9. RISK MANAGEMENT AND DIVERSIFICATION STRATEGY TO EVALUATE MNE SYSTEMATIC RISK IN EMERGING ECONOMY

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Abstract

This study mainly assesses the joint effects of diversification configuration on firm performance and systematic risk. We selected 269 stock public-listed firms to examine the separate and their joint effects on systematic risk. From our findings, high diversification configuration significantly leads to high systematic risk. However, systematic risk goes worse at high levels of country and region diversification. The findings led to the conclusion that the effect through "China involvement" which had co-opted and caught the strategic resources from the regions to focus its FDI policy objectives especially expands the country scope. It's important to consider how to maintain the competitiveness of their ventures in China to expand the markets overseas. The contribution is to connect the impact factors to analyze which model is beneficial for MNEs to evaluate the risk management in emerging economy. The results point out MNEs should use resource-based advantages through moderate diversification strategy and middle China involvement strategy to access to better risk management and reduce systematic risk.

Keywords: joint effects, diversification, systematic risk, China involvement (CI), multinational enterprises (MNEs), emerging economy, risk management
JEL Classification: E44, C11, C32

1. Introduction

1.1 Research Background

Geographical diversification has become increasingly common in the last decade and has great impacts on diversified firms' performance (Delios and Beamish 1999). In fact, geographical diversification can be defined as a foreign expansion a3cross borders of global regions and countries into different geographic locations, or markets (Hill *et al.,* 1992; Li and Qian, 2005). Taiwan has played a key role in creating a competitive industrial structure to coordinate public and private technological development. The most important role of state-led industrialization in advanced electronics has been to build technological competence. By the late 1970s, Taiwanese government had made the development of the IT industry a very

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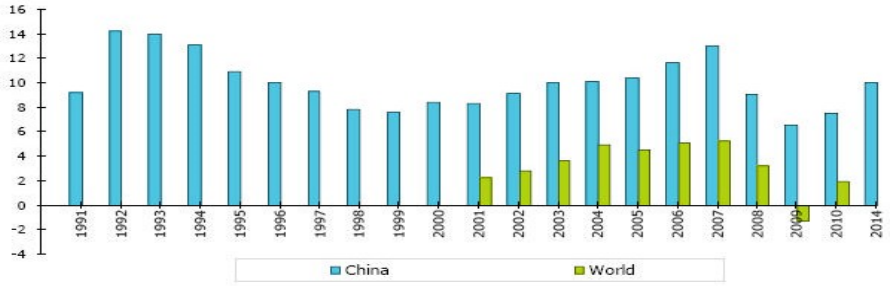
high priority. Around that time, the Taiwanese government formed the publicly-owned Electronic Research and Service Organization (ERSO) under the Industrial Technology Research Institute (ITRI) to acquire semiconductor design and production capability. In the 1980s, the competitiveness of Taiwanese firms eroded due to increased operating costs, such as those of labor and real estate (Chao, 2017). Due to the worsening business environment in Taiwan in the 1980s, many manufacturing firms, especially those that were labor-intensive, relocated their operations in other developing countries (Wei and Christodoulou, 1997).

According to PRC official sources, in the period 1996-1999, FDI from developing Asian nations dominated total FDI flows into China, but since 2000, it's apparent that there is a growing portion of these flows has come from other sources (*i.e.,* Europe, North America, Japan and Taiwan). This latter FDI generally has been of a different character than FDI from developing Asian countries. While the latter has been concentrated in export processing activities in sectors in which China has revealed comparative advantage, much of the former has been directed more toward the domestic market in sectors in which China has no revealed comparative advantage. In the mid-1990s, the majority of investment shifted to the information technology sector, especially personal computer components and peripherals. Taiwan has long limited investments in China by domestic chip makers because of concerns that their technologies might be used by the Chinese military. However, Taiwan government has more recently approved plans by chip makers to invest in China. This signals a significant relaxing of regulations for the Taiwanese manufacture industry. In 2015, 263 Taiwan-invested projects were approved by Mainland, up by 90.6% than that in February, and the actual use of Taiwan capital reached US$270 million, up by 93.9% (MINISTRY OF COMMERCE, P.R.C., 2016). By the end of December, 2015, the total number of Taiwan- invested projects approved by the Mainland was 1,856, and the actual use of Taiwan capital was US$96.87 billion (Statistics of Mainland-Taiwan Trade and Investment, MINISTRY OF COMMERCE., PRC, 2015).

According to the statistics of the Investment Commission of the Ministry of Economic Affairs, Taiwan, 2,549 foreign direct investment (FDI) projects with a total amount of US$10,083,598,000 were approved from January to September 2016. This indicates a decrease of 7.95% in the number of cases, but an increase of 204.34% in the FDI amount as compared with the same period of 2015. With regard to inward investment from Mainland China, 116 cases were approved with an amount of US$212,357,000 from January to September 2016, indicating an increase of 92.29% in the FDI amount as compared with the same period of 2015. Aggregated from June 30, 2009 to September 30, 2016, 905 cases were approved with a total investment added up to US$1,655,573,000. In terms of Taiwan's outbound investment (except to Mainland China), 377 projects were registered from January to September 2016 with a total amount of US$9,570,854,000, indicating an increase of 13.21% in the number of cases, and an increase of 8.85% in the amount as compared with the same period of 2015. As for Taiwan's outward investment to Mainland China, 176 applications have been approved from January to September 2016, indicating a decrease of 30.43% as compared with the same period of 2015. The approved investment amount is US$7,081,172,000, an increase of 2.92% as compared with the same period in 2015(Taiwan FDI Statistics Summary Analysis, Investment Commission, MOEA, 2016).The Chinese government set a growth target of between 6.5% and 7.0% for 2016. Focus Economics Consensus Forecast panelists expect GDP to expand 6.6% in 2017, which is unchanged from last month's estimate. In 2017, the panel sees economic growth coming in lower at 6.3%, which is also unchanged from last month's estimate.

Figure 1

China and World GDP Growth Projections



Source: World Bank, "World Development Indicators Database", 15, July, 2015.

1.2 Research Motivation and Purpose

This study mainly assesses the joint effects of diversification configuration on firm systematic risk. The reason for focusing our study on Taiwan Multinational Enterprises (TMNEs) is their management and operational risk sometimes occurred during China's economic development. Up to now, China iscurrently the largest host for foreign direct investments, around 58.87% of its exports being manufactured by MNEs in 2015 (China Statistical Yearbook, 2016). As more MNEs come to operate in China, how they perceive and manage issues arising from the business–environment interface will have a profound impact on China's macro-economic growth.

