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Global diversification and who can benefit from it

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ABSTRACT

Global diversification has already been a popular and common topic all over the world and with the development of the economy and technology, the relationship among different countries has been more and more closer. This paper will focus on five parts: the trend of Chinese attitudes towards global diversification, the economical advantages and disadvantages that global diversification bring to China, the influences of time differences in global diversification, the relationship between global diversification and stock market fluctuation and the global strategies of risk reduction and increasing return. In my data analysis part, I will use correlation and regression. For the second research question, I will use correlation to analyze how the total volume of China's import and export trade and the growth rate of real GDP of China moved together during the recent 30 years. For the fourth research question, I will use regression to analyze whether different countries' stock market change will affect each other. I will use both multiple variables regression and single variable regression. After analyzing, I found the growth rate of China's GDP will move together with the growth rate of total volume of China's import and export trade. Another finding about the stock market is that in different countries, the stock market change will affect other but the effect is different among different countries.

1. Introduction

Global diversification has become a common and popular topic among people and due to the advantages it brought to the world, more and more countries have a positive attitude towards it and take a lot of actions to join it. The topic of my paper is "the advantages of global diversification and who can benefit from it". It is a general topic but it is necessary to think about this question.

Nowadays, everyone has an idea of global diversification and they are exactly affected by it. Global diversification promotes the communication and exchange among countries. Nowadays, people can buy products from all over the world more easily and they can travel abroad. This is the results of the development of technology, economy and the trend of globalization. In other word, globalization has influenced in our daily life and we can feel that it has brought a lot of benefits to us. It is worth finding what are the advantages that global diversification brings to us.

As more and more investors invest their money in the stock market so it is necessary to learn more about it. Stock market fluctuation is a normal phenomenon and that is the risk investors need to consider. Different countries have different trading times and as the trend of globalization, there are more and more correlation between different countries' stock market. Whether there are some strategies to reduce the risk and earn more profits can be a topic for people to do a research.

Now, China has become a more influential country in the world and there are many connections between China and other countries. China has done many efforts to meet the globalization and there is no doubt that China has a positive attitude towards the global diversification. It is interesting to discuss the trend of Chinese attitudes towards global diversification. China didn't open the door to the all over the world all the time and there was a time China had the negative attitudes. While to join the world is the trend and China made a lot of actions to change the situation. This is an interesting question that we can analyze. After China did a lot of efforts to join the world, what are the benefits or opportunities that globalization brings to China and are there any challenges China facing now? It is also important to think about.

At present, countries all over the world use a standard time system but they have a time difference every day. Whether the time differences can make an influence in global diversification. This is an interesting topic and because of this, countries have different trading hours in the stock market. I will focus on the stock market in US, London, Japan and China and discuss whether they can affect each other. It is also meaningful to discuss the relationship between global diversification and stock market fluctuation. After we discussed how the time difference makes an influence on stock market, I would like to make a analyse on the relationship between global strategies and stock market fluctuation.

After discussed the market fluctuation and globalization, whether we can use these benefits that global diversification bring to us to make a better return or to reduce our risks. It is a common topic that more and more countries and even private companies try to find a more profitable way to invest and whether there are some global strategies we can learn something from them.

In this paper, at first I will narrow the topic and focus on the effects of global diversification in china. Then I will analyse some general topic about the relationship between stock market and global diversification.

After the literature review part, I will do a in-depth analysis in the influence of global diversification to China and collect some data about the imports and exports of China in recent years to find whether it has a relationship with global strategies. In the mean time, I will collect some data of stock market price to make a deeper analysis.

2. Literature Review

In the literature review part, I have looked at some previous papers written by other researchers that have been published already. Through these papers, I got some ideas of my research questions and found some useful information. Next I will make a summary of the findings from these papers.

2.1 The Trend of Chinese Attitudes Towards Global Diversification

2. 1. 1 Negative Attitudes Towards Global Diversification

Wang(2001) said in his paper, at the beginning of Qing Dynasty, China had a really good development which cause to the emperor thought the domestic products were abundant and the national power was strong. They wanted to preserve the feudalism and they didn't need foreign products. Under this situation, emperors chose to take the forbidden overseas trade policy. They refused to have contracts with foreign countries and they focused on their own production. This was not good for long-term development but they didn't realize the problem. While Wang said in his paper "It was not always closed, it underwent a process from the forbidden overseas policy to open to the world and at last, they took the closed-door policy." The reason to closed-door policy was not totally the same as the first time. In order to prevent the invasion of western colonialists and avoid intruder stole important information, they decided to choose this policy. As Wang and Zhu Chang(2001) said "As a result of the closed-door policy, Qing dynasty was behind other countries." They can never develop without connecting with others and learning some progressive technology and knowledge.

