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Abstract

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Rise of the Yuan: Export Similarity and Comparisons to the Yen

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According to recent studies, the yuan has become a reference currency rivaling the US dollar in East Asia within the past decade. The yen never gained enough influence to challenge that of the dollar despite holding a similar share of trade 20 years ago as China does now in the region. This paper asks why the yuan became a reference currency in East Asia while the yen did not 20 years ago. This study hypothesizes that a reason for this discrepancy is that China competes more with its neighbors today than Japan did 20 years ago. In order to test this hypothesis, this study uses an export similarity method developed by Finger and Kreinin (1979) alongside a multiple regression analysis. The data indicates that export similarity plays a major role in increasing regional currency influence. As a result, this paper finds a developmental difference between the renminbi and yen.

INTRODUCTION

Since moving away from its fixed exchange rate peg to the United States dollar in 2005, China has seen its currency's influence increase. This rise though, is not without questions as many wonder what the drivers are behind the renminbi's rise. This study aims to provide some answers to this question by conducting a comparative analysis between China today and Japan 20 years ago. While the yen appeared to have the potential to gain influence in the 1990s, it ultimately stagnated with the rest of Japan and never reached the heights once thought possible. Moving to the present day though, the renminbi has risen to become a reference currency challenging the United States dollar in East Asia. Through a comparative approach, this study attempts to find differences in the developmental tracks of the renminbi and yen. Current scholarly work has identified trade integration as a driver of currency influence in East Asia but there may be other variables at play. In particular, this study tests whether competition between countries increases currency comovement.

This paper covers an area that has recently become a focus of study for scholars. Given recent current events and the renminbi's push towards reserve currency status, the importance of studying and understanding the development of China's currency is becoming increasingly apparent. Overall, the international economics, political science, and international relations communities would be interested in this topic because of the broader geopolitical implications of the renminbi's influence. In addition, this topic is of interest to a wider audience due to the implications of a rising currency that may very well begin to challenge the United States dollar on the global stage. While this study focuses on the renminbi's increasing regional influence, its growth and signs that it is replacing the dollar as the reference currency in East Asia have potential broader implications. Given that the world has lived under the US dollar reserve

currency system for over 70 years, signs that this status quo is beginning to change will have long-term impacts around the world. Having the reserve currency gives the United States a political and economic lever through which it can further its own interests. For example, having a currency that functions as a safe haven for the rest of the world allows one to borrow more cheaply than one would be able to otherwise. This is an advantage many take for granted and has significantly contributed to American economic prosperity for the past several decades. If this lever appears to be eroding, governments need to plan accordingly in order to best prepare themselves for any changes that may occur to the global currency system.

Given the potential for the renminbi to have a considerable impact on the international currency system, it is important to understand the drivers behind its rise in influence. Through a comparative analysis, this study seeks to find factors in the yuan's story that distinguish it from the yen's. By determining the drivers of the renminbi's rise that set it apart, there can be an increased understanding for its influence in East Asia. In addition, by learning about the yuan's development, the future for the currency can become clearer. Poised to integrate more with the international system through reserve currency status, the renminbi will take on a more global role worth the attention and study of scholars, policy makers, and citizens around the world. Given the recent announcement by the International Monetary Fund that the renminbi will be included in the Special Drawing Rights basket, the yuan's increasing status is not a topic of the future but rather the present.

In order to examine the different development tracks of the renminbi and yen, this study required exchange rate and bilateral trade data. Through a multiple regression analysis, this paper tests the relationship between currency comovement coefficients and a several independent variables. While the focus lies with bilateral trade and export similarity, the analysis includes a

number of other variables for a more thorough treatment of the data. In order to derive a proxy for economic competition, this study utilizes the export similarity index method proposed by Finger and Kreinin (1979).

The data from this study confirms other scholarly findings that the yen did not challenge the dollar for currency influence. In addition, the data supports scholarly research indicating that the over the past ten years, the renminbi has risen to challenge the dollar for influence in East Asia.

Overall, while comovement coefficient and bilateral trade have a relationship, export similarity does as well in this study. In addition to confirming the importance of bilateral trade to currency comovement, this paper illustrates the importance of economic competition in assisting the renminbi in becoming a rival reference currency to the US dollar in East Asia.

ANALYTICAL FRAMEWORK

First, this study involved the use of an export similarity index originally developed by Finger and Kreinin (1979). This model will be applied to Chinese and Japanese currency comovements with the respective currencies of South Korea, Thailand, Malaysia, Indonesia, Taiwan, Singapore, and the Philippines. As explained in the literature review, these seven currencies are chosen because Subramanian and Kessler (2013) found that China has become the reference currency for their respective currency baskets. For this study, the following assumptions will track the logical progression of Finger and Kreinin (1979).

As explained by Finger and Kreinen (1979, 905-907), measuring export similarity provides a proxy for which to assess how much economies compete with one another. For example, countries a and b export to a market c and i represents a given commodity. $Xi(ac)$ is i's

share in *a*'s exports to *c* and *Xi(bc)* is *i*'s share in *b*'s exports to *c*. For this study, this yields an equation similar to that used by Finger and Kreinin (1979, 905):

$$Export\ Similarity = \sum_{n=1}^{10} Min(Xi(ac), Xi(bc))$$

In this study, the commodity *i*, represents the ten categories of SITC 1-digit products. In the years 1988-1997, country *a* is Japan while country *b* is one of the seven East Asian countries. For the 2006-2014 period, country *a* is China. The outputs for the equation will range from 0 to 1. An index of 0 indicates no overlap of exports and thus no competition. An index of 1 though, indicates complete alignment of exports and theoretically the highest level of competition possible. Overall this yields the export similarity tables as described in more detail in the methodology section.

LITERATURE REVIEW

Over the past several years, the increasing influence of the renminbi has been a general trend in research. The implications of this rise are that East Asian countries have begun to adjust their currency policy increasingly in response to China rather than the United States. This is particularly interesting given the dominant role of the US dollar in the global currency regime. Expanding on this topic, this study attempts to compare the rise of the renminbi with that of the yen over 20 years ago.

Since introducing a floating rate regime in 2005 and an offshore currency in 2009, the Renminbi has become the 9th most traded currency in the world and the most traded in Asia (Bank for International Settlement's Bank Survey 2013, 5). As a result of the yuan's increasing use and growing trade ties, the use of the renminbi may encourage central banks to stabilize their own currencies against it. This is accomplished by increasing the yuan's weight in the respective country's basket that its currency tracks. In addition, because foreign currencies are part of a

basket against which the exchange rate of local currencies is determined, movements of a stronger international currency will more increasingly cause countries to stabilize their own currency (Subramanian and Kessler 2013, 3).

Several studies have found that since 2005, the yuan has had an increasing effect on Asian currencies. This impact has been seen in how central banks include the renminbi in currencies they track in order to reduce trade flow volatility (Shu, Chow, and Chan 2007; Fratzscher and Mehl 2011; Henning 2012; and Subramanian and Kessler 2013). Simultaneously, these authors have found that investors are increasingly tying the renminbi to currency movements in Asia.

More specifically, after 2005, studies began to show the increasing impact of the renminbi exchange rate on Asian currencies. Shu et al. (2007) found that renminbi movements, independent of dollar movements, were followed by seven of nine Asian currencies in the study. In Fratzscher and Mehl (2011), the authors use the term "China's dominance hypothesis" in comparison to the "German dominance hypothesis". This was where the Deutsche mark played a dominant role in the European currency system throughout the 1980's and 1990's. In their work, both authors find that since the financial crisis in 2008-2009, the renminbi has become a driver of Asian currencies in a fashion similar to the Deutsche mark (Fratzscher and Mehl 2011).

As the renminbi continues its rise, the dollar appears to be in decline in the region. Before 2005, there existed a "softpegging to the dollar regime" where Asian banks emphasized tracking the dollar (McKinnon and Schnabl 2004). Over time though, there has been a decline in US dollar weights and a rising weight for the renminbi in the exchange rate regimes in East Asia. Subramanian and Kessler (2013) find that the renminbi has replaced the dollar and Euro as the

most dominant currency in seven out of ten East Asian countries: South Korea, Thailand, Malaysia, Indonesia, Taiwan, Singapore, and the Philippines.

Meanwhile, studies of the yen's influence in East Asia emerged in the 1990's, as Japan appeared poised to challenge America as an economic power. However some argued that the yen's increased regional influence was a temporary response to an overvalued dollar (Frankel and Wei 1994). Moving ahead though, Bowman (2005) revisits this topic and finds that the yen and Australian dollar actually gained influence in East Asia from 1992-2002. Similarly, Kearney and Muckley (2005) back up this study with the finding that the Yen has been increasing its regional influence since the early 1990s. However, Subramanian and Kessler (2013) and Kearney and Muckley (2007) both found that despite a slight increase in influence, neither the Australian Dollar or Japanese Yen become a reference currency as the dollar has remained dominant. Subramanian and Kessler (2013, 17) continue to explain that over twenty years ago, Japan had a similar share of trade in East Asia as China does now: 22.5 percent for Japan in 1991 and 24.4 percent for China today. However, more trade was denominated in yen, 37.5 percent of exports and 14.4 percent of imports, in the early 1990's than the yuan, 8.8 percent today (Subramanian and Kessler 2013, 30). Simultaneously though, Subramanian and Kessler (2013) found that the yuan has become a dominant reference currency in seven East Asian states while the yen never became a reference currency in East Asia. This brings the question of what explains this discrepancy. Subramanian and Kessler (2013, 17) explain that the yen being relatively more liberalized allowed trade to be denominated more in Japan's currency. However, the question of why the yuan became a dominant reference currency while the yen did not remains up for debate. Subramanian and Kessler (2013) find that trade integration plays a major role in determining the strength of currency comovements. While

An alternative explanation for increased currency influence may be due to economic competition. In a study by the International Monetary Fund, Matoo, Mishra, and Subramanian (2012) found that changes in yuan exchange rate have stronger impacts on another country's exports the more it competes with China. More specifically, the way to measure competition is to look at whether or not a country exports products that are similar to another country's exports. The study though only focused on China's influence on broad regions and does not directly look at currency influence. In other words, the competitive similarity approach should be applied to specific East Asian countries and comovements. It should be noted that in their analysis, Subramanian and Kessler (2013) included a test for competitive similarity that was inconclusive. However, the tests from this study are broad based in that the overall sample includes 43 countries, most of which are not in the region. By not running tests at a more specific level, Subramanian and Kessler (2013) do not account for differences in influential factors at the regional and global level. Using a methodology similar to Finger and Kreinin (1979), this paper utilizes an export similarity index as a proxy for competition between countries. This index will be used to test the hypothesis that in East Asia, the renminbi became a reference currency while the yen did not because countries in the region compete more directly with China today than they did with Japan 20 years ago. Intuitively, this makes sense because Japan developed its economy relatively earlier than its neighbors. As a result, it may very well have not been able to achieve the same level of economic competition with the region that China did.