The reason for focusing on Taiwan Multinational Enterprises (TMNEs) is their management risk occurred in China's fast economic development. Up to now, China is currently the largest host for foreign direct investments, with around 58.87% of its exports being manufactured by MNEs in 2015 (China Statistical Yearbook, 2016). As more MNEs come to operate in China, how they perceive and manage issues arising from the business–environment interface will have a profound impact on China's macro-economic growth. Based on resource dependency theory, which postulates that organizations will react to pressures in their external environment to secure the resources needed for survival, the findings of this research led to the conclusion that the moderating effect through "China involvement " which had co-opted and caught the strategic resources from the regions and resourced-based countries, a TMNE was involved in high concentrated region in order to focus its FDI policy objectives, especially those related to expanding the market scope. With accumulated experience and understanding of global markets, many TMNEs have become more familiar with the conditions under which one may contribute to the other's wellbeing. China governments, in particular, have made progress in their knowledge and understanding not only of the costs, risks and benefits of FDI, but also of the implications of being integrated into the global economy through attracting FDI into China became an important national policy in these years (Chao, 2017). For TMNEs, it's important to consider how to maintain the competitiveness of their ventures in China to expand the business markets overseas, CI strategy may be connected with the beneficial agreements through Cross-Strait economic cooperation.

This research focused on the effects of geographical diversification on the TMNEs' systematic risk using panel data from the Taiwan Stock Exchange Corporation (TSEC). This research not only attempted to provide further evidence on the existence of the theorized relationship

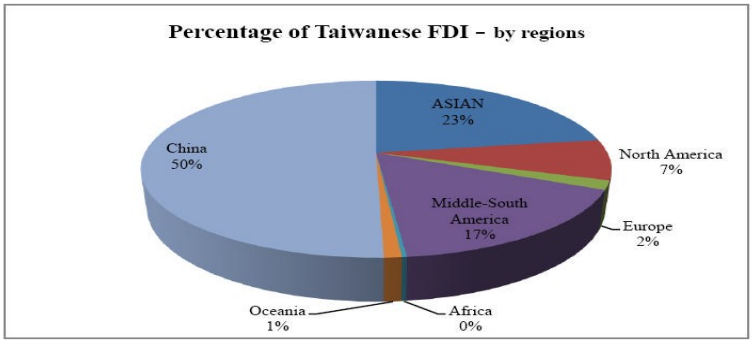
between geographical diversification and systematic risk but also aimed to provide insight into the geographically diversified operation mechanisms that affect the possible variation in risk. Furthermore, an appealing aspect corresponding to the findings is that the number of foreign countries and country segments which were established, though ignored in prior studies, has exerted statistically significant effects on systematic risk (beta value).

Over the last two decades, many Taiwan multinational enterprises (TMNEs) have engaged in internationalization mainly by exporting their products overseas and aligned with TMNE for outsourcing. Some TMNEs have set up foreign subsidiaries in diverse regions and countries to get better foreign operation involvement. It is because that many TMNEs choose geographical diversification as a means of maintaining overall stable and balanced cash flows, especially when some economy or industry slides into recession. Some other economies or industries may be still booming. This study chooses Taiwanese electronic industry as the research sample, which is particularly internationalized and invested in China over fifteen years. By way of geographical diversification, TMNEs have the chance to reach economies of scale and scope to enhance performance and reduce systematic risk effectively. As a matter of fact, since 1996, most TMNEs have aggressively adopted a foreign expanding policy to enhance their overseas competitive advantages. The Statistics on Approved Overseas Chinese and Foreign Investment by Area in 2016, which provided by Investment Commission, Ministry of Economic Affairs, Taiwan (MOEA), demonstrates top five investment destination or countries. Many investment destinations around Caribbean Sea are in fact the tax havens. Many firms invest in this area because of low tax rate, and it is claimed that the investments in tax haven and Hong Kong are expected to reinvest mainly in China or other areas. As the statistical reports shows that FDI to China holds a large part of the whole Taiwanese foreign investment. We provide an important figure analyzing the percentage, amount and cases of TMNEs' investment in China and abroad (See Figure 2).

Figure 1 shows the weight of Taiwanese FDI in regions of the world (The dispersion of Taiwan foreign direct investment invested by region). We particularly separated Chinese market for the reason that China occupied 50% percent of total investment came from TMNEs. That is to say, Taiwan has high investment dependency in China. Based on the reports from Statistics on Approved Outward Investment (MOEA, 2016), and the Statistical reports from Ministry of Commerce of the P.R.C. From the figures, we can get important implications that Taiwanese outward investment to China took the lion's share of the whole.

Figure 2

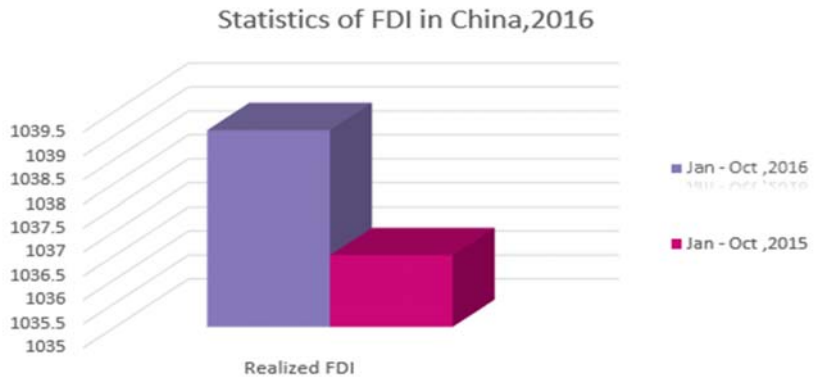
Dispersion of Taiwan Direct Investment - by Region



Source: Investment Commission, MOEA Taiwan, R.O.C. (December, 2016).

This results gain our attentions of Taiwanese companies are highly aggregate in the great China area, and according to Li and Qians' research (2005), the country diversification is positive related to firm performance especially at low region diversification. According to the statistics of news release of foreign investment, in October 2016, Newly Approved Foreign-invested Enterprises amounted to 1288, down by 36.9% year on year; and the actual use of foreign investment reached RMB 57.28billion(USD 8.81billion), increasing-up by 4.7% year on year(Gross Domestic Product of China Yearly Macro Economic Statistics,2016). Chinese investors made direct investment overseas in 7,020 enterprises of 162 countries and regions. The direct investment overseas amounted to RMB 961.93 billion in 2016 (equivalent to US$145.96 billion, up 53.3% year on year, OECD, 2016).

Figure 3



Source: Statistics of FDI in China in January-November 2016.

According to the statistics of news release of foreign investment, from January to November 2017(Figure 3), Newly Approved Foreign-invested Enterprises amounted to 30815, up by 26.5% year on year; and the actual use of foreign investment reached RMB 803.62b(USD 119.91billion), up by 9.8% year on year. In addition, according to statistics of the foreign direct investment in China, from January to July 2017, the Newly Approved Foreign-invested Enterprises amounted to 17,703, up by 12% year on year; and the actual use of foreign investment reached RMB 485.42b, down by 1.2% year on year, In additional, USD 72.14b, down by 6.5% year on year (International Monetary Fund, 2012).

