect to *anchor*, *flexibility* and *volatility*. China has been reforming its exchange rate regime from unilateral dollar peg to crawling peg after July 2005 and managed floating with reference to a basket of currencies after June 2010. To find out the evolving weight of anchor currencies for the renminbi, which reflects the de facto China's exchange rate regime, we adopt the widely used Frankel and Wei's (1994, 2007) estimation.

$$\Delta S_{\frac{CNY}{NZD},t} = \phi_0 + \phi_{1,t}\Delta S_{\frac{U\$}{NZD},t} + \phi_{2,t}\Delta S_{\frac{euro}{NZD},t} + \phi_{3,t}\Delta S_{\frac{JPY}{NZD},t} + \phi_{4,t}\Delta S_{\frac{GBP}{NZD},t} + \nu_t \quad (6)$$

We follow Kawai and Pontines (2016) to use the New Zealand dollar as numeraire currency because it is a freely floating international currency without being weighted in the currency baskets of the ASEAN economies. However, even if the usual Swiss franc is used as the numeraire currency, the qualitative results remain the same with no significant differences in the quantitative measurement. Equation (6) is estimated on a rolling basis with window size of twenty quarters. Figure 3 illustrates the time-varying dollar weight and euro weight for Equation (6) and the expanded Equation (6) with changes in China's exchange market pressure (see Frankel, 2009). Although dollar weight has been declining since the abandonment of dollar peg in 2005, the US dollar remains the decisive anchor currency for the renminbi. Meanwhile, the importance of euro has been weakening since the onset of Eurozone debt crisis.

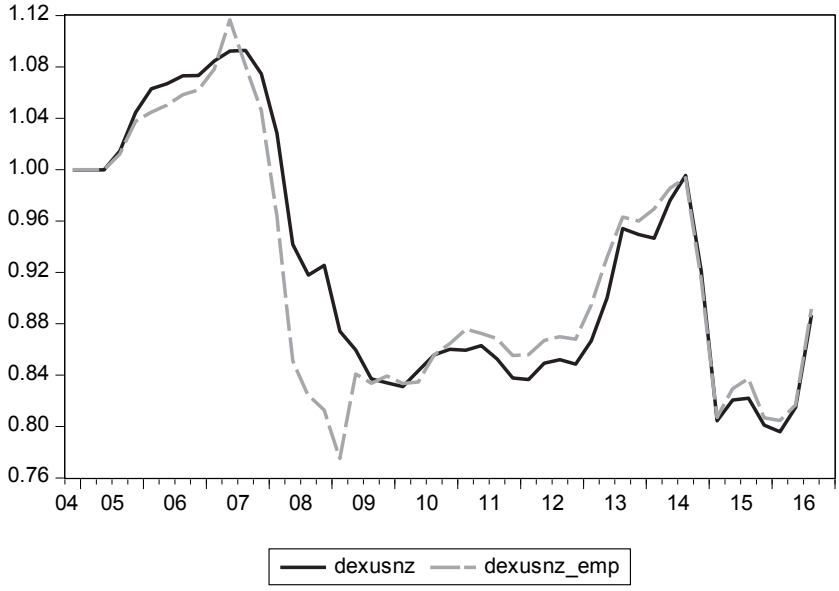
Lastly, flexibility and volatility of the renminbi are measured by quarter-to-quarter changes in yuan-dollar exchange rates and four-quarter moving average standard deviation of changes in yuan-dollar exchange rates, respectively.

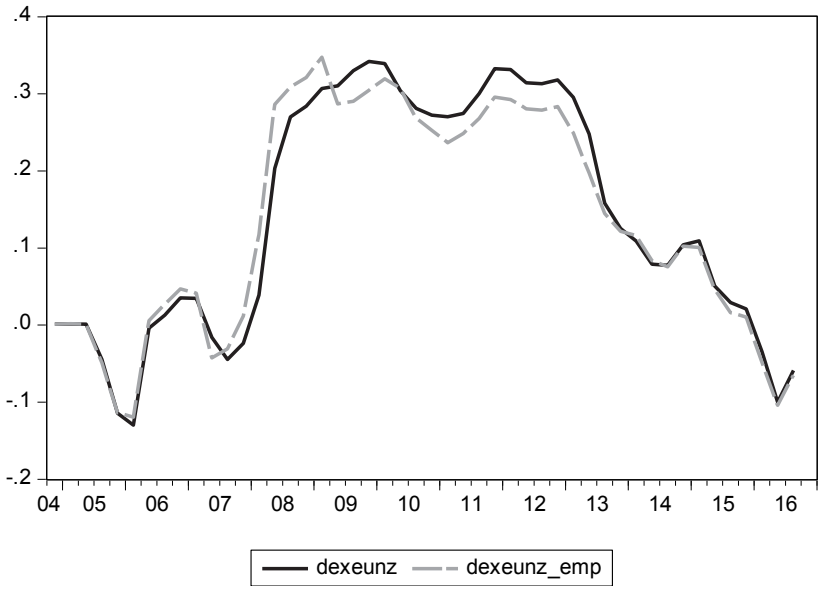
4. Results Discussion

We first estimate a standard UIP relation as in Equation (2). We then estimate the expanded UIP model that incorporates global uncertainty in both level and first difference. We run through three different estimators from pooled OLS to within and GLS estimators with robust standard errors. Results are reported in Table 2. Statistical comparison of models generally points to the superiority of within estimator that considers specifically country effect.

The finding is obvious: forward discount puzzle is present in ASEAN-5 UIP relations. Adjustment of expectation deviation is slow in speed and insignificant statistically. Intercept is nonzero with statistical significance.

Figure 3 Time-Varying Weights of the U.S Dollar and Euro in RMB's Currency Basket, 2004Q4 – 2016Q3





Note: *dexeunz* = time-varying weight of changes in euro in the RMB's currency basket, where *dexusnz* = time-varying weight of changes in the US dollar. The numeraire currency is New Zealand dollar; *dexeunz_emp* and *dexusnz_emp* are the rolling weights that take exchange market pressure (emp) into account. The numeraire currency is New Zealand dollar. Windows = 20 quarters.

Table 2 ASEAN-5 Exchange Rate Variation Unexplained by Global Factors, 1982Q1-2016Q3

	UIPC			*Global Factors-Level*			*Global Factors-First Difference*		
	POLS	*Within Estimator*	*GLS*	*POLS*	*Within Estimator*	*GLS*	*POLS*	*Within Estimator*	*GLS*
$\widehat{LS}_t - LS_{t-1}$	-0.0012	0.065*	-0.0012***	-0.0014	0.0808**	-0.0014***	-0.0009	0.0873**	-0.0009*
	(0.1502)	(0.0781)	(0.0000)	(0.1755)	(0.0321)	(0.0011)	(0.3782)	(0.0165)	(0.0968)
$r - r^*$	0.0693	0.0558	0.0693***	0.903***	0.5754***	0.9030***	0.0666	0.0147	0.0666
	(0.1574)	(0.394)	(0.0084)	(0.000)	(0.0016)	(0.000)	(0.2848)	(0.830)	(0.1069)
Interaction between Interest Differentials and Global Factors									
$VIX \times (r - r^*)$				-0.0037	0.0044	-0.0037			
				(0.5525)	(0.245)	(0.6053)			
$EPU^* \times (r - r^*)$				-0.0079***	-0.0070***	-0.0079***			
				(0.000)	(0.0021)	(0.000)			
$\Delta VIX \times (r - r^*)$							0.1289	0.0986	0.1289
							(0.6878)	(0.7157)	(0.6964)
$\Delta EPU^* \times (r - r^*)$							-0.459	-0.3047*	-0.4695***
							(0.1454)	(0.0514)	(0.0006)
Constant	0.0054*	0.0053**	0.0054***	0.0052	0.0047**	0.0052***	0.0039	0.0027	0.0039**
	(0.0632)	(0.0449)	(0.000)	(0.1241)	(0.0373)	(0.0005)	(0.2418)	(0.1053)	(0.0252)
N	695	695	695	535	535	535	530	530	530
Poolability Test		7.14***			6.66***			7.81***	
BP LM Test	0.00			0.00			0.00		
Hausman Test			27.29***			25.55***			29.7***

Note: Change in local currency unit per US dollar is regressed. Values in brackets are estimated cluster-robust standard errors. $\widehat{LS}_t$ is the estimated fundamental ASEAN exchange rates based on Equation (4). r^* refers to US interest rates. *VIX*, which measures the implied volatility of S&P 500 index option, is a proxy for global risk appetite, and *EPU** measures US economic policy uncertainty (Baker et al., 2016). *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Controlling for global uncertainty in the estimation apparently cannot resolve the puzzle. While global uncertainty is statistically insignificant, and interestingly, greater economic policy uncertainty appreciates higher-yield currency. This seems contradictory to the usual finding that greater policy uncertainty that causes risk off episodes is associated with depreciation (see, for instance, Kido, 2016).

One encounters the same problem when domestic fundamentals are controlled for either independently or together with global uncertainty, as reported in Table 3. Although change in exchange market pressure explains well ASEAN-5 currencies movement, as greater pressure with lesser reserve

Table 3 ASEAN-5 Forward Premium Puzzle also Unexplained by Domestic Factors, 1982Q1-2016Q3

	Domestic factors			*Domestic cum global factors*		
	POLS	*Within Estimator*	*GLS*	*POLS*	*Within Estimator*	*GLS*
$L\tilde{S}_t - LS_{t-1}$	-0.0022***	0.086*	-0.0022**	-0.0032***	0.1026**	-0.0032*
	(0.0108)	(0.0899)	(0.0249)	(0.0016)	(0.0377)	(0.0803)
$r - r^*$	-0.1867	0.0139	-0.1867	0.3900	0.3572	0.3900
	(0.1237)	(0.9734)	(0.6664)	(0.1556)	(0.5439)	(0.4927)
Interaction between Interest Differentials and Domestic Factors						
KAOPEN × $(r - r^*)$	0.0895	-0.2425	0.0895	0.3133	-0.2088	0.3133
	(0.4722)	(0.4537)	(0.7993)	(0.1334)	(0.6593)	(0.5489)
ΔEMP × $(r - r^*)$	0.3579***	0.4063*	0.3579**	0.6074***	0.6883**	0.6074**
	(0.000)	(0.0819)	(0.0179)	(0.000)	(0.0405)	(0.0142)
Interaction between Interest Differentials and Domestic cum Global Factors						
VIX × $(r - r^*)$				-0.0141**	-0.0113**	-0.0141**
				(0.0361)	(0.0336)	(0.0155)
EPU × $(r - r^*)$				-0.0067***	-0.0041***	-0.0067***
				(0.0005)	(0.0011)	(0.000)
Constant	0.0091***	0.0062	0.0091*	0.0122***	0.0091	0.0122
	(0.0026)	(0.2557)	(0.0793)	(0.0009)	(0.2867)	(0.1485)
N	692	692	692	535	535	535
Poolability Test		11.08***			10.68***	
BP LM Test	0.00			0.00		
Hausman Test			41.87***			39.8***

Note: Values in brackets are estimated cluster-robust standard errors. *KAOPEN* refers to Chinn-Ito capital account openness index (Chinn & Ito, 2006), and ΔEMP refers to change in exchange market pressure that measures exchange rate flexibility (the degree of central bank's fear of floating) according to Equation (5). The rest are as in Table 2.

Table 4 China's Exchange Rate Policy Does Matter

	US$ Weight in RMB's Basket			*RMB Flexibility*			*RMB Volatility*		
	POLS	*Within Estimator*	*GLS*	*POLS*	*Within Estimator*	*GLS*	*POLS*	*Within Estimator*	*GLS*
$\widehat{LS}_{it} - LS_{it-1}$	-0.0012	0.1065**	-0.0012	-0.0013	0.1065**	-0.0013	-0.0013	0.1065**	-0.0013
	(0.2314)	(0.0354)	(0.1217)	(0.2208)	(0.0351)	(0.1151)	(0.2321)	(0.0352)	(0.136)
$r - r^*$	-0.3283*	-0.5621	-0.3284***	-0.3537**	-0.5914*	-0.3537***	-0.3396*	-0.5909*	-0.3396***
	(0.0762)	(0.1044)	(0.000)	(0.065)	(0.0916)	(0.000)	(0.0842)	(0.0961)	(0.000)
Interaction between Interest Differentials and Renminbi									
$\omega_{US\$} \times (r - r^*)$	0.3159**	0.4553**	0.3159***	0.3334**	0.4756**	0.3334***	0.3249**	0.4752**	0.3249***
	(0.0221)	(0.0262)	(0.0003)	(0.0191)	(0.0226)	(0.0001)	(0.0248)	(0.0235)	(0.000)
$\Delta LS_{yd} \times (r - r^*)$				0.4793	0.5463***	0.4793***	0.5953	0.5508**	0.5953***
				(0.6041)	(0.0017)	(0.0036)	(0.5483)	(0.048)	(0.0008)
$\sigma(\Delta LS_{yd}) \times (r - r^*)$							-0.0959	-0.0037	-0.0959
							(0.7449)	(0.9827)	(0.4476)
Constant	0.0051	0.0038	0.0051**	0.0052	0.0038	0.0052**	0.0052	0.0038	0.0052**
	(0.1439)	(0.2032)	(0.041)	(0.1393)	(0.1931)	(0.0397)	(0.1426)	(0.1964)	(0.0445)
N	505	505	505	505	505	505	505	505	505
Poolability Test		10.86***			10.86***			10.81***	
BP LM Test	0.00			0.00			0.00		
Hausman Test			40.19***			40.27***			40.1***

Note: Values in brackets are estimated cluster-robust standard errors. $\omega_{US\$}$ is the US$ weight in renminbi's currency basket obtained through rolling regression *à la* Frankel and Wei (1994, 2007) of changes in Chinese yuan on changes in the U.S dollar and other major international currencies against the New Zealand dollar. ΔLS_{yd} refers to quarterly changes in yuan-dollar exchange rate that measures RMB flexibility, and $\sigma(\Delta LS_{yd})$ denotes 4-quarter moving standard deviation of changes in yuan-dollar exchange rates that measures RMB volatility. The rest are as in Table 2.

intervention results in relative price adjustment, forward discount puzzle persists. Also, ASEAN-5 currencies still puzzlingly behave as "safe haven currency" during elevated policy uncertainty.

We turn to China's exchange rate policy in Table 4. We first check the influence of the renminbi's dollar weight. Added to subsequent analysis is the renminbi flexibility, and last the renminbi volatility. Surprisingly, the puzzle disappears. Expanding interest differentials now appreciates the higher-yielding currencies, while holding other factors constant. We also found a delayed adjustment to expectation deviation. Size of these coefficients is economically meaningful and statistically significant.

More interestingly, Chinese exchange rate policy alters the slope of and shifts ASEAN-5's UIP relation. Although expanding interest differentials appreciates the higher-yielding currency, the effect diminishes along with greater renminbi's dollar weight and more flexible yuan-dollar exchange rates. Speaking differently, holding interest differentials constant, increasing dollar weight in the renminbi's currency basket and flexibility in yuan-dollar rates sink ASEAN-5 currencies.

To check for robustness, we take a different vantage point by examining excess risk premium in ASEAN-5 currencies in the spirit of Evans (2012) and Engel (2016). We define excess risk premium as $ER_{it} \equiv \Delta S_{it} - (r_{it} - r_t^*)$. Formally, we deduct interest differentials from both sides of Equation (2) to get

$$ER_{it} = \rho_{i0} + \rho_1 ExpErrorAdj_{it} + \phi(r_{it} - r_t^*) + u_{it} \tag{7}$$

where $\phi = \rho_2 - 1$. Hence, estimated results free of forward discount puzzle are obtained when $\phi < -1$. This is exactly what can be found in Table 5. By controlling for Chinese exchange rate policy, the coefficient ϕ estimated using the preferable within estimator is smaller than –1 with strong statistical significance. The renminbi's dollar weight and flexibility are critical driving forces for excess risk premium in ASEAN-5 exchange rates against the US dollar. The inclusion of domestic fundamentals weakens the results, whereas taking global uncertainty into consideration makes the results irrelevant.

5. Conclusion

Motivated by the persistent weakening of exchange rates in Southeast Asia in the aftermath of the US monetary policy reversal, this paper intends to investigate to what extent the changes in exchange rates can be explained by interest rate differentials. Drawn upon the observations of a panel sample of selected Southeast Asian economies, perhaps unsurprisingly, interest differentials fail to account for the exchange rate movements in terms of direction and magnitude.

Table 5 China Factors and Excess Risk: A Robustness Check

	China Factors			*China and Domestic Factors*			*All Factors*		
	POLS	*Within Estimator*	*GLS*	*POLS*	*Within Estimator*	*GLS*	*POLS*	*Within Estimator*	*GLS*
$L\tilde{S}_t - LS_{t-1}$	-0.0013	0.1065**	-0.0013	-0.0029***	0.1251**	-0.0029	-0.0032***	0.1086**	-0.0032
	(0.2321)	(0.0352)	(0.136)	(0.0058)	(0.0351)	(0.2265)	(0.0026)	(0.0277)	(0.1443)
$r - r^*$	-1.3396***	-1.5909***	-1.3396***	-1.8966***	-1.4338	-1.8966*	-0.7357	-0.6112	-0.7357
	(0.000)	(0.0043)	(0.000)	(0.000)	(0.1329)	(0.0508)	(0.1253)	(0.2244)	(0.1533)
$\omega_{U\$}$	0.3249**	0.4752**	0.3249***	0.1274	0.0513	0.1274***	0.2477	0.1184	0.2477
	(0.0248)	(0.0235)	(0.000)	(0.4428)	(0.2926)	(0.0054)	(0.3684)	(0.4699)	(0.2753)
ΔLS_{yd}	0.5953	0.5508**	0.5953***	0.4534	0.5213	0.4534	0.3867	0.4590	0.3867
	(0.5483)	(0.048)	(0.0008)	(0.6377)	(0.1833)	(0.1134)	(0.6825)	(0.2758)	(0.2275)
$\sigma(\Delta LS_{yd})$	-0.0959	-0.0037	-0.0959	0.1295	0.0546	0.1295	-0.0368	-0.0522	-0.0368
	(0.7449)	(0.9827)	(0.4476)	(0.6596)	(0.8697)	(0.7552)	(0.8986)	(0.8379)	(0.8977)
$KAOPEN \times (r - r^*)$				0.5587**	-0.1379	0.5587	0.3649	-0.2133	0.3649
				(0.0255)	(0.8169)	(0.483)	(0.1383)	(0.6489)	(0.5189)
$\Delta EMP \times (r - r^*)$				0.5749***	0.6878*	0.5749*	0.6062***	0.6995**	0.6062**
				(0.000)	(0.0562)	(0.0609)	(0.000)	(0.0436)	(0.0287)
$VIX \times (r - r^*)$							-0.0234**	-0.0156*	-0.0234***
							(0.0415)	(0.0776)	(0.0001)
EPU* $\times (r - r^*)$							-0.0070**	-0.0053**	-0.007***
							(0.0201)	(0.0211)	(0.0051)
Constant	0.0052	0.0038	0.0052**	0.013***	0.0086	0.013	0.0124***	0.0088	0.0124
	(0.1426)	(0.1964)	(0.0445)	(0.0008)	(0.3762)	(0.2448)	(0.0012)	(0.3029)	(0.1857)
N	505	505	505	505	505	505	505	505	505
Poolability test		10.81***			14.61***			10.98***	
BP LM test	0.00			0.00			0.00		
Hausman test			40.1***			52.66***			40.64***

Note: For notations, please refer to Tables 2 to 4.

Even when global uncertainty and central banks' stance toward more open capital account and less market intervention are taken into consideration, the puzzle remains, which brings us to the role of China's exchange rate policy. The latter is important not only in resolving the puzzle, producing theoretically coherent estimates on the relationship between interest differentials and exchange rate movements, but at the same time is also a wedge that explains the excess currency risk for Southeast Asia. We view this finding as a reminder to regional central banks to take China's exchange rate policy seriously in the effort to curb excessive exchange rate fluctuations in the face of U.S interest hike (see Wong & Eng, 2017, for cross-border macroeconomic implications of the renminbi reform).

Notes

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Chinese-ness Legacy? A Study of Ethnic Chinese Entrepreneur-controlled Banks in Malaysia

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Abstract

In pursuing the mammoth Belt and Road Initiative (BRI), China is counting on the perceived cultural similarities with the overseas Chinese to promote better bilateral understanding and business flows. This presents unprecedented opportunities but also risks because these communities are not identical. Among the overseas Chinese, Malaysia is unique because of its multiracial context, economic significance and growth prospects. As a start, this paper seeks to understand the risk psyche of ethnic Chinese entrepreneurs in Malaysia. It examines whether some traditional Chinese values may differentiate the ethnic Chinese entrepreneur-controlled banks compared with institutional-controlled banks. It traces the historical background of ethnic Chinese businesses and draws upon studies regarding family businesses and entrepreneurship, which yield mixed findings on their effectiveness as compared with institutional-controlled businesses. Using discriminant analysis on a survey of 135 risk management professionals, the findings suggest that the entrepreneur-controlled banks differ from the others through lower scores on two elements taken combinatively: (1) proactive awareness of new techniques, and (2) extent of learning in the course of developing their own risk models. These findings provide an empirical basis for some insights into these banks' risk psyche and enduring success. While such values are beneficial, one may also wish to consider adopting newer and institutionalized approaches to progress further.

Keywords: *overseas Chinese, banks, competency development, risk management*

1. Introduction

China's rapid economic growth, increasing trade with the Association of Southeast Asian Nations (ASEAN) and the mammoth Belt and Road Initiative

(BRI) have placed her even more prominently in the global radar screen. This, coupled with China's call for the Chinese diaspora's engagement in the BRI, will continue attracting discourse at unprecedented levels. It is greeted, on the one hand, by awe and excitement, and on the other, caution and suspicion. It therefore warrants a deeper inspection and reflection of the China and Chinese diaspora links. While many aspects have to be examined from different lenses, this paper takes the approach of *first, understand thyself*. This paper seeks to understand the risk psyche of the Chinese diaspora entrepreneurs. Much has been written on the Southeast Asian Chinese diaspora. Most draw on discourses of historical analysis, some on selected case studies but hardly any are empirically-based. It is in this regard that this paper departs from extant literature. This paper seeks to obtain insights from a survey of 135 risk management professionals of various seniority levels of banks in Malaysia.

The Chinese diaspora is also sometimes labelled as overseas Chinese so as to differentiate them from China's citizens. Yet, there are strong refutations to the use of such a term because this community is no longer sojourners who view China as their homeland. Instead, they have decided to reside in their respective host countries and hence, they are sometimes called "ethnic Chinese". As Chan & Ng (2004) put it, the ethnic Chinese have moved from identifying themselves as "overseas Chinese" in the earlier days of the pre-1950s to one of a local national first, and Chinese descent or ethnic Chinese second. Yet, the ethnic Chinese have complex and dynamic bipolar dimensions which are simultaneously communalistic/cosmopolitan and local in nature. While they identify with the locals and pledge allegiance to their local home (instead of China), they are often seen to differ from the local natives, both outwardly and culturally (Jakobsen, 2015, p. 620). In fact, the wave of migration from China to ASEAN seems to be growing again, in line with China's increasingly globalization moves and increasing China-ASEAN economic integration (Zhuang & Wang, 2010).