METHODOLOGY

Exchange Rate Comovements

In order to assess the importance of export similarity, this study required exchange rate data. For China, Japan, and seven competing East Asian countries, nominal bilateral exchange

rates versus the Swiss franc were acquired for the years 1988-1997 and 2006-2015. These seven East Asian countries were South Korea, Thailand, Malaysia, Indonesia, Taiwan, Singapore, and the Philippines. It should be noted, that the Swiss franc was used as the numeraire in this study due to its use in prior studies. Subramanian and Kessler (2013, 10) explain that the choice of the numeraire is not important and does not affect the results. This data was acquired from the Bloomberg Terminal considering that it has data going back over 30 years. To calculate comovement coefficients, this study applies a multivariate regression analysis where the daily exchange rate movements with the Swiss franc for each of the seven East Asian currencies are the dependent variable. The regressions are run for one East Asian currency for a given year. The independent variables for regression are the daily exchange rate movements with the Swiss franc for the United States dollar, the Japanese yen, the euro, and the Chinese yuan. It should be noted that because the 1988-1997 time window occurred when China had a fixed peg against the dollar, the renminbi is not used as an independent variable for the regression. It is however for the 2006-2015 window. This is possible because after 2005, Beijing switched to a managed floating regime that allowed for differences in movement between the renminbi and the US dollar. In other words, the independent variables used for 1988-1997 are the daily percentage movements in USD/CHF, JPY/CHF, and EUR/CHF. For 2006-2015, the independent variables are the daily percentage movements in USD/CHF, JPY/CHF, EUR/CHF, and CNY/CHF. Overall, these regression analyses yield comovement regression coefficients used later in graphs and the multiple regression analysis. The results of these analyses are discussed below and can be found in Appendices 2-12.

In addition to providing data for the focus of this study, the regression analyses are also used to confirm the different development paths of the yen and renminbi. This was accomplished

by graphing and comparing the comovement coefficients for JPY and USD during the 1988-1997 time window and CNY and USD during the 2006-2015 time window. These graphs provide a view of the relative influence of a currency compared with the US dollar during the given time frame. While the study compares the CNY and USD coefficients for all seven East Asian countries, limited data availability holds the JPY and USD comparison to four countries: Thailand, Taiwan, Singapore, and Korea. These results are discussed below and can be found in Appendices 13 and 14.

Bilateral Trade

In addition to testing export similarity's effect on currency comovements, bilateral trade must be included for a robust analysis. Considering Subramanian and Kessler (2013) find that trade integration is a core predictor of currency comoverments, this study compares the impact of bilateral trade with that of export similarity in predicting currency comovements. Bilateral trade data was retrieved from the United Nations Comtrade database. On the database, this data was obtained by defining bilateral trade as *"All" trade flows and "Total-Total of all HS commodities"*. The data obtained included the bilateral trade flows of the seven East Asian countries with all global partners, China from 2006-2015, and Japan from 1988-1997. It should be noted that the data from Japan was sparse and did not always have reported numbers. As a result, these data points were excluded from the analysis. This data is discussed below and can be found in Appendix 15. Sections where data was unavailable are reflected by the values "0" or "NA".

Export Similarity Index

This study used a process similar to that of Finger and Kreinin (1979), but applied that framework to Chinese and Japanese currency comovements with the respective currencies of

South Korea, Thailand, Malaysia, Indonesia, Taiwan, Singapore, and the Philippines. As mentioned, a nine year time window, 2006 through 2014 for China was used to be thorough. The start year was 2006 and not earlier because China removed its fixed peg system in 2005. For Japan, the data will encompass the 1988-1997 ten year window. This portion of the study also compiled data from the UN Comtrade database. This data covered goods specified at the SITC 1-digit level.

As described in the Analytical Framework section, this study uses the following equation to calculate export similarity for two countries in a given year:

$$Export\ Similarity = \sum_{n=1}^{10} Min(Xi(ac), Xi(bc))$$

In the equation, countries *a* and *b* export to the global market *c*. *Xi(ac)* represents the share of commodity *i* in *a*'s exports to *c*. Commodities *i* are defined at the SITC 1-digit level. These products are numbered zero through nine. Export similarity is discussed further below and the data can be found in Appendix 16.

Multiple Regression Analysis

With the data obtained above, this study runs a multiple regression analysis to test for variables that impact comovement coefficients. With the dependent variable set as the currency comovement coefficients, the main independent variables of focus are percent of bilateral trade with China or Japan and Export Similarity Index. However, the regression takes into account other independent variables for a more robust analysis.

In addition to the percentage of bilateral trade with China or Japan, the regression also uses total volume of trade with China or Japan. In addition, economic size may increase currency influence. As a result the regression includes the Gross Domestic Product of China or Japan with data obtained through the World Bank. To account for the relative value of the United States

dollar, another independent variable is the United States Dollar Index. Data for this was obtained through the Bloomberg Terminal. Lastly, when the data for Japan and China is separated, the sample size is too small to find statistical significance. In order to combine the data for a large enough sample size, a dummy variable is created where China=1 and Japan=0. In addition to acting as a dummy variable, (China=1 Japan=0) also acts as a way to test if there is a significant difference in the currency comovement coefficients between the two countries in the respective time periods. It should be noted that some data points were excluded from the analysis due to their extreme nature. In particular, the points associated with the 2009 coefficients of Malaysia, Indonesia, and Korea were excluded due to their unusual volatility. The results of the regression are the main focus of this study and can be found in Appendix 17.

RESULTS

Exchange Rate Comovements

Overall, the comovement coefficient results for each East Asian country in each year can be found in Appendices 2 through 12. These results are represented graphically in Appendices 13 and 14. Reflecting the relative influence of the yen and the dollar, Appendix 13 illustrates the dominance of the dollar as a reference currency from 1988-1997 in East Asia. While the case for Korea paints an unclear picture, the tables for Thailand, Taiwan, and Singapore indicate the yen had little comovement influence while the dollar dominated the region. Appendix 14 illustrates a more complicated relationship as the renminbi has challenged the dollar as a reference currency from 2006 through 2015.

Multiple Regression

The results for the multiple regression can be found in Appendix 17. The regression overall featured 89 observations. Due to their unusual volatilities, the data points for Malaysia,

Indonesia, and Korea in 2009 were excluded from the dataset. The multiple regression analysis yielded an R Square value of .2138, an Adjusted R square value of .1564, a Standard Error of .6315 and 88 degrees of freedom. The results for each of the independent variables are listed below. Overall, the multiple regression equation was:

Comovement Coefficient =-1.02+37.11*% Bilateral Trade w/ China or Japan-5.66E-12*Volume of Bilateral Trade-1.29E-14*GDP of China or Japan-0.01*Dollar Index+2.21*Export Similarity+0.72*(China=1 Japan=0)

- *% Bilateral Trade w/ China or Japan: % of bilateral trade with China or Japan as seen in Appendix 15*

- *Volume of Bilateral Trade: Total volume of bilateral trade with China as seen in Appendix 15*

- *GDP of China of Japan: Gross Domestic Product of potential reference currency country; Japan or China*

- *Dollar Index: United States Dollar Index (DXY), Measures relative value of USD to foreign currency basket; data provided by Bloomberg Terminal*

- *Export Similarity: Export Similarity Index as explained in Appendix 16 definitions*

- *(China=1 Japan=0): Dummy variable differentiating between potential reference currency country; Japan or China*

% Bilateral Trade w/ China or Japan

This variable yielded a coefficient of 37.11, a t-stat of 1.77 and a p-Value of .080.

Volume of Bilateral Trade

This variable yielded a coefficient of (5.66E-12), a t-stat of (3.01) and a p-Value of 3.48E-03.

GDP of China or Japan

This variable yielded a coefficient of (1.29E-14), a t-stat of (1.10) and a p-Value of .274.

Dollar Index

This variable yielded a coefficient of (0.01), a t-stat of (.34) and a p-Value of .732.

Export Similarity

This variable yielded a coefficient of 2.21, a t-stat of 3.41 and a p-Value of .001.

(China=1 Japan=0)

This variable yielded a coefficient of .72, a t-stat of 2.47 and a p-Value of .015.

DISCUSSION

Exchange Rate Comovements

As shown in Appendices 2 through 14, this study confirms prior findings that the dollar was the dominant currency in East Asia from 1988 through 1997. The yen meanwhile, had little influence during this period. Reflecting the relative influence of the yen and the dollar, Appendix 13 in particular demonstrates this point as the dollar is shown to be continuously dominant. Appendix 14 though indicates that the renminbi appears to rival the dollar in currency influence in East Asia. One issue to look for in this data though is the comovement between the dollar and the renminbi. While China dropped the fixed peg regime in 2005, Beijing adopted a managed float system. As a result, the renminbi tracks the dollar and shows some parallels to USD movements in Appendix 14. This is especially apparent in the Indonesia case of Appendix 14. However, cases such as Thailand and Singapore indicate that despite having a managed float, the relationship between the renminbi, Thai baht, and Singapore dollar differs from that of the dollar. This is reflected in the lack of a parallel curve for the dollar and renminbi. In other words, the data from Appendix 14 helps to address the concern that the renminbi simply parallels the dollar

in its influence of other currencies. Rather, this data shows that the yuan has an independent effect on East Asian currencies despite the managed float policy.

Multiple Regression

Overall, the results of this study present interesting findings. Starting with the multiple regression analysis, there were six independent variables and one dependent variable, comovement coefficient. The (China=1 Japan=0) variable was significant at the 10% and 5%. At the 10% and 5% levels, this confirmed the observations from Appendices 2 through 12 that China has a much stronger influence over the East Asian currencies today than Japan 20 years ago. This is reflected in the coefficient of .71 and the p-Value of .015.

While the Dollar Index is included for a more robust analysis, its effect is statistically insignificant as reflected by the p-Value of .732. This indicates that a strengthening of the dollar relative to a foreign currency basket would not affect the influence of the renminbi or yen against the East Asian currencies. While not the focus of this study, this finding seems to run counter to Frankel and Wei (1994) where the authors argue that an increase in regional influence could be a temporary response to an overvalued dollar.

The GDP of China or Japan variable presents a statistically insignificant result with a p-Value of .274. Even if it was significant, a coefficient of (1.29E-14), this indicates that China or Japan's Gross Domestic Product would have to change by $12.9 trillion just to shift a comovement coefficient by .1. This indicates that there would need to be major economic shifts for this variable to have any meaningful effect. For example, China's 2014 GDP was about $10 trillion, meaning that according to the regression, doubling the size of its economy would not even yield a change in comovement coefficient of .1. Considering only the United States has a GDP greater than $12.9 trillion, any sort of shift on that scale could very likely have an effect on

the global economic system that would require major changes to the regression model used in this study. As a result, GDP of China or Japan does not seem to be a meaningful indicator of currency influence. This result is somewhat surprising because it would make sense for a larger economy to have a stronger influence around the world. However in the case of currencies, there are other variables at play with stronger effects.

The Volume of Bilateral Trade variable is statistically significant but not particularly meaningful. With a coefficient of (5.66E-12), this means that bilateral trade would have to shift by $566 billion to change the currency comovement coefficient by .1. In the dataset, the largest bilateral relationship is Korea and China in 2014 when trade totaled $235 billion. In other words, even for the largest trading partners, bilateral trade would need to more than double in order to change the currency comovement coefficient by .1.   In other words, there would need to be major changes to economic system for such a change to occur. There are other data points however that seem to be more meaningful in predicting comovement coefficients.

When looking at % Bilateral Trade w/ China or Japan, this study found a relationship between this independent variable and currency comovements. This supports the findings of Subramanian and Kessler (2013) where the authors found a strong relationship between trade integration and currency comovements. In this study, the p-Value is .080, making the statistic significant at the 10 percent level. Subramanian and Kessler (2013) has a larger dataset and thus more samples, thus potentially leading to the lower p-Value in that study. In addition, the slope of regression for % bilateral trade is surprisingly steep. According to the model, an increase of 1 percent in % Bilateral Trade w/ China or Japan would correspond to a change in comovement coefficient of .37. Given that the standard deviation of the independent variable is quite low at .5% or .005, it makes sense in this model that the slope is so steep. While this data point should

be treated with some caution due to its steeper than expected slope, this relationship is in line with other scholarly work in that it finds an important relationship where trade integration plays a major role in determining currency comovements. In addition, because Volume of Bilateral Trade was found to not be a meaningful variable, this indicates that the total value matters less than percentage. This is because the percentage of a country's bilateral trade is more indicative of a relative interdependence with a certain trade partner rather than others. Looking at Appendix 15, this result therefore indicates a divergence between the development of the yen and renminbi, where China's stronger trade ties helped the yuan gain influence.