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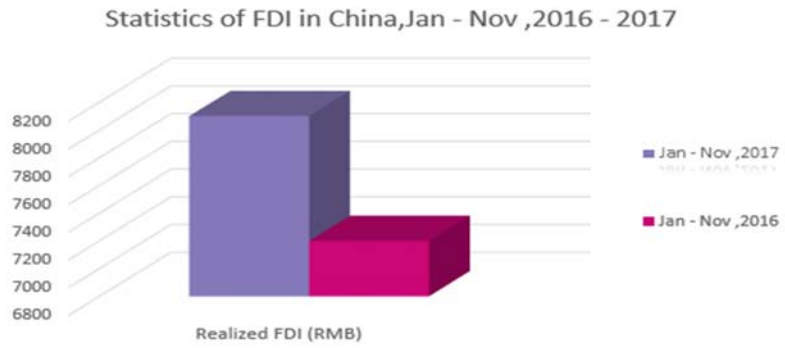
Figure 4

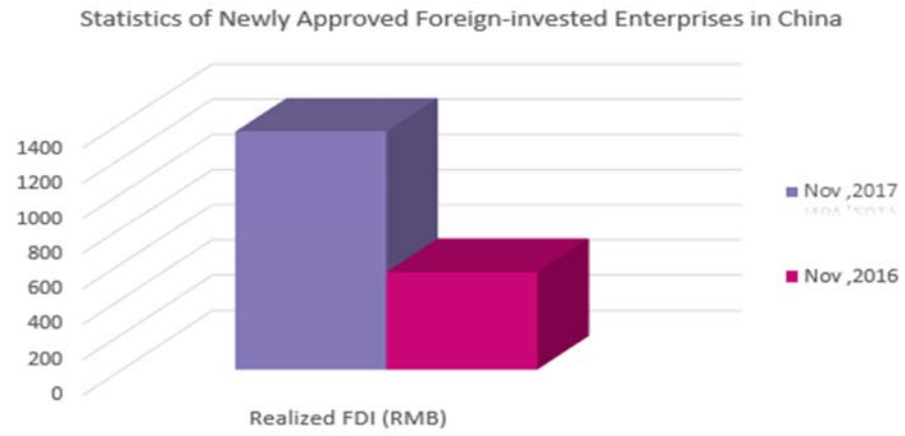


Source: Statistics of FDI in China in January-November , 2016-2017, Information by the Foreign Investment Department of the Ministry of Commerce.

According to the statistics of news release of foreign investment, in November 2017, Newly Approved Foreign-invested Enterprises amounted to 4641, up by 161.5% year on year; and the actual use of foreign investment reached RMB 124.92 billion（USD 18.78billion）, up by 90.7% year on year.

From January to November,2017(Figure 5), the top ten nations and regions with investment in China (as per the actual input of foreign capital) are as follows: Hong Kong (USD 90.47b), Taiwan Province(USD 4.43b) , Singapore (USD 4.41b) , R.O.K.(USD 3.12b) , U.S.A. (USD 2.97b) , Japan (USD 2.95b) , Netherlands (USD 2.11b) , Germany (USD 1.52b) , U.K. (USD 1.23b) and Denmark (USD 820m) , total of which accounted for 95.1% of total actual use of foreign investment in the country (Gross Domestic Product of China Yearly Macro-Economic Statistics (National), 2016.)

Figure 5



Source: Statistics of FDI in China in January-November , 2016-2017, Information by the Foreign Investment Department of the Ministry of Commerce.

In January-October 2017, the total import and export value of China reached US$3.30722 trillion, with an increase of 11.6% year on year (the same as below). The export was US$1.82099 trillion, with an increase of 7.4% and the import was US$1.48622 trillion, with an increase of 17.2%, the trade surplus was US$334.77 billion, with a decrease of 21.7%.In October, the total value of the Chinese import and export was US$339.79 billion, with an increase of 11.2%. The export was US$188.98 billion, with an increase of 6.9% and the import was US$150.81 billion, with an increase of 17.2%. The trade surplus was US$38.17 billion, with a decrease of 20.6 %(OECD Economic Outlook 100 database, 2018). From January to November in 2017, the top ten nations and regions regarding investment in China (according to the actual input of foreign capital) are as follows:

Table 1

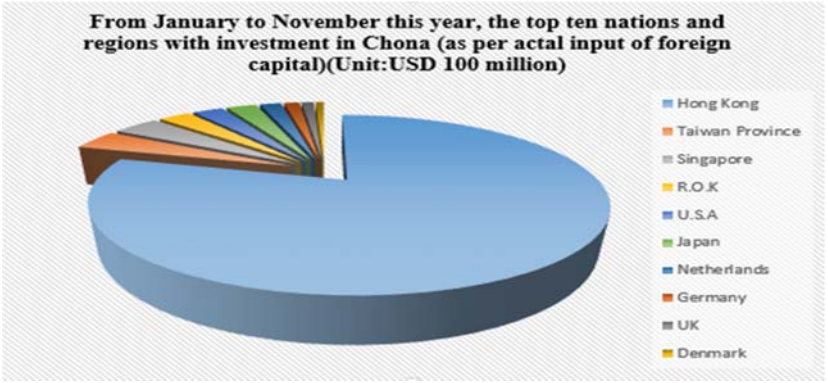
Top ten nations and regions regarding investment in China

Country	Investment amount
Hong Kong	USD 52.57 b
Taiwan	USD 3.26 b
Singapore	USD 2.81 b
Japan	USD 1.84 b
U.S.A.	USD 1.78 b
R.O.K.	USD 1.75 b
Netherlands	USD 1.36 b
Germany	USD 1.24 b
U.K.	USD 890 m
Denmark	USD 610 m
Total	USD 68.1 b

The total of which accounted to USD 68.1b, accounting for 94.4% of total actual use of foreign investment in the country, down by 6.7% year on year (See Figure 6)

Figure 6

The Top Ten Nations and Regions with Investment in China



Source: Statistics of FDI in China in January-November 2017, Information by the Foreign Investment Department of the Ministry of Commerce.

1.3 China's Continuous GDP Growth and TMNEs' China Involvement Strategy

China has an opportunity to further leverage the role of sustainable investment to significantly benefit the country and its business community. With rising awareness and understanding of good economic environment among mainstream investors, MNEs, in addition, requirements for transparency would increase which would lead to better corporate governance and ultimately, more successful companies. The tremendous market would reward the most innovative MNEs that address the country' s most critical sustainability challenges, and financial resources would be more efficiently allocated. With the right incentives and commitments from China government, and large mainstream investors on board, sustainable investment could flourish and support TMNEs to create better advantages and opportunity to compete with the other MNEs came from the other countries through high level of China involvement connected with low region diversification (Pan and Chao, 2010). Despite tentative signs that the fading of policy support could hurt growth, the Chinese economy showed its strength again in Q3 and expanded at a steady rate of 6.7% for the third consecutive quarter. The print was in line with market expectations and puts the economy on track to comfortably attain this year's 6.5%-7.0% growth target. Post-flood reconstruction works, a burgeoning real estate market and solid gains in private consumption likely shored up growth in Q3, 2016 (Ying *et al.,* 2014). An accommodative monetary policy stance and government-fueled growth via cheap credit prompted private sector debt, which includes household and corporate borrowing, to skyrocket from around 115% of GDP in 2008 to 230% of GDP in Q1,2015 (China GDP Growth & Financial Balance OECD, 2016). The State Council unveiled a raft of measures on 10 October to cut private-sector leverage, including swapping bad debt for equity and facilitating the bankruptcy of zombie firms. However, analysts are skeptical about the plan as it does not address structural problems, such as how to prevent companies from incurring bad debt again in the future. Up to now, supply-side reforms to cut excess capacity need to accelerate and bankruptcy of zombie firms be made easier. Leveraged investment in asset markets should be contained and monitored. Public investment should focus on efficiency and avoid crowding out the private sector. The Chinese government set a growth target of between 6.5% and 7.0% for 2016[2].