2.1.2 Positive Attitudes Towards Global Diversification

After the fall of Qing dynasty, Chinese people realized the importance to cater to the trend of globalization. "After 1978, China has entered a new stage of development. It carried out the Reform and Open Policy which promoted the relationship with other foreign countries. The international law has played an important role."(Wang & Hu, 2010) China has realized the importance to communication with other countries and they began to take actions. After 1979, they put the opening to outside in a quite important place.

Prime(2002) wrote his paper about China joined in the WTO, he said China had done a lot of efforts to join in the WTO and in 2001, "The People's Republic of China

officially becomes the 143rd member of WTO". Also as Blancher and Rumbaugh(2004) mentioned in their paper, since China opened to the world in 1979, the international trade of China has increased steadily. And joining in the WTO is according to a standard developed market economy rules, China can promote its reform and the development of economy in an international way.

Yong (2016) mentioned the China's Belt and Road initiative, "It represents a more positive method of Chinese new leader Xi Jinping in meeting the expectation on China's international obligation and leadership." It aimed at providing more international cooperation opportunities and build a bridge between Asia, Africa, Europe and Oceania. Although the risks and uncertainties can not be ignored, China expressed its expectation to connect with the rest of the world and this action will increase the position and influence of China in the world.

2.1.3 The Current Situation of China In The World

"In 2013, China has become the largest trader of goods in the world. China has about 110 Global Fortune 500 companies and is in the world's top two for receiving and being the source of foreign direct investment (FDI)." (Woetzel et al, 2019) While in his findings, not all the aspects of China has changed to the globalization, most of the revenue of Chinese companies is still from domestic economy. They agreed to the idea that more integration could be done in China and there were more opportunities for China to have a better development. As Yong (2016) mentioned, the leader of China Xi continue to work on the development of China and open the door to all over the world to get closer with other countries.

2.2 The Economical Advantages and Challenges That Global Diversification Bring to China

2.2.1The Economical Advantages from Global Diversification

Since China actively joined the globalization, it brought a lot of advantages to it and there are many benefits in Chinese economy. After China joined in WTO, it benefited a lot from it. Prime(2002) said in his paper, the most important reason for China joined in WTO was to promote the process of reform. Also, more and more foreign companies and banks would come to China and set examples to help Chinese firms and banks to make a progress. Hung-Gay, et al (2017) mentioned in their paper that China joined in WTO represents a big step in the national economical development. The competition of China has been increased a lot in the international markets.

Delios, et al (2008) talked about the findings in their paper, "Due to the economic globalization, domestic companies could organize production and operate activities on a global scale. At the same time, they could implement optimized allocation of resources, reduce costs and earn more profits which improve the development of enterprises." Also there were more private investors which was good to lead to an expansion in product variety and accelerate the pace to enter into the international market.

2.2.2The Economical Challenges from Global Diversification

It is obvious of the advantages that global diversification brings to China, it doesn't mean that all the results that global diversification brings to China is good, there are still some challenges should be pay attention to.

Medeiros (2009) mentioned in his paper that other countries especially some neighbor countries had a high expectation to China but it was not sure whether China can face this burden. Also a lot of governance challenges limited China to have a better ability to solve internal problems with neighbor countries. Morrison (2015) written in his paper, it was optimistic that we could see China has a good development of economy, while the real GDP of China has begun to fall since 2010. It was a serious problem that could not be ignored. Although China has taken a lot of actions to reform and it attracted a lot of foreign companies and bank, the market power was limited and many parts of China's financial system are inefficient. The imports, exports and FDI has decreased during these years.

Yu and Li(2009) raised another challenge, "Most domestic companies have been hit by multinationals. Some traditional industries in China were almost destroyed, which led to the maladjustment of national economy and the bankruptcy of national industries."

2.3 The Influences of Time Differences in Global Diversification

2.3.1The Establishment of A Standard Time system

Zerubavel (1982) made a summary of the process of the establishment of united time system. He said it was a necessary trend to build a united measurement system and with the development of railway transportation and telegraphic communication, the connection among countries increased which represents the importance of synchronize. He also mention, "The society of time determines that the development of global communication inevitably requires the establishment of time planning and system with global significance." Aubry, Marie-Pierre and et (2009) also mentioned in their paper that it's better to have a standard time system to make sure worldwide unification.