A metric for future studies to look into could be change in bilateral trade over time. While not a significant predictor in this study's data, it could very well provide useful insight into the future of the renminbi's influence. While Japan was integrated with its neighbors, % Bilateral Trade declined for Japan from 1988-1997. From 2006-2015 this figure showed increases for China. In other words, while trade integration with Japan declined over its respective time window, China appears to be getting increasingly integrated with its neighbors. Considering the result of the regression and that of Subramanian and Kessler (2013), an increasingly integrated China may very well indicate that the renminbi and its influence will grow. While the % Bilateral Trade w/ China or Japan variable draws a distinction between the development of the renminbi and the yen, there are other variables that should be considered. In particular, this study finds that when factoring in competition between countries, understanding the currency comovement relationship becomes more complicated.

In the multiple regression analysis, export similarity was a strong statistical predictor of currency comovement. With a t-stat of 3.41 and a p-Value of .001, this result was significant at the 10 percent, 5 percent, and 1 percent levels. In other words, according to the data, stronger

competition between countries can lead to a higher currency influence. As shown in Appendix 15, China's higher export similarity indices indicate another juncture at which its path diverges from Japan's. As the regression shows, competing more with its East Asian neighbors has aided the renminbi in gaining an influential position the yen was never able to achieve. This result indirectly complements Matoo, Mishra, and Subramanian (2012) as the authors found that changes in China's exchange rate more strongly impact the exports of close competitors. When the outputs of the regression are compared to Subramanian and Kessler (2013), an interesting potential takeaway emerges.

Given the lower p-Value, the regression also indicates that while works such as Subramanian and Kessler (2013) have focused on trade, export similarity may very well be a better predictor of currency influence at the regional level. As mentioned earlier, Subramanian and Kessler (2013) find that trade integration is statistically significant while competitive similarity is inconclusive. However, the authors use a broad sample size that encompasses countries from around the world, with a minority coming from East Asia. As a result, the contrasting results indicated that Subramanian and Kessler (2013) do not capture how the predictive strength of variables that influence currency comovement can vary depending on if the level of analysis is at the global or regional level. This study though, when compared to Subramanian and Kessler (2013), indicates that while a stronger predictor at the regional level, export similarity becomes a weaker indicator in a broad global analysis. This indicates that future studies should account for an economic backyard effect when looking at currency comovements and influence.

In addition, the results paint an interesting picture because they indicate that timing of economic development can play an important role in currency influence. While Japan developed

before its neighbors, this also means that its economy advanced earlier. As explained by Lau (2003), because most of East Asia is in the developing stage, there was less overlap and competition with Japan. The developing economies though, face more intense direct competition due to export similarity. In other words, one way to look at the emergence of the renminbi in context with competition is through the lens of timing. Had China developed at a different time than its neighbors, it may very well be the case that the renminbi would not have reached the reference currency competition stage with the US dollar. On the flip side, had Japan developed later and concurrently with its neighbors, the yen may very well have gained more influence and began to challenge the dollar in the region as well.

An interesting way to test this theory in the future would be to see how the renminbi's influence changes as its economy begins to change. For example, recent news has indicated that China has begun to shift from a manufacturing driven to a services economy. In the Wall Street Journal, Mark Magnier explains that in 2015, first time services climbed from 48.1 percent to 50.5 percent of the economy. Not only was this the first time that this metric has increased above 50 percent, but manufacturing fell two points in the same year to 40.5 percent. Other statistics indicate that this shift is reflected in China's recent economic woes. While economic growth slowed to 6.9 percent, industrial growth fell to 7.3 percent from 6.0 percent. Simultaneously though, services growth increased to 8.3% from 7.8% the prior year. While these shifts may be necessary for ensuring long-term growth, this shift to the services sector may very well begin to erode China's competitive similarity with its neighbors. As a result, the renminbi could see its influence weaken if China's East Asian members follow a different economic path. Given that these economic shifts are happening currently, it is hard to statistically test whether or not these shifts have affected the renminbi's influence. In a few years though, it will be interesting to see if

China's economy has shifted enough so that there is a change in renminbi influence caused by a change in export similarity.

Even if export similarity declines though, this does not mean that the renminbi's influence will completely fall. While an important takeaway from the regression is that export similarity helps set the renminbi's development path apart from the Yen, bilateral trade still has an influence on currency comovement. As seen in this study and Subramanian and Kessler (2013), bilateral trade remains a strong predictor of currency comovements. As a result, if export similarity goes down, the effect on renminbi influence could very well be offset by increases in trade integration. This idea is supported by Appendix 15, where one can see that China is becoming increasingly integrated with its neighbors. The main takeaway from this study emphasizes the importance of export similarity and how it sets the yuan's development path apart from the yen. However, this is not the same as saying that export similarity is the only factor that affects currency comovements. Rather this study finds that there are two key drivers in trade integration and economic competition. These two variables though, do not necessarily change in parallel over time and thus may find themselves in offsetting roles.

Reserve Currency

While not the main focus of this study, there are interesting data points in the comovement coefficients when this study is compared to Subramanian and Kessler (2013). The authors look at 2010 through 2013 and find that the renminbi has become the dominant reference currency in the seven East Asian countries in this study. In Appendix 14, a vast majority of the data points show that the renminbi was more influential in East Asia than the US dollar from 2010 through 2013. However, the interesting part of the data emerges when one takes 2014 and 2015 into account. In the cases of Thailand, Malaysia, Taiwan, Singapore, and Philippines, the

US dollar makes a comeback against the renminbi and gains a higher comovement coefficient. While these are preliminary observations that would require a more thorough treatment, the data points provide an initial indication that perhaps the renminbi is not simply a dominant reference currency. If that were the case, it would by no means diminish the findings of this study. Even if the renminbi is not the dominant currency, its strong influence in East Asia and contrast to the yen's development deserves attention and the interest of the scholarly community. These data points though, may very well indicate that it is not necessarily clear if the renminbi is a reference currency. In addition, given the changing dynamics of China's economy, it will be interesting to see the scholarly works in the coming years that assess the relative influence of the renminbi and the dollar.

CONCLUSION

Over the past several years, the Chinese yuan has seen its influence increase to the point where it is challenging the US dollar as a dominant currency in East Asia. Despite having a similar share of trade in East Asia 20 years ago as China does now, the Japanese yen never rose to significantly challenge the dollar at the regional level. As a result, this study aimed to compare the development of the renminbi and yen to find drivers of currency influence. This in turn would help shed light on the differences between the two currencies and why their influences diverged.

Recent scholarly works focused on how currency comovement coefficients would increase with a rise in trade ties. While this tells part of the story, other explanations may present a more complete picture of why the yuan gained influence and the renminbi did not. Given the concurrent development timing of China and its East Asian neighbors, it intuitively makes sense that resulting increased competition would predict increasing currency influence. After running

the multiple regression analysis, this study finds that export similarity can play a pivotal role in the influence of a currency. These results present interesting findings and help contribute an understanding of the renminbi's rise. When paired with Subramanian and Kessler (2013), this study indicates that while trade integration is more predictive in a broad global analysis, export similarity can serve as a more useful indicator at the regional level. In order to improve on this paper, larger sample sizes would be necessary. Fortunately, the UN Comtrade database has weekly data starting in 2010. This study used annual data because it encompasses years that precede 2010. With weekly data though, future studies could have much larger sample sizes that lead to more statistically significant outputs. In addition, more accurate measures of export similarity could be obtained by using higher digit good classifications on the UN Comtrade database. Given the extra categories that emerge from going past the 1-digit level, stronger computer processors than the ones used in this study would be required.

Moving forward, the topic of the renminbi and its rise will become all the more interesting given the changing Chinese economy. In addition to the slowing of growth, the country's shift from manufacturing to services may alter its competitive similarity to its neighbors and thus alter the yuan's influence. Simultaneously, China's increasing trade ties may introduce the opposite effect and increase comovement coefficients. In addition, given the complicated and dynamic nature of the global economy, there may be additional explanations for the development differences between the renminbi and the yen that scholars are yet to uncover.

In addition to increasing currency influence, the yuan will continue to internationalize as Beijing allows it to increasingly flow beyond its borders. With the introduction of the offshore renminbi in 2009 and the use of the yuan in the IMF Special Drawing Rights starting in late 2016, the rise of the renminbi as an international and influential currency is an event of the

present and not just the future. As a result, understanding the drivers behind the currency may help understand the future of the renminbi and the international currency system.

The world has been dominated by the dollar for several decades as the world's reserve currency. This has been a defining feature of the global economic system. As China continues to grow, it may very well be the case that a rebalancing of the international economic system may be in order. Given the financial shocks that hit the United States and Europe in the past few years, currencies regarded as low risk such as the dollar and euro started to show potential cracks in their foundation. While economic disaster was avoided, the introduction of a new currency to the global monetary system may very well provide needed stability when economic headwinds emerge. It remains to be seen if the yuan will challenge the dollar for global dominance in the future, but attempting to understand it now can help leaders make informed decisions when dealing directly or indirectly with the international currency system.

Appendix 1: Variable Definitions and Descriptions

Below are the variables used in Appendices 2 through 12
- *Note: Dependent variables for Appendices 2 through 12 are the exchange rate for the given currency to the Swiss franc. For example, the dependent variable for Appendix 2 is THB/CHF*
- *USD/CHF: United States dollar to Swiss franc exchange rate*
- *JPY/CHF: Japanese yen to Swiss franc exchange rate*
- *EUR/CHF: Euro to Swiss franc exchange rate*
- *CNY/CHF: Chinese yuan to Swiss franc exchange rate*

Below are the variables used in Appendices 13 and 14
- *USD: USD/CHF regression coefficients from Appendices 2 through 12*
- *JPY: JPY/CHF regression coefficients from Appendices 2 through 12*
- *CNY: CNY/CHF regression coefficients from Appendices 2 through 12*

Appendix 15
- *Bilateral Trade defined as "All" trade flows and "Total-Total of all HS commodities" on the United Nations Comtrade Database*

Appendix 16
- *Export Similarity[1] calculated via the following equation where countries a and b export to the global market c. Xi(ac) represents the share of commodity i in a's exports to c:*

$$Export\ Similarity = \sum_{n=1}^{9} Min(Xi(ac), Xi(bc))$$

- *Commodities i are defined at the SITC 1-digit level on the United Nations Comtrade Database*

Below are the variables used in Appendix 17
- *Note: The dependent variable for Appendix 17 is the comovement regression coefficient for JPY and CNY as seen in Appendices 2 through 12*
- *% Bilateral Trade w/ China or Japan: % of bilateral trade with China or Japan as seen in Appendix 15*
- *Volume of Bilateral Trade: Total volume of bilateral trade with China as seen in Appendix 15*
- *GDP of China of Japan: Gross Domestic Product of potential reference currency country; Japan or China*
- *Dollar Index: United States Dollar Index (DXY), Measures relative value of USD to foreign currency basket; data provided by Bloomberg Terminal*
- *Export Similarity: Export Similarity Index as explained in Appendix 16 definitions*
- *(China=1 Japan=0): Dummy variable differentiating between potential reference currency country; Japan or China*

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[1] Note: Export Similarity method obtained from Finger and Kreinin (1979)

Appendix 2: THB Reference Currencies 1988-1997[2]