The ethnic Chinese continues to attract attention because of their contributions, growth and mythical complexity. The fascination grows with the rapid ascendance of China as a global economic powerhouse and the increasing China-ASEAN bilateral trade flows. Within ASEAN, Malaysia stands out for five reasons. First, within ASEAN, Malaysia is China's top trading partner (Tan, 2017). Second, China has been Malaysia's top trading partner for eight consecutive years since 2009, in the order of some USD60 to 100 billion per year (Ministry of International Trade and Industry, 2017). Third, unlike the majority Chinese-descent countries, such as Taiwan and Singapore, multi-racial Malaysia's Chinese-descent people constitute only 25 per cent of its population but contribute 60 to 70 per cent of its economy (FMT Reporters, 2016; Jakobsen, 2015). Fourth, China's expansion into ASEAN will see Malaysia being one the biggest beneficiaries, as manifested

in mega port and rail projects worth USD93 billion (Y.N. Lee, 2017). Fifth, three of China's major banks operate in Malaysia. China's fourth largest bank, Bank of China, recommenced operations in 2001, having previously ceased operations in 1959. China's (and the world's) top two banks by assets, Industrial and Commercial Bank and China Construction Bank, commenced operations in 2010 and 2017 respectively.

While the outlook seems to be one of huge growth, some have cautioned the risks in being overly dependent on China whose growth is slowing or whose growth bubble may burst (Knowledge@Wharton, 2016). In fact, China's ambitious Belt and Road Initiative is a strategic move aimed at a more robust economic growth trajectory. This will see even greater China involvement especially because ASEAN is strategically located between the two Asian giants of China and India. China is also asking ethnic Chinese businessmen to contribute towards the Initiative's success. Two prominent scholars, Leo Suryadinata and Wang Gungwu, have cautioned the ethnic Chinese to be alert that China is putting its own national agenda as top priority (Cheong, 2017). Hence, there is a need to enhance understanding of the ethnic Chinese business psyche in Malaysia by first tracing the historical background of their forefathers' migration to Malaysia, the key figures' backgrounds, their unique societal context in Malaysia and gauging the extent of their Chinese-ness which may still prevail today.

Within the ethnic Chinese business, banks play a unique role for three reasons. First, their origins were closely tied to enabling business growth during the early migration days. In fact, these banks continue to be key growth enablers in Malaysia today. Second, they largely survived the onslaught of the Asian Financial Crisis and are among the top banks in Malaysia. Hence, understanding their risk management prowess may offer valuable insights. Third, bringing the China-Malaysia trade and economic ties to a new frontier would inevitably need greater engagement of not only Chinese banks but more so, banks in Malaysia, especially those controlled by ethnic Chinese entrepreneurs. Hence, this paper focuses on the three major ethnic Chinese entrepreneur-controlled banks operating in Malaysia, namely Public Bank, Hong Leong Bank and United Overseas Bank. Of the three banks, United Overseas Bank is a Singaporean rather than a Malaysian-owned bank. Nonetheless, it is included in this study because of its inextricably intertwined historical and current Malaysia-Singapore ties. Moreover, besides being a major player especially among the ethnic Chinese SMEs, United Overseas Bank's Malaysian operations is the second largest contributor to the banking group's business.

The remainder of this paper is organized as follows. Section 2 reviews previous works on the historical background of the ethnic Chinese business, ethnic Chinese entrepreneur-controlled banks in Malaysia and key concepts in

entrepreneurship and family businesses. Section 3 discusses how prior work on risk management competency development is extended so as to identify the difference in the ethnic Chinese risk psyche, using discriminant analysis. Section 4 discusses the findings and Section 5 concludes.

2. Literature Review

2.1. Background – Ethnic Chinese Business

The Chinese who came to Malaysia and Singapore in the 1900s were mainly coolies and peasants. Many who were diligent and entrepreneur-inclined subsequently played intermediary roles between the local indigenous people (who largely remained in the agricultural sector) and the British colonial masters (Limlingan, 1986; Yen, 1998; Long & Han, 2008). The frequent interactions with the British enabled them to enhance their business knowledge and absorb modern Western values. The hybrid combination of the Chinese entrepreneurship traits and modern Western management techniques saw the later emergence of large, modern ethnic Chinese-controlled firms. While the Western approach to business was typically based on pure meritocracy and owner/manager separation, the Chinese approach emphasized personal connections and intertwined ownership and management. The contemporary ethnic Chinese, in adopting a hybrid approach, typically took the middle path. For instance, they considered both merit and matters of indebtedness and loyalty too. Likewise, the family would typically take ownership control, with a family member as the chief executive officer (Yen, 1998).

Having come to the newly-found and untested states of Malaysia and Singapore and being a new minority migrant group, the ethnic Chinese supported one another through informal but closely knit networks of kinship, collegiality and clans (Mackie, 1995). These reliable and personal networks provided access to a wide range of contacts, procurement sources, credit and market information – which facilitated efficient and successful business activities. A typical ethnic Chinese entrepreneur was averse to "unproven 'state-of-the-art' technology that involved high capital outlay" because of unfavourable past experiences and financial prudence; instead, they tend to gravitate towards cost-effective technology which suited the purpose (Jakobsen, 2015, p. 100). Businesses were built based on the time-tested gut feel and deep personal relationships with the business community to the extent possible. As businesses grew into large corporates, although more scientific methods of governance were required statutorily, it was still validated by personal knowledge and relationships (Hoflich, 2012).

Besides, they generally remain cautious of their precarious social position because their economic prowess was sometimes viewed with resentment and

suspicion by the indigenous natives. Hence, the ethnic Chinese largely steered away from politics and focused on running businesses and were careful not to stoke unpleasant sentiments among the indigenous population (S.-W. Cheong, 2017). The disparaging gap between the wealthy ethnic Chinese tycoons and the indigenous majority was blamed for the racial riots of May 1969. In order to curtail racial tensions, the government initiated the New Economic Policy (NEP) which aims for a more equitable wealth distribution. This results in affirmative actions which favour the indigenous majority and present challenges to the ethnic Chinese, more so when there are alleged abuses accompanying the NEP implementation. Hence, despite having been citizens of two generations or more, the ethnic Chinese businessmen still typically adopt a low public profile mind-set and navigate cautiously, much like their earlier migrant forefathers.

Even within Chinese-majority but multiracial Singapore, the ethnic Chinese businesses and Chinese-majority government often tread carefully so as not to cause uneasiness among their substantial non-Chinese locals and also the neighbouring Chinese-minority countries such as Malaysia and Indonesia (Wang, 2016). Instead, they learn to be "highly flexible and adaptable" to survive and fit in to the local conditions (Long & Han, 2008), a positive trait which Malaysia's former premier, Dr Mahathir Mohamad, notices as he describes the ethnic Chinese as being "accustomed to fighting for their very existence because of their precarious social position…. Thus, the Chinese have developed a mind-set of entrepreneurship and robustness" (Jakobsen, 2015, p. 82). Indeed, the resilience of the ethnic Chinese businesses, despite the lack of direct government assistance, was a key enabler for Malaysia's ability to survive the Asian financial crisis (K.C. Cheong, Lee, & Lee, 2015).

Traditional Confucian values, such as moral standards, hierarchy, paternalism, filial piety, loyalty, harmony, prioritising communal over personal interests and reciprocity, were passed on through families and also the vernacular school system (Wu, 1975). Even as the ethnic Chinese became more exposed to the forces of globalization, studies find that some traditional values such as paternalism or centripetal authority are very much alive even in modern-day Malaysia and Singapore (Hurtado, Smythe, Farrell, & Kopecki, 2013). This is manifested by observations that Chinese business management "even in large business groups – is based on tight personal control" as manifested in the case of Hong Leong Malaysia's chairman, Quek Leng Chan. Moreover, the chairman's power "rests not only in his control of shares … but also in his personal hold as the head of the family" (Tong, 2014, p. 18) and usually, one of "commanding personalities" (Hoflich, 2012, p. 183).

The extent of Chinese-ness is, however, not very clear because the ethnic Chinese business values seem to be increasingly different from one country to another (Loy, 2012). Meanwhile, some interviews with businessmen familiar

with China suggest that communism had largely broken down Confucianism, thus causing different business cultures among the Chinese nationals and the overseas ethnic Chinese (Redding, 1993). Nonetheless, with China's breakneck pace of economic growth and ascendance to the global arena, the age-old traditional Chinese values may gradually return to modern-day China. In fact, President Xi Jinping seems to be reviving Confucianism, or at least selectively, as a national ideology (Schuman, 2014).

2.2. Background – Ethnic Chinese Banks

The early ethnic Chinese banks were typically well connected through strong communal relationship. In order to mitigate their lack of Western banking technical knowhow, they were more particular about having collateral and dealt with customers of high credit standing. There are only two known failures thus far (Kwong Yik Bank in 1913 and Bank of Malaya in the 1930s). These failures were not attributed to customer defaults but rather customer deposit withdrawals due to alleged huge loans to directors (Gomez, 2013) and disruption of the remittances businesses due to China's political uncertainty (K.C. Cheong et al., 2015), respectively. In fact, K.H. Lee and Lee (2003) cite an OCBC study which suggests that the large ethnic Chinese businesses (which includes Public Bank and Hong Leong Bank) weathered the Asian financial crisis well.

The first bank in the then Malaya was the British-headquartered Chartered Bank in 1875. Together with the other foreign-controlled banks, it catered to the upper class elite, multinationals and cross-border trade, especially with the then colonial master, Great Britain. In order to meet the needs of the masses, the ethnic Chinese set up banks along dialect and clan groups. The first ethnic Chinese entrepreneur-controlled bank traces its roots to Kwong Yik Bank in Singapore. It was set up in 1903 by Wong Ah Fook, a Cantonese, Johor Baharu-based building contractor (S.-Y. Lee, 1974). Kwong Yik Bank set up its operations in Malaya in 1913 but was liquidated soon after because of sudden depositor withdrawals in the midst of alleged abuse through big loans taken by directors. Over the next 30 years, some 15 banks were established. Among the more prominent ones was OCBC Bank, established in Singapore in 1932. OCBC turned out to be a training ground for Khoo Teck Phuat, Teh Hong Piow and Khoo Khay Peng who are the founders of Maybank, Public Bank and MUI Bank (which later evolved into Hong Leong Bank today) respectively.

Teh, born in Singapore in 1930 into a poor migrant family from China, started his career as a bank clerk in OCBC and was appointed to a managerial position within five years. He subsequently joined Khoo's Maybank in Kuala Lumpur, where he quickly rose to become a General Manager. Teh's

aspiration of having his own bank came true in 1966 when he obtained a licence to run Public Bank (Jain & Kumar, 2014). Teh remains at the helm, surrounded by his faithful top management team whose average age exceeds 70, "and its IT infrastructure could do with an expensive upgrade" (Sidhu, 2017). Teh and Public Bank have won many accolades over its 50 years of history. Despite announcing his plan to retire in 2019, he will remain influential as Chairman Emeritus and Director. Most modern banks tend to centralize their back-room operations. But Public Bank counts on its branch managers to drive its business. Nazir Razak (Chairman of CIMB, Malaysia's second largest bank) says this facilitates "quick and de-centralised decision-making for small businesses that most institutionalised banks found hard to challenge" (Sidhu, 2017). This structure is said to be set by Teh, perhaps a reflection of his preference for a personalized "on-the-ground" approach for customer dealings. This bodes well for its both business development and risk management considerations.

Meanwhile, Hong Leong Bank, which started as Kwong Lee Mortgage and Remittance Company and controlled by the Lam family, was incorporated in Kuching, Sarawak in 1905. In 1982, the Khoo Khay Peng-controlled conglomerate, MUI Group, acquired Kwong Lee and renamed it Malayan United Bank and subsequently, in 1989, MUI Bank. In 1994, Quek Leng Chan's Hong Leong Group acquired MUI Bank and renamed it Hong Leong Bank. Quek beat another prominent ethnic Chinese entrepreneur, Vincent Tan, to the acquisition. Quek, born in 1941 in Singapore to a Chinese migrant family, is a UK-trained lawyer, who inherited part of his father's business but propelled it to greater heights and breadth when he was sent to run the Malaysian operations.

While Public Bank's Teh and Hong Leong Bank's Quek were both born in Singapore and migrated to Malaysia, United Overseas Bank's Wee family is the reverse. United Overseas Bank was founded as United Chinese Bank in 1935 in Sarawak by Wee Kheng Chiang, the late father of Chairman Emeritus, Wee Cho Yaw and grandfather of current CEO and deputy chairman, Wee Ee Cheong. Wee Kheng Chiang was born into a poor migrant Hokkien Chinese family in Sarawak and lost his father at the tender age of six. He grew up in harsh poverty and started off his career with a British company in Sarawak. He subsequently joined a company controlled by a local ethnic Chinese millionaire, Ong Tiang Swee, a local Chinese community leader. Soon, his diligence and good job performance caught his employer's attention who, in turn, match made Wee with his daughter. Wee's background of dealing with agricultural products and being sent to his ancestral home in China during his childhood put him in good stead to be a good trader. Wee's entrepreneurial traits, combined with Ong's networking with the elite, enabled him to prosper and eventually set up United Chinese Bank (Lam, 2012). Cho Yaw took

full control of United Overseas Bank in 1960 and took it further through innovative forays into foreign exchange dealings, overseas expansion, and mergers and acquisitions. Among the major recent mergers was Overseas Union Bank (in 2001), a large Singapore-based bank founded by Lien Ying Chow, a migrant ethnic Teochew Chinese. Cho Yaw's son, Ee Cheong (now aged 64), took over as deputy chairman and CEO in 2007. Although Cho Yaw (now aged 88) retired as chairman in 2013, his influence continues through his position as Chairman Emeritus and Adviser.

There are some similarities among all three key players – Teh Hong Piow, Quek Leng Chan and Wee Cho Yaw. First, they are not direct Chinese migrants. They are at least second generation Malaysians/Singaporeans, have lived here for more than 70 years and have their affinities tied to these countries rather than to China. Nonetheless, they are cognisant of the potential sensitivities of their dealings with the non-Chinese government authorities at home and in the region. The adverse impact of the NEP on ethnic Chinese business is particularly pronounced in the banking sector. In the 1970s, virtually all of Malaysia's domestic banks were ethnic Chinese-controlled but this sector is now controlled either by government-linked companies or privately-held indigenous capital (Hara, 1991), leaving the ethnic Chinese with only two, namely Public Bank and Hong Leong Bank (Sidhu, 2017). Second, just like many typical ethnic Chinese businesses, these highly respected business leaders remain hands on in running their banks. Third, their dominant positions are well entrenched, not only in terms of having the largest shareholdings but also because of the patriarchal respect given to them (Tong, 2014).

Conversely, there are two differences. First, unlike Teh and Wee who focus on banking, Quek runs a conglomerate in several diverse industries and is said to adopt the business philosophy of "buy low, sell high and never fall in love with any of [his] businesses" ("Leng Chan's business", 2016). Quek's foray into Hong Leong Bank is also relatively shorter, some 20 years as compared with Teh and Wee's 60 years and more. Nonetheless, Quek already had his finger in banking back in the 1980s, in the form of Dao Heng Bank in Hong Kong.

Second, Teh is the only true founder of a bank. Nonetheless, Wee significantly transformed the bank he inherited from his father, through diversification, internationalization and several acquisitions. Likewise, Quek acquired MUI Bank from founder Khoo Khay Peng and renamed it Hong Leong Bank. Five years later, Hong Leong Bank's existence was threatened; it was not listed as an anchor bank in the government-initiated banking rationalization plan. This was in the heat of the Asian financial crisis and after the dramatic sacking of Finance Minister and Deputy Premier Anwar Ibrahim, with whom Quek was said to be affiliated. Nonetheless, Quek

fought hard to have his bank included in an expanded anchor bank list. Quek also saw through the acquisition of EON Bank, all of which leads to Hong Leong Bank's position as the fifth largest banking group in Malaysia. Hence, although Wee and Quek are not the original founders of their banks, they significantly transformed and grew their banks. As such, their engagement level would be similar to that of an original founder, such as Teh.

2.3. Entrepreneurship and Family Business

The question of whether entrepreneur-controlled businesses are managed better remains unresolved. On the one hand, employing Jensen & Meckling's (1976) agency theory, there should be closer goals alignment between the owners (as principals) and the managers (as agents) because the owners are also actively managing the firm. In fact, goals alignment or deeper engagement levels may not be limited to the proportion of shares owned but also applies to psychological ownership (Mustafa, Ramos, & Man, 2015). If firm ownership is more concentrated, the intensity of monitoring the business should be greater, and there would be fewer incidences of free-riders and hence, such firms should perform better (Shleifer & Vishny, 1986). In fact, if the firm is still controlled by the founding family, it would perform even better (Anderson & Reeb, 2003). This is exemplified by what a United Overseas Bank director says of Wee Cho Yaw's thinking: "I have a billion dollars in the bank. It's my interest at stake. You think I will make a fool of myself?" (Tsui-Auch & Yoshikawa, 2015, p. 15). Studies on banks suggest that the greater involvement of the controlling (and founding) entrepreneur help improve firm performance and reduce default risk (Barry, Lepetit, & Tarazi, 2010). Such firms tend to have a longer-term emphasis oriented towards ensuring intergenerational survivability (James, 1999; Stein, 1989; Wong, 2010). Specifically, in the case of Chinese businesses, the longevity and honour attached to the family name is of paramount importance (Redding, 1995).

On the other hand, overly concentrated ownership may yield suboptimal results for minority shareholders (Shleifer & Summers, 1990; Shleifer & Vishny, 1986). This is especially true in two possible contrasting scenarios pertaining to the controlling entrepreneur's character. The first is when the entrepreneur is overly focused on maintaining family control and hence, becomes too risk averse (Morck, Shleifer, & Vishny, 1988). This results in suboptimal returns because opportunities for reasonable risk/reward deals are not taken up. The second scenario is when the controlling entrepreneur is too aggressive and hence, takes on too much risk (S.-W. Cheong, 2017; Haw, Ho, Hu, & Wu, 2009). In fact, (Tschoegl, 2001) reasons that "owner-managed firms possibly have[ing] a higher variance in their performance [because] … the owner-manager does not have to persuade others"; he also cites a study

of banks in East Asia which finds that "family-owned banks were among the most risky". Besides suboptimal risk/return trade-off considerations, the entrepreneur-controlled firms may tend to limit top positions to family members and close associates, not all of whom may necessarily be the best for those positions (Anderson & Reeb, 2003; Shleifer & Vishny, 1986). This would hamper attainment of the firm's true growth potential (Shleifer & Summers, 1990).

2.4. Summary

The ethnic Chinese's thinking is not only shaped partly by traditional Chinese culture but also tempered by challenges they faced as migrants or even refugees at some point in their ancestry. The foregoing discussions suggest that while some traditional Chinese values are likely to exist among the ethnic Chinese entrepreneurs today, the question as to which aspects are more pronounced remain unclear. The search for this answer is guided by Redding's (1995) three broad themes of *paternalism*, *personalism* and *insecurity* which he observes from a study of 72 executives from four countries. These themes also nicely summarize the foregoing discussions. *Paternalism* is the Confucian core value to promote social order. Ethnic Chinese businesses typically see power highly concentrated in their key leader, an extension of the family unit, who provides long lasting and stable leadership which facilitates the building of deep knowledge and strong networks. *Personalism* refers to informal but deep-rooted personal connections built on trust and reputation. *Insecurity* arises from the hostile environment faced both in China's history and also as migrants in their new host countries. This in turn leads to the traits of defensiveness, thrift and wealth accumulation (Redding & Hsiao, 1990).

3. Methodology

This paper extends the work of Koh, Avvari & Tan (2015) who developed an integrated framework which facilitates the continuous churning of talent for banks' risk management functions. This was done through a two-stage process. First, literature reviews and interviews with nine leading chief risk officers yielded a list of 23 operationalized elements. Second, a survey of 135 risk management professionals was conducted to test the framework. The results reaffirmed the appropriateness of the integrated risk management competency development framework.

This paper, however, aims to identify the areas in which the ethnic Chinese's risk psyche differs from the others. Hence, this section focuses on the process of conducting a discriminant analysis of the survey responses. Discriminant analysis seeks a combination of elements which best differentiates

between category groupings. It identifies a regression equation (comprising these pertinent elements) which best predicts membership into these category groupings (Field, 2009; George & Mallery, 2009). In the context of this paper, the category groupings are the ethnic Chinese entrepreneur-controlled banks and the others, i.e. the non-entrepreneur-controlled banks.

Some authors seem silent on the data prerequisites for discriminant analysis (e.g. Field, 2009; Malhotra, 2007). Hair, Black, Babin and Anderson (2010), however, suggested consideration of five criteria: sample size, sub-sample size for each category, dividing the sample into analysis and holdout subsamples, normality of the elements and the dependent variables having unknown but equal dispersion and covariance structures. While ideally all five criteria should be met, some non-conformity does not necessarily invalidate the use of discriminant analysis if the other requirements are largely met.

Of these five criteria, only the sample size requirement was not met. The ideal minimum sample size should be 115 (based on the guideline of at least five observations per element, i.e. 5 x 23 elements = 115). Of the 23 elements in the questionnaire, two are conditional because they relate to advanced banking practices which are less prevalent in Malaysia and hence, did not apply to all banks. These two elements gauge the extent to which the respondent's bank staff: (1) learn risk dynamics if the bank develops its own quantitative risk models, and (2) leverage sophisticated mathematical skills to complex derivatives. Not all banks develop their own risk models and not all banks utilize the mathematical skills of staff (from quantitative, non-business disciplines) for complex derivatives. The inclusion of these two conditional elements reduces the effective sample size from 135 to 79. This presents a statistical versus theoretical trade-off. Using the entire sample and ignoring these two conditional elements would mean that the sample size criterion is met but with the theoretical trade-off that these two elements are excluded from the analysis. Conversely, inclusion of these two conditional elements reduces the effective sample size to 79, which is below the required minimum of 115.

The remaining procedures for discriminant analysis follow Malhotra (2007), namely to estimate the function coefficients, to determine the function's statistical significance, to interpret the results and finally, to assess the function's validity. First, in estimating the coefficients, there is a choice between the simultaneous and stepwise estimation methods. Also, besides the *SPSS*'s default *F* value cut-off points, the more liberal points of 1.15 and 1.0, following George and Mallery (2009) were also run.