2.3.2 The Influence of Different Trading Time in US, UK, Japan and China Stock Market

Lau and Diltz (1994) said in their paper, London stock market is the largest stock market in the world. And Japan stock market is the biggest foreign exchange trading market in Asia and also the third biggest foreign exchange trading center in the world. While US stock market is the largest capital flow center in the world and the New York foreign exchange market is also the most active foreign exchange market in the world, there are more opportunities for investors to get profits from it.

According to the Beijing time, Japan was the first country to start the trading, next was the UK stock market and followed by US stock market. Jeong(1999) found that "not only the fluctuation of the domestic market can make an influence on the conditional variance of its own market, but also foreign markets can." Every countries' fluctuation may make an effect on other countries and the spillover of

fluctuation is not monodirectional. Kofman and Martens (1997) made an research about how US and UK stock market influenced each other. In the findings, they summarized that both countries made an influence to each other while the effects from US to UK was more than those from UK to US. Nishimura et al (2012) did a research which analyzed the influences of stock market price fluctuation between China and Japan. Both of their stock markets were big in Asia area and had a big effect on others. He found that whether from the return or volatility, China had an unidirectional influence to Japan and after earnings spillover, volatility spillovers were delayed.

2.4 The Relationship Between Global Diversification and Stock Market Fluctuation.

2.4.1 The Factors That Cause To The Stock Market Fluctuation

Kennedy and Nourzad (2015) found that the influence of the change of exchange rate to the stock market volatility had statistically significant meaning. In other words, they found that when the major drivers of financial volatility are under control, an increase in the volatility of exchange rate had a positive effect on the volatility of stock returns.

Li (2013) made a research on the relationship between the growth rate of real GDP and the volatility of stock market. He found that because of the globalization, the fluctuation of stock returns in emerging market countries decreased. Also, The growth rate of real GDP had no influence on developed countries while in developing countries, the higher the real GDP growth rate, the more stable the volatility of stock market returns.

2.4.2 The Influences That Stock Market Fluctuation Bring to

Li and Yi (2013) did a research on the stock market volatility under the financial globalization perspective and they found because of the irrational trading, stock price fluctuations will spread from one country's stock market to another country's stock market, then caused the instability of stock market of other counties. Solnik et al (1996) found similar results in their research and they had some other findings. They found national factors could affect the local capital price strongly and the international correlation could be used to reduce the risk when the domestic market had a shock.

2.5 The Global Strategies of Risk Reduction And Increasing Return

2.5.1 The Strategies of Multinational Corporations

Peng (2012) said MNEs usually underappreciated the role that the home country governments had on them and the main method to enter into the international market was through the rapid adoption of acquisitions. It was important to notice that do not provide a too high price which may lead to a bidding war and they should focus on the integration.

Boateng et al (2008), they said the main motivation of Chinese cross‐border M&As formation was the development of market which means to have more market shares. It could help Chinese firms to enter the new markets more quickly and get

more advanced technology or other resources. It was valuable. Jiang et al(2013) raised similar opinions and they replenished that wherever the areas those Chinese investors chose to invest, they can have a considerable returns through reducing the risks.

2.5.2 The Importance To Diversify In Investing

Perry (2015) wrote in his paper, because of the correlation between global stock market was not perfect, in order to increase the return at the same level of risk, it was wise to add more countries in the investment portfolio. It could produce more expected returns than domestic ones or compared to the domestic investment portfolio,it could have a lower level of risks.

Lan-CuiLiu and Wei (2009) wrote in their paper, from the perspective of energy supply, China should increased the imports from neighbor countries to reduce the security risks. In the meantime, China could promote the oil system and change the oil imports strategies.

Koenig (2018) and Chen et al (2014) have similar ideas that because of the uncertainty, diversifying the investment can help reduce the risks in any time and any places. It was good to invest in different capital categories or in different industries which can be a useful strategy to reduce the risks.

3. Methodology And Data

After doing the literature review, I decided to do 2 analysis and I collected some data which is useful. I picked 30 years' data about the real GDP of China and calculate the growth rate of that to represent the development of China. Using the total volume of China's import and export trade to represent China's attitudes toward global diversification. I will also pick four countries' typical stock market index to calculate the change of that and to analyze whether they will affect each other.

3.1 Discussion and Explanation of DataSet:

The first research I want to analyze is that what are the economical advantages and challenges that global diversification bring to China so I want to analyze what is the relationship between the total volume of China's import and export trade and the growth rate of real GDP of China. I want to use the total volume of China's import and export trade to reflect China's attitude toward globalization and use the growth rate of real GDP of China to reflect Chinese development. I collected the data of the total volume of China's import and export trade from Bloomberg and the real GDP of China from "National Bureau of Statistics of China".