THB Reference Currencies 1988

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.98	Regression	3	0.01	0.00	1845.93	0.00
R Square	0.96	Residual	256	0.00	0.00		
Adjusted R Square	0.96	Total	259	0.01			
Standard Error	0.00						
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.63	0.53	(0.00)	0.00	(0.00)	0.00
USD/CHF	1.03	0.02	63.12	0.00	1.00	1.07	1.00	1.07
JPY/CHF	0.05	0.03	1.78	0.08	(0.01)	0.10	(0.01)	0.10
EUR/CHF	(0.04)	0.04	(1.07)	0.29	(0.11)	0.03	(0.11)	0.03

THB Reference Currencies 1989

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.97	Regression	3	0.01	0.00	1586.94	0.00
R Square	0.95	Residual	256	0.00	0.00		
Adjusted R Square	0.95	Total	259	0.02			
Standard Error	0.00						
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.42	0.68	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.98	0.02	57.86	0.00	0.94	1.01	0.94	1.01
JPY/CHF	0.03	0.03	1.32	0.19	(0.02)	0.09	(0.02)	0.09
EUR/CHF	(0.03)	0.03	(1.08)	0.28	(0.09)	0.03	(0.09)	0.03

THB Reference Currencies 1990

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.96	Regression	3	0.01	0.00	960.02	0.00
R Square	0.92	Residual	257	0.00	0.00		
Adjusted R Square	0.92	Total	260	0.01			
Standard Error	0.00						
Observations	261						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.36)	0.72	(0.00)	0.00	(0.00)	0.00
USD/CHF	1.01	0.03	39.22	0.00	0.96	1.06	0.96	1.06
JPY/CHF	(0.01)	0.02	(0.43)	0.66	(0.05)	0.03	(0.05)	0.03
EUR/CHF	(0.04)	0.04	(1.03)	0.31	(0.12)	0.04	(0.12)	0.04

THB Reference Currencies 1991

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.97	Regression	3	0.02	0.01	1210.45	0.00
R Square	0.93	Residual	257	0.00	0.00		
Adjusted R Square	0.93	Total	260	0.02			
Standard Error	0.00						
Observations	261						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.05	0.96	(0.00)	0.00	(0.00)	0.00
USD/CHF	1.00	0.02	44.56	0.00	0.95	1.04	0.95	1.04
JPY/CHF	(0.01)	0.03	(0.37)	0.71	(0.07)	0.05	(0.07)	0.05
EUR/CHF	0.01	0.03	0.47	0.64	(0.04)	0.07	(0.04)	0.07

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[2] Note: Data retrieved from Bloomberg Terminal

		THB Reference Currencies 1992					
Regression Statistics		ANOVA					
Multiple R	0.98		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.96	Regression	3	0.02	0.01	2232.77	0.00
Adjusted R Square	0.96	Residual	257	0.00	0.00		
Standard Error	0.00	Total	260	0.02			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	0.23	0.81	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.95	0.02	50.91	0.00	0.91	0.99	0.91	0.99
JPY/CHF	0.06	0.02	2.62	0.01	0.01	0.10	0.01	0.10
EUR/CHF	0.04	0.02	1.67	0.10	(0.01)	0.08	(0.01)	0.08

		THB Reference Currencies 1993					
Regression Statistics		ANOVA					
Multiple R	0.97		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.93	Regression	3	0.01	0.00	1151.59	0.00
Adjusted R Square	0.93	Residual	253	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	0.02	0.98	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.96	0.02	40.39	0.00	0.92	1.01	0.92	1.01
JPY/CHF	0.02	0.02	1.27	0.21	(0.01)	0.06	(0.01)	0.06
EUR/CHF	(0.01)	0.03	(0.38)	0.71	(0.06)	0.04	(0.06)	0.04

		THB Reference Currencies 1994					
Regression Statistics		ANOVA					
Multiple R	0.99		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.98	Regression	3	0.01	0.00	3605.98	0.00
Adjusted R Square	0.98	Residual	253	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.55)	0.58	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.92	0.01	72.98	0.00	0.90	0.95	0.90	0.95
JPY/CHF	0.01	0.01	1.01	0.31	(0.01)	0.04	(0.01)	0.04
EUR/CHF	0.09	0.01	6.77	0.00	0.06	0.11	0.06	0.11

		THB Reference Currencies 1995					
Regression Statistics		ANOVA					
Multiple R	0.97		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.94	Regression	3	0.02	0.01	1273.84	0.00
Adjusted R Square	0.94	Residual	256	0.00	0.00		
Standard Error	0.00	Total	259	0.02			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	0.11	0.91	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.91	0.02	41.64	0.00	0.87	0.96	0.87	0.96
JPY/CHF	0.04	0.02	1.70	0.09	(0.01)	0.09	(0.01)	0.09
EUR/CHF	0.07	0.03	2.40	0.02	0.01	0.12	0.01	0.12

THB Reference Currencies 1996								
Regression Statistics			ANOVA					
Multiple R	0.99			df	SS	MS	F	*Significance F*
R Square	0.98		Regression	3	0.01	0.00	4542.20	0.00
Adjusted R Square	0.98		Residual	258	0.00	0.00		
Standard Error	0.00		Total	261	0.01			
Observations	262							

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.00	0.32	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.89	0.01	68.93	0.00	0.87	0.92	0.87	0.92
JPY/CHF	0.05	0.01	4.68	0.00	0.03	0.07	0.03	0.07
EUR/CHF	0.08	0.01	5.87	0.00	0.05	0.11	0.05	0.11

THB Reference Currencies 1997								
Regression Statistics			ANOVA					
Multiple R	0.33			df	SS	MS	F	*Significance F*
R Square	0.11		Regression	3	0.01	0.00	10.31	0.00
Adjusted R Square	0.10		Residual	257	0.08	0.00		
Standard Error	0.02		Total	260	0.09			
Observations	261							

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	2.07	0.04	0.00	0.00	0.00	0.00
USD/CHF	0.71	0.21	3.44	0.00	0.30	1.12	0.30	1.12
JPY/CHF	0.12	0.16	0.74	0.46	(0.20)	0.44	(0.20)	0.44
EUR/CHF	0.23	0.25	0.91	0.36	(0.27)	0.72	(0.27)	0.72

Appendix 3: TWD Reference Currencies 1988-1997[3]

TWD Reference Currencies 1988							
Regression Statistics		ANOVA					
Multiple R	0.99		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.98	Regression	3	0.01	0.00	4063.30	0.00
Adjusted R Square	0.98	Residual	256	0.00	0.00		
Standard Error	0.00	Total	259	0.01			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.82)	0.41	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.98	0.01	93.53	0.00	0.96	1.00	0.96	1.00
JPY/CHF	0.02	0.02	1.40	0.16	(0.01)	0.06	(0.01)	0.06
EUR/CHF	(0.01)	0.02	(0.46)	0.65	(0.06)	0.03	(0.06)	0.03

TWD Reference Currencies 1989							
Regression Statistics		ANOVA					
Multiple R	0.90		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.80	Regression	3	0.01	0.00	348.36	0.00
Adjusted R Square	0.80	Residual	256	0.00	0.00		
Standard Error	0.00	Total	259	0.02			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.38)	0.17	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.94	0.04	25.99	0.00	0.87	1.01	0.87	1.01
JPY/CHF	0.09	0.06	1.64	0.10	(0.02)	0.20	(0.02)	0.20
EUR/CHF	0.05	0.07	0.69	0.49	(0.08)	0.18	(0.08)	0.18

TWD Reference Currencies 1990							
Regression Statistics		ANOVA					
Multiple R	0.97		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.94	Regression	3	0.01	0.00	1258.59	0.00
Adjusted R Square	0.94	Residual	257	0.00	0.00		
Standard Error	0.00	Total	260	0.01			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.25	0.21	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.98	0.02	43.44	0.00	0.94	1.02	0.94	1.02
JPY/CHF	0.02	0.02	1.23	0.22	(0.01)	0.06	(0.01)	0.06
EUR/CHF	(0.01)	0.03	(0.22)	0.83	(0.07)	0.06	(0.07)	0.06

TWD Reference Currencies 1991							
Regression Statistics		ANOVA					
Multiple R	0.98		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.96	Regression	3	0.02	0.01	2277.78	0.00
Adjusted R Square	0.96	Residual	257	0.00	0.00		
Standard Error	0.00	Total	260	0.02			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.99)	0.05	(0.00)	(0.00)	(0.00)	(0.00)
USD/CHF	0.96	0.02	59.80	0.00	0.93	0.99	0.93	0.99
JPY/CHF	0.02	0.02	1.09	0.28	(0.02)	0.06	(0.02)	0.06
EUR/CHF	0.04	0.02	1.73	0.09	(0.01)	0.08	(0.01)	0.08

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[3] Note: Data retrieved from Bloomberg Terminal

TWD Reference Currencies 1992							
Regression Statistics		ANOVA					
Multiple R	0.97		df	SS	MS	F	Significance F
R Square	0.94	Regression	3	0.02	0.01	1372.94	0.00
Adjusted R Square	0.94	Residual	257	0.00	0.00		
Standard Error	0.00	Total	260	0.03			
Observations	261						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.38)	0.71	(0.00)	0.00	(0.00)	0.00
USD/CHF	1.01	0.02	42.57	0.00	0.97	1.06	0.97	1.06
JPY/CHF	(0.03)	0.03	(1.17)	0.24	(0.09)	0.02	(0.09)	0.02
EUR/CHF	0.01	0.03	0.19	0.85	(0.05)	0.06	(0.05)	0.06

TWD Reference Currencies 1993							
Regression Statistics		ANOVA					
Multiple R	0.98		df	SS	MS	F	Significance F
R Square	0.96	Regression	3	0.01	0.00	1796.39	0.00
Adjusted R Square	0.95	Residual	253	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.86	0.06	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.98	0.02	50.29	0.00	0.94	1.02	0.94	1.02
JPY/CHF	0.01	0.01	0.39	0.70	(0.02)	0.03	(0.02)	0.03
EUR/CHF	0.02	0.02	1.06	0.29	(0.02)	0.07	(0.02)	0.07

TWD Reference Currencies 1994							
Regression Statistics		ANOVA					
Multiple R	0.97		df	SS	MS	F	Significance F
R Square	0.94	Regression	3	0.01	0.00	1360.57	0.00
Adjusted R Square	0.94	Residual	253	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.50)	0.62	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.99	0.02	46.44	0.00	0.95	1.03	0.95	1.03
JPY/CHF	(0.01)	0.02	(0.67)	0.50	(0.05)	0.03	(0.05)	0.03
EUR/CHF	0.05	0.02	2.18	0.03	0.00	0.09	0.00	0.09

TWD Reference Currencies 1995							
Regression Statistics		ANOVA					
Multiple R	0.96		df	SS	MS	F	Significance F
R Square	0.92	Regression	3	0.02	0.01	964.33	0.00
Adjusted R Square	0.92	Residual	256	0.00	0.00		
Standard Error	0.00	Total	259	0.03			
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.62	0.53	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.99	0.03	36.78	0.00	0.94	1.04	0.94	1.04
JPY/CHF	0.06	0.03	1.85	0.07	(0.00)	0.12	(0.00)	0.12
EUR/CHF	0.04	0.03	1.15	0.25	(0.03)	0.11	(0.03)	0.11

TWD Reference Currencies 1996							
Regression Statistics		ANOVA					
Multiple R	0.97		df	SS	MS	F	Significance F
R Square	0.94	Regression	3	0.01	0.00	1392.25	0.00
Adjusted R Square	0.94	Residual	258	0.00	0.00		
Standard Error	0.00	Total	261	0.01			
Observations	262						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.31	0.76	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.98	0.02	40.90	0.00	0.94	1.03	0.94	1.03
JPY/CHF	0.01	0.02	0.62	0.53	(0.02)	0.05	(0.02)	0.05
EUR/CHF	0.01	0.03	0.36	0.72	(0.04)	0.06	(0.04)	0.06