Second, the function's significance is tested using a *p* value benchmark of 0.05. Third, the discriminant function's results were interpreted by focusing on three items: standardized coefficients because these values are more useful than the unstandardized ones (Field, 2009), discriminant loadings using

absolute values exceeding 0.4 as being substantive (Hair et al., 2010), and group centroids. The coefficients represent the explanatory weights and show the power of that element across the two categorical groups. The loadings show the correlation between each element and the discriminant *z* score for each discriminant function. The group centroid shows the mean value for the discriminant *z* scores.

Fourth, assessment of the function's validity was done by comparing the proportions of correct classifications with proportions that would have been obtained by chance. To recapitulate, the discriminant functions which were considered, were those run based on three sets of variations: (1) include all elements versus exclude the two conditional elements, (2) the simultaneous versus stepwise estimation method, and (3) the default versus the more liberal F value cut-off. A total of six discriminant functions (i.e. *a1* to *a3* and *b1* to *b3*) were studied. The results of these functions are summarized in Table 1.

A review of Table 1 suggests that although *a1* has the highest eigenvalue, it does not comply with the covariance matrix equality assumption.

Table 1 Comparison of the Discriminant Functions

	Includes All Elements			*Excludes Two Conditional Elements*		
Criteria	*a1 simul-taneous*	*a2 stepwise F default*	*a3 stepwise F liberal*	*b1 simul-taneous*	*b2 stepwise F default*	*b3 stepwise F liberal*
Equality of covariance matrix?	no	no	yes	no	yes	yes
Eigenvalue	0.726	0.299	0.544	0.297	0.099	0.249
% variance in the dependent variable accounted for	42	23	35	23	9	20
Wilks' lambda significant?	yes (marginal)	yes	yes	no	yes	yes
Benchmark for validation %		66			71	
% correctly classified:	n/a – no substantive discrimi-nant loadings					
– original		73	84	78	67	70
– cross-validation		72	75	62	66	67

Likewise, all the other functions (except for *a3*) have at least one area of non-compliance, as shown in the shaded cells. Function *a3* is the only one with no violations and has decent results for all the other tests. Hence, *a3* is selected as the model for further discussions. The benchmark criterion for validation (66 per cent and 71 per cent respectively) is computed such that the proportion correctly classified should exceed that obtained by chance by ¼, i.e. using $\sum pi^2 * 1¼$ where p_1 and p_2 are the proportions of respondents in the entrepreneur- and non-entrepreneur-controlled banks respectively (Hair et al., 2010).

4. Findings

The results of the discriminant function are shown in Table 2. A review of the table shows the two elements which form the discriminant function and also have substantive loadings. Both the coefficients are positive. Hence, taken together with the function at group centroids (i.e. entrepreneur: -0.930, non-entrepreneur: 0.570), responses with higher scores for these two elements are more likely to have come from non-entrepreneur-controlled banks. Put another way, the entrepreneur-controlled banks are more likely associated with lower scores for these two elements.

First, the entrepreneur-controlled banks are likely to score lower for the extent of learning in the course of developing their own quantitative risk models. This may reflect *paternalism* in that staff members are more accustomed to tight and central directives from the key patriarchal figure (Tong, 2014) rather than actively engaging in reflecting processes at the ground level. They may be more respectful and submissive to the views and directional guidance from the patriarch, a core of Confucian tradition (Wu, 1975). Moreover, the financial conservatism and defensiveness arising from the ethnic Chinese's sense of *insecurity* would mean that they tend to avoid over-spending on purchase or even developments of risk models which may be overly complex (Jakobsen, 2015). Instead, they may adopt a more

Table 2 Discriminant Function: Ethnic Chinese Entrepreneur-controlled Banks versus Non-entrepreneur-controlled Banks

Elements	*Standardized Coefficients*	*Discriminant Loadings*
Extent learnt risk dynamics in developing own model	0.773	0.439
Proactive – new risk management techniques	0.556	0.431

pragmatic approach and rely more on information readily obtained from informal *personal* networks (Mackie, 1995).

Next, the entrepreneur-controlled banks are likely to score lower for proactive awareness of new techniques because *paternalism* largely prevails; the controlling entrepreneurs are still hands on, actively involved in their respective banks' daily activities and exerting tight controls (Tong, 2014). Given their conservatism, they probably emphasize a more *personal* touch to risk management. This may manifest in various ways. For instance, they may insist on tighter internal controls, be more personally involved in business deals or monitoring of risks and rely more on their personal business insights or network of contacts (Mackie, 1995). Besides, the controlling entrepreneurs may be more conservative in terms of spending or allocating resources for new risk management techniques. They may emphasize conservative and time-tested techniques which focus on fundamental issues rather than newer, less-proven risk management techniques (Hoflich, 2012).

In sum, each of the two elements which combinatively differentiate the ethnic Chinese entrepreneur-controlled banks can illustrate Redding's (1995) three broad themes of the ethnic Chinese – *paternalism*, *personalism* and *insecurity* – in different ways. Put another way, the ethnic Chinese in Malaysia today still exhibit some, though not all, aspects of Chinese-ness corresponding to all the three broad themes

5. Conclusion

China's phenomenal growth and increasing ties with ASEAN is poised to reach new heights with the mammoth BRI. Although it is unclear how the BRI will actually be run, China has already sought the support of ethnic Chinese abroad. This provides a two-edged sword of opportunity and risk. The China-ethnic Chinese link is dynamically complex. While many aspects have to be deliberated, this paper takes the first step of providing an empirical basis for understanding the risk psyche of the ethnic Chinese entrepreneur-controlled banks in Malaysia.

It begins by tracing the background of the ethnic Chinese businesses and the ethnic Chinese entrepreneur-controlled banks so as to understand the forces that mould them. It also looks at some key studies on entrepreneurship and family businesses which present mixed findings of the risk psyche of the entrepreneur-controlled businesses. Applying discriminant analysis on a survey of 135 risk management professionals, this paper finds that two elements combinatively differentiate the ethnic Chinese entrepreneur-controlled banks from the rest. These banks tend to have less intensity of being proactively aware of new risk management techniques and also the

extent of learning risk dynamics in the course of developing their own quantitative risk models.

These two elements suggest that some aspects of Chinese-ness in terms of *paternalism*, *personalism* and *insecurity* still exist today. While such traits have put these banks in good stead, one may also consider adopting more institutionalized risk management approaches so as to adapt to increasing complexity, volume, diversity and opportunities beyond these banks' traditional realm. Moreover, efforts to engage a wider spectrum of the staff members with more open dialogue may deepen psychological ownership and encourage more robust learning. Such approaches and efforts would help propel these banks to newer frontiers of excellence.

As in all research, this paper has limitations. The findings are based purely on a survey. A carefully administered post-hoc interview may help shed more light, facilitate triangulation and enhance the validity of the findings. Besides, the survey was limited to risk management professionals of banks. Inclusion of other business professionals from other key industry sectors would provide a more comprehensive picture of the ethnic Chinese entrepreneurs' risk psyche. Nonetheless, these limitations do not dilute the value of the insights obtained; rather, it provides avenues for future research to deepen and widen the understanding of this topic.

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Note

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Impact of Currency Reform on Chinese External Trade

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Abstract

This paper discusses the impact of Chinese authorities' 2005 decision to abandon the fixed exchange rate regime on China's international trade. After such reform, exchange rate volatility tend to arise and that can affect a country's international trade. As the Chinese economy is highly reliant on international trade, the consequences of exchange rate reform may be serious. Our findings reveal that the influence of exchange rate changes is negative only on China's imports. There is no such influence for its exports. Therefore, the exchange rate fluctuations after the 2005 reform are encouraging for China's trade balance. On the other hand, there is no significant effect on exchange rate volatility.

Keywords: *exchange rate, volatility, trade, China*

1. Introduction

In the absence of a fixed exchange rate regime, the exchange rate is an important issue for a country's international trade position. At the international level, the exchange rate can affect a country's trade competitiveness. It can cause uncertainty to a firm's cash flows and subsequently, its profitability. To manage these challenges, for example, the European Union introduced a common currency. China has followed a fixed exchange rate regime for a long time after the breakdown of the Bretton Woods agreement. Frequent central bank interventions is a common feature in the currency markets to ensure exchange rate stability.

Given the importance of exchange rate volatility effects on international trade, there exists a vast literature on the issue. However, available evidence on the influence of exchange rate volatility on trade is inconclusive. A long list of empirical studies is available that shows positive, negative, or no effects.

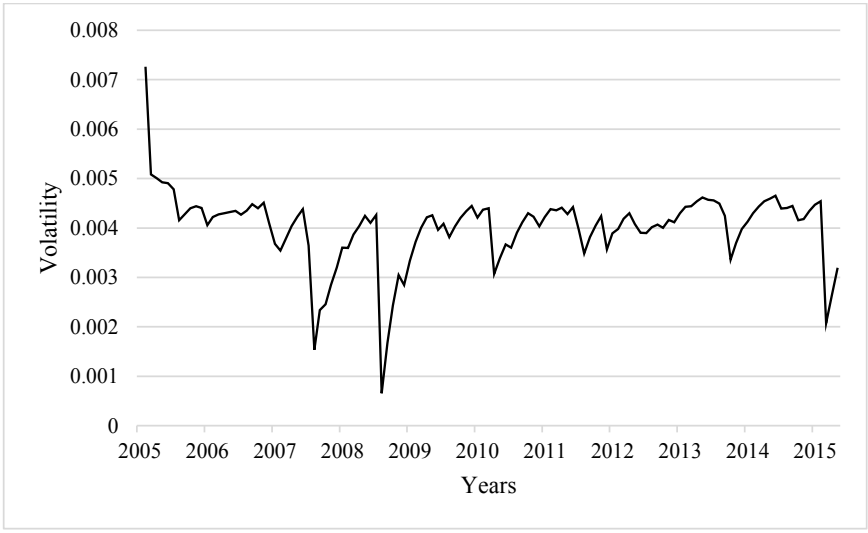
Theoretically, the literature is also supportive of the possibility of positive or negative, or even no effects. For example, loss averse traders divert their international trade to domestic trade to avoid currency risk. On the other hand, risk loving traders increase their international trade to compensate themselves to possible losses due to exchange rate uncertainty (De Grauwe, 1988). Risk neutral traders may not care about exchange rate risk due to exchange rate appreciation or depreciation. Moreover, the availability of hedging mechanisms like forward or swap contracts may help traders and firms avoid exchange rate risk. Therefore, even the theory opens up exchange rate uncertainties' influence over trade to further empirical evidence.

With the passage of time, China is opening up to the world. Previously a centrally controlled economy, Chinese authorities have now started to move towards market-based mechanisms. Within this line of reforms, China has abandoned the fixed exchange rate regime since 21st July 2005. Currently, China is on a managed float exchange rate regime. After the introduction of this new regime, fluctuations in the renminbi's exchange rate are notable (refer to Figures 1 and 2). Being a highly export-based economy, any uncertainty in the exchange rate can have serious effects on China's external trade.[1]

After the liberalization of the exchange rate, exchange rate risk may be a challenge for China's international trade position. This can affect the overall profitability of Chinese firms and their competitiveness in the global market. This issue is quite relevant for firm managers as well as for policymakers. Being more informed about exchange rate uncertainty's links with trade, a manager may be in a better position to decide either to opt for a forward

Figure 1 Renminbi/Dollar Real Exchange Rate, 2005-2015

Figure 2 Renminbi/Dollar Real Exchange Rate Volatility, 2005-2015



currency contract or leave the firm's position unhedged. This knowledge not only helps the manager to craft a proper and cost effective strategy to currency risk but it also maintains the firm's future profits at an optimal level relative to its international trade. On the other hand, policymakers can design suitable exchange rate policies that caters to domestic and international economic interests that are very important for China's export-based economy.

The primary objective of this paper is to build an understanding over the possible renminbi exchange rate risk effects on China's external trade. To this end, we examine the possible adverse effects on both China's exports and imports.

The rest of the paper is organized as follows: The next section provides a literature survey. Section 3 elaborates on the paper's methodology. Section 4 discusses the results and finally Section 5 concludes the paper.

2. Literature Review

Starting with the initial work of Hooper and Kohlhagen (1978), the extant literature on the effect of exchange rate volatility on international trade is voluminous.[2] However, the literature is still inconclusive on the topic. The findings can be categorized into at least three categories.

The first category of literature reported the negative effect of exchange rate volatility on trade. For instance, Bahmani-Oskooee and Wang (2007) examined bilateral trade between China and the US on an annual basis over the period 1978-2002. They reported the sensitivity of trade to exchange rate

volatility in half of their sample industries. Similarly, Yuan and Jianxiang (2011) studied the effect of exchange rate volatility on China's exports on a quarterly basis over the period Q1-1995 to Q1-2010. Based on cointegration approach, they found that exchange rate volatility had a significant negative effect on China's exports in the long-run. However, no such effects are observable in the short-run. In the same line, Nishimura and Hirayama (2013) examined the effect of exchange rate volatility on bilateral trade between China and Japan. They found that Japanese exports to China are not affected by exchange rate volatility. On the other hand, Chinese exports to Japan are negatively affected by the exchange rate volatility. Bahmani-Oskooee, Hegerty and Zhang (2014) studied the impact of exchange rate risk on bilateral trade between the UK and China. They reported that exchange rate volatility affected a few industries and this effect was negative. Wong and Tang (2014) researched the consequences of exchange rate variability on the top five Malaysian exports over the period 1990-2001 which found a negative effect on their considered exports industries. Doğanlar (2002) studied the effect of exchange rate volatility on the Asian economies' exports (i.e. Indonesia, Malaysia, Pakistan, South Korea, Turkey) and reported a reduction in exports due to exchange rate volatility. Arize, Osang and Slottje (2000) pondered on the exchange rate variability effect on thirteen less developed countries (LDCs) over the period 1973-1996. Their findings suggested that exchange rate volatility had a negative effect on their considered LDCs export flows. Sauer and Bohara (2001) used a panel approach to study regional countries' response to exchange rate risk. They showed that the effects on exports of LDCs in America and Africa are negative to the exchange rate risk. On the other hand, there was no such case for export's response for industrialized countries and LDCs of Asia.

The second category of literature reported positive effects of exchange rate volatility on trade. For instance, Soleymani and Chua (2014) studied the effect of exchange rate volatility on bilateral trade between Malaysia and China. Based on cointegration approach, they reported that exchange rate volatility influenced the majority of industries positively. Similarly, Poon, Choong and Habibullah (2005) studied the effect of exchange rate volatility in five Asian countries, namely, Indonesia, Japan, South Korea, Singapore and Thailand. Based on their analysis, they reported a positive effect of exchange rate volatility on the exports of Indonesia and Thailand in the long-run, as well as a positive response on Singapore's exports in the short-run. Choudhry (2008) found positive effects of exchange rate volatility on the exports of Canada, Japan, and New Zealand to the UK over the period 1980-2003.

The third category of literature reported ambiguous results over the effect of exchange rate volatility on trade. Examples of such include Aristotelous (2001), Tenreyro (2007), etc.

Based on this literature survey, the issue of exchange rate volatility effect on trade is still inconclusive and it is a topic that needs further investigation. This paper attempts to fill this gap by examining the effect of exchange rate volatility considering the liberal exchange rate regime in the context of China's international trade position.

3. Research Model and Econometrics

We model the export demand and import demand following recent research where they are modeled as a function of economic activity, exchange rate and exchange rate volatility (e.g. Bahmani-Oskooee & Aftab, 2017; Soleymani & Chua, 2014). These functions in an econometric form are as below:

$$LnExp_t^{CH} = \alpha_o + \alpha_1 Fc_t + \alpha_2 LnEA_t^{US} + \alpha_3 Ln\,\mathrm{Re}x_t + \alpha_4 LnVol_t + \varepsilon_t \qquad (1)$$

$$LnMpt_t^{CH} = \beta_o + \beta_1 Fc_t + \beta_2 LnEA_t^{CH} + \beta_3 Ln\,\mathrm{Re}x_t + \beta_4 LnVol_t + \mu_t \qquad (2)$$

where Exp and Mpt are Chinese exports and imports, respectively, with the rest of the world, Fc is a dummy variable for 2008 financial crisis, EA^{US} and EA^{CH} are proxies for economic activity in the US and China, respectively. Rex is real exchange rate defined as Chinese renminbi per unit of US dollar and Vol is real exchange rate volatility. Based on theory, the coefficient sign for EA^{US} and EA^{CH} is expected to be positive. The coefficient sign for Rex is expected to be positive in (1) and negative in (2). Finally, the sign for the coefficient of Vol is not clear in theory and thus, will be the main focus of our analysis.

Equations (1) and (2) are estimates for long-run effects. In order to estimate the short-run effects, the error correction specification is required. Given the fact that our model variables are of mixed order (i.e. stationary at level I(0) and stationary at first difference I(1)), we follow the bound testing approach suggested by Pesaran, Shin and Smith (2001).[3] The specification is as follows:

$$\Delta LnExp_t^{CH} = \alpha_o + \alpha_1 Fc_t + \sum_{i=1}^{n1} \alpha_{2,i} \Delta LnExp_{t-i}^{CH} + \sum_{i=0}^{n2} \alpha_{3,i} \Delta LnEA_{t-i}^{US} +$$

$$\sum_{i=0}^{n3} \alpha_{4,i} \Delta Ln\,\mathrm{Re}x_{t-i} + \sum_{i=0}^{n4} \alpha_{5,i} \Delta LnVol_{t-1} + \beta_o LnExp_{t-1}^{CH} +$$

$$\beta_1 LnEA_{t-1}^{US} + \beta_2 Ln\,\mathrm{Re}x_{t-1} + \beta_3 LnVol_{t-1} + \mu_t \qquad (3)$$

$$\Delta LnMpt_t^{CH} = \chi_o + \chi_1 Fc_t + \sum_{i=1}^{n5} \chi_{2,i} \Delta Mpt_{t-i}^{CH} + \sum_{i=0}^{n6} \chi_{3,i} \Delta EA_{t-i}^{CH} + \sum_{i=0}^{n7} \chi_{4,i} \Delta \mathrm{Re}x_{t-i} + \sum_{i=0}^{n8} \chi_{5,i} \Delta Vol_{t-1} + \delta_o LnMpt_{t-1}^{CH} + \delta_1 LnEA_t^{CH} + \delta_2 Ln\mathrm{Re}x_t + \delta_3 LnVol_t + \nu_t \quad (4)$$

Equations (3) and (4) are tested to examine whether cointegration exist among the variables. To do this, Pesaran et al. (2001) suggested new critical values. If the calculated F-statistic through the Wald test is greater than the upper tabulated critical value, one can establish the presence of cointegration. Once cointegration is established, one can gather the short-run estimates and long-run estimates through the coefficient attached to the first differenced variables and the estimates of normalized variables $\beta_1 - \beta_3$ on β_0 in (3) and $\delta_1 - \delta_3$ on δ_0 in (4), respectively.

In the case where cointegration is not established through the F-statistic, there is an alternative test to examine the presence of cointegration (i.e. the lagged error correction term, ECM_{t-1}). To calculate the ECM_{t-1}, lagged level variables are replaced through normalization in (3) and (4). For instance in the case of Equation (3);

$$ECM_{t-1} = LnExp_{t-1}^{CH} - \frac{\beta_1}{\beta_o} LnEA_{t-1}^{US} + \frac{\beta_2}{\beta_o} Ln\mathrm{Re}x_{t-1} + \frac{\beta_3}{\beta_o} LnVol_{t-1} \quad (5)$$

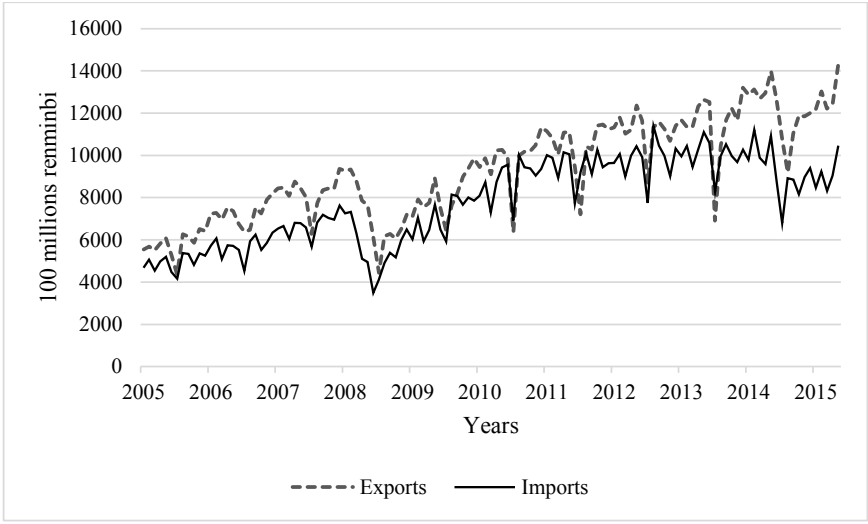
In the same fashion, ECM_{t-1} is calculated for Equation (4). Pesaran et al. (2001) provided critical tabulated t-statistic values for ECM_{t-1} as well. If the estimated ECM_{t-1} is negative and the t-statistic attached to the estimated ECM_{t-1} is higher than the upper tabulated t-statistics value, cointegration is established.

4. Results

Figures 2 and 3 show fluctuations in the exchange rate volatility and China's exports and imports. Is there any influence from exchange rate volatility on China's external trade after the 2005 exchange rate reform? To answer this question, we move to some systematic analysis. Based on bound testing approach, the analysis results are reported in Tables 1 and 2 for export and import models, respectively.

We examine, first of all, the presence of cointegration through the F-statistic and ECM_{t-1}. We do this by taking maximum eight lags and putting Akaike information criterion (AIC) to select optimal lag length. The estimates

Figure 3 Chinese Imports and Exports Over the Period 2005-2015



based on these tests and reported in Tables 1 and 2, reveal the presence of cointegration for both export and import models.

Before we interpret the results, it is necessary to check both export and import models through a set of diagnostic tests. The results of these tests are reported in the lower parts of Tables 1 and 2. We discuss these tests one by one. The adjusted R^2 show model fit. Lagrange Multiplier (LM) test examines the serial correlation. It is based on a chi-squared distribution with one degree of freedom. Its critical value is 2.70 (3.84) at the 10 per cent (5 per cent) level of significance. The estimates show that both export and import models have no serial correlation issues. To test the model specification, we use Ramsey's RESET test. This test also follows a chi-squared distribution with one degree of freedom. Its critical value is 2.70 (3.84) at 10 per cent (5 per cent) level of significance. The estimates show that both export and import models are rightly specified. To examine the stability of our estimates, we use CUSUM and CUSUM square tests. The stability graphs show that estimates are stable in both export and import models. These diagnostic tests ensures confidence in the validity of the results that follow.