The second research I want to analyse is about what is relationship between global diversification and stock market fluctuation. I will use the change of stock market index and I collected four typical countries' stock market index from "Investing.com". I will analyze whether they will affect each other.

3.2 Discussion of Sample:

The first research I will focus on China's data and I picked recent 30 years' data.

The second research I will focus on four countries, China, US, UK, Japan and I picked Shanghai securities composite, NYSE Composite, FTSE and Nikkei 225. And I picked monthly data for 30 months. These index are typical.

3.3 Discussion and Explanation of Methodology:

I will use a correlation test to analyze how the total volume of China's import and export trade and the growth rate of real GDP of China moved together during the recent 30 years.

In the same time, I will also use regression to analyze whether different countries' stock market change will affect other countries' stock market change.

3.4 Discussion and Explanation of Model and Hypotheses:

The first one, I want to use the total volume of China's import and export trade to reflect China's attitude toward globalization and use the growth rate of real GDP of China to reflect Chinese development. The hypotheses is that "the growth rate of real GDP of China will not move together with the total volume of China's import and export trade."

The second one, I pick the recent one month data of Shanghai securities composite, NYSE Composite, FTSE and Nikkei 225 to analyze and I will use the change of index.

My null hypotheses is H0: There is on effect of other three countries' stock market change on one country's stock market change.

$Y1=aX1+bX2+cX3+d$.

Y1 is the dependent variable of change of Shanghai securities composite, all X are independent variables. X1 is the change of NYSE Composite, X2 is the change of FTSE and X3 is the change of Nikkei 225.

The same as other three countries so the total of analysis I will do is four in this part.

4. Data Analysis And Findings

In the previous sections, I have already made an introduction about my thesis topic and made a literature review about previous papers to look at others' findings to learn some knowledge related to my research questions. In my data analysis part, I want to analyze two questions. The first one is about whether the growth rate of China's GDP will move together with the growth rate of total volume of China's trade. For the second problem, I want to analyze whether different countries' stock index volatility will affect each other.

For the first question, I picked the dataset of 30 years from 1987 to 2018 and the data is yearly. This dataset is from the "National Bureau of Statistics of China" and I will use correlation to analyze whether the growth rate of China's GDP will move together with the growth rate of total volume of China's trade. For the second

question, I picked four typical countries which are US, UK, Japan and China and I also picked the stock market index to reflect the price. The dataset I collected was monthly data from 2017/6 to 2019/11, adding up to 30. In this situation, I will use regression and pick one countries stock index change as Y, the other 3 countries' stock index change as X_1, X_2, X_3, use the equation $Y=aX_1+bX_2+cX_3+d$. I will do this for four times.

4.1 The Relationship Between China's Attitudes towards globalization And Its Economical Development

The first analysis I did was about the relationship between China's attitudes towards globalization and its economical development. In this part, I will use China's GDP to reflect its economical development and use the total volume of China's trade to reflect its attitudes towards the globalization and I got 30 years' data to do a correlation analysis in excel. My null hypothesis H_0: the growth rate of China's GDP will not move together with the growth rate of total volume of China's trade. Here is the results I get using excel.

	The growth rate of China's GDP	the growth rate of total volume of China's trade
The growth rate of China's GDP	1	
the growth rate of total volume of China's trade	0.5314	1

Table 1:The correlation between the growth rate of China's GDP and the growth rate of total volume of China's trade

From this table, I got the data of 0.5134 which means the growth rate of China's GDP will move together with the growth rate of total volume of China's trade. So I will reject my null hypothesis. This data is more than 0 which means they have a positive relationship between them.

This data analysis is related to the second research question: What are the economical advantages and disadvantages that global diversification bring to China? This result is obvious that brings benefits to China. According to the previous papers, China has a positive attitudes towards the globalization which can be reflected by the total number of China's total trade volume. It has been increasing since 1989 that China is carrying out comprehensive reform and opening up(Wang & Hu, 2010). As China carrying out some positive policies to support the globalization, its GDP grows as time goes by. Here is a line for the the growth rate of China's GDP.