TWD Reference Currencies 1997							
Regression Statistics		ANOVA					
Multiple R	0.77		df	SS	MS	F	Significance F
R Square	0.60	Regression	3	0.01	0.00	127.48	0.00
Adjusted R Square	0.59	Residual	257	0.01	0.00		
Standard Error	0.01	Total	260	0.02			
Observations	261						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	2.01	0.05	0.00	0.00	0.00	0.00
USD/CHF	1.01	0.06	15.85	0.00	0.88	1.13	0.88	1.13
JPY/CHF	(0.06)	0.05	(1.22)	0.22	(0.16)	0.04	(0.16)	0.04
EUR/CHF	(0.04)	0.08	(0.46)	0.65	(0.19)	0.12	(0.19)	0.12

Appendix 4: SGD Reference Currencies 1988-1997[4]

SGD Reference Currencies 1988							
Regression Statistics		ANOVA					
Multiple R	0.95		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.91	Regression	3	0.01	0.00	863.91	0.00
Adjusted R Square	0.91	Residual	256	0.00	0.00		
Standard Error	0.00	Total	259	0.01			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.78)	0.43	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.99	0.02	42.98	0.00	0.94	1.04	0.94	1.04
JPY/CHF	(0.01)	0.04	(0.23)	0.82	(0.08)	0.07	(0.08)	0.07
EUR/CHF	0.03	0.05	0.67	0.50	(0.06)	0.13	(0.06)	0.13

SGD Reference Currencies 1989							
Regression Statistics		ANOVA					
Multiple R	0.95		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.91	Regression	3	0.02	0.01	823.73	0.00
Adjusted R Square	0.91	Residual	256	0.00	0.00		
Standard Error	0.00	Total	259	0.02			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.75)	0.45	(0.00)	0.00	(0.00)	0.00
USD/CHF	1.01	0.02	42.20	0.00	0.96	1.05	0.96	1.05
JPY/CHF	0.00	0.04	0.01	0.99	(0.07)	0.07	(0.07)	0.07
EUR/CHF	(0.04)	0.04	(0.92)	0.36	(0.13)	0.05	(0.13)	0.05

SGD Reference Currencies 1990							
Regression Statistics		ANOVA					
Multiple R	0.94		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.88	Regression	3	0.01	0.00	613.61	0.00
Adjusted R Square	0.88	Residual	257	0.00	0.00		
Standard Error	0.00	Total	260	0.01			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.86)	0.06	(0.00)	0.00	(0.00)	0.00
USD/CHF	1.00	0.03	30.55	0.00	0.93	1.06	0.93	1.06
JPY/CHF	0.00	0.03	0.14	0.89	(0.05)	0.06	(0.05)	0.06
EUR/CHF	0.01	0.05	0.17	0.86	(0.09)	0.10	(0.09)	0.10

SGD Reference Currencies 1991							
Regression Statistics		ANOVA					
Multiple R	0.92		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.86	Regression	3	0.02	0.01	507.53	0.00
Adjusted R Square	0.85	Residual	257	0.00	0.00		
Standard Error	0.00	Total	260	0.02			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.31)	0.19	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.99	0.03	28.98	0.00	0.92	1.05	0.92	1.05
JPY/CHF	(0.03)	0.04	(0.61)	0.54	(0.11)	0.06	(0.11)	0.06
EUR/CHF	0.04	0.05	0.85	0.40	(0.05)	0.13	(0.05)	0.13

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[4] Note: Data retrieved from Bloomberg Terminal

SGD Reference Currencies 1992							
Regression Statistics		ANOVA					
Multiple R	0.97		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.94	Regression	3	0.02	0.01	1347.71	0.00
Adjusted R Square	0.94	Residual	257	0.00	0.00		
Standard Error	0.00	Total	260	0.02			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.04)	0.97	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.90	0.02	39.59	0.00	0.85	0.94	0.85	0.94
JPY/CHF	0.02	0.03	0.72	0.47	(0.03)	0.07	(0.03)	0.07
EUR/CHF	0.09	0.03	3.34	0.00	0.04	0.15	0.04	0.15

SGD Reference Currencies 1993							
Regression Statistics		ANOVA					
Multiple R	0.95		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.89	Regression	3	0.01	0.00	710.90	0.00
Adjusted R Square	0.89	Residual	253	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.68)	0.50	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.82	0.03	28.50	0.00	0.76	0.87	0.76	0.87
JPY/CHF	0.07	0.02	3.38	0.00	0.03	0.11	0.03	0.11
EUR/CHF	0.12	0.03	3.63	0.00	0.05	0.18	0.05	0.18

SGD Reference Currencies 1994							
Regression Statistics		ANOVA					
Multiple R	0.96		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.93	Regression	3	0.01	0.00	1093.29	0.00
Adjusted R Square	0.93	Residual	253	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(2.77)	0.01	(0.00)	(0.00)	(0.00)	(0.00)
USD/CHF	0.84	0.02	38.87	0.00	0.80	0.89	0.80	0.89
JPY/CHF	0.13	0.02	6.37	0.00	0.09	0.17	0.09	0.17
EUR/CHF	0.03	0.02	1.50	0.13	(0.01)	0.08	(0.01)	0.08

SGD Reference Currencies 1995							
Regression Statistics		ANOVA					
Multiple R	0.95		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.89	Regression	3	0.02	0.01	722.72	0.00
Adjusted R Square	0.89	Residual	256	0.00	0.00		
Standard Error	0.00	Total	259	0.02			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.62)	0.53	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.79	0.03	31.18	0.00	0.74	0.84	0.74	0.84
JPY/CHF	0.13	0.03	4.44	0.00	0.07	0.18	0.07	0.18
EUR/CHF	0.02	0.03	0.59	0.56	(0.05)	0.08	(0.05)	0.08

SGD Reference Currencies 1996							
Regression Statistics		ANOVA					
Multiple R	0.96		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.92	Regression	3	0.01	0.00	970.03	0.00
Adjusted R Square	0.92	Residual	258	0.00	0.00		
Standard Error	0.00	Total	261	0.01			
Observations	262						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.11)	0.27	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.83	0.03	30.98	0.00	0.77	0.88	0.77	0.88
JPY/CHF	0.08	0.02	4.01	0.00	0.04	0.12	0.04	0.12
EUR/CHF	0.08	0.03	2.73	0.01	0.02	0.13	0.02	0.13

SGD Reference Currencies 1997							
Regression Statistics		ANOVA					
Multiple R	0.85		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.72	Regression	3	0.01	0.00	218.23	0.00
Adjusted R Square	0.71	Residual	257	0.00	0.00		
Standard Error	0.00	Total	260	0.02			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	2.26	0.02	0.00	0.00	0.00	0.00
USD/CHF	0.80	0.05	16.78	0.00	0.70	0.89	0.70	0.89
JPY/CHF	0.11	0.04	2.91	0.00	0.03	0.18	0.03	0.18
EUR/CHF	0.18	0.06	3.10	0.00	0.07	0.29	0.07	0.29

Appendix 5: KRW Reference Currencies 1988-1997[5]

KRW Reference Currencies 1988

Regression Statistics	
Multiple R	0.18
R Square	0.03
Adjusted R Square	0.02
Standard Error	0.01
Observations	260

ANOVA

	df	SS	MS	F	Significance F
Regression	3	0.00	0.00	3.00	0.03
Residual	256	0.01	0.00		
Total	259	0.01			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(1.50)	0.14	(0.00)	0.00	(0.00)	0.00
USD/CHF	(0.21)	0.08	(2.65)	0.01	(0.37)	(0.06)	(0.37)	(0.06)
JPY/CHF	0.01	0.13	0.07	0.94	(0.25)	0.27	(0.25)	0.27
EUR/CHF	0.41	0.17	2.38	0.02	0.07	0.76	0.07	0.76

KRW Reference Currencies 1989

Regression Statistics	
Multiple R	0.06
R Square	0.00
Adjusted R Square	(0.01)
Standard Error	0.01
Observations	260

ANOVA

	df	SS	MS	F	Significance F
Regression	3	0.00	0.00	0.34	0.80
Residual	256	0.02	0.00		
Total	259	0.02			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.55)	0.58	(0.00)	0.00	(0.00)	0.00
USD/CHF	(0.07)	0.08	(0.92)	0.36	(0.22)	0.08	(0.22)	0.08
JPY/CHF	(0.01)	0.12	(0.12)	0.91	(0.24)	0.22	(0.24)	0.22
EUR/CHF	0.06	0.14	0.44	0.66	(0.21)	0.33	(0.21)	0.33

KRW Reference Currencies 1990

Regression Statistics	
Multiple R	0.06
R Square	0.00
Adjusted R Square	(0.01)
Standard Error	0.01
Observations	261

ANOVA

	df	SS	MS	F	Significance F
Regression	3	0.00	0.00	0.32	0.81
Residual	257	0.01	0.00		
Total	260	0.01			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	2.33	0.02	0.00	0.00	0.00	0.00
USD/CHF	(0.00)	0.08	(0.04)	0.97	(0.15)	0.15	(0.15)	0.15
JPY/CHF	(0.05)	0.06	(0.85)	0.39	(0.18)	0.07	(0.18)	0.07
EUR/CHF	0.04	0.11	0.33	0.74	(0.19)	0.26	(0.19)	0.26

KRW Reference Currencies 1991

Regression Statistics	
Multiple R	0.16
R Square	0.03
Adjusted R Square	0.02
Standard Error	0.01
Observations	261

ANOVA

	df	SS	MS	F	Significance F
Regression	3	0.00	0.00	2.37	0.07
Residual	257	0.02	0.00		
Total	260	0.02			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.12)	0.91	(0.00)	0.00	(0.00)	0.00
USD/CHF	(0.15)	0.09	(1.78)	0.08	(0.32)	0.02	(0.32)	0.02
JPY/CHF	0.14	0.11	1.30	0.20	(0.07)	0.35	(0.07)	0.35
EUR/CHF	(0.20)	0.11	(1.75)	0.08	(0.42)	0.03	(0.42)	0.03

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[5] Note: Data retrieved from Bloomberg Terminal

KRW Reference Currencies 1992

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.06						
R Square	0.00	Regression	3	0.00	0.00	0.30	0.83
Adjusted R Square	(0.01)	Residual	257	0.02	0.00		
Standard Error	0.01	Total	260	0.02			
Observations	261						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.85	0.40	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.07	0.08	0.82	0.42	(0.10)	0.23	(0.10)	0.23
JPY/CHF	(0.07)	0.10	(0.70)	0.48	(0.26)	0.12	(0.26)	0.12
EUR/CHF	(0.06)	0.10	(0.55)	0.58	(0.26)	0.14	(0.26)	0.14

KRW Reference Currencies 1993

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.03						
R Square	0.00	Regression	3	0.00	0.00	0.08	0.97
Adjusted R Square	(0.01)	Residual	253	0.02	0.00		
Standard Error	0.01	Total	256	0.02			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.02	0.98	(0.00)	0.00	(0.00)	0.00
USD/CHF	0.01	0.12	0.08	0.94	(0.22)	0.24	(0.22)	0.24
JPY/CHF	0.00	0.09	0.03	0.98	(0.17)	0.18	(0.17)	0.18
EUR/CHF	0.04	0.13	0.33	0.74	(0.22)	0.30	(0.22)	0.30