Now we move on to discuss our main estimates. Table 1 reveals no effects of exchange rate changes as well as exchange rate volatility on China's export trade. This implies that recent Chinese exchange rate reform has not led to exchange rate influence on China's exports. This may also reveal some pertinent information where Chinese authorities are able to manage the exchange rate in favour of their export trade. Similar to our results, Bélanger,

Gutiérrez, Racette and Raynauld (1992) found that the free float exchange rate regime has no effect on Canada and the US trade. On the other hand, Table 2 reveals that exchange rate volatility has also no influence on China's imports. However, the change in exchange rate affects China's imports negatively.[4] This indicates the current response of international trade to yuan exchange rate is in favour of China's trade balance.[5] These findings may corroborate the view that Chinese authorities manipulate the exchange rate to their economy's favour.

Table 1 Long-run Estimates for Exports Demand Model

Dependent variable: Exports

Variable	*Coefficient*
C	2.0552(5.4525)***
DM	-.0847(-.4107)
$LnEA^{US}$	-.4437(-.4222)
LnRex	-1.6598(-1.423)
LnVol	.1636(1.3943)
Diagnostic Statistics	
F-test	5.4051
ECM_{t-1}	-.3027(5.3894)
Adj. R^2	.9261
LM	2.2573
RESET	1.5916
CUSUM	Stable
CUSUMQ	Stable

Notes: *, ** and *** indicate significance at 10%, 5% and 1% level respectively. At the 10% (5%) significance level when there are three exogenous variables (k=3), the upper bound critical value of the F-test is 3.77 (4.35). These come from Pesaran et al. (2001, Table CI Case III, page 300). Numbers in parentheses next to ECM_{t-1} are the absolute values of the t-ratio. Its upper bound critical value at the 10% (5%) significance level is -3.46 (-3.78) when k=3 and these come from Pesaran et al. (2001, Table CII-Case III, page 303). LM is Lagrange Multiplier test of residual serial correlation. It is distributed as χ^2 with one degree of freedom (first order). Its critical value at 10% (5%) significance level is 2.70 (3.84). These critical values are also used for Wald tests since they also have an χ^2 distribution with one degree of freedom. RESET is Ramsey's test for misspecification. It is distributed as χ^2 with one degree of freedom.

Table 2 Long-run Estimates for Imports Demand Model

Dependent variable: Imports

Variable	*Coefficient*
C	8.466(5.2701)***
DM	-.3827(-3.0632)***
$LnEA^{CH}$	-2.0756(-1.9984)**
LnRex	-3.8599(-11.6688)***
LnVol	-.3696(-.8998)
Diagnostic Statistics	
F-test	5.1291
ECM_{t-1}	-.8025(5.2628)
Adj. R^2	.9179
LM	1.8852
RESET	.2152
CUSUM	Stable
CUSUMQ	Stable

Notes: *, ** and *** indicate significance at 10%, 5% and 1% level respectively. At the 10% (5%) significance level when there are three exogenous variables (k=3), the upper bound critical value of the F-test is 3.77 (4.35). These come from Pesaran et al. (2001, Table CI Case III, page 300). Numbers in parentheses next to ECM_{t-1} are the absolute values of the t-ratio. Its upper bound critical value at the 10% (5%) significance level is -3.46 (-3.78) when k=3 and these come from Pesaran et al. (2001, Table CII-Case III, page 303). LM is Lagrange Multiplier test of residual serial correlation. It is distributed as χ^2 with one degree of freedom (first order). Its critical value at 10% (5%) significance level is 2.70 (3.84). These critical values are also used for Wald tests since they also have an χ^2 distribution with one degree of freedom. RESET is Ramsey's test for misspecification. It is distributed as χ^2 with one degree of freedom.

5. Conclusion

The influence of exchange rate on trade has been a hot topic since the debacle of the Bretton Woods fixed exchange rate regime. Therefore, it is no wonder there exists a huge literature on the topic. However, the findings to-date are still inconclusive. Although exchange rate liberalization is an old phenomenon in advanced economies, it is a quite a new phenomenon in many emerging and developing economies. Thus arise the need to collect new evidence over

exchange rate effects. Following this line of thought, our study examines the effect of exchange rate volatility on China's external trade. International trade has a substantial role in China's emergence as the second largest economy in the world. In July 2005, Chinese authorities decided to abandon their fixed exchange rate regime. We find that after this reform, the exchange rate effects on Chinese imports are negative while no influence is observable on Chinese exports. Therefore, the exchange rate changes are in favour of China's trade surplus. This may imply that reforms and liberalization in exchange rate regime favour China's external trade interests.

Notes

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1. The contribution of international trade is quite significant in China's emergence as the second largest global economy.
2. Two pertinent studies by McKenzie (1999) and Bahmani-Oskooee and Hegerty (2007) provide an extensive survey on the topic.
3. For details about this approach operationalization see Bahmani-Oskooee, Aftab and Harvey (2016).
4. Other studies that found the effect of exchange rate on trade are: Aftab, Abbas and Kayani (2012), Aliyu (2010), Asseery and Peel (1991), Cho, Sheldon and McCorriston (2002), etc.
5. In emerging and developing economies, exchange rate regimes are still not freely floating. The exchange rate is often used to maintain international competitiveness. The mechanism is such that any devaluation or depreciation in the exchange rate makes the exports of an economy cheaper in the international markets while imports of an economy expensive in its domestic market (Bahmani-Oskooee and Hegerty, 2010).

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Decomposition of Global Value Chains for Equipment Exports of China

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Abstract

Traditional trade statistics on gross trade is clouded by double counting of trade in intermediates across national borders. The value-added statistical method provides clarity to such situations which decomposes the global value chains (GVC) of exports. We have examined China's equipment manufacturing products trade by adopting value-added statistical method based on Wang, Wei and Zhu (2013). The decomposition results show a dominant share of domestic value-added (DVA), a small share of foreign value-added (FVA), a tiny share of returned domestic value-added (RDV), and pure double counting (PDC). This indicates that the exports of China's equipment products are mainly final products. Moreover, the results of participation and position indices show a stable participation trend and an upward trend in GVC respectively. Comparing with five selected countries, China's equipment industry participation in GVC is moderate and belongs to downstream industries.

Keywords: *global value chains, value added, decomposition, China, equipment industry*

1. Introduction

Since the nineties, international vertical specialization has spearheaded economic globalization. Final products comprise a large number of intermediate product that lead to the growth of world trade growth. Lamy and Shiraishi (2011) pointed out that the current production of many products is fast carrying the label of "Made in the World" with participation from many countries in various sectors yielding product division to form the global value chain (GVC) model.

Since joining the World Trade Organization (WTO) in 2001, China's exports had increased to US$1.2 trillion in 2009, surpassing that of Germany.

The total trade of commodities of China was US$4.16 trillion in 2013, which exceeded that of the United States as the largest trading country in the world. Simultaneously, the share of Chinese global exports accounted for 11.8 per cent of the world's gross trade. China's trade imbalance has become prominent and significant with trade deficit of US$1.14 billion in 1978 turning to a trade surplus of US$382.5 billion in 2014. China-US trade surplus was US$242.9 billion.

The conventional representation of trade numbers may not be an accurate definition of the inter country trade. Trade in intermediate goods far exceeded that for the final product when the production of exported products require imports of large quantities of intermediate products. Statistical measurements will overestimate the true value of the country's ability to create, making it easy to trigger trade disputes and other critical issues. According to a commonly cited study of the Apple iPod (Dedrick, Kraemer, & Linden, 2010), an iPod assembled in China cost US$144 at factory gate price, had only US$4 of value added from China. Intermediate products through global manufacturing chains mandates that the value of the final product is drawn from source countries of the final assembly country. Multiple transactions across national boundaries causes "double counting" problem clouding the accuracy of trade numbers.

After nearly thirty years of rapid development, China is now the world's largest manufacturing country. China being the final assembly location of many final products is part of the GVC. This is especially poignant for the equipment manufacturing industry, which represents an important portion of the manufacturing industry. This study explores the position of equipment manufacturing industry in the GVC and provide the empirical support for planners and policy makers in monitoring, evaluating and formulating relevant policies. Despite the importance of the equipment manufacturing industry, the decomposition of this value-added exports has yet to be fully researched. This study aims to analyse the decomposition of equipment's value-added exports of China. Total value-added exports can be decomposed into: 1) domestic value-added, 2) domestic value-added that returned home, 3) foreign value-added, and 4) pure double counting of value-added exports.

2. Statistical Reporting Issues for Global Value Chains in International Trade

2.1. Main Drawbacks of Conventional Trade Statistics

Conventional statistical calculation is characterized by the total amount from the final product technology and price. Schott (2008) in using the exports similarity index (ESI), stated that China's export products complexity was

similar to OECD countries, but of lower quality and did not appear to be catching up in most manufacturing industries. Gaulier, Lemoine, and Ünal-Kesenci (2007), Bensidoun, Gaulier, Lemoine, and Ünal (2009) and other scholars also proved this using different methods. Rodrik (2006) believed that China and India's exports have complexity, within its own economic capacity, and are dissimilar. Yi (2003), Hale and Long (2006), Wang and Wei (2008), Guo and Yang (2010) produced different interpretations on the causes of export complexity. Qiu, Ye, and Sun (2012) found that there is an overall upward trend by calculating the exports of manufacturing complexity for 24 industries in China. However, the economic freedom and the research and development of China's manufacturing value chain with positive effect is not found to be significant. Some of the drawbacks include the fact that the technical complexity of the method does not distinguish between technological content and source. Therefore, it cannot accurately distinguish whether the two sides are complementary or competitive. Moreover, the deciding factor of a competitive advantage of a country is not only on its technology, but also include factors such as infrastructure, natural resources and capital.

2.2. Rules of Origin of the Final Product Statistics

Under the global value chain, the international division of labour reported a new change from the labour division within the industry to that for intra-industry, gradually evolving into labour based division of intra-product international division of the labour system. In this division of the labour system, the final product goes through two or more links. These production links are distributed in two or several countries, and produce value-added in various production processes (Milberg, Jiang, & Gereffi, 2014). The intermediate inputs cross national borders. Traditional international trade statistics is based on the rules of origin of the final product statistics. However, with the rapid development of trade in intermediates, their proportion has exceeded the trade in final product. This new trade regime had dynamically altered international trade patterns. Traditional statistical methods look more and more obsolete in tandem with these changes. Specifically, there is a large number of repeated trade data for intermediate goods in multiple production links. If trade statistics are counted based on the gross value instead of the value-added method, it will result in large amounts of double counting. Another consideration is that a country's trade in goods contains the value of inputs from other countries, that is, the rule of origin does not reflect the product in the value chain of different production processes. A country's trade statistics will therefore include other countries' intermediate products (Koopman, Wang, & Wei, 2014). Thus, the total value of the statistical final

product does not truly reflect the real situation of a country's trade. There is a need for the existing international trade statistical methods to be improved so that it is more reflective of the true scale of international trade and national trade incomes.

2.3. Double-counting Value-added in Trade Statistics

The trade in value added accounting method is gaining more traction. This method forms the base of the global value chain to calculate the contribution of countries to the product value, which deducts the intermediate products each time through customs' statistics of the double-counting value-added. It represents the status of the countries in global trade. The trade gains of countries can also be determined by the ratio of each country's exports of domestic value-added and foreign value added (Koopman, Wang, & Wei, 2012). In 2010, WTO proposes "World Manufacturing" to measure the added value of each link in the value chain to solve the double counting problem and restore the true face of international trade in order to promote the reform of international trade statistical methods under the global value chain. The former WTO Director General Pascal Lamy, pointed out that the statistical trade data based on trade value of total imports and exports resulted in misunderstandings on the imbalance between many countries in 2011. The statistical method with an altered domestic value-added measurement in total trade flows is better able to detect the global trade situation and reflect trade imbalance.

2.4. Global Value Chains Framework

Koopman, Powers, Wang, and Wei (2010) proposed a new measurement framework for value-added and participation in global value chains in the process of international trade, known as the KPWW method. Koopman et al. (2012) reported the advantages of value added method which is further detailed by Daudin, Rifflart and Schweisguth (2011). They expanded the total exports into five parts, and for the first time, provided a set of measurement formula for the "double counting" in trade value. Koopman et al. (2012) also proposed a method to measure the position of a country's international division of labour called "GVC_Position". They believed that if a country is located in an industrial high-end global value chain (upstream industry), it means that it is more inclined to participate as an intermediate product provider of the international division of labour, and vice versa. This method contributes towards a complete unified framework for added value theory. Lately, Wang, et al. (2013) expanded the KPWW method to thoroughly decompose a country's exports into 16 terms. This method is more comprehensive compared to the KPWW method.

3. Methodology

Based on literature on global value chain theory presented earlier, we will utilize the latest method of decomposition of value-added proposed by Wang, et al. (2013) to decompose the share of foreign value-added and the domestic value-added for the exports of equipment manufacturing industry products of China from year 2000 to 2014. Based on the world input output tables (WIOT), the equipment manufacturing industry includes manufacture of basic metal, manufacture of fabricated metal products, except machinery and equipment; manufacture of computer, electronic and optical products; manufacture of electrical equipment; manufacture of machinery and equipment n.e.c. (not elsewhere classified); manufacture of motor vehicles, trailers and semi-trailers and manufacture of other transport equipment.

Based on Wang et al. (2013), the total exports of a country were decomposed into four major categories: 1) domestic value-added absorbed by countries abroad (DVA), including the DVA in the final goods exports, DVA in intermediate exports, and DVA in re-exported intermediates to third countries, 2) returned domestic value-added (RDV), which includes intermediates that return as final imports, and intermediates that return as intermediate imports, 3) foreign value-added (FVA) which include foreign value-added used in final goods export, and foreign value added used in intermediate exports, and 4) pure double counting (PDC), which is made up of pure double counting from foreign source and domestic source.

4. Results

4.1. The Share of Equipment Industry Products in China's Manufacturing Industry Exports

Since China's equipment manufacturing industry reported a trade surplus in 2004, its industrial scale and imports and exports trade volume experienced rapid growth. In 2007, China's imports and exports of equipment manufacturing products accounted for 49.3 per cent and 49.7 per cent of total import and export respectively (Chen & Liu, 2011). China became the largest trading country in the equipment manufacturing industry in 2009. In 2012, the trade volume of Chinese equipment industry exceeded US$1.8 trillion, which is 1.1 times larger than that of the United States, 1.6 times that of Germany, and 2.5 times that of Japan. Imports and exports in 2013 were US$820 billion and US$113 billion, respectively, accounting for 42 per cent of total imports and 51 per cent of total exports (Lin & He, 2015).

Table 1 shows the exports share of Chinese equipment industry products in the whole manufacturing industry products exports from 2000-2014. According to this table, the proportion of equipment industry exports

Table 1 Share of Equipment Industry Exports in Manufacturing Industry Exports, 2000-2014 (USD billion)

Year	*Manufacturing*	*Equipment*	*Proportion of Manufacturing (%)*		
			Total	*Final*	*Intermediate*
2000	199.2	95.6	48.0	27.7	20.3
2001	210.5	101.1	48.0	27.8	20.2
2002	259.3	131.6	50.7	29.5	21.2
2003	366.2	200.4	54.7	32.3	22.5
2004	518.0	306.3	59.1	34.7	24.5
2005	671.4	396.9	59.1	35.1	24.0
2006	862.7	523.1	60.6	35.0	25.6
2007	1087.8	670.6	61.7	35.7	26.0
2008	1259.0	799.5	63.5	36.0	27.5
2009	1036.3	649.2	62.6	37.4	25.2
2010	1375.9	891.0	64.8	37.6	27.2
2011	1639.1	1044.7	63.7	36.2	27.6
2012	1727.8	1099.4	63.6	36.4	27.2
2013	1876.1	1178.4	62.8	34.0	28.8
2014	1994.7	1257.8	63.1	33.3	29.8

Note: The equipment manufacturing industry includes manufacture of basic metal; manufacture of fabricated metal products, except machinery and equipment; manufacture of computer, electronic and optical products; manufacture of electrical equipment; manufacture of machinery and equipment n.e.c.; manufacture of motor vehicles, trailers and semi-trailers; manufacture of other transport equipment.

Source: World Input-Output Table.

accounted for 48.0 per cent of total manufacturing industry exports in 2000. Until the end of 2014, the proportion has increased to 63.1 per cent of the total exports of manufacturing exports, which reported a 15 per cent growth and captured more than half of the share of gross exports. This indicates that the exports of equipment products have become the primary enzyme of China's manufacturing exports growth. Based on types of exported products, the final products share has increased from 27.7 per cent in 2000, to 33.3 per cent in 2014, of the percentage of gross exports in manufacturing, while the intermediates exports show a rapid growth from 20.3 per cent in 2000, to 29.8 per cent in 2014. The share of final products exports is consistently higher than the intermediate products during the reporting period, which means that the exports of Chinese equipment product are mainly final products.

4.2. Value-added Decomposition of China's Equipment Industry Exports

The decomposition results of value-added for China's equipment exports are shown in Tables 2 and 3. The total DVA of China's equipment manufacturing exports increased from US$72.5 billion in 2000 to US$945.4 billion in 2014, with an average annual growth rate of 20.2 per cent. The proportion of domestic added-value in total exports shows a smile curve, which decreases from 75.9 per cent in 2000 to 67.1 per cent in 2008, and then gradually increases to 75.2 per cent in 2014. This explains the fact that China's equipment manufacturing industry is increasingly participating in GVC. The domestic value added in final exports (DVA_Fin) also shows a significant downward trend, the value declines from 44.0 per cent in 2000 to 41.6 per cent in 2014, which is a decrease of 2.4 per cent.

The domestic value added in intermediate exports (DVA_Int) shows a weak upward trend. The value increases from 18.7 per cent in 2000 to 21.5 per cent in 2014. The domestic value added in re-exported intermediates to third countries (DVA_Intrex) also shows a slight downward trend. The value decreases from 13.2 per cent in 2000 to 12.1 per cent in 2014, a decrease of only one percentage point.

Although China's equipment exports have a high relative proportion of DVA, it does not mean that the exports are high in technological content and in the upstream position of GVC. This is because the exports of domestic value-added is mainly dominated by final exports rather than intermediate exports. This indicates that China's equipment exports in GVC is not significant and is in downstream position. However, the decreasing share of DVA_Fin, as well as the increasing share of domestic exports of intermediate goods (including DVA_Int and DVA_Intrex) shows that the Chinese equipment manufacturing industry has a tendency of moving upwards in GVC.

The returned domestic value added (RDV) of the Chinese equipment manufacturing industry shows a steady upward trend, rising from US$1 billion in 2000 to US$33.7 billion, while its share of total exports increases from 1.1 per cent in 2000 to 2.7 per cent in 2014 per cent, an increase of 1.6 percentage points. However, it still occupies a small portion of total exports of equipment. The returned domestic value added as final imports (RDV_Fin) volume increases from US$0.4 billion in 2000 to US$13.3 billion in 2014, while the share of total exports increases slowly from 0.5% to 1.1%. The returned domestic value added as intermediate imports (RDV_Int) rises sharply from US$0.6 billion in 2000 to US$13.3 billion in 2014, with the proportion of total exports rising from 0.6 per cent in 2000 to 1.6 per cent in 2014.

The relatively small increase in RDV of China's equipment exports is mainly due to the fact that China's equipment industry belongs to downstream industry within the GVC, which mainly follows the design of the core

Table 2 Decomposition of GVC Exports of Chinese Equipment Products (USD billion)

Year	*Total exports*	*DVA*				*RDV*			*FVA*			*PDC*		
		DVA_ Fin	*DVA_ Int*	*DVA_ Intrex*	*Total*	*RDV_ Fin*	*RDV_ Int*	*Total*	*FVA_ Fin*	*FVA_ Int*	*Total*	*DDC*	*FDC*	*Total*
2000	95.6	42.0	17.8	12.7	72.5	0.4	0.6	1.0	13.2	4.3	17.6	0.3	4.1	4.5
2001	101.1	45.1	19.0	13.2	77.4	0.6	0.7	1.3	13.4	4.3	17.8	0.4	4.3	4.6
2002	131.6	57.2	23.8	16.3	97.4	0.9	1.1	2.0	19.4	6.0	25.3	0.7	6.1	6.8
2003	200.4	83.5	33.3	23.0	139.8	1.6	1.7	3.3	34.6	10.4	45.0	1.4	10.9	12.3
2004	306.3	122.8	49.3	34.6	206.6	2.6	2.6	5.2	56.7	17.0	73.7	2.6	18.0	20.7
2005	396.9	160.8	62.7	43.0	266.5	3.2	3.3	6.4	74.8	22.1	97.0	3.9	23.0	27.0
2006	523.1	206.6	84.1	60.5	351.2	4.5	4.3	8.8	95.6	29.3	124.8	6.0	32.2	38.3
2007	670.6	264.3	110.5	75.0	449.8	3.6	6.1	9.7	123.7	39.3	163.0	7.8	40.3	48.1
2008	799.5	320.7	140.5	94.4	555.6	4.5	7.7	12.1	1319.0	46.3	178.2	8.8	44.8	53.5
2009	649.2	292.2	114.1	69.8	476.1	5.2	6.6	11.7	95.5	31.3	126.8	6.1	28.4	34.5
2010	891.0	383.0	153.2	98.5	634.7	8.2	10.2	18.4	134.4	47.9	182.2	10.5	45.2	55.6
2011	1044.7	442.3	184.1	120.7	747.1	10.7	13.4	24.1	150.5	56.8	207.3	12.4	53.8	66.2
2012	1099.4	477.4	198.7	121.8	797.9	11.5	15.7	27.2	1519.0	56.8	208.7	13.7	51.9	65.6
2013	1178.4	487.5	232.8	135.8	856.0	12.1	19.4	31.5	150.5	67.3	217.8	15.6	57.4	73.0
2014	1257.8	522.9	270.5	151.9	945.4	13.3	20.4	33.7	140.9	67.4	208.2	15.8	54.6	70.4

Notes: Please refer to Appendix 1 for definitions of the variables.