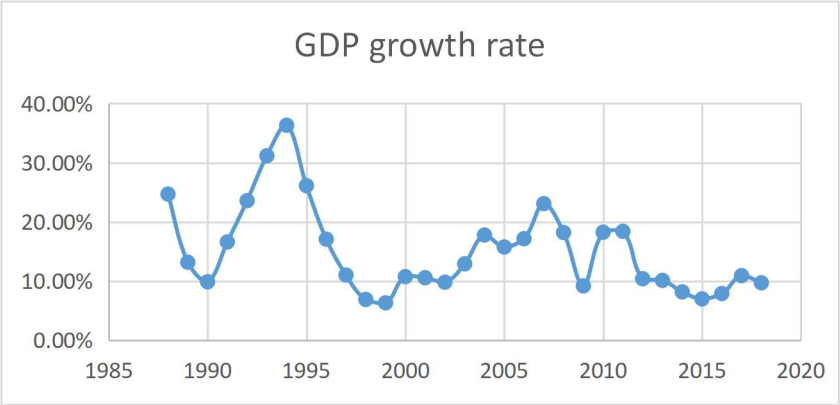

Chart 1 The growth rate of China's GDP

This line shows all the growth rate of China's GDP is positive which means the GDP of China grows as time goes by.

While the line for the growth rate of China's total trade volume has some special points. Here is the line.

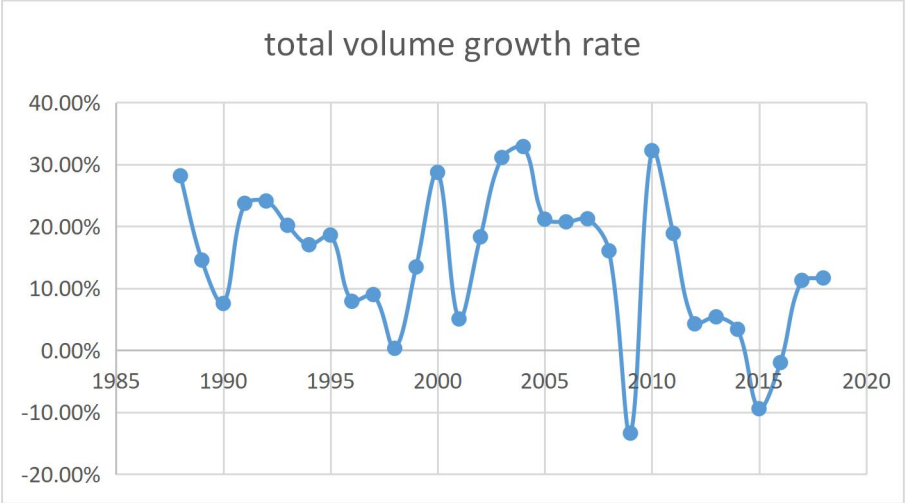

Chart 2 The growth rate of China's total trade volume

From this chart, we can see, the growth rate of China's total trade volume was negative in 2009, 2015 and 2016. From previous paper and some international events, we can predict the negative growth rate in 2009 may be affected by the recession in 2008. In the meanwhile, from previous reading(Yong, 2016), we know that the Chinese new leader Xi came up with the China's Belt and Road initiative in 2016. So after this new policy improved, the growth rate of China's total trade volume has become positive again since 2017.

4.2 The Effect of Other Countries' Stock Market Change On The One Country's Stock Market Change

For this analysis, I want to analyze whether different countries' stock change will affect each other. So I picked four typical countries which are US, UK, Japan and

China and I picked their typical stock index to reflect the stock price. I collected monthly data for 30 months and I will use the regression to find the result.

4.2.1 The other countries' effect in the US

Firstly, I did a analysis of the effect of other three countries' stock index change on the US stock index change. I used regression test and my equation is $Y=aX_1+bX_2+cX_3+d$. Y is the monthly change of US stock index, X_1 is the monthly change shanghai stock exchange index, X_2 is the monthly change of Nikkei index, X_3 is the monthly change of FTSE index. My null hypothesis H_0 : other countries' stock index change has no significant effect on US stock index change. Here is my results:

	coefficients	P-value
Intercept	0.0027	0.4855
X variable 1	0.2031	0.0515
X variable 2	0.5097	0.00008
X variable 3	0.1569	0.3114

Table 2:The other countries' effect in the US

For this regression test, I used 90% confidence which means the α =0.1. From these results, we can get the equation $Y=0.2031X_1+0.5097X_2+0.1569X_3+0.2031$. Comparing these p-value to α , we can reject X variable 1 and 2. So we can get the result of the stock market change of China and Japan but not UK have effect on the stock market change of US and compare these two coefficients, we can get the result that the stock index change in Japan has more significant effect in the stock market change in US.

From this multiple variables regression, we can not reject the X variable 3, while in previous reading, Kofman and Martens (1997) has found that US and UK stock market will affect each other and the effects from US to UK was more than those from UK to US which is different from what I have found. What I found is that the UK has no effect in US. Maybe there are some limitations. I collected monthly data for recent 30 months and what they did based on a larger data sample. In addition, the date of data we chose are also different, I picked recent data which is different from theirs.