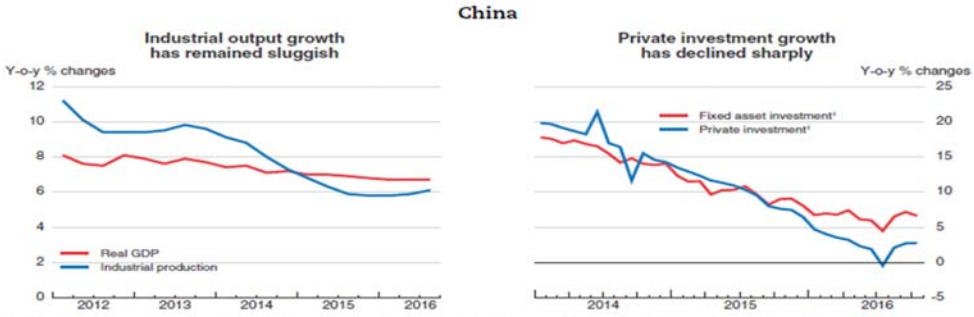
The Gross Domestic Product (GDP) in China expanded 6.8 % YoY in Sep 2017, following a growth of 6.9 % in the previous quarter. Real GDP Growth YoY data in China is updated quarterly, available from Mar 1992 to Sep 2017, with an average rate of 9.4 %. The data reached an all-time high of 15.3 % in Mar 1993 and a record low of 6.4 % in Mar 2009. CEIC calculates Real GDP Growth from quarterly Real GDP Index. The National Bureau of Statistics provides Real GDP Index, at previous year prices. In the latest reports, Nominal GDP of China reached 3,176.1 USD b in Sep 2017. Its GDP deflator (implicit price deflator) increased 4.1 % in Sep 2017. GDP Per Capita in China reached 8,127.5 USD in Dec 2016. Its Gross Savings Rate was measured at 46.4 % in Dec 2016. Focus Economics Consensus Forecast panelists expect GDP to expand 6.6% in 2016, which is unchanged from last month's estimate. In 2017, the panel sees

[2] In January-October of 2016, China's import and export totaled US$ 2.98148 trillion, down 7.6% year on year. The export was US$ 1.71155 trillion, down 7.7%, and the import was US$ 1.26993 trillion, down 7.5%. The trade surplus was US$ 441.61 billion, down 8.1% year on year. In October, China's import and export totaled US$ 307.3 billion, down 4.9% year on year. The export was US$ 178.18 billion, down 7.3%, and the import US$ 129.12 billion, down 1.4%. The trade surplus amounted to US$ 49.06 billion, going down 20% year on year.

economic growth coming in lower at 6.3%, which is also unchanged from last month's estimate.

Figure 7

China Industrial Output and Private Investment Growth



1. Fixed asset investment and private investment refer to nominal values and do not include investment by rural households.
Source: CEIC.

StatLink http://dx.doi.org/10.1787/888933437512

Source: China Industrial Output and Private Investment Growth, CEIC, March 2017.

This research focused on the effects of geographical diversification on the TMNEs' financial performance and systematic risk using panel data from the Taiwan Stock Exchange Corporation (TSEC). This research not only attempted to provide further evidence on the existence of the theorized relationship between geographical diversification and systematic risk but also aimed to provide insight into the geographically diversified operation mechanisms that affect the possible variation in risk. Furthermore, an appealing aspect corresponding to the findings is that the number of foreign countries and region segments which were established, though ignored in prior studies, has exerted statistically significant effects on systematic risk (beta value).

This research provided a considerate look at the financial performance and systematic risk ramifications of TMNEs' investment at this interesting juncture in China's integration and a deep insight of the worldwide economic situation. Furthermore, we aimed to provide an empirical assessment of the impact of geographical diversification (country and business diversification) – a key driver of globalization for TMNEs entering into China and other countries on the financial performance and systematic risk of TMNEs. The effects of geographical diversification on TMNEs' systematic risk were investigated via statistical tool "Stata". Despite the lack of a unifying theory, we used several theories to discuss indicators which can be used for the independent variable, i.e. geographical diversification and examine how it affects the financial performance and systematic risk of TMNEs and we provide a particular test which by way of a statistical tool can reveal possible results. We intend to examine the relationship between diversification configuration and systematic risk and to examine the moderating effect factor "China- involvement" on "diversification configuration and systematic risk".

2. Literature Review

Although MNEs can exploit these sources of competitive advantage that are not available to domestic firms, they are also exposed to costs and risk that do not face domestic firms.

Cross-border arbitrage opportunities are not risk free. As the number of foreign countries in which the MNE operates, and the percentage of its operations that take place overseas increase, for more deep analysis, we highly expect to construct diversification configuration-performance-systematic risk relationship to examine. Operating in international markets sometimes involves exposure to volatile movements in currency exchange rates (Hill,Hitt and Hoskisson, 2004). The economic impact of currency exchange rate movements is complex because such changes are often linked to variability in real growth, inflation, interest rates, governmental actions and other factors. International diversification by itself does not enhance performance, but that it is the leveraging of firm specific assets – mainly intangible assets – across country markets that confer performance advantages. In a floating exchange rate regime, where purchasing power parity does not hold perfectly, a MNC has to face exchange rate risk. As noted by Pan and Chao (2010), all firms face foreign exchange exposure. However, as firms expand overseas, this exposure may increase the level of systematic risk for the firm. Exposure to foreign currency movements systematically increases the variation of foreign returns in domestic currency. The findings led to the conclusion that the moderating effect through *'China involvement'* which had co-opted and caught the strategic resources from the regions and resource-based country a TMNE was highly concentrated involved had to focus its FDI policy objectives, especially expand the country scope. From the amount of investment ratio, TMNEs' main investments are concentrated in electronics, mechanical and petroleum industries. The electronics investment ratio in China is the highest one which was occupied 40.89% overseas. Due to the electronic industry occupying a high- investment ratio in China, there has been a significant development in Chinese electronic manufacturers (Rugman,Yip and Jayaratne 2008) The export ratio of high technical labor intensive products is 39.69%, and the export ratio of Chinese high technical products is 45.87% (MOEA,ROC 2015); therefore, it is suggested that TMNEs not only increase industrial development, but also have the competitive advantage over other foreign MNEs investing in China.