KRW Reference Currencies 1994

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.18						
R Square	0.03	Regression	3	0.00	0.00	2.97	0.03
Adjusted R Square	0.02	Residual	253	0.01	0.00		
Standard Error	0.01	Total	256	0.01			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.29	0.77	(0.00)	0.00	(0.00)	0.00
USD/CHF	(0.23)	0.09	(2.51)	0.01	(0.41)	(0.05)	(0.41)	(0.05)
JPY/CHF	(0.03)	0.08	(0.40)	0.69	(0.20)	0.13	(0.20)	0.13
EUR/CHF	0.15	0.09	1.66	0.10	(0.03)	0.33	(0.03)	0.33

KRW Reference Currencies 1995

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.06						
R Square	0.00	Regression	3	0.00	0.00	0.26	0.85
Adjusted R Square	(0.01)	Residual	256	0.02	0.00		
Standard Error	0.01	Total	259	0.02			
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.20	0.23	(0.00)	0.00	(0.00)	0.00
USD/CHF	(0.05)	0.08	(0.60)	0.55	(0.21)	0.11	(0.21)	0.11
JPY/CHF	0.00	0.09	0.00	1.00	(0.18)	0.18	(0.18)	0.18
EUR/CHF	(0.00)	0.11	(0.04)	0.97	(0.21)	0.21	(0.21)	0.21

KRW Reference Currencies 1996							
Regression Statistics		ANOVA					
Multiple R	0.15		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.02	Regression	3	0.00	0.00	1.99	0.12
Adjusted R Square	0.01	Residual	258	0.01	0.00		
Standard Error	0.01	Total	261	0.02			
Observations	262						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	0.43	0.67	(0.00)	0.00	(0.00)	0.00
USD/CHF	(0.06)	0.14	(0.46)	0.65	(0.34)	0.21	(0.34)	0.21
JPY/CHF	0.25	0.11	2.32	0.02	0.04	0.46	0.04	0.46
EUR/CHF	(0.01)	0.15	(0.08)	0.94	(0.31)	0.28	(0.31)	0.28

KRW Reference Currencies 1997							
Regression Statistics		ANOVA					
Multiple R	0.05		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.00	Regression	3	0.00	0.00	0.24	0.87
Adjusted R Square	(0.01)	Residual	257	0.19	0.00		
Standard Error	0.03	Total	260	0.19			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.32	0.19	(0.00)	0.01	(0.00)	0.01
USD/CHF	0.19	0.32	0.61	0.54	(0.43)	0.82	(0.43)	0.82
JPY/CHF	0.00	0.25	0.01	0.99	(0.48)	0.49	(0.48)	0.49
EUR/CHF	0.03	0.39	0.07	0.95	(0.73)	0.78	(0.73)	0.78

Appendix 6: THB Reference Currencies 2006-2015[6]

THB Reference Currencies 2006							
Regression Statistics		ANOVA					
Multiple R	0.75		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.57	Regression	4	0.00	0.00	82.05	0.00
Adjusted R Square	0.56	Residual	252	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.89)	0.06	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.35	0.34	1.02	0.31	(0.32)	1.02	(0.32)	1.02
USD/CHF	0.31	0.34	0.89	0.37	(0.37)	0.98	(0.37)	0.98
JPY/CHF	0.22	0.06	3.42	0.00	0.09	0.34	0.09	0.34
EUR/CHF	0.21	0.15	1.38	0.17	(0.09)	0.51	(0.09)	0.51

THB Reference Currencies 2007							
Regression Statistics		ANOVA					
Multiple R	0.42		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.17	Regression	4	0.01	0.00	13.24	0.00
Adjusted R Square	0.16	Residual	251	0.03	0.00		
Standard Error	0.01	Total	255	0.04			
Observations	256						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.56)	0.58	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.28	0.71	1.80	0.07	(0.12)	2.68	(0.12)	2.68
USD/CHF	0.02	0.74	0.03	0.97	(1.43)	1.48	(1.43)	1.48
JPY/CHF	(0.04)	0.18	(0.21)	0.83	(0.38)	0.31	(0.38)	0.31
EUR/CHF	(0.43)	0.42	(1.01)	0.31	(1.26)	0.40	(1.26)	0.40

THB Reference Currencies 2008							
Regression Statistics		ANOVA					
Multiple R	0.82		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.67	Regression	4	0.02	0.00	130.03	0.00
Adjusted R Square	0.66	Residual	257	0.01	0.00		
Standard Error	0.01	Total	261	0.03			
Observations	262						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.74	0.08	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.31	0.28	1.08	0.28	(0.25)	0.87	(0.25)	0.87
USD/CHF	0.56	0.28	1.96	0.05	(0.00)	1.11	(0.00)	1.11
JPY/CHF	0.01	0.05	0.23	0.82	(0.09)	0.11	(0.09)	0.11
EUR/CHF	0.18	0.09	1.99	0.05	0.00	0.35	0.00	0.35

THB Reference Currencies 2009							
Regression Statistics		ANOVA					
Multiple R	0.95		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.91	Regression	4	0.01	0.00	658.65	0.00
Adjusted R Square	0.91	Residual	255	0.00	0.00		
Standard Error	0.00	Total	259	0.02			
Observations	260						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.09)	0.27	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.65	0.42	3.90	0.00	0.82	2.48	0.82	2.48
USD/CHF	(0.74)	0.42	(1.75)	0.08	(1.56)	0.09	(1.56)	0.09
JPY/CHF	0.01	0.02	0.73	0.47	(0.02)	0.05	(0.02)	0.05
EUR/CHF	0.07	0.04	1.84	0.07	(0.01)	0.15	(0.01)	0.15

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[6] Note: Data retrieved from Bloomberg Terminal

THB Reference Currencies 2010

Regression Statistics	
Multiple R	0.95
R Square	0.89
Adjusted R Square	0.89
Standard Error	0.00
Observations	259

ANOVA

	df	SS	MS	F	Significance F
Regression	4	0.01	0.00	531.02	0.00
Residual	254	0.00	0.00		
Total	258	0.01			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(2.61)	0.01	(0.00)	(0.00)	(0.00)	(0.00)
CNY/CHF	0.28	0.13	2.10	0.04	0.02	0.54	0.02	0.54
USD/CHF	0.61	0.13	4.51	0.00	0.34	0.87	0.34	0.87
JPY/CHF	0.03	0.02	1.33	0.18	(0.01)	0.07	(0.01)	0.07
EUR/CHF	0.06	0.03	2.53	0.01	0.01	0.11	0.01	0.11

THB Reference Currencies 2011

Regression Statistics	
Multiple R	0.96
R Square	0.92
Adjusted R Square	0.92
Standard Error	0.00
Observations	260

ANOVA

	df	SS	MS	F	Significance F
Regression	4	0.03	0.01	743.66	0.00
Residual	255	0.00	0.00		
Total	259	0.03			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.55	0.12	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.65	0.17	3.87	0.00	0.32	0.97	0.32	0.97
USD/CHF	0.17	0.17	0.98	0.33	(0.17)	0.50	(0.17)	0.50
JPY/CHF	0.02	0.04	0.45	0.66	(0.06)	0.09	(0.06)	0.09
EUR/CHF	0.17	0.03	6.05	0.00	0.11	0.22	0.11	0.22

THB Reference Currencies 2012

Regression Statistics	
Multiple R	0.85
R Square	0.72
Adjusted R Square	0.72
Standard Error	0.00
Observations	256

ANOVA

	df	SS	MS	F	Significance F
Regression	4	0.00	0.00	162.62	0.00
Residual	251	0.00	0.00		
Total	255	0.00			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.70)	0.48	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.44	0.12	3.68	0.00	0.20	0.67	0.20	0.67
USD/CHF	0.21	0.13	1.70	0.09	(0.03)	0.46	(0.03)	0.46
JPY/CHF	0.03	0.03	0.89	0.37	(0.03)	0.08	(0.03)	0.08
EUR/CHF	0.20	0.12	1.61	0.11	(0.04)	0.44	(0.04)	0.44

THB Reference Currencies 2013

Regression Statistics	
Multiple R	0.82
R Square	0.67
Adjusted R Square	0.67
Standard Error	0.00
Observations	257

ANOVA

	df	SS	MS	F	Significance F
Regression	4	0.01	0.00	128.54	0.00
Residual	252	0.00	0.00		
Total	256	0.01			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.54	0.13	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.42	0.33	1.28	0.20	(0.22)	1.06	(0.22)	1.06
USD/CHF	0.40	0.33	1.21	0.23	(0.25)	1.06	(0.25)	1.06
JPY/CHF	0.01	0.03	0.29	0.77	(0.06)	0.08	(0.06)	0.08
EUR/CHF	0.13	0.10	1.32	0.19	(0.06)	0.32	(0.06)	0.32

THB Reference Currencies 2014							
Regression Statistics		ANOVA					
Multiple R	0.84		df	SS	MS	F	Significance F
R Square	0.71	Regression	4	0.00	0.00	154.02	0.00
Adjusted R Square	0.70	Residual	256	0.00	0.00		
Standard Error	0.00	Total	260	0.00			
Observations	261						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.69)	0.49	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.12	0.12	1.00	0.32	(0.11)	0.35	(0.11)	0.35
USD/CHF	0.66	0.12	5.44	0.00	0.42	0.90	0.42	0.90
JPY/CHF	0.07	0.03	2.04	0.04	0.00	0.14	0.00	0.14
EUR/CHF	0.21	0.13	1.64	0.10	(0.04)	0.47	(0.04)	0.47

THB Reference Currencies 2015							
Regression Statistics		ANOVA					
Multiple R	0.98		df	SS	MS	F	Significance F
R Square	0.96	Regression	4	0.06	0.01	1511.54	0.00
Adjusted R Square	0.96	Residual	250	0.00	0.00		
Standard Error	0.00	Total	254	0.06			
Observations	255						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.37	0.17	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.29	0.11	2.61	0.01	0.07	0.51	0.07	0.51
USD/CHF	0.51	0.12	4.34	0.00	0.28	0.75	0.28	0.75
JPY/CHF	0.11	0.05	2.44	0.02	0.02	0.20	0.02	0.20
EUR/CHF	0.08	0.03	2.63	0.01	0.02	0.14	0.02	0.14

Appendix 7: MYR Reference Currencies 2006-2015[7]

MYR Reference Currencies 2006							
Regression Statistics		ANOVA					
			df	*SS*	*MS*	*F*	*Significance F*
Multiple R	0.91						
R Square	0.83	Regression	4	0.01	0.00	312.32	0.00
Adjusted R Square	0.83	Residual	252	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.05)	0.29	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.03	0.21	5.00	0.00	0.62	1.43	0.62	1.43
USD/CHF	(0.14)	0.21	(0.67)	0.50	(0.55)	0.27	(0.55)	0.27
JPY/CHF	0.12	0.04	3.12	0.00	0.04	0.19	0.04	0.19
EUR/CHF	(0.11)	0.09	(1.23)	0.22	(0.29)	0.07	(0.29)	0.07

MYR Reference Currencies 2007							
Regression Statistics		ANOVA					
			df	*SS*	*MS*	*F*	*Significance F*
Multiple R	0.86						
R Square	0.75	Regression	4	0.01	0.00	184.31	0.00
Adjusted R Square	0.74	Residual	251	0.00	0.00		
Standard Error	0.00	Total	255	0.01			
Observations	256						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.76)	0.45	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.18	0.16	1.13	0.26	(0.13)	0.49	(0.13)	0.49
USD/CHF	0.70	0.16	4.29	0.00	0.38	1.02	0.38	1.02
JPY/CHF	(0.08)	0.04	(2.01)	0.05	(0.16)	(0.00)	(0.16)	(0.00)
EUR/CHF	0.38	0.09	4.05	0.00	0.20	0.57	0.20	0.57