4.2.2 The other countries' effect in the UK

The second data analysis I did was about the effect of other three countries' stock index change on the UK stock index change. I used same model and same method to calculate the results. My equation of this test is $Y=aX_1+bX_2+cX_3+d$. Where the Y is the change of monthly stock index in UK, X_1 is the monthly change of NYSE index, X_2 is the monthly change of Shanghai stock exchange index and X_3 is the monthly change of Nikkei index. I used regression again and my null hypothesis H_0 : other countries' stock index change has no significant effect on UK stock index

change. Here is my results:

	coefficients	P-value
Intercept	-0.0026	0.5916
X variable 1	0.2509	0.3114
X variable 2	0.1011	0.4576
X variable 3	0.1808	0.3339

Table 3:The other countries' effect in the UK

The result of equation I got was $Y= -0.0026+0.2509X_1+0.1011X_2+0.1808X_3$. Because the α I used was 0.1 and all of the p-value of these three variables are more than 0.1 so I can not reject the null hypothesis. As a result, my result is other countries' stock index change has no significant effect on UK stock index change. This result is different from what Kofman and Martens (1997) found. In this analysis, the stock market change from US has no effect on the stock market change in UK while they found it has. Maybe the same limitations as what I have explained in the previous test. So the conclusion I can make is that other countries' stock index change has no significant effect on UK stock index change.

4.2.3 The other countries' effect in China

The next data analysis I did was about whether other three countries' stock market change has effect on the China's stock market change. The method I used was the same as before which was regression. My equation is $Y=aX_1+bX_2+cX_3+d$. Where the Y is the change of monthly stock index in China, X_1 is the monthly change of NYSE index, X_2 is the monthly change of Nikkei index and X_3 is the monthly change of FTSE index. My null hypothesis H_0: there is no effect of other three countries' stock market change on the stock market change in China. I used excel to do the regression and I got this result:

	coefficients	P-value
Intercept	-0.0050	0.4789
X variable 1	0.6799	0.0515
X variable 2	-0.0645	0.8134
X variable 3	0.2117	0.4576

Table 4:The other countries' effect in China

From this analysis, we can get the equation $Y=-0.005+0.6799X_1-0.0645X_2+0.2117X_3$. I used the α =0.1 so compared this with all the p-value, I can only reject the variable 1. In conclusion, I can get the result that the stock market change of US will affect the stock market change in China and the stock market change from Japan and the UK has no effect on the stock market volatility in China.

Compared to what Nishimura et al has found in 2012, the change of stock market in Japan has no significant effect in China and this is consistent with what I have found.

4.2.4 The other countries' effect in Japan

The fourth data analysis I did was to analyze whether other three countries' stock market change will affect the stock market change in Japan. So I did the regression test again to get what I want. My equation is $Y=aX_1+bX_2+cX_3+d$. Where the Y is the change of monthly stock index in Japan, X_1 is the monthly change of NYSE index, X_2 is the monthly change of Shanghai stock exchange index and X_3 is the monthly change of FTSE index. My null hypothesis H_0: there is no effect of other three countries' stock market change on the stock market change in Japan. Here is my results:

	coefficients	P-value
Intercept	0.0015	0.7629
X variable 1	-0.0338	0.8135
X variable 2	0.8956	0.00008
X variable 3	0.1987	0.3339

Table 5:The other countries' effect in Japan

From this result, I get the equation $Y=-0.0338X_1+0.8956X_2+0.1987X_3+0.0015$. Since I used $\alpha=0.1$, and compared this with all the p-value I can reject the variable 2. In conclusion, I can get that the stock market change of China will affect the stock market change in Japan and the stock market change from US and the UK has no effect on the stock market change in Japan.

From table 1.6 and 1.7, we found when we did the multiple variables' regression, between Japan and China, the effect of change between the two stock markets is not mutual but the stock market change in China has a significant effect in japan which is consistent with what I have found.

4.2.5 The effect between China and US

Since I have found that the effect of the stock market change between China and US is mutual, I did a simple regression to so a deeper analysis between these two countries. First, I will do the study about whether the stock market change in US will affect the stock market change in China. I used the equation $Y=aX+b$ and use the regression test. My null hypothesis H_0: t the change of stock market in US has no significant effect in China, here is what I get from excel:

	coefficients	P-value
Intercept	-0.0057	0.4027

X variable 1	0.7231	0.00053

Table 6:The effect of US in China

This table shows us the equation Y=-0.0057+0.7231X. Because the p-value<0.1, I can reject the null hypothesis and get the result: the change of stock market in US has a significant effect in China.