2.1 The Separate Effects of Diversification Configuration on Systematic Risk[3]

Systemic risk refers to the risk or probability of breakdowns (losses) in an entire system as opposed to breakdowns in individual parts or components and is evidenced by co-movements (correlation) among most or all the parts. Thus, systemic risk is evidenced by a high correlation and clustering of firm failures in a country, a number of countries, or globally; and in currencies, by a clustering of deprecations in exchange rates in a number of countries (Gomes and Ramaswamy, 1999; Geringer *et al.,* 2000). In this study, we supposed to think which different risks occurred to different country or region invested by TMNEs, particularly with respect to causation through overseas diversification strategy. Another popular definition

[3] *Because beta is a comparison to the overall market, a benchmark or baseline representing the overall market is needed - usually, the S&P 500 is used, although betas can also be calculated against industry-specific indices. A negative beta means that the stock moves inversely with the market. When one rises, the other falls and vice versa. Precious metals and inverse ETFs often have negative beta values since their values tend to increase as the market falls. On an individual asset level, measuring beta can give clues to volatility and liquidity in the marketplace. In fund management, measuring beta is thought to separate a manager's skill from his or her willingness to take risk. Academic theory claims that higher risk investments should have higher return long-term. Further, highly rational investors should use correlated volatility, and we use beta value to measure instead of simple volatility (sigma).*

refers to a big shock that produces near simultaneous adverse effects for most or all of the domestic /foreign economy or system. Moreover, as a MNC expands into more countries, it is affected by higher cross-border transactions costs and higher interaction costs with a wider variety and number of governments (Callahan and Soileau, 2017).

According to our literature reviewed, it's apparent that multiple levels of authority also create higher political risk for the MNE. The principal market risks (i.e., the risk of loss arising from adverse changes in market rates and prices) to which MNEs are exposed are: interest rates on debt and short-term investment portfolios, foreign exchange rates, generating translation and transaction gains and losses and in some instances commodity prices affecting the cost of products (Eddleston *et al.,* 2008).According to or panel data, for TMNEs, China-oriented investment strategy would be thought a better way to enhance performance and we chose China involvement usage acted as a crucial role to effect TMNEs' systematic risk. Analyzing the relationship between geographical diversification and systematic risk is justified because estimates of systematic risk (beta) have a direct effect on security valuation. In addition, investors risk perceptions directly influence their decision- made investment process (Koufteros *et al.,* 2014). The lower postulated systematic risk is based on the notion that MNEs due to diversification have cash flows in different countries.

2.2 The Joint Effects of Geographical Diversification on Systematic Risk

Multinational theory indicates that low country diversification constrains firms' operational scale, as firms restrict their operation in certain countries. Low country diversification limits market opportunities and growth potential for each product line within a diversified firm as low country diversification limits market size (Delios and Beamish, 1999). Diversified firms can hardly achieve large volume with low country diversification. Consequently, they can hardly spread R&D costs and promotion costs of each product line over a large volume and thus suffer high costs (Pan and Chao, 2012; Matei and Dinu, 2016). In this study, the positive relationship (benefits of diversification) might be defended by the concepts which include (1) economies of scale, (2) economies of scope, (3) the international product life cycle, (4) factor speculation, (5) risk diversification, and (6) learning knowledge transfer. Low region diversification will also expose MNEs to similar environments, but at the same time might not necessarily restrict the MNEs' market opportunities if the MNE diversifies into various countries within a particular region. Low level country diversification might also minimize the disadvantages of business diversification as MNEs face the environmental similarities and then reduce coordination costs between different product lines (Geringer *et al*., 2000). This paper empirically investigated the joint effects of geographical diversification on TMNEs' systematic risk. Using a sample of 2,690 firm-year observations of firms from 2006 to 2015, the findings show that geographical diversification is partly negatively associated with an increase in systematic risk. At the same time, we found that geographically country-diversified firms possibly meet higher R&D expenditures, advertising expenses, and operating income than industrially-diversified firms.

2.3 The Moderating Effects of China involvement on Systematic Risk

Most foreign competitors may have different information sources than the MNE, resulting in additional risk for the MNE. TMNEs not only have to increase the industry development, but also have the competitive pressure to compete with the other foreign MNEs which invested in China. Analyzing the close trade and investment relations between geographic and cultural perspectives, one can easily find it not surprising that China should become one

of the strategic areas of Taiwan' s overseas investments. Furthermore, political tension and hostility made it necessary for Taiwan to look at its high economic/trade dependency on China from the standpoint of national security (Pan and Chao, 2010). The lower postulated systematic risk is based on the notion that MNEs due to diversification have cash flows in different countries. However, MNEs may increase their systematic risk owing to an increase in the standard deviation of cash flows from geographical diversification which offsets the lower correlation associated with diversification (Bromiley *et al*., 2015). As monitoring foreign operations by shareholders and other stakeholders becomes more difficult and less cost-effective, the risk of the expected cash flows from overseas operations may actually increase, in addition, factors such as increased tax regulation uncertainty may increase the systematic risk of TMNEs (Matei and Dinu, 2016; Chao, 2017). As firms increase their involvement in foreign markets, they may realize cost savings from economies of scope. The major factor noted in international finance literature that is linked to a reduction in systematic risk for the MNE is the notion that the firm operates in multiple countries which increases the diversity of its cash flows. As MNE is more diversified relative to domestic enterprise, the returns of the firm will be less correlated with the market and its systematic risk may decrease (Callahan and Soileau, 2017).

3. Methodology and Data Analysis

3.1 Data set and Collection

The author discusses how much China involvement ratio (CI ratio) and how diversified degree in different regions and countries TMNEs should decide in order to get better lower systematic risk. Past research has few analyzed and provided findings on these issues. It remains unclear and few papers studied now, thus, it's important to examine how the strategic decisions related to these issues influence firm systematic risk. This study was mainly focused on these issues and the dataset was based on public data and finally chose 269 publicly qualified middle-large sized firms which had invested over ten years in China. In addition, the samples are mainly adopted from Taiwan Economic Journal Co., Ltd (TEJ databank) and Taiwan Security Exchange (TAISEX). The samples are mainly adopted from Taiwan Economic Journal Co., Ltd (TEJ databank) and Taiwan Security Exchange (TAISEX). Samples are collected by following rules: (1) public listed companies in the Market Observation and (2) The samples occupied about 79.85 % are electronic industry and machinery industry in TAISEX. The size of these MNEs ranged from more than 1,000 employees. Two hundred and ninety two firms were selected, but only two hundred and seventy nine firms were collected effectively qualified in our sample. In order to smooth annual fluctuations in the accounting data, we used a ten-year average from 2006 to 2015 for each variable. The author conceptualized the geographical diversification as a multidimensional construct that includes two important dimensions, namely country diversification and business diversification and used company-level data including annual reports, and other data sources such as Taiwan Economic Journal and Market Observation Post Systems (established in The Taiwan Stock Exchange Inc.).