Table 3 Decomposition of GVC Exports of Chinese Equipment Products (percentage)

Year	*DVA*				*RDV*			*FVA*			*PDC*		
	DVA_ Fin	*DVA_ Int*	*DVA_ Intrex*	*Total*	*RDV_ Fin*	*RDV_ Int*	*Total*	*FVA_ Fin*	*FVA_ Int*	*Total*	*DDC*	*FDC*	*Total*
2000	44.0	18.7	13.2	75.9	0.5	0.6	1.1	13.8	4.5	18.4	0.3	4.3	4.7
2001	44.6	18.9	13.1	76.5	0.6	0.7	1.3	13.3	4.3	17.6	0.4	4.2	4.6
2002	43.5	18.1	12.4	74.0	0.7	0.8	1.5	14.7	4.6	19.3	0.5	4.7	5.2
2003	41.6	16.6	11.5	69.7	0.8	0.8	1.6	17.3	5.2	22.5	0.7	5.4	6.1
2004	40.1	16.1	11.3	67.5	0.9	0.9	1.7	18.5	5.6	24.1	0.9	5.9	6.7
2005	40.5	15.8	10.8	67.2	0.8	0.8	1.6	18.8	5.6	24.4	1.0	5.8	6.8
2006	39.5	16.1	11.6	67.1	0.9	0.8	1.7	18.3	5.6	23.9	1.2	6.2	7.3
2007	39.4	16.5	11.2	67.1	0.5	0.9	1.4	18.4	5.9	24.3	1.2	6.0	7.2
2008	40.1	17.6	11.8	69.5	0.6	1.0	1.5	16.5	5.8	22.3	1.1	5.6	6.7
2009	45.0	17.6	10.8	73.3	0.8	1.0	1.8	14.7	4.8	19.5	0.9	4.4	5.3
2010	43.0	17.2	11.1	71.2	0.9	1.1	2.1	15.1	5.4	20.5	1.2	5.1	6.2
2011	42.3	17.6	11.6	71.5	1.0	1.3	2.3	14.4	5.4	19.8	1.2	5.2	6.3
2012	43.4	18.1	11.1	72.6	1.1	1.4	2.5	13.8	5.2	19.0	1.2	4.7	6.0
2013	41.4	19.8	11.5	72.6	1.0	1.6	2.7	12.8	5.7	18.5	1.3	4.9	6.2
2014	41.6	21.5	12.1	75.2	1.1	1.6	2.7	11.2	5.4	16.6	1.3	4.3	5.6

Notes: Figures are in percentage of total exports and percentage of distribution for the respective category. Please refer to Appendix 1 for definitions of the variables.

components product, research and development, and branding from developed countries that participate in the processing and assembly-based low-end production processes. However, the share of RDV in China's equipment exports shows an upward trend. Although the share of RDV is small, the value-added of Chinese exports would be rarely returned to the domestic market, from the subdivision level aspects, the proportion of intermediate products exports (RDV_Int) is higher than the final products (RDV_Fin) in China's equipment industry. This indicates that the returned goods are mainly intermediate, may be mainly primary intermediate products, processed into advanced intermediate products, then exported to foreign countries.

The foreign value added (FVA) in the exports of Chinese equipment manufacturing industry increases significantly from US$17.6 billion in 2000 to US$208.3 billion in 2014, with an average annual growth rate of 19.3 per cent. As of 2011, the foreign value-added in final goods (FVA_Fin) amounted to US$140.9 billion. While, the foreign value-added in intermediate goods (FVA_Int) constitutes US$67.4 billion. The FVA_Fin is more than twice that of the FVA_Int. From the perspective of the proportion of total equipment products exports, the FVA also shows a significant downward trend where the value of 18.4 per cent in 2000 has decreased to 16.6 per cent in 2014, a drop of 1.8 percentage points. It indicates that the foreign value added in China's equipment exports is slowly decreasing. FVA_Fin is significantly higher than that of FVA_Int, decreasing by 2.6 points, from 13.8 per cent in 2000 to 11.2 per cent in 2014. The FVA is mainly accounted for by the final product during the reporting period. This shows that China's equipment industry products are mainly engaged in the final process of production, such as processing and assembly-based activities, which participated in cross-country production sharing on the low end of GVC. However, FVA_Int is increasing during this period, which implies that China is upgrading its equipment industries to begin producing intermediate products for foreign countries to produce the final products.

The proportion of pure double counting (PDC) shows a tendency to increase. A percentage of 4.7 per cent in 2000 increases to 5.6 per cent in 2014. Simultaneously, the exports from US$4.6 billion in 2000 increases to US$70.4 billion in 2011. These data indicate that the intermediate goods of the equipment industry have been going through few domestic and foreign customs before it has been utilized in the final production. Moreover, the pure double counting from domestic country (DDC) is significantly lower than that of the pure double-counting from foreign countries (FDC), which respectively increases from 0.3 per cent and 4.3 per cent in 2000, to 1.3 per cent and 4.3 per cent in 2011, and separately increased by 1 and zero percentage points, respectively. It implies that PDC is mainly due to the fact that their imports of intermediate products frequently cross national borders, but it does not explain

how Chinese equipment industry participates in the international division of labour or whether it is deepening in GVC. Moreover, since intermediate trade crosses national borders, it is similar to domestic inter-industry transactions that produces intermediate inputs where the values of these intermediate trade values do not constitute the gross domestic production (GDP).

According to Table 4, the participation rate of China's equipment industry shows a slight downward trend, decreasing from 31.6 in 2000 to 28.6 in 2014. The participation reported the highest index of 35.5 in 2007, and the lowest rate of 28.6 in 2014. Furthermore, the position index of China's equipment manufacturing industry is always negative during the reporting period, but has a slight uptrend, where the value of index has risen from -0.0443 in 2000 gradually to -0.0392 in 2014. It implies that the equipment industry of China

Table 4 Index of Participation and Position of GVC for Chinese Equipment Industry

Year	*GVC Participation Index*	*GVC Position Index*
2000	31.6	-0.0443
2001	30.7	-0.0390
2002	31.7	-0.0594
2003	33.9	-0.0942
2004	35.4	-0.1088
2005	35.3	-0.1157
2006	35.4	-0.1046
2007	35.5	-0.1115
2008	34.1	-0.0896
2009	30.3	-0.0763
2010	31.5	-0.0812
2011	31.4	-0.0716
2012	30.1	-0.0687
2013	30.0	-0.0606
2014	28.6	-0.0392

Note: GVC participation index is calculated based on Koopman et al. (2010) where GVC participation index = (DVA_Intrex / total exports) + (FVA / total exports), GVC position index = ln ((1 + (DVA_Intrex / total exports)) – ln ((1 + (FVA / total exports)). Larger GVC participation index indicates higher degree of participation in GVC. For position index, if a country's DVA_Intrex share is higher than its FVA share, it probably lies upstream of the GVC. Conversely, it means that it lies in downstream of the GVC indicating that country uses a large share of intermediates inputs from other countries to produce its own exports products.

remains in the lower position and participation in global value chains, but has a tendency to move up, which is in tandem with the results reported by Wang (2014) on China's manufacturing industry.

During this period, the GVC position index shows an unstable trend, going down in 2005, then up in 2014. The reason for the decrease in position index is highly resulted from the decrease in FVA which slightly dropped from 58.1 per cent in 2000 to 57.8 per cent in 2014. In addition to the greater share of FVA as compared to DVA_Intrex, it implies that the contribution of foreign imports to China's equipment manufacturing exports is significantly greater than the contribution of the exports of China's equipment industries to foreign supply chains.

5. Discussion

It can be seen that the result for DVA exhibited a "smile curve" during the entire study period. The decrease began in year 2000 and reached the bottom in 2006. However, FVA showed an opposite trend where it reached the highest value in year 2007 and decreases thereafter. This illustrates that after joining the WTO, the degree of participation in international trade division becomes deeper, especially in the rapid development of processing trade. During this period, China used a large number of foreign materials and intermediate products to produce industrial equipment. Therefore, the proportion of DVA decreased while FVA increased. On the other hand, the global economic crisis in 2008 has reduced the demand from foreign markets. In the short term, the exports fell sharply due to the increase of protectionism in some countries, which encourages the adoption of domestic intermediate products.

The increasing trend of the small share of PDC from 4.6 per cent in 2001 to 7.2 per cent in 2007 shows that after China joined the WTO, the trade tariffs and barriers has largely decreased, which leads to increased demand for intermediate goods in the manufacturing sector. Therefore, the frequent trade between China and other countries in intermediate goods leads to the increase of double counting. RDV which constitutes the smallest share in total equipment exports shows that China choose to outsource some products to other countries for production and processing, then re-export it to the homeland (Liou, Lin, Chang, and Hsu, 2016).

Table 5 shows the top five importers of equipment manufacturing products from China during 2000 to 2014. Based on the results, the top two importers of Chinese equipment manufacturing exports, the US and Japan remained unchanged from 2000-2014. The bilateral trade between China and the US increased from US$22.9 billion in 2000 to US$208.1 billion in 2014. Since joining the WTO in 2001, China's trade with Germany, South Korea, UK, and Taiwan had surpassed US$10 billion. This implies that joining

Table 5 The Top Five Importers of Equipment Products from China during 2000-2014 (USD billion)

Country	Ranking	2000		2005		2010		2014	
China	1	USA	22.9	USA	88.8	USA	152.6	USA	208.1
	2	Japan	12.4	Japan	42.3	Japan	67.2	Japan	102.2
	3	Germany	5.1	Germany	21.2	Germany	43.8	S. Korea	62.6
	4	S. Korea	4.2	S. Korea	18.0	S. Korea	42.2	Germany	48.6
	5	UK	3.5	Taiwan	11.5	UK	23.3	Taiwan	30.3

Source: Author's calculation based on World Input-Output Table from 2000 to 2014.

the WTO has successfully promoted and developed China's equipment manufacturing exports. This coincides with the development trend of China's overall equipment manufacturing trade.

As shown in Table 6, the US is the only country that shows positive GVC index between 2000 and 2014. In the same period, Germany, as a highly developed industrialized country, showed a downward trend in its position index. The number was from -0.05 in 2001 to -0.07 in 2007, from the high position, decreasing in its GVC position. The GVC position index for Japan, although positive in the early period, shows a slight downward trend that achieves a negative value after 2011. This indicates that Japan's equipment industry is changing from upstream to downstream industry. This is also consistent with the result of Suder, Liesch, Inomata, Mihailova, and Meng (2015, p. 409) that the high gain potential in Japan has decreased during the period of 2000 to 2007. The reason cited by them is that some of production activity has moved out of Japan to other countries through foreign direct investment (FDI).

Compared with the aforementioned countries, China ranked in the middle level position in GVC. By the end of 2014, China has caught up with Japan. The position index line of China shows a sharp wave during that period. From 2000 to 2007, the position index shows a downward trend which can be explained by China joining the WTO in 2001. Foreign direct investment (FDI) continues into the equipment manufacturing industry, mainly engaged in low-end assembly and processing stage of production, leading to China's decreasing position index in GVC. This is consistent with Lin and He (2015), who posited that China is still in the low-end position in GVC, lower than the USA and Japan.

6. Conclusion

This paper uses the GVC method proposed by Wang et al. (2013) to decompose the gross exports of China's equipment industry products based on the World Input-Output Tables from 2000 to 2014. The first aspect is the

Table 6 Participation and Position Indices for Six Countries

Year	*Participation (%)*						*Position*					
	China	*Korea*	*Japan*	*Germany*	*UK*	*USA*	*China*	*Korea*	*Japan*	*Germany*	*UK*	*USA*
2000	31.6	35.8	24.2	32.6	36.1	22.0	-0.0443	-0.0896	0.0806	-0.0501	-0.0075	0.0352
2005	35.3	35.1	26.8	33.4	37.1	23.1	-0.1157	-0.0843	0.0515	-0.0530	-0.0007	0.0300
2010	31.5	37.9	30.2	35.5	41.5	24.9	-0.0812	-0.1272	0.0313	-0.0771	-0.0839	0.0339
2014	28.6	37.5	33.6	35.6	40.2	25.7	-0.0392	-0.1160	-0.0373	-0.0756	-0.0715	0.0015

Source: Authors' calculation.

result of gross exports decomposition of China's equipment industry. (1) the exports of domestic value-added is mainly dominated by DVA_Fin, while both DVA_Int and DVA_Intrex are relatively small, which to some extent indicates that China's equipment manufacturing industry in the GVC is not significant. (2) the share of FVA_Fin is greater than FVA_Int which shows that the China's equipment products are mainly engaged in the final process of production, such as processing, assembly-based activities. (3) China's exports would be rarely returned to the domestic market shown by the smallest share of RDV.

It demonstrates an upward trend for intermediate products exports of China's equipment manufacturing industry from 2000 to 2014, while the final products show a downward trend. The domestic value-added in China's equipment industry exports is significantly less than its gross exports trade, and the gap between them is growing. This indicates that the value-added accounting method for international trade objectively restore the real situation of China's equipment manufacturing trade. During the reporting period, the share of domestic value-added in the exports of equipment manufacturing industry of China shows a downward trend, and dominated by the exports of final product. However, the proportion of the domestic added value of the intermediate product exports is increasing. It illustrates that although China's equipment industry is still in a relatively downstream position in the global value chain, it is gradually rising to the upper position of the value chain. The exports of China's equipment product is made up of more and more foreign value-added, which means that it improves the degree of its participation in the global value chain, but mainly in the low-end production process, such as assembly or final product processing. Simultaneously, the proportion of value-added in intermediate products in the China's manufacturing industry keeps increasing, which indicates that China's equipment industry has the tendency in upgrading from downstream position of the GVC to middle stream.

Moreover, the value of foreign value added in final products (FVA_FIN) is higher than the sum of foreign value added in intermediate products (FVA_INT) and purely double-counting from foreign accounts (FDC), indicating that it lies in the lower position in GVC. An increase in the share of FDC and FVA_INT in China's equipment industry shows that participation in the GVC for the equipment industry belongs to a downstream industry. The value-added exports of intermediate goods to third countries (DVA_REX) is significantly higher than the returned domestic value-added (RDV), indicating that China's equipment industry is mainly involved in a few global value chain production links.

Appendix 1 Definition of Variables

Variable	*Definition*
DVA_Fin	Domestic value added in final exports
DVA_Int	Domestic value added in intermediate exports
DVA_Intrex	Domestic value added in re-exported intermediate exports to third countries
FVA_Fin	Foreign value added in final goods
FVA_Int	Foreign value added in intermediate goods
RDA_Fin	Returned domestic value added as final imports
RDA_Int	Returned domestic value added in intermediate imports
DDC	Double counting from domestic country
FDC	Double counting from foreign countries

Notes

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Managing Risk inside China: Insights from In-depth Empirical Analyses in Manufacturing Industry

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Abstract

This article provides key insights into the valuation of enterprise risk management (ERM) inside China. According to data gathered from manufacturing industry in China, the article examined the implication of risk management within firms through the effect of ERM on the relationship between individual risks and risk portfolio, on the relationships among categorical risks and risk structure, and on the relationship between categorical risk and firm performance. In order to evaluate the benefits of ERM in a comprehensive manner, a covariance-based structural equation modeling (CBSEM) was adopted as the major method. The results revealed that ERM mitigated the association between individual risks and risk portfolio in China. In addition, the relationships among categorical risks in the risk structure were weakened as well. Since the relationship between categorical risks and firm performance became significantly weak when firms embraced with ERM, therefore, it implied that ERM can optimize the risk structure and add value to firm performance by managing risk in China.

Keywords: *China, manufacturing industry, risk management, firm performance, structural equation modeling*

1. Introduction

The continuing economic uncertainties and unfortunate operational-risk events affecting firms around the world, a serious concern for both academics and industry commentators, have led to the development of risk management for

organizations (Bhimani, 2009; Gephart, Van Maanen, & Oberlechner, 2009). In this context, the concept of enterprise risk management (ERM), which is also known as integrated risk management, holistic risk management, consolidated risk management, and corporate risk management, has been proposed and rapidly become the criterion reference of managing risk for all entities (Hoyt & Liebenberg, 2011).

Different from silo-based traditional risk management, ERM is a future-focused and process-oriented approach that aims to trade all risk exposures within an organization into one risk portfolio, in which the risk management activates are governed and arranged in an integrate and holistic framework (Verbano & Venturini, 2011). Therefore, ERM is deemed as an appropriate means to benefit governance and allow management to effectively deal with uncertainties, consequent risks, and opportunities that will eventually contribute to the promotion of firm performance (Bromiley, McShane, Nair, & Rustambekov, 2015).

Benefiting from the rapid economic growth, China has become one of the major economies of the world (Su, Wan, & Li, 2013). The huge market potential in China inevitably attracts a growing number of multinational firms who want to join in and take a share of the economic profits. This puts additional pressures on Chinese organizations in facing the increasing categorical business risks, endogenous and exogenous environmental uncertainties, and complicated market competition. Consequently, the unsatisfactory performance of firms in China has been attributed to the lack of readiness in taking advantage of risk management at the enterprise level (Xiaolun, 2010; Xiaochen & Aijing, 2013).

In China, firms undesirably experience barriers in the process of carrying out ERM programs and these barriers include weakness of risk awareness, invalid recognition of risk management, discrepant comprehension of internal control, and confusion of relevant participators (Xiaochen & Aijing, 2013; Xiaolun, 2010). Accordingly, the application of ERM programs for Chinese organizations has been a stringent and difficult process. Nonetheless, this should not serve as a reason to rule out the need to conduct studies for providing empirical analyses of enterprise-wide risk management in China because the application of ERM is essential and necessary.

In order to contribute to the body of knowledge that is related to risk management that is specific to China, this article is inclined to explore whether firms in China can manage risk and enhance performance through establishing the mechanism of ERM programs. Specially, this article is designed to evaluate the effects of ERM on the association between individual risk and risk portfolio, on the relationships among categorical risks in risk structure, and on the association between categorical risk and firm performance.

2. Risk Management in China

Due to the fact that capital markets are not sound and not well served in China, Chinese organizations experience a lack for diversified instruments in implementing risk aversion (Qiya, 2000). In 2009, the International Swaps and Derivatives Association (ISDA) made an inquiry to disclose the utilization of derivatives for the Fortune Global 500 firms. The results indicated that 94 per cent of firms utilized financial derivatives as tools for risk management. Indeed, there were 29 Chinese firms on the list of Fortune Global 500 and 18 of them were regarded as among the 94 per cent target firms. However, the usage rate of derivatives in China was much less than any other top 10 countries which had the minimum rate that is higher than 80 per cent (as shown in Figure 1). In addition, China was seen to be unable to experience the advantage even if it competed with some emerging countries (as shown in Figure 2).

Although the cognition of risk management at the enterprise level for most firms in China is not mature (Huancheng, Changqing, & Yonglai, 2010), the concept of ERM has been generally accepted in China, especially by the fast-developing insurance industry (Qiuying, Yue, Ojiako, Marshall, & Chipulu, 2014). In 2009, the China Insurance Regulatory Commission (CIRC) announced the guidelines for ERM implementation for life insurance markets in China. In 2012, the announcement of a more standardized framework was proposed for assessing the ERM implementation within the insurance industry (Qiuying et al., 2014). Ever since the financial crisis broke out in late 2008, regulators in China have been more concerned about ERM. In the aftermath of the financial crisis, both investors and rating agencies were

Figure 1 Highest Reported Use of Derivatives for Top 10 Countries

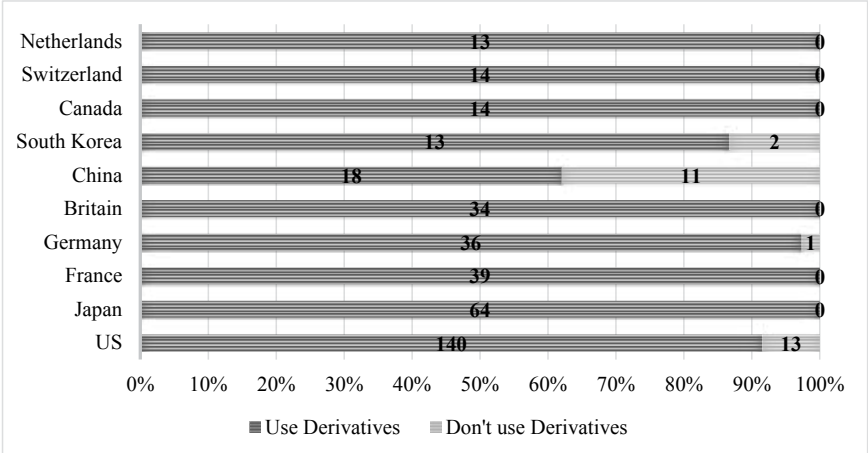
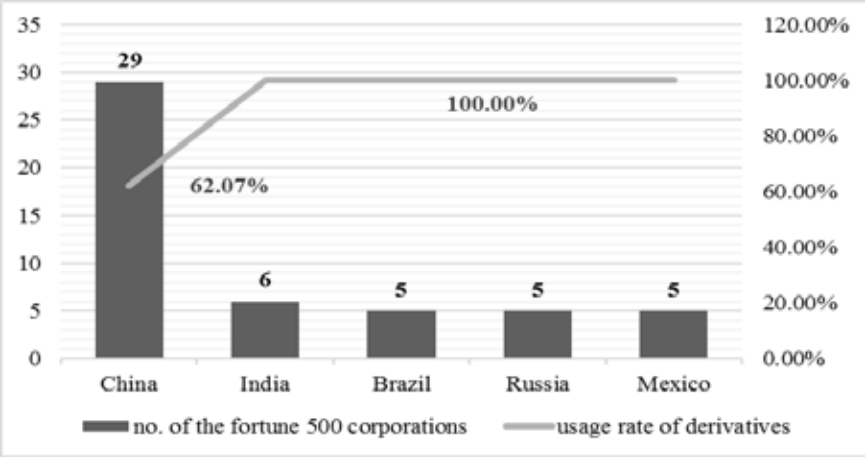


Figure 2 Usage Rate of Derivatives for Emerging Market Economics



beginning to request for ERM implementation within their concerned firms, on a continuous basis.

Known as one of the Big Four accounting firms, KPMG conducted a survey among insurance companies operating in mainland China and Hong Kong in 2009 which aimed at investigating the insurer's awareness of ERM, the responsibility for implementing ERM, the various policies and models available, and the expectations for future risk management initiatives. The results indicated that 73 per cent of the firms surveyed had established a separate department or cross functional committee to govern enterprise risks. In addition, the survey implied that insurance companies in mainland China and Hong Kong preferred to choose risk appetite and tolerance (44 per cent), risk assessment (28 per cent), risk management framework (12 per cent), and risk monitoring and reporting (12 per cent) as further works on risk management. All these signs explicitly demonstrate that insurers in China are aware that ERM is a process of evolution.

According to KPMG's investigation, even if most large firms have established risk management programs, they are not putting in sufficient investments in trading risk issues in a comprehensive manner. This is attributed to the influence of government rules and regulations in China. In 2007, the CIRC announced the principles of a sound risk management framework that identifies the assessment of risk categories and the constitution of risk controls. In 2008, the CIRC supplemented a solvency regulation for insurance companies and set requirements for implementing a risk-based monitoring framework. In 2006, the State-owned Assets Supervision and Administration Commission (SASAC) set out the requirements of risk

management for state-owned firms in China. In 2012, the SASAC announced that all state-owned firms in China need to comprehensively implement ERM programs. As a result, some firms in China are forced to establish ERM programs in their aim to fulfil the compliance purpose.

3. Risk Management with Firm Value

Although there is insufficient evidence to illustrate the benefits of ERM in China, however, the theoretical arguments presented in the literature suggest that ERM can and does indeed add value within organizations (Hoyt & Liebenberg, 2011; Nocco & Stulz, 2006). Due to the existence of numerous market imperfections and frictions occurring in the business world, ERM is deemed to be a value-added project with net present value which helps to mitigate the idiosyncratic risks firms face (Pagach & Warr, 2011). In addition, ERM is recognized as a means of improving firm value by enhancing the value of expected cash flows (Nocco & Stulz, 2006). According to the theory of corporate risk management, firms with smooth cash flows will have lower financial distress costs, less expected tax liabilities, and few contracting costs (Smith & Stulz, 1985).