Next I want to find the effect of change of stock market from China to US and I also used the regression test through the excel.I used the equation Y=aX+b. My null hypothesis H_0 : the change of stock market in China has no significant effect in US, here is what I get from excel:

	coefficients	P-value
Intercept	0.0066	0.2364
X variable 1	0.4881	0.0005

Table 7:The effect of China in US

This table shows us the equation Y=0.0066+0.4881X. Because the p-value<0.1, I can reject the null hypothesis and get the result: the change of stock market in China has a significant effect in US.

Compare these two coefficients, 0.7231>0.4881, we can get the conclusion that the effect of change of stock market from US to China is more the effect of change of stock market from China to US.

5. Conclusion

Since global diversification is a general topic and I just pick some factors of that and did the analysis. But what I found is interesting. First, China has changed its attitudes towards global diversification a lot from the negative attitudes to positive attitudes. China carried out the reform and opening policy in 1978 and joined in WTO in 2001. China made a lot of efforts to deal with the globalization. Now the leader of China Xi came up with the China's Belt and Road initiative to build a deeper relationship with other countries. As the data showed, the GDP of China increased for more than 30 years. I collected the data of the real GDP of China for 30 years and the total volume of China’s import and export trade for 30 years. I did a correlation test to study how the total volume of China's import and export trade and the growth rate of real GDP of China moved together during the recent 30 years and I get the result that the growth rate of China’s GDP will move together with the growth rate of total volume of China’s trade.

Another problem I made analysis is about the stock market information. Since the world has become smaller and smaller, there are more and more connections among countries and I want to study whether in different countries, the stock market change will affect each other. Firstly, I did an analysis about the effect of other three countries’ stock index change on the US stock index change and I used regression. I got the result the stock market change of China and Japan but not UK have effect on

the stock market change of US. Secondly, I change the Y as the change of monthly stock index of UK and did the regression test again. I got the result of other countries' stock index change has no significant effect on UK stock index change. Thirdly, I did an analysis about other countries effect in China and used the same method to calculate the results. In conclusion, the stock market change of US will affect the stock market change in China and the stock market fluctuation from Japan and the UK has no effect on the stock market change in China. Last but not least, I did the analysis about the other countries' effect in Japan and my result is that the stock market change of China will affect the stock market change in Japan and the stock market change from US and the UK has no effect on the stock market change in Japan.

To summarize, the effect of stock market change between US and China is mutual, the change of stock market in China has a significant effect in the change of stock market in Japan. Also the change of stock market in Japan has a significant effect in US. According to the globalization, the effect among different countries are different and there are many investors doing the international investing in the global market. Maybe these information can be used by them.

Since I just picked four typical countries to analyze this problem which can not represent all of countries but these four countries are typical and have a good development, they can reflect some problems and results. What I found is that actually, in different countries, the change of stock market can affect each other while the effect of different countries are different. Because different countries have different trade time, this can also make some effects in the change of stock market.

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Appendix:

Appendix A (regression output for the other countries' effect in the US)

SUMMARY OUTPUT	effect in US
Regression Statistics	
Multiple R	0.848452533
R Square	0.719871702
Adjusted R Square	0.687549206
Standard Error	0.020291261
Observations	30

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	3	0.02751	0.00917	22.27153813	2.35E-07
Residual	26	0.010705	0.000412		
Total	29	0.038215			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 90.0%*	*pper 90.0%*
Intercept	0.002682316	0.003791	0.707595	0.485491617	-0.00511	0.010474	-0.00378	0.009148
X Variable 1	0.203096773	0.099512	2.04092	0.051532427	-0.00145	0.407647	0.033367	0.372827
X Variable 2	0.509736553	0.109076	4.673227	0.00008	0.285528	0.733945	0.323695	0.695778
X Variable 3	0.156924131	0.152015	1.032296	0.31144067	-0.15555	0.469395	-0.10235	0.416203

Appendix B (regression output for the other countries' effect in the UK)

SUMMARY OUTPUT	effect in UK
Regression Statistics	
Multiple R	0.617118315
R Square	0.380835015
Adjusted R Square	0.309392901
Standard Error	0.025657513
Observations	30