3.2 The All Variables Described

3.2.1 Systematic Risk (Beta Value)

Based on portfolio theory, diversification works to reduce firm-specific risk and due to the imperfect correlation among economies of different regions, systematic risk tends to be acted as an affected factor, therefore, systematic risk as another dependent variable to measure

TMNEs' systematic risk overseas. Correlations are evident between companies within the same industry, or even within the same asset class (such as equities), as was demonstrated in the Wall Street crash of 1929. This correlated risk, measured by Beta, creates almost all of the risk in a diversified portfolio. We measure systematic risk by following Laeven and Levine (2007), and we define the operational definition of β value as:

$$\beta_a = \frac{\mathrm{Cov}(r_a, r_p)}{\mathrm{Var}(r_p)}$$

where: ra measures the rate of return of the asset, rp measures the rate of return of the portfolio, and Cov (ra,rp) is the covariance between the rates of return.

3.2.2 Country Diversification

I define and calculated the country diversification index as the average from two of the three ratios (we collect FATA and FSTS in this study) and used the ratio to measure country diversification. The measurement is shown as follows:

$$CD = (FATA + FSTS) / 2$$

where: "FATA" is the foreign assets as the percentage of a firm's total assets and "FSTS" is the foreign sales as the percentage of a firm's total sales.

3.2.3 Business Diversification

The basic concept of business diversification is derived from product diversification. We define it a firm operating in m industry segments, the entropy measure of business diversification is defined as follows:

$$\text{Business Diversification} = \sum_{i=1}^{n} Pi \times ln\,(1 / \text{Pi})$$

where: Pi is the sales attributed to segment i and ln (1 / Pi) is the weight given to each segment within the same two-digit industry group.

3.2.4 China Involvement (Moderator)

The exogenous variable, CI is viewed as an important moderator to test the moderating effects between diversification configuration and systematic risk. CI = Actual investment amount in China / Total investment amount

3.2.5 Control Variables

Firm size

Firm size represents physical and financial resources. Therefore, it is frequently used as a proxy for competitive positioning (e.g., economies and diseconomies of scale) within an industry (Johnson *et al.,* 1997).

Debt ratio

Debt ratio was measured as the percentage of long-term debt to total capital (firm's debt plus equity) and was mainly used to control for the potential effect of non-capital financing

R&D intensity

R&D intensity played as an important determinant of firm's profitability and measured by using the firm's annual expenditure on R&D investment divided by annual revenues.

In summary, the specific terms were introduced as follows. Ln size represents firm size, and measure it by using natural logarithm. Debt-ratio represents debt ratio (long-term financial

leverage). R & D intensity represents RD i / Net sales amount. Statistical Description of all the variables can be seen on Table 2. (Statistical Description of all variables)

Table 2

Coefficients of the Result of Hausman Test on Beta Value

	(b) fixed	(B) random	(b-B)Difference	sqrt(diag(V_b-V_B))S.E.
debtratio	-.0164697	.0010564	-. 0175261	. 0193086
rdintensity	.0015849	-.0245854	. 0261703	. 0184122
lnsize	.0098982	.0160305	-. 0061323	. 0017967
cd	.065129	.0753316	-. 0102026	. 0102716
bd	-.0637137	-.0240838	-. 0396299	.014161
ci	-.1090142	-.1013469	-. 0076672	. 0095195

3.2 Model Constructed and Analyzed

We pooled the cross-sectional and time-series data to take the advantage of the greater degrees of freedom, and capture both the dynamic information of time series and the variation due to cross-sections. The main models are fits cross-sectional time-series linear models using feasible generalized least squares examine all models. This command allows estimation in the presence of autocorrelation within panels and cross-sectional correlation and heteroscedasticity across panels. In order to find the relationship among different diversification configuration, performance and systematic risk, and the effect of economic changes on degree of diversification at the same time, we pool the cross-sectional and time-series data into Fit panel-data models using GLS model test method and analyze. In order to find the relationship among different diversification configuration, performance and systematic risk, and the effect of economic changes on degree of diversification at the same time, we pool the cross-sectional and time-series data into Fit panel-data models using GLS model test method to analyze.

To avoid the possible emergence of problems that stemmed from autocorrelation, however, the result strongly rejects the assumption, which stands for a heteroscedasticity problem in our cross-time regression models. To avoid this problem, we change to fit panel-data models using GLS statistical analysis. The regression equation is designed as follows. GLS regression models are constructed as follows.

Regression Model and Test for □ Value (Systematic Value)

$$\boldsymbol{Beta} = \beta_1(cd\,) + \beta_2(bd) + \beta_3(cd \times bd) + \beta_4(cd \times ciu) + \beta_5((bd \times ci) + \beta_6(cd \times bd \times ci) + Control\,Variables + \alpha_i + \mu_{it}$$

α_i= an unobserved effect; μ_{it} = idiosyncratic error

$\boldsymbol{Beta}$ = Systematic Risk (Beta Value)

cd: country diversification; bd: business diversification; ci: China involvement.

We test the models based which were included cross-sectional time-series FGLS regression test for the representative coefficient, β value. In addition, correlation and descriptive analysis of β value to test the results of those four regressing models among business and country diversification to effect TMNEs' systematic risk. The four regression models are stated as follows.

Regression Model 1

$$\boldsymbol{Beta} = \beta_1(cd\,) + \beta_2(bd) + \alpha_i + \mu_{it}$$

Regression Model 2

$$\boldsymbol{Beta} = \beta_1(cd\,) + \beta_2(bd) + \beta_3(cd \times bd) + Control\ Variables + \alpha_i + \mu_{it}$$

Regression Model 3

$$\boldsymbol{Beta} = \beta_1(cd\,) + \beta_2(bd) + \beta_3(cd \times bd) + \beta_4(cd \times ci) + \beta_5((bd \times ci) + Control\ Variables + \alpha_i + \mu_{it}$$

Regression Model 4

$$\boldsymbol{Beta} = \beta_1(cd\,) + \beta_2(bd) + \beta_3(cd \times bd) + \beta_4(cd \times ci) + \beta_5((bd \times ci) + \beta_6(cd \times bd \times ci) + Control\ Variables + \alpha_i + \mu_{it}$$

4. Findings and Results

The tests show that systematic risk will be decreasing when the diversification configuration increases and the joint effects of diversification configuration have negative relation with TMNEs' systematic risk. In addition, the results show that the squared effects of diversification configuration have negative relation with TMNEs' systematic risk but just partially supported. Another important finding shows that the joint effects exerted by these diversification variables were highly significant when compared to those exerted individually. Thus, a diversification dimension may moderate the effects of other diversification dimensions. Business diversification and geographical diversification may create or destroy value, depending on TMNEs' overall diversification strategies. We can see the systematic risk is increasing by degrees accompanied by increasing business diversification and decreasing CI level (see Figure 8).