MYR Reference Currencies 2008							
Regression Statistics		ANOVA					
			df	*SS*	*MS*	*F*	*Significance F*
Multiple R	0.91						
R Square	0.83	Regression	4	0.02	0.01	305.81	0.00
Adjusted R Square	0.82	Residual	257	0.00	0.00		
Standard Error	0.00	Total	261	0.03			
Observations	262						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.01	0.31	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.69	0.19	3.57	0.00	0.31	1.06	0.31	1.06
USD/CHF	0.26	0.19	1.34	0.18	(0.12)	0.63	(0.12)	0.63
JPY/CHF	(0.08)	0.03	(2.37)	0.02	(0.15)	(0.01)	(0.15)	(0.01)
EUR/CHF	0.15	0.06	2.50	0.01	0.03	0.27	0.03	0.27

MYR Reference Currencies 2009							
Regression Statistics		ANOVA					
			df	*SS*	*MS*	*F*	*Significance F*
Multiple R	0.87						
R Square	0.76	Regression	4	0.01	0.00	204.14	0.00
Adjusted R Square	0.76	Residual	255	0.00	0.00		
Standard Error	0.00	Total	259	0.02			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.01)	0.99	(0.00)	0.00	(0.00)	0.00
CNY/CHF	3.66	0.72	5.07	0.00	2.24	5.08	2.24	5.08
USD/CHF	(2.75)	0.72	(3.83)	0.00	(4.17)	(1.34)	(4.17)	(1.34)
JPY/CHF	(0.12)	0.03	(3.52)	0.00	(0.18)	(0.05)	(0.18)	(0.05)
EUR/CHF	0.26	0.07	3.79	0.00	0.12	0.39	0.12	0.39

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[7] Note: Data retrieved from Bloomberg Terminal

MYR Reference Currencies 2010

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.82						
R Square	0.67	Regression	4	0.01	0.00	131.69	0.00
Adjusted R Square	0.67	Residual	254	0.01	0.00		
Standard Error	0.00	Total	258	0.02			
Observations	259						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(1.26)	0.21	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.19	0.29	4.03	0.00	0.61	1.77	0.61	1.77
USD/CHF	(0.10)	0.30	(0.33)	0.74	(0.68)	0.49	(0.68)	0.49
JPY/CHF	(0.16)	0.05	(3.46)	0.00	(0.26)	(0.07)	(0.26)	(0.07)
EUR/CHF	0.10	0.06	1.71	0.09	(0.01)	0.21	(0.01)	0.21

MYR Reference Currencies 2011

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.93						
R Square	0.86	Regression	4	0.03	0.01	396.94	0.00
Adjusted R Square	0.86	Residual	255	0.00	0.00		
Standard Error	0.00	Total	259	0.03			
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.45	0.15	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.46	0.24	6.21	0.00	1.00	1.92	1.00	1.92
USD/CHF	(0.48)	0.24	(1.99)	0.05	(0.95)	(0.01)	(0.95)	(0.01)
JPY/CHF	(0.08)	0.05	(1.59)	0.11	(0.19)	0.02	(0.19)	0.02
EUR/CHF	0.08	0.04	1.93	0.05	(0.00)	0.15	(0.00)	0.15

MYR Reference Currencies 2012

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.26						
R Square	0.07	Regression	4	0.00	0.00	4.43	0.00
Adjusted R Square	0.05	Residual	251	0.00	0.00		
Standard Error	0.00	Total	255	0.00			
Observations	256						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.54)	0.59	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.33)	0.21	(1.53)	0.13	(0.75)	0.09	(0.75)	0.09
USD/CHF	0.32	0.23	1.40	0.16	(0.13)	0.76	(0.13)	0.76
JPY/CHF	0.12	0.05	2.30	0.02	0.02	0.22	0.02	0.22
EUR/CHF	0.47	0.22	2.10	0.04	0.03	0.90	0.03	0.90

MYR Reference Currencies 2013

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.28						
R Square	0.08	Regression	4	0.00	0.00	5.24	0.00
Adjusted R Square	0.06	Residual	252	0.01	0.00		
Standard Error	0.01	Total	256	0.01			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.59	0.56	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(1.64)	0.57	(2.86)	0.00	(2.77)	(0.51)	(2.77)	(0.51)
USD/CHF	1.86	0.58	3.20	0.00	0.72	3.01	0.72	3.01
JPY/CHF	(0.03)	0.06	(0.50)	0.62	(0.15)	0.09	(0.15)	0.09
EUR/CHF	0.12	0.17	0.69	0.49	(0.22)	0.45	(0.22)	0.45

MYR Reference Currencies 2014							
Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.27	Regression	4	0.00	0.00	4.96	0.00
R Square	0.07	Residual	256	0.00	0.00		
Adjusted R Square	0.06	Total	260	0.01			
Standard Error	0.00						
Observations	261						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.73)	0.46	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.03)	0.22	(0.14)	0.89	(0.47)	0.41	(0.47)	0.41
USD/CHF	0.05	0.23	0.23	0.82	(0.41)	0.51	(0.41)	0.51
JPY/CHF	0.19	0.07	2.84	0.00	0.06	0.32	0.06	0.32
EUR/CHF	0.67	0.25	2.68	0.01	0.18	1.16	0.18	1.16

MYR Reference Currencies 2015							
Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.21	Regression	4	0.00	0.00	2.80	0.03
R Square	0.04	Residual	250	0.05	0.00		
Adjusted R Square	0.03	Total	254	0.05			
Standard Error	0.01						
Observations	255						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.92	0.36	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.16	0.50	2.31	0.02	0.17	2.15	0.17	2.15
USD/CHF	(1.15)	0.53	(2.17)	0.03	(2.19)	(0.11)	(2.19)	(0.11)
JPY/CHF	0.20	0.21	0.98	0.33	(0.20)	0.61	(0.20)	0.61
EUR/CHF	(0.27)	0.13	(2.02)	0.04	(0.53)	(0.01)	(0.53)	(0.01)

Appendix 8: IDR Reference Currencies 2006-2015[8]

IDR Reference Currencies 2006							
Regression Statistics		ANOVA					
Multiple R	0.66		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.43	Regression	4	0.01	0.00	47.51	0.00
Adjusted R Square	0.42	Residual	252	0.01	0.00		
Standard Error	0.01	Total	256	0.01			
Observations	257						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.55)	0.58	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.08	0.50	2.16	0.03	0.10	2.06	0.10	2.06
USD/CHF	(0.27)	0.50	(0.54)	0.59	(1.26)	0.72	(1.26)	0.72
JPY/CHF	0.17	0.09	1.78	0.08	(0.02)	0.35	(0.02)	0.35
EUR/CHF	(0.08)	0.22	(0.34)	0.73	(0.51)	0.36	(0.51)	0.36

IDR Reference Currencies 2007							
Regression Statistics		ANOVA					
Multiple R	0.74		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.55	Regression	4	0.01	0.00	76.47	0.00
Adjusted R Square	0.54	Residual	251	0.01	0.00		
Standard Error	0.00	Total	255	0.01			
Observations	256						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.02	0.31	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.14	0.28	0.52	0.60	(0.40)	0.69	(0.40)	0.69
USD/CHF	0.80	0.29	2.79	0.01	0.23	1.37	0.23	1.37
JPY/CHF	(0.26)	0.07	(3.84)	0.00	(0.40)	(0.13)	(0.40)	(0.13)
EUR/CHF	0.51	0.16	3.08	0.00	0.18	0.83	0.18	0.83

IDR Reference Currencies 2008							
Regression Statistics		ANOVA					
Multiple R	0.66		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.43	Regression	4	0.03	0.01	48.65	0.00
Adjusted R Square	0.42	Residual	257	0.03	0.00		
Standard Error	0.01	Total	261	0.06			
Observations	262						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.01	0.31	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.84	0.53	1.60	0.11	(0.20)	1.89	(0.20)	1.89
USD/CHF	0.12	0.53	0.22	0.83	(0.93)	1.16	(0.93)	1.16
JPY/CHF	(0.23)	0.09	(2.47)	0.01	(0.42)	(0.05)	(0.42)	(0.05)
EUR/CHF	0.44	0.17	2.61	0.01	0.11	0.77	0.11	0.77

IDR Reference Currencies 2009							
Regression Statistics		ANOVA					
Multiple R	0.67		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.45	Regression	4	0.02	0.00	52.40	0.00
Adjusted R Square	0.44	Residual	255	0.02	0.00		
Standard Error	0.01	Total	259	0.04			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.12)	0.26	(0.00)	0.00	(0.00)	0.00
CNY/CHF	5.74	1.63	3.53	0.00	2.54	8.94	2.54	8.94
USD/CHF	(4.68)	1.62	(2.89)	0.00	(7.87)	(1.48)	(7.87)	(1.48)
JPY/CHF	(0.28)	0.07	(3.72)	0.00	(0.42)	(0.13)	(0.42)	(0.13)
EUR/CHF	0.38	0.15	2.47	0.01	0.08	0.69	0.08	0.69

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[8] Note: Data retrieved from Bloomberg Terminal

IDR Reference Currencies 2010

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.81	Regression	4	0.01	0.00	125.58	0.00
R Square	0.66	Residual	254	0.00	0.00		
Adjusted R Square	0.66	Total	258	0.01			
Standard Error	0.00						
Observations	259						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.94)	0.35	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.31	0.27	1.15	0.25	(0.22)	0.83	(0.22)	0.83
USD/CHF	0.70	0.27	2.60	0.01	0.17	1.23	0.17	1.23
JPY/CHF	(0.25)	0.04	(5.85)	0.00	(0.33)	(0.17)	(0.33)	(0.17)
EUR/CHF	0.13	0.05	2.59	0.01	0.03	0.23	0.03	0.23

IDR Reference Currencies 2011

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.90	Regression	4	0.02	0.01	266.15	0.00
R Square	0.81	Residual	255	0.01	0.00		
Adjusted R Square	0.80	Total	259	0.03			
Standard Error	0.00						
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.35	0.73	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.58	0.27	2.14	0.03	0.05	1.12	0.05	1.12
USD/CHF	0.28	0.28	1.01	0.31	(0.27)	0.83	(0.27)	0.83
JPY/CHF	(0.08)	0.06	(1.30)	0.20	(0.20)	0.04	(0.20)	0.04
EUR/CHF	0.17	0.05	3.81	0.00	0.08	0.26	0.08	0.26

IDR Reference Currencies 2012

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.30	Regression	4	0.00	0.00	6.27	0.00
R Square	0.09	Residual	251	0.01	0.00		
Adjusted R Square	0.08	Total	255	0.01			
Standard Error	0.01						
Observations	256						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.79	0.43	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(1.13)	0.31	(3.62)	0.00	(1.75)	(0.52)	(1.75)	(0.52)
USD/CHF	1.16	0.33	3.50	0.00	0.50	1.81	0.50	1.81
JPY/CHF	0.12	0.08	1.55	0.12	(0.03)	0.27	(0.03)	0.27
EUR/CHF	0.56	0.32	1.73	0.09	(0.08)	1.20	(0.08)	1.20

IDR Reference Currencies 2013

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.24	Regression	4	0.00	0.00	3.80	0.01
R Square	0.06	Residual	252	0.02	0.00		
Adjusted R Square	0.04	Total	256	0.02			
Standard Error	0.01						
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.55	0.12	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(1.78)	0.85	(2.11)	0.04	(3.44)	(0.11)	(3.44)	(0.11)
USD/CHF	2.16	0.86	2.51	0.01	0.47	3.85	0.47	3.85
JPY/CHF	(0.12)	0.09	(1.39)	0.16	(0.30)	0.05	(0.30)	0.05
EUR/CHF	(0.10)	0.25	(0.39)	0.69	(0.59)	0.40	(0.59)	0.40