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	3	0.010528	0.003509	5.330679553	0.005356
Residual	26	0.017116	0.000658		
Total	29	0.027644			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 90.0%*	*pper 90.0%*
Intercept	-0.002613975	0.004812	-0.54322	0.591602304	-0.01251	0.007277	-0.01082	0.005593
X Variable 1	0.250900078	0.24305	1.032296	0.31144067	-0.2487	0.750497	-0.16365	0.665451
X Variable 2	0.101091879	0.134077	0.753985	0.457632573	-0.17451	0.37669	-0.12759	0.329775
X Variable 3	0.180845495	0.183692	0.984501	0.333942503	-0.19674	0.558431	-0.13246	0.494155

Appendix C (regression output for the other countries' effect in the China)

SUMMARY OUTPUT effect in China

Regression Statistics	
Multiple R	0.605802986
R Square	0.366997257
Adjusted R Square	0.293958479
Standard Error	0.037125968
Observations	30

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0.020777159	0.006926	5.024690549	0.007029849
Residual	26	0.035836776	0.001378		
Total	29	0.056613935			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 90.0%*	*Upper 90.0%*
Intercept	-0.004981334	0.006933737	-0.71842	0.4789053	-0.019233835	0.009271166	-0.01680764	0.006844972
X Variable 1	0.679892958	0.33313061	2.04092	0.051532427	-0.004866819	1.364652734	0.111699419	1.248086496
X Variable 2	-0.064460898	0.270413393	-0.23838	0.813455875	-0.620303587	0.491381792	-0.525682826	0.396761031
X Variable 3	0.211661917	0.280724139	0.753985	0.457632573	-0.365374814	0.788698649	-0.267146205	0.690470039

Appendix D (regression output for the other countries' effect in the Japan)

SUMMARY OUTPUT effect in Japan

Regression Statistics	
Multiple R	0.813094
R Square	0.661121
Adjusted R Square	0.62202
Standard Error	0.026896
Observations	30

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	3	0.036693	0.012231	16.90786543	2.69E-06
Residual	26	0.018808	0.000723		
Total	29	0.055502			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 90.0%*	*pper 90.0%*
Intercept	0.001544	0.005064	0.304892	0.762876075	-0.00886	0.011953	-0.00709	0.010181
X Variable 1	-0.03383	0.141922	-0.23838	0.813455875	-0.32556	0.257894	-0.2759	0.208234
X Variable 2	0.895582	0.191641	4.673227	0.0000796	0.501658	1.289506	0.568716	1.222449
X Variable 3	0.198727	0.201855	0.984501	0.333942503	-0.21619	0.613646	-0.14556	0.543015

Appendix E: Dataset for different countries' index change

date	Shanghai chang	NYSE chang	NIKKEI chang	FTSE change
2019/11/1	-0.92%	2.94%	2.23%	2.14%
2019/10/1	0.82%	1.28%	5.38%	-2.16%
2019/9/1	0.66%	2.10%	5.08%	2.79%
2019/8/1	-1.58%	-2.52%	-3.80%	-5.00%
2019/7/1	-1.56%	0.13%	1.15%	2.17%
2019/6/1	2.77%	6.40%	3.28%	3.69%
2019/5/1	-5.84%	-6.10%	-7.45%	-3.46%
2019/4/1	-0.40%	2.87%	4.97%	1.91%
2019/3/1	5.09%	0.41%	-0.84%	2.89%
2019/2/1	13.79%	2.81%	2.94%	1.52%
2019/1/1	3.64%	8.13%	3.79%	3.58%
2018/12/1	-3.64%	-8.69%	-10.45%	-3.61%
2018/11/1	-0.56%	2.04%	1.96%	-2.07%
2018/10/1	-7.75%	-6.68%	-9.12%	-5.09%
2018/9/1	3.53%	0.50%	5.49%	1.05%
2018/8/1	-5.25%	0.41%	1.38%	-4.08%
2018/7/1	1.02%	3.67%	1.12%	1.46%
2018/6/1	-8.01%	-0.18%	0.46%	-0.54%
2018/5/1	0.43%	0.09%	-1.18%	2.25%
2018/4/1	-2.74%	0.51%	4.72%	6.42%
2018/3/1	-2.78%	-1.58%	-2.78%	-2.42%
2018/2/1	-6.36%	-5.35%	-4.46%	-4.00%
2018/1/1	5.25%	4.37%	1.46%	-2.01%
2017/12/1	-0.30%	1.43%	0.18%	4.93%
2017/11/1	-2.24%	2.32%	3.24%	-2.22%
2017/10/1	1.33%	1.08%	8.13%	1.63%
2017/9/1	-0.35%	2.81%	3.61%	-0.78%
2017/8/1	2.68%	-0.77%	-1.40%	0.80%
2017/7/1	2.52%	1.75%	-0.54%	0.81%
2017/6/1	2.41%	1.41%	1.95%	-2.76%