Table 3

Statistical Description of All Variables (Observations =2690)

Variable	Obs	Mean	Std. Dev.	Min	Max
betavalue	2690	0.847808	0.358306	0.0817	1.844537
cd	2690	0.462416	0.214348	0.1896	0.978675
bd	2690	0.602434	0.334356	0.1158	1.7911
Lnsize(Firm size)	2690	6.910979	2.021211	0.038127	13.30801
Rd intensity	2690	0.051245	0.080309	0.0587	2.0803
Debt ratio	2690	0.350352	0.155186	0.03997	1.4054
ci	2690	0.538093	0.23806	0.0679	1
cd*bd	2690	0.612473	0.538578	0.010351	6.606876

Table 4

The Model Test between Diversification Configuration and Beta

Diversification Configuration				
Dependent Variables	Model 1	Model 2	Model 3	Model 4
Intercept	0.8047	0.8904	0.9886	1.0543
Firm size	0.0135	0.1135*	0.1138*	0.1137*
R & D Intensity	0.0156	0.0213	0.0126	0.0224
Debt Ratio	-0.0794**	-0.0792**	-0.0798**	-0.0835**
Country Diversification		0.0198	-0.0760	-0.1487

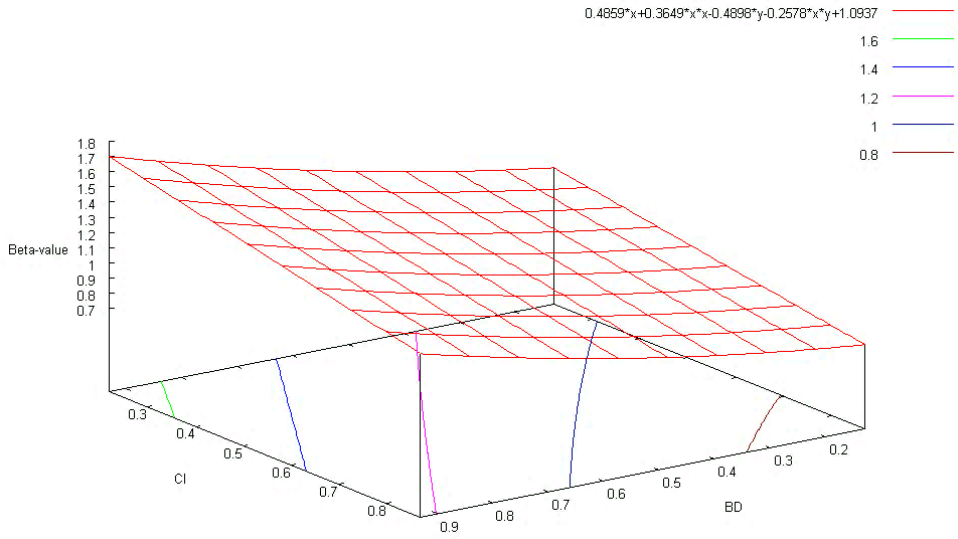
Business Diversification		0.0561	0.5853	0.5628
CD*BD		-0.3489**	-0.4898***	0.2354*
China involvement (CI) CD*CI BD*CI			-0.4689*** -0.0539 -0.3578**	-0.4556*** -0.1582 -0.4657***
CD*BD*CI CD*CI BD*CI			-0.4629*** -0.2739** -0.6578	-0.4586*** -0.2617** -0.4657***
Log likelihood	392.172	399.475	406.691	418.425

*Notes: * P≦0.05; ** P≦0.01;***; P≦0.001; Beta stands for systematic value*

The relationship between CI and joint effect of country diversification and business diversification reach the significance level. We conclude that the results of the moderating effect between diversification configurations and systematic risk is stated that the moderating effect of CI (moderating variable) has impact on the diversification configuration-systematic risk relationship and the important findings that CI is statistically significant but negative related to systematic risk. Furthermore, when country diversification increases not over 0.6 and business diversification level not over 0.7, systematic risk will locate in the lower area. The results indicate that TMNEs engaging in the low level country diversification combined with low level business diversification can spread and reduce systematic risk.

Figure 8

The Relationship of Three-dimension Diagram among China-oriented Investment, Business Diversification and Beta-Value (BD-CI-Beta Value)



Notes: It shows that if BD is over 0.8.and CI is under 0.35, resulting in Beta-Value (systematic risk) goes higher level and systematic risk increases accompanied by increasing business diversification and decreasing CI level. The result shows that high BD and low CI strategy makes TMNEs lead to high systematic risk (the coefficient of CI≦0.35).

According to our test, the results indicate that the approximate results that TMNEs should consider to engage in moderate geographical diversification strategy under low level systematic risk. Moreover, structural changes in systematic risk systems to affect performance in emerging economies make it particularly important to track and reduce systematic risks over time. To examine the effects of geographical diversification on firm systematic risk, we get the results that the joint effects of diversification configuration on firm systematic risk tested in Model 3 and 4 indicate that with low BD and low CI MNEs have negative relation to systematic risk which is significant but negative at the 0.05 level (see Table 4 The Model Test between Diversification Configuration and Beta).

5. Conclusions, Suggestions and Implications

5.1 Conclusions

According to our results, with low CI level and low country diversified MNEs have negative relation to systematic risk-significant but negative at the 0.05 level. The systematic risk appeared negative but significant as they diversified into fewer regions or areas-the significance levels ranging from 0.05 to 0.01 level. The empirical findings strongly indicate that different levels of geographical diversification and CI lead to a systematically different impact on TMNEs' systematic risk when TMNEs expand into global markets. Furthermore, differences in firm characteristics might provide possible linkages between CI and geographical diversification. TMNEs should consider engaging in light moderate geographically diversified strategy in order to achieve better performance under low level of systematic risk. In addition, from the previous statistical tests, we find that it's harmful to TMNEs' performance when TMNEs are under high level of systematic risk and/or exceedingly expanded geographical diversification. In low level systematic risk, TMNEs outperform than the ones in high level systematic risk. Under low level systematic risk, country diversification is significant, but negative relation to business diversification ($p<0.001$). In Asia economy, especially in China, TMNEs gradually integrating geographical diversification under a resource-based country which can increase the performance across borders seem to be an important strategy. In China, there have some regulatory barriers to universal and cross-state TMNEs has been taken into consideration in expanding scope and engaging in FDI. we get the conclusion that the moderating effect of CI is statistically significant and positive effect related to performance. According to our findings, it's very important for TMNEs to take risk control approach into consideration, especially the three kinds of risk which are political risk, operating risk and systematic risk. Political risk can be viewed as governmental or societal actions and policies originating either within or outside the host country, and negatively affecting either a select group or a majority of foreign business operations and investments. For all these reasons, under different types of systematic risk, from the statistical test, we can present a new approach how to assess systematic risk and apply our findings to MNEs' CEO or decision-makers.