ERM is posited to create shareholder value by enabling firms to obtain an optimized risk-return tradeoff (Hoyt & Liebenberg, 2011). If ERM can enhance the optimization of risk-return in a cost-effective manner, then it is reasonable to conjecture that risk management would increase firm value (Farrell & Gallagher, 2015). Accordingly, ERM is recommended to benefit firms by enhancing firms' internal decision making, which will ultimately improve their performance through efficient capital allocations (Myers & Read Jr, 2001). In addition, it has been theoretically argued that ERM can lead to an abridgement in the likelihood of large detrimental cash flow shortfalls, costly capital acquisition and distribution, and underinvestment of profitable projects (Farrell & Gallagher, 2015).

Compared to treating each risk exposure in isolation, ERM is inclined to manage and control all risk exposures in the portfolio context, then only the remaining risk requires being governed because conducting each risk independently will add more onerous works to risk mitigation (Farrell & Gallagher, 2015). Therefore, the aggregation of risks benefits firms in avoiding the duplication of risk management expenditures and in reinforcing the coordination among different departments in an organization (Hoyt & Liebenberg, 2011). According to empirical studies in the existing literature, different maturity stages of corporate risk management will bring different impacts to organizations (Ballantyne, 2013; Farrell & Gallagher, 2015). Since firms in China are rarely able to establish mature ERM, thus, it is meaningful to clarify the effects of ERM on firm performance in China.

4. The Sample

After a long period of rapid growth, China has entered into a new stage of economic slowdown. In order to pursue a sustainable development, the government is concentrating on economic system reforming and economic structure optimizing in last decades (Su, Li, & Wan, 2017). Since manufacturing industry is regarded as the pillar of China's economy and contributes most to the growth in GDP, thus, the downward pressure on economy has increased the requirement of transformation and innovation for traditional manufacturers in China (Baichuan, 2016). Accordingly, it becomes more important for Chinese manufacturers to manage all risk exposures in an effective and efficient manner, so as to survive and develop in the complicated and volatile economic environment. In this context, the manufacturing industry in China was chosen as the target for participation in this investigation, which results will provide key insights into empirical evidence of corporate risk management inside China.

Data used in this article were derived from the Wind Financial Database that covered twelve fiscal years between 2004 and 2015. For the purpose of addressing the research objectives, the article categorized manufacturers in China into two groups and attempted to distinguish among different scenarios. Therefore, firms that have established ERM programs were classified as one group while firms that have not established ERM programs were classified as the other group. The identification of ERM implementation was exploited from the publicly displayed information noted in firms' financial reports, internal control reports, and supervisory committee reports. Adapting the method proposed by Hoyt and Liebenberg (2011), a detailed search was focused on phrases with keywords such as "risk management department", "risk management system", "chief risk officer", "ERM framework", "risk management committee", "enterprise risk management", "consolidate risk management", "strategic risk management", "holistic risk management", and "integrated risk management". The search strings were manually reviewed within the mentioned reports for every firm during each year between 2004 and 2015. After excluding invalid data, the sample consisted of 3,012 observations with ERM implementation and 1,356 observations without ERM implementation.

5. Metrics of Risk Indicators

One of the objectives of this article is to assess and manage risk structure within originations by identifying risk portfolio. An investigation of Mercer Management Consulting (MMC) disclosed that the falling stock prices of Fortune 1,000 firms were primarily caused by erroneous decisions in 58 per cent of strategies, 31 per cent of operations, and 6 per cent of finances. In

this context, the risk portfolio in this article is estimated by measuring three categories of risks in respect of strategy, operation, and finance. According to empirical studies, the influence of strategic risk is always reflected in the inefficient collection and distribution of resources as well as the low conversion of profitability. However, the occurrence of operational risk is caused by frictions and imperfections in the utilization of capital, human resources, and techniques for both internal and external control activities. In addition, financial risk is underlyingly correlated with debts and investments, financial market trends, and transactions with third parties (Andersen, 2008; Verbano & Venturini, 2011).

This article adopted management costs (MNTC), operation costs (OPRC), finance costs (FANC), return on total assets (ROTA), return on invested capital (ROIC), and net profit margin (NPM) as the indicators of strategic risks. It applied total asset turnover (TOATO), fixed assets turnover (FXATO), receivables turnover (RECTO), inventory turnover (IVNTO), and operating cycle (OPTC) as the metrics to estimate operational risks. It took operating cash flow ratio (OCFRTO), acid test ratio (ATRTO), debt ratio (DRTO), solvency ratio (SRTO), real ratio (RRTO), and equity ratio (ERTO) as the indicators to examine financial risks. The statistics of these metrics of risk indicators are summarized in Table 1.

6. Metrics of Performance Indicators

This article is also aimed at investigating the effects of risk portfolio on firm performance. According to most prior empirical studies, Tobin's q is an efficient indicator of firm value while estimating the valuation of risk

Table 1 Descriptive Statistics on Risk Indicators

	N	*Mean*	*Median*	*Std. Dev.*	*P 25*	*P 75*
Group 1: Firms Embracing ERM						
MNTC	3012	8.0936	6.6116	7.8546	4.2245	9.8118
OPRC	3012	5.7922	3.9123	6.2614	2.2300	6.6518
FANC	3012	2.6945	2.0530	3.1639	0.8779	3.6833
ROTA	3012	5.0589	4.6780	6.7792	2.5243	7.8458
ROIC	3012	15.4105	10.1690	313.8792	4.9612	19.1806
NPM	3012	2.1425	3.8711	40.0731	0.9413	7.5669
TOATO	3012	0.7984	0.6855	0.4708	0.4935	0.9811
FXATO	3012	3.5283	2.3039	4.4913	1.4012	4.2309
RECTO	3012	31.2115	8.6223	225.4943	4.9257	20.1304
IVNTO	3012	5.1086	4.0564	4.6499	2.5690	6.3305
OPTC	3012	176.1823	142.2635	141.4133	84.8657	221.3761

Table 1 (continued)

	N	*Mean*	*Median*	*Std. Dev.*	*P 25*	*P 75*
OCFRTO	3012	0.1134	0.0853	0.1759	0.0183	0.1873
ATRTO	3012	0.8840	0.7637	0.5804	0.5275	1.0502
DRTO	3012	53.3362	52.8841	16.1659	41.5562	65.0984
SRTO	3012	12.8558	10.1772	17.6762	5.0893	18.0516
RRTO	3012	1.2769	1.1192	0.7474	0.8402	1.4778
ERTO	3012	2.0294	1.2354	6.6881	0.7737	2.0694
Group 2: Firms Not Embracing ERM						
MNTC	1356	8.0531	6.8896	5.8075	4.8540	10.0290
OPRC	1356	6.0110	4.0731	6.0336	2.2427	7.6179
FANC	1356	2.3025	1.9059	2.0742	0.9038	3.3281
ROTA	1356	4.8068	4.4502	6.7370	2.4547	7.4900
ROIC	1356	18.2436	8.9638	337.8389	4.7520	18.3773
NPM	1356	2.9118	3.2596	11.7412	1.1111	7.1584
TOATO	1356	0.8022	0.6824	0.4965	0.5050	0.9760
FXATO	1356	3.7380	2.4108	6.2453	1.3931	4.0811
RECTO	1356	20.2538	7.6950	43.1732	4.3873	16.9850
IVNTO	1356	4.8142	4.0272	3.2874	2.6445	6.1626
OPTC	1356	191.7989	144.4773	158.5564	92.0732	228.8885
OCFRTO	1356	0.1143	0.0972	0.1537	0.0280	0.1874
ATRTO	1356	0.8387	0.7400	0.4294	0.5278	1.0559
DRTO	1356	52.2009	52.5825	15.0812	41.1749	63.2426
SRTO	1356	12.0120	10.3556	14.1939	5.6226	17.6074
RRTO	1356	1.2572	1.1656	0.5551	0.8537	1.5185
ERTO	1356	1.7498	1.1820	3.8284	0.7525	1.8895

Note: Managing costs = Management expenditures / Sales revenue; Operating costs = Operating expenditures / Sales revenue; Financing costs = Financing expenditures / Sales revenue; Return on total assets = EBIT / Book value of assets; Return on invested capital = After tax net income / (Working capital + Book value of fixed assets); Net profit margin = Net income / Sales revenue; Total assets turnover = Sales revenue / Book value of assets; Fixed assets turnover = Sales revenue / Book value of fixed assets; Receivables turnover = Sales revenue / Average accounts receivable; Inventory turnover = Cost of goods sold / Average inventory; Operating cycle = Age of inventory / Collection period; Operating cash flow ratio = Cash flow from operations / Book value of short term liabilities; Acid test ratio = (Book value of liquid assets – Inventories) / Book value of short term liabilities; Debt ratio = Book value of debt / Book value of assets; Solvency ratio = (After tax net profit + Depreciation) / (Book value of short term liabilities + Book value of long term liabilities); Real ratio = Book value of liquid assets / Book value of short term liabilities; Equity ratio = Book value of equity / Book value of assets.

management within organizations. Tobin's q dominates other performance measurements because data normalization or risk adjustment is not indispensable in the computation (Lang & Stulz, 1993). Additionally, Tobin's q can reveal future expectations of investors because the impacts of risks are not expected to be immediately recognized. However, since there are non-tradable shares in China, Tobin's q cannot be directly quantified through market value of shareholder equity in the capital market (Xiaoming & Chunyu, 2009). In this context, the accuracy of Tobin's q in assessing firm performance is not adequate in the case of China.

In order to comprehensively estimate firm performance for Chinese organizations, this article was inclined to apply the structural equation

Table 2 Descriptive Statistics on Key Performance Indicators

	N	*Mean*	*Median*	*Std. Dev.*	*P 25*	*P 75*
Group 1: Firms Embracing ERM						
SIZE	3012	22.0366	21.8954	1.1798	21.1641	22.7179
GROWTH	3012	23.5720	10.6626	264.7724	-4.3768	26.0952
POSITION	3012	1.0621	0.6595	1.3150	0.3604	1.2305
ROA	3012	1.7029	1.5262	5.7828	-0.2594	4.1837
CHANGE	3012	25.3716	4.2186	78.1813	-14.1869	39.8721
VOLATILITY	3012	46.9112	43.3349	17.4408	34.3367	56.0803
WACC	3012	25.6343	22.2562	21.7757	12.6621	34.1964
TOBINQ	3012	1.4467	1.1383	1.0997	0.8158	1.6848
Group 2: Firms Not Embracing ERM						
SIZE	1356	21.6698	21.5658	0.9494	21.0355	22.1991
GROWTH	1356	18.4657	14.5361	34.9863	1.1579	31.8334
POSITION	1356	1.4047	0.6963	2.2601	0.3489	1.3469
ROA	1356	1.7396	1.6405	5.2478	0.0922	3.8842
CHANGE	1356	28.4344	3.2644	124.9150	-14.6463	47.5296
VOLATILITY	1356	47.4523	44.3467	18.8573	32.3318	59.3834
WACC	1356	24.3649	21.3133	17.8157	14.1090	31.3258
TOBINQ	1356	1.4162	1.0438	1.1146	0.8226	1.6545

Note: Firm size = ln (Book value of assets); Sales growth = (Sales revenue$_t$ – Sales revenue$_{t-1}$) / Sales revenue$_{t-1}$; Market position = (Firm sales / Industry sales) / (Firm shares / Industry shares); Return on asset = Net income / Book value of assets; Value change = (Firm value$_t$ – Firm value$_{t-1}$) / Firm value$_{t-1}$; 24-months volatility = Standard deviation of monthly logarithmic return / Square root of 24; Weight average cost of capital = Percentage of debt × After tax cost of debt + Percentage of common equity × Cost of common equity; Tobin' s q = (Market value of common stock + Book value of non-tradable stock + Book value of debt) / Book value of assets.

modeling (SEM) which is designed by using multiple indicators of firm performance. On the basis of empirical evidence in prior studies, the article selected firm size (SIZE), sales growth (GROWTH), market position (POSITION), return on assets (ROA), value change (CHANGE), stock price volatility (VOLATILITY), weight average cost of capital (WACC), and Tobin's q (TOBINQ) as metrics of performance indicators to reflect firm performance in China. The statistics of performance indicators are then summarized in Table 2.

7. Covariance-Based Structural Equation Modeling

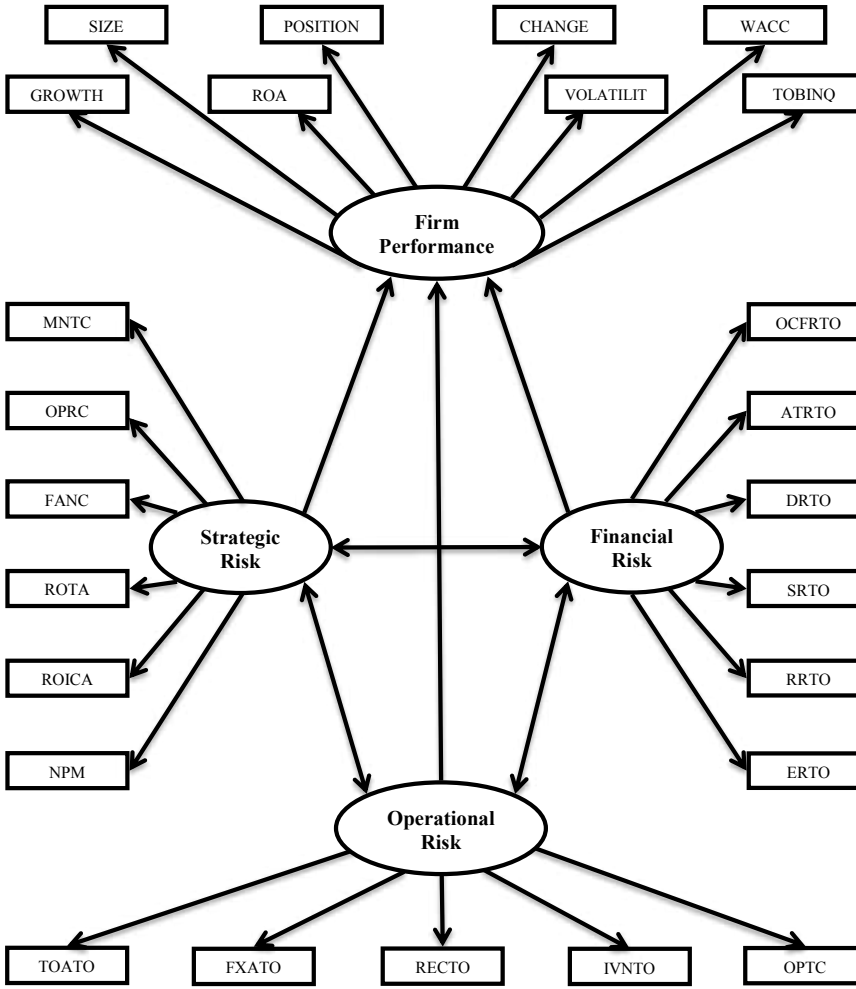
In order to estimate the relationships between individual risks, categorical risks, and firm performance in China, this article adopted a covariance-based structural equation modeling (CBSEM). Compared to regression-based approaches, CBSEM has advantages in modeling unobservable contents with latent variables. In addition, measurement errors will be represented in CBSEM in which case the measurement bias can be eliminated (Finch & French, 2011). Since the categorical risks cannot be directly measured by observable variables, thus, CBSEM is adequate for exploring the risk structure and risk portfolio within organizations by using latent variables. In this context, the structural and measurement models for the whole CBSEM is designed in Figure 3.

According to the CBSEM framework, it can be noted that there are totally three paths in the article. Firstly, it attempted to examine the relationship between individual risk and risk portfolio by comparing the effects of risk indicators in respect of strategy, operation, and finance between firms with ERM and those without. It sought to ascertain whether risk exposures in China can be mitigated by risk management activities. Secondly, the article intended to estimate the components of risk portfolio for Chinese organizations in relative to the risk structure of Fortune 1,000 firms (58 per cent strategic risk, 31 per cent operational risk, and 6 per cent financial risk). Finally, it aimed to explore the contribution of each categorical risk to firm performance. Therefore, if there is a significant relationship between risk indicators and performance indicators, then firms can improve performance by managing risk with the assistance of ERM programs in China.

8. Validity of the CBSEM Model

For the purpose of confirming that the CBSEM model is designed to be perfectly adequate for the research data, this article examined the model validity before analyzing results and findings from the computation. Even if there are many goodness-of-fit statistics that can be used to indicate model

Figure 3 Complete Model of CBSEM



fitness, however, the accurate validity of a measurement model can only be revealed by adopting no less than four goodness of fit indexes as reference standards (Hair, Tatham, Anderson, & Black, 1998). In this context, this article selected the normed fit index (NFI), the comparative fit index (CFI), the goodness-of-fit index (GFI), and the root mean square error of approximation (RMSEA) as the dominating goodness-of-fit indicators to validate the CBSEM model. The outcomes of the validity examination are summarized in Table 3.

Since all observable variables in the article are quantified by accounting formulas and some of them share same elements via assessments, thus, it

Table 3 Summary for Goodness-of-Fit Statistics

Validity Indicators	*Original CBSEM*	*Modified CBSEM*	*Acceptable Criteria*
Normed Fit Index (NFI)	0.4530	0.9118	> 0.90 Good Fit
Comparative Fit Index (CFI)	0.4465	0.9384	> 0.90 Good Fit
Goodness-of-Fit Index (GFI)	0.5872	0.9236	> 0.90 Good Fit
Root Mean Square Error of Approximation (RMSEA)	0.1325	0.0692	< 0.05 Close < 0.08 Good < 0.10 Reasonable

is usual for some of the residual variables to be correlated with each other. In this context, linking errors that are high in terms of relevance should be done during the modification process so as to improve goodness-of-fit for the CBSEM model. It is reasonable to assert that the modified CBSEM model is relatively valid because all validity indicators are well within the range of acceptable criteria.

9. Equivalence of the CBSEM Model

Since this article compares the differences between firms with ERM and firms without ERM by executing two groups of firms separately in the CBSEM model, it is thus necessary to know whether the components in the structural model, as well as the measurement model, are equivalent across groups of firms. In seeking evidence of multigroup equivalence, this article employed five consecutive tests to orderly estimate invariance for measurement weight, structural weight, structural covariance, structural residual, and measurement residual.

In the process of implementation, it sets imposition of equality constraint for measurement weight in model a; adding imposition of equality constraint for structural weight in model b; adding imposition of equality constraint for structural covariance in model c; adding imposition of equality constraint for structural residual in model d; and adding imposition of equality constraint for measurement residuals in model e. The modified CBSEM model in the previous section is treated as the configural model that provides a baseline against which all the tests for invariance are compared.

Normally, the traditional approach in arguing for evidence of invariance is based on the χ^2 difference test. If the difference in value is statistically significant, then evidence of noninvariance is indicated. However, Cheung and Rensvold (2002) claimed that it may be more reasonable to base invariance decisions on the difference in CFI rather than on χ^2 values.

According to their criteria, a ΔCFI with a value less than 0.01 is proposed as evidence of invariance. Therefore, this article adopted both of the two tests to estimate equivalence of five restricted models compared with the unrestricted baseline model.

Table 4 disclosed that even if comparisons of models a, b, c, and d with the configural model result in χ^2 difference tests are statistically significant, the CFI difference tests meet the criteria of invariance. As χ^2 is sensitive to sample size, it will reject even models fit reasonably well when the sample size is large (Schermelleh-Engel, Moosbrugger, & Müller, 2003). The χ^2 difference tests always present excessively stringent tests of invariance, nevertheless, SEM is only approximations of reality in practice (MacCallum, Roznowski, & Necowitz, 1992). Model e is absolute noninvariance because it is common that measure-ments of error variances are rarely constrained equally across groups (Byrne, 2009). Given these findings, it can be concluded that operations of the modified CBSEM model are equivalent but not stringently equivalent to firms with ERM and firms without ERM.

10. Testing for Effect of ERM on Risk Portfolio

Table 5 revealed the different scenarios faced by two groups of firms in China, which is distinguishable in terms of ERM engagement. Since the standard beta of all indicators in respect of financial risk (except for ATRTO) in group 1 is less than that in group 2, it is thus reasonable to assert that the relationship between individual risk and financial risk can be significantly mitigated if firms in China embraced ERM programs. However, among all indicators of operational risk, firms with ERM get higher FXATO and IVNTO. On the contrary, firms without ERM get higher TOATO, RECTO, and OPTC. It indicates that the effect of ERM on the association between individual risk and operational risk is ambiguous. The influence trend is consistent in the association between individual risk and strategic risk. It can be observed that the effects of MNTC, OPRC, and FANC on strategic risk increased for firms that have established ERM. Nevertheless, the effects of ROTA, ROIC, and NMP decreased when firms have not embraced ERM. In this context, the results cannot provide an accurate conclusion about how ERM can affect risk portfolio just based on the variance of regression weight.

The effect of ERM on the relationships between strategic risk, operational risk, and financial risk can be deemed as evidence that indicates the association between ERM and risk portfolio within organizations. It can be noted from Table 6 that there is a significant positive relationship between strategic risk and financial risk for all manufacturing firms in China. In addition, the strategic risk is less interactive with financial risk when firms in China adopt ERM. Although the association between strategic risk and

Table 4 Summary for Multigroup Equivalence

Model Description	χ^2	*df*	$\Delta\chi^2$	Δdf	*Statistical Significance*	*CFI*	ΔCFI
Configural Model: No Equality Constraints Imposed	3212.1884	290	—	—	—	0.9384	—
Model A: All Measurement Weights Constrained Equal	3355.1607	311	142.9723	21	P < 0.001	0.9360	0.0024
Model B: Model A With All Structural Weights Constrained Equal	3367.3067	314	155.1183	24	P < 0.001	0.9358	0.0026
Model C: Model B With All Structural Covariances Constrained Equal	3385.1900	320	173.0016	30	P < 0.001	0.9356	0.0028
Model D: Model C With All Structural Residuals Constrained Equal	3385.2072	321	173.0188	31	P < 0.001	0.9356	0.0028
Model E: Model D With All Measurement Residuals Constrained Equal	5943.8343	470	2731.6459	180	P < 0.001	0.8891	0.0493

Table 5 Association between Risk Indicators and Categorical Risk

		R^2	*St. Beta*	*Beta*	*St. Dev*	*T-Value*	*Sig.*
Group 1: Firms Embracing ERM							
MNTC	← Strategic Risk	0.0577	0.2401	0.6012	0.0552	4.3498	***
OPRC	← Strategic Risk	0.2413	0.4913	1.0471	0.0228	21.5731	***
FANC	← Strategic Risk	0.0281	0.1675	0.1530	0.0356	4.7112	***
ROTA	← Strategic Risk	0.4000	0.6325	1.4089	0.0215	29.3747	***
ROIC	← Strategic Risk	0.1412	0.3758	44.9862	0.0354	10.6078	***
NPM	← Strategic Risk	0.2054	0.4533	3.8691	0.1048	4.3239	***
TOATO	← Operational Risk	0.6129	0.7829	0.3524	0.0700	11.1763	***
FXATO	← Operational Risk	0.4299	0.6556	2.4549	0.0390	16.7923	***
RECTO	← Operational Risk	0.0827	0.2876	63.5425	0.1101	2.6117	**
IVNTO	← Operational Risk	0.5274	0.7262	3.1059	0.1044	6.9551	***
OPTC	← Operational Risk	0.3601	-0.6001	-76.2870	0.3285	1.8266	No Sig.
OCFRTO	← Financial Risk	0.3737	-0.6113	0.2657	0.0201	30.4658	***
ATRTO	← Financial Risk	0.5661	0.7524	1.0170	0.0115	65.3645	***
DRTO	← Financial Risk	0.5108	-0.7147	-28.3119	0.0302	23.6936	***
SRTO	← Financial Risk	0.5845	0.7645	35.6217	0.0140	54.4880	***
RRTO	← Financial Risk	0.5974	0.7729	1.3247	0.0104	74.6620	***
ERTO	← Financial Risk	0.0045	0.0669	1.2420	0.1698	0.3942	No Sig.
Group 2: Firms Not Embracing ERM							
MNTC	← Strategic Risk	0.0145	0.1204	0.3025	0.0347	3.4705	***
OPRC	← Strategic Risk	0.1488	0.3858	0.9312	0.0229	16.8339	***
FANC	← Strategic Risk	0.0071	0.0843	0.0709	0.0184	4.5892	***
ROTA	← Strategic Risk	0.5085	0.7131	1.9082	0.0124	57.7370	***
ROIC	← Strategic Risk	0.1716	0.4142	53.2177	0.0162	25.5543	***
NPM	← Strategic Risk	0.3119	0.5585	2.7609	0.0262	21.3174	***
TOATO	← Operational Risk	0.7284	0.8534	0.3466	0.0113	75.4911	***
FXATO	← Operational Risk	0.3883	0.6231	2.9112	0.0144	43.2127	***
RECTO	← Operational Risk	0.3076	0.5546	18.9104	0.0200	27.7501	***
IVNTO	← Operational Risk	0.4741	0.6885	1.9334	0.0115	60.0752	***
OPTC	← Operational Risk	0.4800	-0.6928	-92.6673	0.0111	62.3147	***
OCFRTO	← Financial Risk	0.3815	0.6177	0.2231	0.0192	32.1887	***
ATRTO	← Financial Risk	0.5327	0.7299	0.7438	0.0105	69.7136	***
DRTO	← Financial Risk	0.6357	-0.7973	-27.7278	0.0102	77.8326	***
SRTO	← Financial Risk	0.6166	0.7852	25.9449	0.0127	61.7032	***
RRTO	← Financial Risk	0.6184	0.7864	1.0400	0.0087	90.2216	***
ERTO	← Financial Risk	0.2638	-0.5136	-3.8268	0.0427	12.0232	***

Table 6 The Relationships among Categorical Risk in Risk Structure

		Correlation	*St. Dev*	*T-Value*	*Sig.*
Group 1: Firms Embracing ERM					
Strategic Risk	↔ Operational Risk	-0.1880	0.0287	6.5613	***
Operational Risk	↔ Financial Risk	0.0265	0.0271	0.6095	No Sig.
Financial Risk	↔ Strategic Risk	0.3625	0.0354	10.2525	***
Group 2: Firms Not Embracing ERM					
Strategic Risk	↔ Operational Risk	-0.2884	0.0397	2.2241	*
Operational Risk	↔ Financial Risk	-0.0159	0.0175	0.9053	No Sig.
Financial Risk	↔ Strategic Risk	0.4099	0.0217	18.8537	***

operational risk is negative, however, its absolute value for firms with ERM is less than that for firms without ERM. In addition, the negative interactions between strategic risk and operational risk turned to be more significant if ERM is established within origination. Since interactions between strategic risk, operational risk, and financial risk are underlying risks within organizations, thus, the buffered relationships among categorical risks can be served as a sign of good performance of ERM on risk portfolio.

11. Testing for Effect of ERM on Risk Structure

The association between categorical risk and firm performance briefly explores the risk structure within organizations for firms in China. It can be noted from Table 7 that the strategic risk and operational risk contribute to most of risk exposures to the whole risk portfolio for Chinese manufacturers no matter whether ERM is adopted or not. Compared to strategic and operational risks, the effect of financial risk on firm performance is slightly weak. The results also revealed that though the relationship between financial risk and firm performance increased a little bit, however, strategic risk and operational risk became less associated with firm performance if ERM was established within originations.

For the purpose of compressively investigating the risk distribution in risk structure, the article attempted to explore the weight of effects of categorical risks on firm performance in China. The measurement of risk distribution is then formulated as Equation 1. It can be observed from Table 7 that the squared multiple correlations (R^2) for firms with ERM and firms without ERM are separately estimated as 0.5689 and 0.6254. It is reasonable to assert

Table 7 Association between Categorical Risk and Firm Performance

	R^2	*St. Beta*	*Beta*	*St. Dev*	*T-Value*	*Sig.*
Group 1: Firms Embracing ERM						
Firm Performance ← Strategic Risk	0.5689	0.5134	0.3403	0.0409	7.6617	***
Firm Performance ← Operational Risk	0.5689	0.5712	0.6735	0.0656	5.6564	***
Firm Performance ← Financial Risk	0.5689	0.3639	0.7490	0.0261	6.2675	***
Group 2: Firms Not Embracing ERM						
Firm Performance ← Strategic Risk	0.6254	0.5689	0.4024	0.0191	19.3576	***
Firm Performance ← Operational Risk	0.6254	0.6469	0.7319	0.0154	29.0102	***
Firm Performance ← Financial Risk	0.6254	0.3058	0.5394	0.0162	6.5447	***

that the risk portfolio which consists of strategic risk, operational risk, and financial risk can interpret 56.89 per cent and 62.54 per cent variance of firm performance for firms that adopt ERM and those that do not adopt ERM.

$$Distribution_{\,i} = \left[Categorical\ Risk_{\,i} \div \sum (St.Beta_{\,i})\right] \times R^2{}_{i} \times 100\% \quad (1)$$

According to the computation in Equation 1, it revealed that all risk exposures in the risk structure for firms with ERM programs is roughly classified as 20.16 per cent of strategic risk, 22.43 per cent of operational risk, and 14.29 per cent of financial risk. While the risk structure for firms without ERM programs is composed of 23.38 per cent of strategic risk, 26.59 per cent of operational risk, and 12.57 per cent of financial risk in an approximate manner. Therefore, it implies that establishing ERM can help to buffer the effects of strategic and operational risks while strengthening the effect of financial risk on the whole risk structure. This result is also supported by the variation trends of the regression weights of categorical risks when manufacturing firms in China engaged in ERM programs.

12. Testing for Effect of ERM on Firm Performance

In the CBSEM model, the percentage variance of firm performance is explained by categorical risk for all firms, which can directly be reflected as the variance of each performance indicator. It can be noted from Table 8 that the R^2 of ROA for all Chinese manufacturers exceeds 0.4. Therefore, it is reasonable to assert that return on asset is the strongest predictor of firm performance in the manufacturing industry in China. In addition, CHANGE is another significant indicator in this article because 1 unit change of standard deviation in risk portfolio will result in 0.56 and 0.53 unit change of standard deviation in firm value respectively. According to the judgment

Table 8 The Association between Performance Indicators and Firm Performance

		R^2	*St. Beta*	*Beta*	*St. Dev*	*T-Value*	*Sig.*
Group 1: Firms Embracing ERM							
SIZE	← Firm performance	0.1261	0.3552	0.3092	0.0260	13.6801	***
GROWTH	← Firm performance	0.1400	0.3742	83.6026	0.0908	4.1216	***
POSITION	← Firm performance	0.2471	0.4971	0.5247	0.0225	22.1401	***
ROA	← Firm performance	0.4281	0.6543	2.7621	0.0230	28.4800	***
CHANGE	← Firm performance	0.3177	0.5636	36.5834	0.0253	22.2487	***
VOLATILITY	← Firm performance	0.0974	0.2921	4.3282	0.0220	14.1808	***
WACC	← Firm performance	0.0773	0.2780	4.7437	0.0776	3.5834	***
TOBINQ	← Firm performance	0.1503	0.3877	0.3407	0.0258	15.0075	***
Group 2: Firms Not Embracing ERM							
SIZE	← Firm performance	0.1951	0.4417	0.2999	0.0170	26.0095	***
GROWTH	← Firm performance	0.2040	0.4516	10.9239	0.0314	14.3653	***
POSITION	← Firm performance	0.2500	0.5000	0.7683	0.0169	29.6159	***
ROA	← Firm performance	0.4302	0.6559	2.4939	0.0144	45.4541	***
CHANGE	← Firm performance	0.2760	0.5254	42.1428	0.0196	26.7460	***
VOLATILITY	← Firm performance	0.0822	0.2867	3.7627	0.0213	13.4857	***
WACC	← Firm performance	0.0759	0.2754	3.4295	0.0258	10.6950	***
TOBINQ	← Firm performance	0.1809	0.4253	0.3338	0.0249	17.1064	***

criteria, indicators with factor loading less than 0.3 should be eliminated from the measurement model (Hair et al., 1998). Therefore, VOLATILITY and WACC are not effective proxies even if they are associated with firm performance at statistically significant level. It is clear that risk portfolio has limited influence on stock price volatility and cost of capital. In this context, it can be demonstrated that all risk exposures within organizations affect firm performance in respect of firm size, sales growth, market position, profitability, change of market value, and Tobin's q.

Looking at the factor loadings of significant performance indicators in Table 8, it is clear that firms embracing ERM have lower SIZE, GROWTH, POSITION, ROA and TOBINQ relative to firms not embracing ERM. The findings revealed that the effect of risk portfolio on firm size, sales growth, market position, profitability, and market value can be mitigated through establishing ERM programs. In contrary, the factor loading of CHANGE for firms in group 1 are higher than that for firms in group 2. However, the result does not mean that ERM has a negative influence on the association between risk portfolio and firm performance in terms of firm value for manufacturing firms in China. Since the establishment of ERM for most

Chinese manufacturers is not mature, thus, the function of ERM programs in managing risks as well as earning profits is limited within organizations.

13. Conclusions

Based on the results and findings above, it is reasonable to assert that ERM is helpful in managing risk in China as it can reduce the effects of some risks to the whole portfolio. In addition, the interactions among categorical risks can also be minimized by ERM. Nevertheless, this function is limited because the establishment of ERM programs is not in a maturity stage for most Chinese organizations and that primarily causes the growing effects of some specific risks on risk portfolio. Therefore, for firms that have embraced ERM, it is better to improve the effectiveness and efficiency of risk management activities into maturity stage. However, for firms that do not embrace ERM, it is necessary to make adequate preparation for establishing ERM.

MMC claims that most Fortune 1,000 firms suffered a decline in stocks due to the failure of decisions in terms of 58 per cent strategies, 31 per cent operations, and 6 per cent finance. Compared to the risk structure of most big firms in the world, the performance change in Chinese organizations is caused by 20 per cent of strategic risk, 22 per cent of operational risk, and 14 per cent of financial risk when firms embraced ERM. However, for those firms without ERM, the firm performance is influenced by 23 per cent of strategic risk, 27 per cent of operational risk, and 13 per cent of financial risk. Differing from the MMC result, firms in China should pay more attention to strategic and operational risks while formulating tactics in response to the achievement of firm objectives. Since strategy and operations are the objectives while establishing the ERM framework, thus, firms in China should enforce ERM programs for better managing of risk exposures.

Managing risk within organizations has been demonstrated to benefit firms in China. It implies that firms with ERM will suffer less impacts of categorical risks on their firm size, growth of sales, market share, earning capacity and market value. In addition, due to the increased association between value change and risk portfolio, it is reasonable to assert that firms in China can realize growth in firm value with the help of ERM. Consequently, it can be concluded that corporate risk management can help firms to mitigate the association between business risk and firm performance in China. Since most Chinese organizations are in the nascent stage of implementing ERM, thus, the theoretical benefits of effective ERM cannot be completely achieved in the current situation. It suggests that if firms in China can improve the ERM effectiveness in a mature manner, then the effects of each risk exposure and/or risk portfolio can be further buffered.

The empirical analyses of this article provide key insights into the valuation of managing risk inside China, especially for the manufacturing industry. Nevertheless, there are several limitations that need to be addressed in future studies. Firstly, since the information about the establishment of ERM is collected from self-reported documents, thus, the reliability of the relative data may be affected by the quality of the documents, which will eventually influence the accuracy of results and analysis. Secondly, due to the restricted information at the enterprise level for firms in China, the determination of either risk indicators or performance indicators is mainly dependent on the availability of data. Therefore, it leads to the bad case scenario that some indicators in the CBSEM is not effective. In this context, further studies that adopt effective proxies of risk exposure and firm performance will better explore the theoretical benefits of ERM.

Notes

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Responses of ASEAN-5 to China Stock Market Reforms[1]

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Abstract

China's influence on the financial sector of ASEAN has been more significant as a result of the recent strengthening of China's monetary and exchange rate policies, its growing financial sector, as well as the fast expansion of its corporate and financial investment around the world. This paper analyses the influence of the China stock market on its ASEAN counterparts over the period of 2002-2015. The extent of ASEAN stock market responses to three major stock market trading reforms in China are examined. These reforms include the liberalization of the A-shares to Qualified Foreign Institutional Investors (QFII reform) starting from 5th November 2002, the split share structure reform starting from 29th April 2005, and the lifting of short sale constraints and margin-trading starting from 21st March 2010. Data on 2,166 public listed firms in Indonesia, Malaysia, the Philippines, Singapore and Thailand are used to investigate if their responses, normalized to the responses of listed firms in China, are economically significant and have amplified over time with the increased influence of China's economy in the global market. Evidence shows that firms from Indonesia, Malaysia and Singapore have significant and increased relative responses to these reforms in the China market. The increase is particularly drastic in response to the short-sale reform in 2010. Listed firms from the Philippines and Thailand did not exhibit similar responses. The result is consistent with the development of bilateral trade ties between China and these ASEAN countries.

Keywords: *ASEAN, China, market reform, stock market*

1. Introduction

Over the two decades in the 1980s and 1990s, the ASEAN economy has been driven by its export oriented policy. The major trading partners of its member

countries were centered in the Western hemisphere, particularly the US and EU, as well as Japan. At the same time, the stock markets of the member countries of ASEAN have undergone rapid development since the opening up of its economy in the late 1980s. Spillover from the real sector to the financial sector has also taken place. Influences from the US and Japan stock markets have long dominated the trading sentiments of ASEAN investors. Starting from the new millennium, however, the Chinese economy has started to partake in a bigger share of ASEAN's trade and emerged to become one of the top five trading partners of ASEAN. The introduction of the China–ASEAN Free Trade Area (CAFTA) on 1st January 2010 has contributed to China's increased share in trade with ASEAN. In 2013, ASEAN accounted for 10.7 per cent of China's total trade, and China was the largest individual trading partner, sharing 14 per cent of trade with ASEAN (Salidjanova, Koch-Weser and Klanderman, 2015). Although China's share of foreign direct investments into ASEAN stood at a low 2.3 per cent in 2013, the amount has increased from just over USD300 billion in 2003 to over USD1.5 trillion (Salidjanova, et al., 2015). While these earlier developments have been taking place in China's real economy, the increasing heft of its financial markets as well as the rising and fast expansion of China's corporate and financial investments in ASEAN is expected to make significant headways into and therefore impact the ASEAN financial sector, in particular the stock markets of its member countries.

The growing importance of China in the global stage has led to a proliferation of research to investigate the impact China has on the economy of other countries. Of particular interest is the transmission of information on China to the international financial markets, especially those of the neighbouring countries. A recent example is Huang and Kuo (2015) who investigated the transmission of information from Mainland China to Taiwan and Hong Kong stock markets, focussing on volatility spillover specifically. Through an analysis of the trilateral relationship between these three economies, Huang and Kuo (2015) found evidence that the spillover effects flowed from Mainland China to Taiwan and Hong Kong, thus supporting the international center hypothesis that Mainland China played the leading role as a big player in the global markets. However, although significant, the cross-market influence was found to be small compared to the influence from the domestic market. Another recent study (Shu, He, Wang, & Dong, 2015, p. 179) concluded that China's influence on Asian stock markets has risen to a level comparable with that of the US although the latter had a stronger impact in times of stress. Arslanalp, Helbling, Lee and Mathai (2016) also noted some countries like Singapore have both direct links with China and indirect links through Hong Kong. Of more direct relevance for our study is that by Chien, Lee, Hu and Hu (2015) which used cointegration techniques to link China and

the ASEAN-5 stock markets and came to the conclusion that these markets are becoming more integrated. While this conclusion complements similar findings with respect to Chinese foreign direct investment in ASEAN-5 (Li, Scollay, & Maani, 2016), neither study explored specific developments or events that might have contributed to greater integration.

These recent evidence stood in sharp contrast to older studies by Chakravarty, Sarkar and Wu (1998), and Lin and Wu (2003) that did not find any significant links among the three markets. The three stock markets did not exhibit any long-run relationship, although short-run spillovers were reported by Johansson and Ljungwall (2009). The explanation likely lies in the much less developed Chinese markets when these earlier studies were undertaken.

Beyond the Asia-Pacific, recent evidence also suggests that the China market has a stronger link with global markets than earlier reported, especially after its accession to the WTO in 2001 that also led to substantial measures being taken to liberalize its financial sector. He, Chen, Yao and Ou (2014, 2015) devised an index that measures the impact of China's financial liberalization on its linkages with other markets in the world. Interdependence between China and other markets has been enhanced as a result of the country's financial liberalization. Stock market linkages were reported between China and other major players including Korea, Japan and US by Li (2012). Li (2012) attributed his finding of increased linkages between China and the other major global players to the reforms undertaken by the China government to liberalize its stock exchange. Li's conclusion (p. 368) that implementation of "the reform policies on the stock exchanges stage by stage under government direction is compatible with the approach of gradual liberalisation of China's economy" provides the basis to suggest that the stronger economic integration between China and ASEAN through increased trade flows could be occurring alongside with higher dependence in the financial sectors, including the stock exchanges. The evidence documented in Vithessonthi and Kumarasinghe (2016) showed that China's stock exchanges were increasingly integrated with the world market, particularly after 2006, when, under China's WTO undertaking, foreign banks were allowed to operate in China for the first time. Allen, Amran and McAleer (2013) argued that such relationships with other markets may not remain constant, especially during crisis such as the global financial crisis that changed the flow of information transmission which may have led to different patterns in volatility spillovers. These relationships will also change as China liberalizes further its financial markets, as its markets grow in size, and as the RMB internationalizes further.

The growing importance of China's stock market in the international financial sector is evident from the brief review above. Studies examining the impact of China's stock market reforms on ASEAN are generally lacking.

Much work remains to be done in examining its impact on the other markets in terms of information transmission. Recent events have made this work more urgent. Together with China's growth deceleration, its stock markets were hit by severe turbulence in the summer of 2015 and again in January, 2016 ("China's stockmarket crashes", 2016). This, together with the economic slowdown, has sparked fears of contagion.

These fears are particularly salient in ASEAN, adversely impacting ASEAN stock markets, directly through fears that the falling market could affect China's already slowing growth, and indirectly through weakening US and other advanced country markets (Hughes, 2016). In view of these developments, this study seeks to focus on information transmission between China and the stock markets of ASEAN countries, specifically the impact of fundamental market reforms in China on ASEAN stock market access to China's stock markets. Arguably, this type of impact is more lasting than those engendered by short-term fluctuations brought about by expectations or news.

The paper is organized as follows. The next section highlights a few events that brought changes to the China stock market, and elaborates on the methodology adopted to study how information related to these events were transmitted and impacted the ASEAN stock exchanges. Results and discussion are presented in Section 3, and Section 4 concludes this study.

2. Methodology and Data

2.1. The Events

We identified three trading reforms in China that were representable as major reforms that influenced capital flow into China, as well as the liquidity and stock market development of the ASEAN countries over the last one and a half decade. These reforms' importance lay in their progressive removal of barriers to entry into China's financial markets for investors, domestic as well as foreign.[2] The three market reforms are briefly described as follows.

2.1.1. Qualified Foreign Institutional Investors (QFII) Reform

The stocks of China companies can be listed in the A-shares and B-shares markets. A-shares can be traded only by domestic investors who are Chinese citizens living in China. On 5th November 2002, the China Securities Regulatory Commission (CSRC) relaxed this restriction. Select Qualified Foreign Institutional Investors (QFII), which consists of overseas fund management firms, insurance companies, securities companies, and other asset management institutions were allowed to buy and trade on A-shares. Once licensed, the select foreign investors are permitted to invest onshore

in the Chinese stock market, that is the Shanghai Stock Exchange and the Shenzhen Stock Exchange, but they are subject to capital controls governing the movement of assets in-and-out of the country.

2.1.2. Split-share Reform

Prior to 2005, A-shares were divided into tradable and non-tradable shares, and the non-tradable shares were about two thirds of the total number of outstanding shares. On 29th April 2005, the CSRC announced a pilot programme to transform non-tradable shares into tradable shares. Two pilot batches and 66 regular batches went through this transformation from 2005 to 2007. The reform obliged the holders of non-tradable shares to compensate the holders of tradable shares for the possibility to sell their shares in the future. This reform is regarded as value-enhancing in the long run as it implied the Chinese government's commitment on privatization. The reform is also expected to uplift corporate governance of their listed firms by creating more diffused ownership structure, boosting liquidity and reducing risk premium on non-diversifiable risk.

2.1.3. Short-sale Reform

Prior to 2010, the Chinese stock market imposed strict short-sale constraints. CSRC announced the launch of the first pilot scheme on 21st March 2010 to lift the ban on short-selling and margin-trading for stocks on a designated list, covering 90 constituent stocks of the Shanghai Stock Exchange 50 Index (SSE-50) and the Shenzhen Stock Exchange Component Index (SZSE-40). The list was revised in July 2010 following changes in the composition of SSE-50 and SZSE-40. On 25th November 2011, CSRC gave the green light to short-selling and margin-trading for a total of 190 stocks and 7 Exchange Traded Funds (ETFs). The change took effect as of 5th December 2011.