5.2 Suggestions and Implications

5.2.1 Is It the Right Time to Invest in China Now?

The economy continues to defy signs of an abrupt slowdown on the back of resilient household consumption in China. GDP expanded 6.8% annually in Q3, just a notch below 6.9% to achieve this year's 6.5% growth target. The slight deceleration reflected poor investment dynamics partially due to stricter environmental regulations. In addition, China

will continue with its managed deceleration as authorities seek to achieve a more sustainable growth trajectory, while implementing economic reforms. Fiscal policy will remain accommodative next year, while the government will likely tighten financial conditions. The economy in China will grow 6.4% in 2018, which is unchanged from last month's forecast. In 2019, the economy is expected to grow 6.1%. Stock market (annual variation in %) growth rate is 3.2%, -6.7%, 12.9%, 9.4% and -12.3%, from 2012 to 2016. Sequential data shows that GDP in Q3 adjusted for seasonal factors increased 1.7%, slightly down from the 1.8% expansion in Q2. Overall nominal GDP grew 11.2% annually in Q3, which was above the 11.1% increase in Q2 and mainly the result of higher commodity prices (see Table 5, China GDP Growth & Financial Balance). Chinese stock markets tumbled to record low December, 2017 making investors concerned about the long-term sustainability of the Chinese economy. Though the market has recovered partially from the crash, investors are left wondering if low economic slowdown will lead to a temporary policy correction. The future investment strategy in China is an important issue for many MNEs to take into consideration. Stable economic growth will allow the continuation of economic and social reforms to meet China Chairman Xi's call for putting quality first and prioritizing the country's economic development. While fears of rising protectionist trade policies have vanished, the main downside risk to China's stellar economic performance is an abrupt slowdown in the property market and disordered financial deleveraging. The investors should take high attention and consideration to invest in China capital market based on risk-sharing strategy (Chao, 2017). This research is mainly focused on the relationship between 'geographical diversification' and 'systematic risk' to examine the moderator 'China involvement' whether is an important factor to effect. The author thinks that geographical diversification provides MNEs opportunities but incur high transaction costs as well. Finally, the results can provide some useful suggestions for most MNEs and decision makers who intend to invest in China to take their FDI policy into consideration.

5.2.2 The Risk Avoiding Strategy in China

In fact, China has been successful in both inward and outward FDI activities and accordingly, governmental policies in nurturing MNEs to go geographically diversified are even more profound than global today. In our point of view, policymakers can consider Chinese government policies and measures as a benchmark to compare and improve with ours to make optimal China investment strategy. Chao (2017) points out that Chinese government has constructed some international best practices that governments are using to implement innovative policies and support the development of sustainable investment. Therefore, a growing sustainable investment market also supports government agendas by two ways.

(1) Making longer-term investments which increase market stability and encourage more responsible ownership.

(2) Making investments in companies that are actively contributing to sustainable development, and also not investing in companies that are in breach of the law or negatively impacting the country' s sustainable development.

Those TMNEs that concentrate their business in different regions, CI degree should be carefully considered to take into strategic consideration to enhance performance and lower the systematic risk in FDI operation. In other words, they should moderately allocate the optimal resources and investment amount into different regions and control their business lines.

5.3 Suggestions

Up to now, an increasing number of strict regulations exist over the way business can be done in China. While all competitors are subject to the same laws and regulations, the enforcement of those compliance regulations may be different for many local competitors. In certain designated industries, for example, multinational companies are required to co-operate with local joint venture partners, who are generally selected by the Chinese government, and governmental orders may be redirected towards local competitors in the future. In fact, investing in China seems to accompany with high uncertainty and potential for profits, scenarios could provide avenues to analyze interrelated, macro-environmental, industrial, and corporate level sources of business risk. In China, managers have to assign subjective probabilities to several key variables in risk analysis. The lure of enormous markets and profits in China comes entangled with various sources of risks and uncertainties, including inability to ascertain markets' true sizes, infant distribution channels, copyright violations that strike at the core of the multinationals' competitive advantages, high-regulatory risks, and corrupt business environments. Finally, it's very important for TMNEs to take risk control into consideration, especially the three kinds of risk which are political risk, operating risk and systematic risk. Political risk can be viewed as governmental or societal actions and policies originating either within or outside the host country, and negatively affecting either a select group or a majority of foreign business operations and investments.

5.4 The Contribution to Theory and Practice

First, the author contributes to this strand of literature by examining whether geographical diversification affects firm performance and systematic risk. Second, another contribution is that the author constructs an integrated conceptual framework put an important moderator "China investment (CI)" to examine the impact of Taiwan MNEs on systematic risk. Both database and conceptual framework document the geographical distribution of TMNEs overseas and analyze the impact of geographical diversification on firm systematic risk. We define a firm as being geographically diversified if it both has main subsidiaries outside the country of the firm's headquarters and invest over two countries and measure its degree of geographical diversification by the entropy measure of business and country in which the MNE has operated and spread. The third contribution is to provide new viewpoints related to international diversification theory and to construct the framework "*balanced to less risky configuration in geographical diversification*" to identify averaging the balance of international diversification between country and business seems to be a low risky strategy in FDI operation. The final contribution is to compare our new findings with the past literature, in addition, providing the future research development related to current international diversification theories. The contribution in practice is that the findings are important for decision makers to determine and take an optimal-level decision to involve how deep both in diversification strategy and China-involvement degree to reduce the systematic risk to stabilize the MNEs' operation performance.

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Appendix

Table 5

China GDP Growth & Financial Balance

	2013	2014	2015	2016	2017	2018 (forecasting)
	Current P. CNY trillion	Percentage changes, volume (2005 prices)				
GDP at market Prices.	59.5	7.3	6.9	6.7	6.4	6.1
Total domestic demand	58.1	8.2	9.5	8.3	6.5	6.4
Exports of goods/services	14.5	6.8	-2.0	0.9	2.3	2.4
Imports of goods/services	13.0	9.3	3.9	5.4	2.2	3.0
Net exports	1.4	-0.3	-2.0	-1.4	0.1	-0.1
GDP deflator	-	0.8	-0.5	0.9	2.0	2.5
CPI	-	2.1	1.5	2.1	2.2	2.9
governmental financial balance	-	-0.6	-1.3	-1.8	-2.3	-2.7
Current account balance	-	2.7	3.0	2.4	2.4	2.4

Source: OECD Economic Outlook 100 database. February, 2018.

1. Contributions to changes in real GDP, actual amount in the first column.

2. As a percentage of GDP.

3. Encompasses the balances of all four budget accounts (general account, government managed funds, social security funds and the state-owned capital management account).

4. The headline fiscal balance is the official balance defined as the difference between revenues and outlays.

Revenues include general budget revenue, revenue from the central stabilization fund and sub-national budget adjustment.

Outlays include: general budget spending, replenishment of the central stabilization fund and repayment of principal on sub-national debt.