2.2. The Method (Methodology)

This study examines whether the firms listed in the stock exchanges of ASEAN countries responded to the three major market reforms in China. These reforms that happened at different points of time allow the investigation into whether the responses of the ASEAN markets have changed over time, given the increasing role of China's trade with and investment flow into the ASEAN member countries. Following Faff & Hiller (2005), we employed the dummy variable regression method to study the impact of the identified events on market responses. The standard event study methodology based on market model is not considered. The three events are not firm based announcement,

and they apply to all the firms listed on the exchange. They are regulatory reforms that affect the whole market and all the firms in one way or another, and the impact is expected to affect both the market and firm price movements systematically. In this case, the abnormal return generated from the market model using the event study approach cannot capture the impact of the regulatory reforms on an individual firm because of its co-movements with market changes due to the same reform. A dummy variable approach offers a better way to capture the responses of ASEAN firms to these events. The following firm stock return regression is estimated for all individual firms:

$$R_{ijt} = \alpha + \delta_{ij}^{1}(D_t^{AShare}) + \delta_{ij}^{2}(D_t^{Split}) + \delta_{ij}^{3}(D_t^{ShortSale}) + e_{ijt} \quad (1)$$

where R_{ijt} is the stock return of firm-*i* listed in market-*j* at time-*i*, D_t^{AShare}, D_t^{Split} and $D_t^{ShortSale}$ are dummy variables that take a value of one for the period of 10 days prior to 10 days after the event date, and zero otherwise. The announcement date represents the event date of each market reform, i.e., 5th November 2002 for QFII reform, 29th April 2005 for the split-share reform, and 21st March 2010 for the short-sale reform. The error term is denoted as e_{ijt}. The δ_{ij}^{k} coefficients for k = 1, 2 and 3 provide a measure of the impact of the respective market reforms on firm-*i* listed in stock exchange-*j*.

The δ_{ij}^{k} coefficients for the three events are different in scale. They need to be normalized so that the impacts of the different reforms are comparable. A suitable normalizing factor is the responses of the firms listed in China's stock market to the event. Given that the impact of any policy changes in China will influence the listed firms in China the most, their responses are useful to gauge the scale of the event on stock market trading. By using the response of listed firms in China as the normalizing factor, the responses of firms in the ASEAN stock exchanges can be measured without being biased by the scale of a particular reform in the China market. To obtain the normalizing factor, equation (1) is estimated for the listed firms in the China market. Let *j* = 1 represent the China market. The estimated firm-level coefficients δ_{i1}^{k} are measures of the responses of Chinese firms to market reform-*k*. These estimates are then averaged to obtain $\delta_1^k = \sum_{i=1}^{n_1} \delta_{i1}^k \Big/ n_1$ for k = 1, 2 and 3 where n_1 is the number of listed firms in the Chinese market. The normalized measure of the impact of market reform-*k* on firm-*i* listed in stock exchange-*j*, denoted by A_{ij}^{k}, is then given by:

$$A_{ij}^{k} = \delta_{ij}^{k} \Big/ \delta_1^k \quad (2)$$

The normalized coefficients are grouped according to country for each event. The normalized measure of the impact of market reform-*k* on stock exchange-*j* is computed as:

$$A_j^k = \sum_{i=1}^{n_j} A_{ij}^k \Big/ n_j \tag{3}$$

where n_j is the number of listed firms in stock exchange-*j*.

2.3. The Data

The sample of this study covers all the public listed companies in the stock exchanges of the five founding members of ASEAN, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand. These are the five biggest economies in ASEAN, both in terms of economy size and development. Their stock markets are more developed compared to others in ASEAN, trading is more active, and the information required for this study are available. The daily closing stock prices over the period 2002 to 2015 are collected. These prices are used to calculate the stock returns. A total of 2,166 firms are included in the sample. The breakdown by country are 325 firms listed in the stock exchange of Indonesia, 803 in Malaysia, 243 in the Philippines, 408 in Singapore and 387 in Thailand.

3. Results and Discussion

Table 1 reports the descriptive statistics for the average normalized coefficients of the individual firms listed in the respective stock markets, or A_j^k. The normalized coefficients measure the average responses of the firms to the three market reforms. An analysis of the distribution of the normalized coefficients suggests that differences exist across the three events as well as by countries. The standard deviation shows that the variation of the normalized coefficients is the largest for the most recent short-sale reform, followed by the QFII reform, and lastly the split-share reform. This pattern is consistently observed for all the ASEAN countries. The listed firms in Indonesia have the largest variation (2.41) in normalized coefficients for the QFII reform. The split-share reform elicited the largest variation in firm response (0.79) from firms in the Philippines. Malaysia's listed firms display the largest variation (5.03) of firm normalized coefficients for the short-sale reform.

The listed firms in Malaysia and Singapore did not respond significantly to the QFII reform in 2002. The listed firms in the Philippines and Thailand responded significantly to the short-sale reform in 2010. However, all countries taken together, the three average normalized coefficients of the firms (Total) show that the firms in ASEAN have significant responses to market reform in China. More importantly, the responses are bigger in magnitudes to market reforms that are more recent. The recentness of the reform explains

Table 1 Descriptive Statistics of the Normalized Coefficients by Country[3]

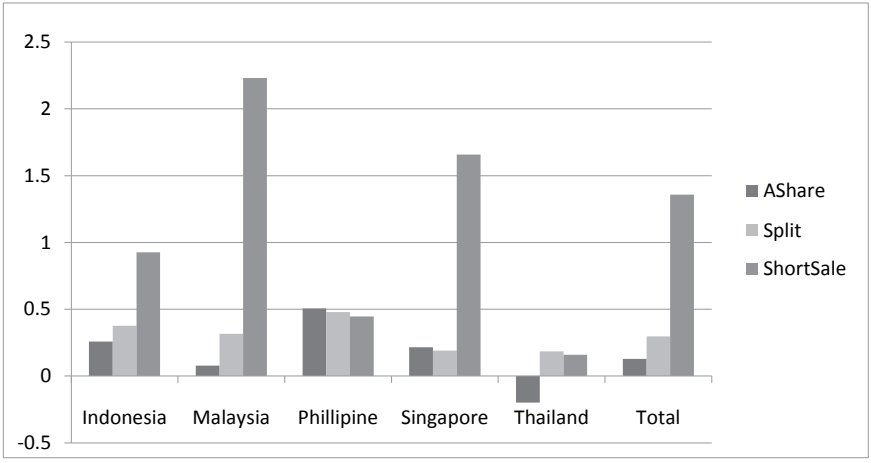
Country / Event	Indonesia			Malaysia			Philippines			Singapore			Thailand			Total		
	AShare	Split	Short-sale	AShare	Split	Short-sale	AShare	Split	Short-sale	AShare	Split	Short-sale	AShare	Split	Short-sale	AShare	Split	Short-sale
Mean	0.26* (0.06)	0.38*** (0.00)	0.93*** (0.00)	0.08 (0.29)	0.32*** (0.00)	2.23*** (0.00)	0.51*** (0.00)	0.48*** (0.00)	0.45 (0.15)	0.22*** (0.00)	0.19*** (0.00)	1.66*** (0.00)	-0.20** (0.01)	0.19*** (0.00)	0.16 (0.37)	0.13*** (0.00)	0.30*** (0.00)	1.36*** (0.00)
Standard deviation	2.41	0.75	4.59	2.08	0.77	5.03	2.32	0.79	4.85	1.49	0.65	3.47	1.51	0.57	3.49	1.98	0.72	4.50
Maximum	14.75	2.57	41.58	40.05	7.62	33.51	9.97	3.09	39.28	12.72	6.04	18.91	6.17	3.31	31.87	40.05	7.62	41.58
Minimum	-9.42	-5.66	-26.99	-9.34	-3.62	-37.56	-8.95	-2.72	-14.12	-5.43	-2.39	-10.59	-10.35	-4.02	-13.97	-10.35	-5.66	-37.56
Range	24.17	8.23	68.57	49.38	11.25	71.07	18.91	5.81	53.40	18.16	8.43	29.49	16.52	7.33	45.84	50.39	13.28	79.14
p25	-0.39	0.01	-0.47	-0.45	-0.03	-0.03	-0.04	0.01	-1.21	-0.28	-0.06	-0.09	-0.70	-0.02	-1.23	-0.43	-0.01	-0.33
p50	0.06	0.27	0.00	0.02	0.17	1.01	0.10	0.18	-0.14	0.06	0.05	0.65	-0.01	0.13	-0.15	0.05	0.15	0.29
p75	0.83	0.75	1.59	0.54	0.52	3.36	0.70	0.84	0.86	0.72	0.36	2.84	0.30	0.44	0.75	0.59	0.53	2.41
No. of firms	325	325	325	803	803	803	243	243	243	408	408	408	387	387	387	2,166	2,166	2,166

Note: Figures in parentheses are the p-values. *, ** and *** indicate statistical significance at the 1%, 5% and 10% levels respectively.

partly the smaller event coefficients for the split share and QFII reforms that are all less than 0.5, compared to those for the short-sale reform. This finding is consistent with the fact that prior to 2005, the influence of China's market on ASEAN countries has been low, despite the increasing trade flows with ASEAN. The capital markets in the region were still primarily driven by the influence of the US market. It is also argued that with the growth of China's stock markets, its impact on ASEAN would have increased both directly and indirectly through its greater impact on the US and other markets in more recent years. The findings of a larger impact of the short-sale reform, could also reflect the possibility of speculators taking position in response to increased opportunities for speculation, of which are less possible with the other two reforms.

The country results, however, display slightly different patterns, in particular for the Philippines and Thailand. For easy comparison, the event coefficients are plotted in Figure 1. The coefficients are on the increase for three of the ASEAN countries, but not for the Philippines and Thailand. For the listed firms in Indonesia, Malaysia and Singapore, the responses are larger for more recent market reforms. Firms in Malaysia obviously have the biggest responses to the most recent event. Its average normalized coefficient is above 2 for the response to the changes in regulation on short selling. This is followed by Singapore firms, with an average coefficient value slightly above 1.5. The magnitude of response of Indonesian firms to the reform on short selling is close to 1. Prior to that, the average coefficients for Malaysian and Singapore firms are well below 0.5 for the first two market reforms in China, even lower than the Indonesian firms. This is probably due to the

Figure 1 Average Normalized Coefficients by Countries



relatively fast increasing bilateral trade and investment flow between China with Malaysia and Singapore over the last one decade, which led to higher stock market sensitivity with respect to market changes in China.

This pattern could be explained in the context of trade statistics. The trade statistics released by the World Bank suggested that China has become the largest trade partner of Malaysia since 2009, which overtook trade with Singapore and the US. For Indonesia and Thailand, China only replaced Japan to become their largest trading partners after 2013. Similarly for Singapore, China has become its largest trading partner after 2013 replacing Malaysia. However, the largest trade partner for the Philippines has always been Japan, while China emerged as their third largest trading partner in 2011, after Japan and the US. In short, the results reflected that the three countries with increased trade ties with China also exhibit higher market sensitivity to China market reform announcements. It seems plausible to conjecture that the responses of stock markets in ASEAN countries to China events are driven by trade linkages with China. This represents an important link between China's financial sector – its stock markets – and the real economies of ASEAN.

4. Conclusion

This study employs the dummy variable regression approach to estimate the changes in returns in the five biggest stock exchanges in ASEAN as a measure of their responses to three major market reforms in China. The evidence suggests that reforms in the Chinese market have significantly influenced the returns of stock exchanges in Indonesia, Malaysia, the Philippines, Singapore and Thailand. The results clearly show that governance reforms in China's financial markets, while domestically directed, have consequences for the ASEAN stock markets as well. As China continues its reforms, they will continue to impact the latter. The more recent reforms have caused larger responses, particularly from firms listed in the stock markets of Indonesia, Malaysia and Singapore. It is conjectured that these results were closely related to the increasing bilateral trades between these three countries with China. Thus, even as the real sectors between China and ASEAN become more integrated, so also will their financial sectors.

It should finally be noted that the links explored in this study represent just one of several avenues through which the financial sectors of China and ASEAN become increasingly intertwined. Another is Chinese companies listing on ASEAN stock exchanges. Singapore, with 140 Chinese companies listed on the SGX as of September 2015, is the leader in ASEAN, while Malaysia's Bursa Malaysia has 10 (Liu, 2015). With Chinese entities involved in the Belt and Road Initiative, and in infrastructural construction connected

with the Asian Infrastructure Investment Bank, joint ventures with local ASEAN entities represent yet another avenue. A third avenue would likely consist of Chinese multinationals like Huawei establishing subsidiaries in ASEAN countries as part of their localization initiatives.

Overall, then, despite the contagion risks inherent in closer integration, that ASEAN and China have forged and continue to forge links in both the real and financial sectors suggest that the cost of strategic and geopolitical contests between China and ASEAN member countries, exemplified most recently by the South China Sea dispute, will hopefully not be allowed to jeopardize the gains from financial integration.

Notes

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1. An earlier version of this paper was presented at the Joint International Seminar 2016 of China-ASEAN Research Institute of Guangxi University and Institute of China Studies, University of Malaya, Nanning, China, 10-11 September 2016.
2. These were not the only financial reforms China enacted. For instance, China's Qualified Domestic Institutional Investor (QDII) Scheme announced in 2006 was a counterpart to the QFII Scheme. However, this scheme did not grant foreign investors greater access to Chinese financial markets; rather, it enabled Chinese enterprises to invest overseas.
3. The figures reported are statistics for the average normalized coefficients, A_j^k. The t-test is used for assessing the statistical significance of the coefficients (p-values reported in parentheses). The values p25, p50 and p75 are the 25th,

50th and 75th percentile, respectively. The normalized coefficients are computed from the estimates of the baseline model for each firm: $R_{ijt} = \alpha + \delta_{ij}^{1}(D_t^{AShare}) + \delta_{ij}^{2}(D_t^{Split}) + \delta_{ij}^{3}(D_t^{ShortSale}) + e_{ijt}$, where R_{ijt} is the stock return of the firm, D_t^{AShare}, D_t^{Split} and $D_t^{ShortSale}$ are dummy variables that take a value of one for the period of 10 days prior to 10 days after the event date, and zero otherwise.

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Book Review

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Book Review

Ji Ruan, *Guanxi, Social Capital and School Choice in China: The Rise of Ritual Capital*, London: Palgrave Macmillan, 2017, 194 pages.

This book examines why and how the Chinese use *guanxi* to secure admissions in key schools. In China, students must pass the Provincial Exam (*zhong kao*) and the National Exam (*gao kao*) before they can secure admission to highly regarded senior high schools and universities. Senior high schools in China fall into two categories: the regular schools and the key schools. The number of places available in the key schools is highly inadequate compared to the number of students applying for admission, since the vast majority of parents hope and expect that their children will secure admission in the key school. Some key schools in China have worked around the problem of shortage of places by opting for the dual registration system. Under this system, some of the available places are reserved for students who pass the entrance examination, while the remaining are reserved for students who have not passed the qualifying examinations, but whose parents are willing to pay a higher tuition fee in exchange for a prized seat. In terms of methodology, the author uses an ethnographic approach and collected data through participant observation and semi-structured interviews.

The relationship between *guanxi* and social capital is well discussed in this book. *Guanxi* is a cultural concept that explains the personal relationships of the Chinese. The author explains that the Chinese rely on traditional Confucian cultural concepts to define the relationships between two individuals. For example, the Five Cardinal Relationships (*wu lun*) defines basic personal and interpersonal relationships, including the relationships between the government and the country's citizens, parents and offspring, husband and wife, siblings, and friends. The definitions govern how relationships are treated and what rules, ethics, and personal interactive practices apply to each relationship, depending on the level of intimacy and social distance between the individuals. The author reviews the major theoretical and conceptual works of major Chinese social anthropologists, such as Fei Xiaotong's concept of ego-centered social relationships, K.K. Hwang's model of three types of personal ties (the expressive, instrumental, and mixed), Yan Yunxiang's model of two types of *guanxi* (primary and extend), and Chang Xiangqun's model of four types of Chinese reciprocity-based (*wanglai*) personal relationships (generous, expressive, instrumental, and negative).

Based on these works, the author proposes the concepts of close *guanxi*, moderate *guanxi*, and distant *guanxi* to differentiate personal relationships among people of different social distance and personal intimacy. The idea of close *guanxi* bears close resemblance to Hwang's expressive tie, Yan's primary *guanxi*, and Chang's expressive *wanglai*. The concept of moderate *guanxi* is akin to Hwang's definition of mixed tie, while the notion of the distance *guanxi* is much like Hwang's instrumental tie, Yan's extended *guanxi*, and Chang's instrumental *wanglai* (p. 61). All of these categorizations can predict the different social and ethical behaviours the Chinese will exhibit depending on the social distance and personal intimacy they share with the other individual. Depending on the different types of *guanxi* between individuals, individuals may display differing levels of attachments and frequency of interactions.

How is *guanxi* related to social capital? Since the components of social capital include social networks, norms, and sanctions, the author considers Chinese *guanxi* as one of the components essential for building social capital. In order words, *guanxi* is not independent of social capital; rather, *guanxi* is one part of social capital. In this regard, the author is curious about how parents utilize their *guanxi* to help their children gain social capital, or in this particular instance, admission to the key school.

Following the theoretical discussion, the author attempts to analyze how Chinese parents employ types of *guanxi* practices to develop and maintain good personal relationships with the people who could help their children secure a place in the key school. The types of *guanxi* practices include ritualistic customs, giving money, using power, and *guanxi-guanxi* relations. Ritualistic customs involves demonstrating several kinds of tactical ritual behaviours, such as giving gifts, exchanging favours, giving face, and *ketao* (客套) to develop a relationship to achieve the goals of *la guanxi*. The aim of performing these ritual behaviours is to invoke mutual emotional attachment between the parents and the headteachers or the educational officials, and thus develop closer *guanxi* and intimate *ganqing* between them.

The author also illustrates why *guanxi* is used. He explains that his research uncovered two main reasons behind the use of *guanxi* in securing school places. The first reason is the institutional vague. The author points out that prior to the enforcement of the educational policy reform in 2011, most key schools in the two research locations reserved some seats for students who had failed to clear the high school entrance examination and for the *guanxi* students. According to a participant, who was a teacher in one of the city's school, the school reserved 100 of the 600 available seats each academic year for *guanxi* students. Further, the participant explained that government rules did not include any regulations or stipulations about how to allocate the school seats (p. 102). Owing to the institutional vague

and the dearth of the school enrollment regulations prior to 2011, schools had the flexibility to reserve seats for *guanxi* students, and thus, earn higher revenues and profits by charging the *guanxi* students higher school selection fees and donations. However, these *guanxi* practices negatively influenced school education in the two research locations. Corruption in the educational system is a serious issue and the author reveals that school officials and head teachers use their positions of power as a resource to gain financial favours or other resources (p. 107).

The second reason behind the use of *guanxi* is the prevalence of particularism, collectivism, and diffuse culture in local society in contemporary China. The collectivism cultural background means that the Chinese regard society as more important than the individual and subsequently, the interests of society as more important than the interests of the individual. As a result, they are quite willing to use societal *guanxi* (e.g., family, friends, kinship relationships, and so on) to influence the distribution of social resources. The fact that the Chinese find it difficult and awkward to reject requests from their societal *guanxi* has given rise to particularism, which in turn, influences the distribution of social recourses in China. In this study, the author claims that Chinese parents do not have any qualms about using their societal relationships to secure the place or a seat for their children in key schools. This cultural phenomenon is widely seen, especially in the research locations where the fieldwork was conducted. Subsequently, the author explains that most participants in the study did not see anything wrong in making or receiving these kinds of requests.

However, the author does note that not everyone could utilize *guanxi* practices successfully. He suggests that demonstrating the proper ritual behaviours during the processes of *la guanxi* might help parents achieve greater success in their quest to utilize *guanxi* for securing school placements. As discussed earlier, the Chinese demonstrate different social interaction behaviours and ethics depending on the level of social distance and interpersonal *guanxi*. As a result, when someone demonstrates an inappropriate behavioral ritual, it makes a negative impression on the other person and may adversely affect their *guanxi*. In this regard, the author proposes the concepts of 'Ritual Capital'. Ritual capital prescribes how people can successfully obtain social resources by performing the appropriate ritual behaviours to enhance their *guanxi* and interpersonal relationships.

Based on these findings from the fieldwork and interview data, the author concludes that there is the presence of a weak-strong-weak pattern related to ritual capital. According to the author, the Chinese demonstrate the expressive type of ritual behaviour to their close *guanxi*, comprising family and close friends. However, they would not expect to demonstrate these ritual behaviours in exchange for social resources and benefits from their close

guanxi. Demonstrating the expressive ritual is purely to express emotions and attachment for close *guanxi* and not for material gain. As a result, the Chinese get weak ritual capital from close *guanxi*. However, the author claims that the Chinese frequently demonstrate ritual behaviours toward moderate *guanxi*. By demonstrating the appropriate ritual behaviours toward moderate *guanxi*, people expect their moderate *guanxi* to help them to network with others to obtain useful information and social resources. The author believes that people must demonstrate a high degree of appropriate ritual behaviours to gain the necessary social resources, which means that ritual capital proves more useful in acquiring resources from moderate *guanxi*. Finally, the author points out that the Chinese would not demonstrate ritual behaviours toward distance *guanxi* because the social distance between them is too alienating to do so.

Based on his theory of the weak-strong-weak pattern of ritual capital, the author concludes that ritual capital is more useful for acquiring resources from moderate *guanxi*, and therefore, ritual capital contributes most to bridging social capital (p. 132). In other words, from the author's perspective, ritual capital is a part of an individual's social capital rather than an independent form of capital (p. 131).

This book includes hence demonstrates three key ideas. First, the book demonstrates how Chinese parents utilize their *guanxi* so their children can secure a place in the key school and obtain a larger share of social resources. The author shows clearly that parents apply different types of *guanxi* practices depending on the social distance with different *guanxi*. The author also proposes a weak-strong-weak model to explain how different *guanxi* practices and different ritual behaviours can help obtain social resources and accumulate social capital. Further, the author explains the features of *guanxi* closeness as a continuum that is ever changing, adaptable, and personally subjective, rather than something that is constant and unchanging. This book also demonstrates how and why *guanxi* is used in the context of school placements. The author found four different types of *guanxi* practices and two key reasons for the use of *guanxi*. In this regard, the book enriches our understanding of how and why people use *guanxi* for school placements. Next, the author proposes the idea of ritual capital and suggests that an individual who demonstrates the appropriate ritual behaviours to their *guanxi* stands to gain social resources and social capital. In this regard, the author contributes to the ideas of the social capital theory. Finally, the author indicates that ritual capital is more useful for acquiring resources through a person's moderate *guanxi*, and concludes that the ritual capital mostly contributes to bridging social capital.

For future research directions, this book points out that ritual behaviours matter; however, ritual behaviours are not exclusive to China, and each

country around the world is likely to have its own ritual customs. Therefore, it would be interesting to examine and empirically test how the ritual behaviours in various countries influence their people's personal relationships and their social capital.

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