	IDR Reference Currencies 2014							
Regression Statistics		ANOVA						
Multiple R	0.16		df	SS	MS	F	Significance F	
R Square	0.03	Regression	4	0.00	0.00	1.68	0.16	
Adjusted R Square	0.01	Residual	256	0.01	0.00			
Standard Error	0.01	Total	260	0.01				
Observations	261							

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.92)	0.36	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.02	0.28	0.08	0.94	(0.52)	0.57	(0.52)	0.57
USD/CHF	0.10	0.29	0.33	0.74	(0.47)	0.67	(0.47)	0.67
JPY/CHF	0.01	0.08	0.15	0.88	(0.15)	0.18	(0.15)	0.18
EUR/CHF	0.43	0.31	1.39	0.17	(0.18)	1.04	(0.18)	1.04

	IDR Reference Currencies 2015							
Regression Statistics		ANOVA						
Multiple R	0.18		df	SS	MS	F	Significance F	
R Square	0.03	Regression	4	0.00	0.00	2.21	0.07	
Adjusted R Square	0.02	Residual	250	0.04	0.00			
Standard Error	0.01	Total	254	0.04				
Observations	255							

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.59	0.56	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.79	0.46	1.72	0.09	(0.11)	1.70	(0.11)	1.70
USD/CHF	(0.75)	0.48	(1.56)	0.12	(1.71)	0.20	(1.71)	0.20
JPY/CHF	0.19	0.19	1.02	0.31	(0.18)	0.57	(0.18)	0.57
EUR/CHF	(0.27)	0.12	(2.19)	0.03	(0.50)	(0.03)	(0.50)	(0.03)

Appendix 9: TWD Reference Currencies 2006-2015[9]

TWD Reference Currencies 2006

Regression Statistics		ANOVA	df	SS	MS	F	Significance F
Multiple R	0.88						
R Square	0.77	Regression	4	0.01	0.00	210.58	0.00
Adjusted R Square	0.77	Residual	252	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.57	0.57	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.17	0.25	4.63	0.00	0.67	1.66	0.67	1.66
USD/CHF	(0.26)	0.25	(1.03)	0.30	(0.76)	0.24	(0.76)	0.24
JPY/CHF	0.10	0.05	2.17	0.03	0.01	0.19	0.01	0.19
EUR/CHF	(0.14)	0.11	(1.29)	0.20	(0.36)	0.08	(0.36)	0.08

TWD Reference Currencies 2007

Regression Statistics		ANOVA	df	SS	MS	F	Significance F
Multiple R	0.95						
R Square	0.90	Regression	4	0.00	0.00	561.51	0.00
Adjusted R Square	0.90	Residual	251	0.00	0.00		
Standard Error	0.00	Total	255	0.01			
Observations	256						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.48	0.63	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.23	0.09	2.60	0.01	0.05	0.40	0.05	0.40
USD/CHF	0.75	0.09	8.28	0.00	0.57	0.93	0.57	0.93
JPY/CHF	(0.02)	0.02	(0.84)	0.40	(0.06)	0.02	(0.06)	0.02
EUR/CHF	(0.04)	0.05	(0.68)	0.50	(0.14)	0.07	(0.14)	0.07

TWD Reference Currencies 2008

Regression Statistics		ANOVA	df	SS	MS	F	Significance F
Multiple R	0.93						
R Square	0.87	Regression	4	0.02	0.00	423.17	0.00
Adjusted R Square	0.87	Residual	257	0.00	0.00		
Standard Error	0.00	Total	261	0.02			
Observations	262						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.84	0.40	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.60	0.16	3.76	0.00	0.29	0.91	0.29	0.91
USD/CHF	0.33	0.16	2.09	0.04	0.02	0.65	0.02	0.65
JPY/CHF	(0.02)	0.03	(0.85)	0.39	(0.08)	0.03	(0.08)	0.03
EUR/CHF	0.04	0.05	0.88	0.38	(0.05)	0.14	(0.05)	0.14

TWD Reference Currencies 2009

Regression Statistics		ANOVA	df	SS	MS	F	Significance F
Multiple R	0.93						
R Square	0.87	Regression	4	0.02	0.00	409.47	0.00
Adjusted R Square	0.86	Residual	255	0.00	0.00		
Standard Error	0.00	Total	259	0.02			
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.43)	0.67	(0.00)	0.00	(0.00)	0.00
CNY/CHF	2.85	0.55	5.17	0.00	1.77	3.94	1.77	3.94
USD/CHF	(1.89)	0.55	(3.43)	0.00	(2.97)	(0.80)	(2.97)	(0.80)
JPY/CHF	(0.05)	0.03	(2.09)	0.04	(0.10)	(0.00)	(0.10)	(0.00)
EUR/CHF	0.15	0.05	2.96	0.00	0.05	0.26	0.05	0.26

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[9] Note: Data retrieved from Bloomberg Terminal

		TWD Reference Currencies 2010					
Regression Statistics		ANOVA					
Multiple R	0.93		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.87	Regression	4	0.01	0.00	426.12	0.00
Adjusted R Square	0.87	Residual	254	0.00	0.00		
Standard Error	0.00	Total	258	0.01			
Observations	259						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.60)	0.11	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.00	0.16	6.28	0.00	0.69	1.31	0.69	1.31
USD/CHF	0.02	0.16	0.14	0.89	(0.29)	0.34	(0.29)	0.34
JPY/CHF	(0.07)	0.03	(2.86)	0.00	(0.12)	(0.02)	(0.12)	(0.02)
EUR/CHF	0.05	0.03	1.68	0.09	(0.01)	0.11	(0.01)	0.11

		TWD Reference Currencies 2011					
Regression Statistics		ANOVA					
Multiple R	0.97		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.94	Regression	4	0.03	0.01	939.45	0.00
Adjusted R Square	0.94	Residual	255	0.00	0.00		
Standard Error	0.00	Total	259	0.03			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.48	0.14	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.75	0.15	4.88	0.00	0.44	1.05	0.44	1.05
USD/CHF	0.22	0.16	1.40	0.16	(0.09)	0.53	(0.09)	0.53
JPY/CHF	(0.03)	0.03	(0.99)	0.32	(0.10)	0.03	(0.10)	0.03
EUR/CHF	0.06	0.03	2.28	0.02	0.01	0.11	0.01	0.11

		TWD Reference Currencies 2012					
Regression Statistics		ANOVA					
Multiple R	0.95		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.91	Regression	4	0.01	0.00	617.31	0.00
Adjusted R Square	0.91	Residual	251	0.00	0.00		
Standard Error	0.00	Total	255	0.01			
Observations	256						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.23)	0.22	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.55	0.09	6.22	0.00	0.38	0.73	0.38	0.73
USD/CHF	0.47	0.09	4.96	0.00	0.28	0.65	0.28	0.65
JPY/CHF	(0.03)	0.02	(1.59)	0.11	(0.08)	0.01	(0.08)	0.01
EUR/CHF	0.01	0.09	0.12	0.91	(0.17)	0.19	(0.17)	0.19

		TWD Reference Currencies 2013					
Regression Statistics		ANOVA					
Multiple R	0.94		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.89	Regression	4	0.01	0.00	492.92	0.00
Adjusted R Square	0.88	Residual	252	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.78	0.08	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.05	0.19	5.39	0.00	0.66	1.43	0.66	1.43
USD/CHF	(0.06)	0.20	(0.32)	0.75	(0.45)	0.32	(0.45)	0.32
JPY/CHF	(0.00)	0.02	(0.08)	0.93	(0.04)	0.04	(0.04)	0.04
EUR/CHF	0.03	0.06	0.53	0.59	(0.08)	0.14	(0.08)	0.14

TWD Reference Currencies 2014							
Regression Statistics		ANOVA					
Multiple R	0.95		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.90	Regression	4	0.00	0.00	590.77	0.00
Adjusted R Square	0.90	Residual	256	0.00	0.00		
Standard Error	0.00	Total	260	0.01			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	2.30	0.02	0.00	0.00	0.00	0.00
CNY/CHF	0.32	0.07	4.49	0.00	0.18	0.46	0.18	0.46
USD/CHF	0.68	0.08	9.05	0.00	0.53	0.83	0.53	0.83
JPY/CHF	0.03	0.02	1.17	0.24	(0.02)	0.07	(0.02)	0.07
EUR/CHF	(0.06)	0.08	(0.79)	0.43	(0.22)	0.09	(0.22)	0.09

TWD Reference Currencies 2015							
Regression Statistics		ANOVA					
Multiple R	0.98		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.95	Regression	4	0.06	0.02	1311.78	0.00
Adjusted R Square	0.95	Residual	250	0.00	0.00		
Standard Error	0.00	Total	254	0.06			
Observations	255						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	0.26	0.79	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.59	0.12	4.74	0.00	0.34	0.83	0.34	0.83
USD/CHF	0.44	0.13	3.36	0.00	0.18	0.69	0.18	0.69
JPY/CHF	(0.01)	0.05	(0.17)	0.87	(0.11)	0.09	(0.11)	0.09
EUR/CHF	(0.02)	0.03	(0.62)	0.54	(0.08)	0.04	(0.08)	0.04

Appendix 10: SGD Reference Currencies 2006-2015[10]

SGD Reference Currencies 2006

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.39	Regression	4	0.02	0.00	11.58	0.00
R Square	0.16	Residual	252	0.10	0.00		
Adjusted R Square	0.14	Total	256	0.11			
Standard Error	0.02						
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.63	0.53	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.64	1.77	0.36	0.72	(2.85)	4.13	(2.85)	4.13
USD/CHF	0.91	1.78	0.51	0.61	(2.60)	4.42	(2.60)	4.42
JPY/CHF	0.08	0.33	0.23	0.82	(0.57)	0.73	(0.57)	0.73
EUR/CHF	(0.23)	0.78	(0.30)	0.76	(1.78)	1.31	(1.78)	1.31

SGD Reference Currencies 2007

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.90	Regression	4	0.00	0.00	283.12	0.00
R Square	0.82	Residual	251	0.00	0.00		
Adjusted R Square	0.82	Total	255	0.00			
Standard Error	0.00						
Observations	256						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(1.00)	0.32	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.06	0.11	0.49	0.62	(0.17)	0.28	(0.17)	0.28
USD/CHF	0.71	0.12	5.95	0.00	0.47	0.94	0.47	0.94
JPY/CHF	(0.06)	0.03	(2.02)	0.04	(0.11)	(0.00)	(0.11)	(0.00)
EUR/CHF	0.40	0.07	5.93	0.00	0.27	0.54	0.27	0.54

SGD Reference Currencies 2008

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.91	Regression	4	0.01	0.00	309.07	0.00
R Square	0.83	Residual	257	0.00	0.00		
Adjusted R Square	0.83	Total	261	0.02			
Standard Error	0.00						
Observations	262						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.15	0.88	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.53	0.15	3.44	0.00	0.23	0.83	0.23	0.83
USD/CHF	0.16	0.15	1.01	0.31	(0.15)	0.46	(0.15)	0.46
JPY/CHF	(0.06)	0.03	(2.34)	0.02	(0.12)	(0.01)	(0.12)	(0.01)
EUR/CHF	0.32	0.05	6.56	0.00	0.22	0.41	0.22	0.41

SGD Reference Currencies 2009

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.91	Regression	4	0.01	0.00	317.40	0.00
R Square	0.83	Residual	255	0.00	0.00		
Adjusted R Square	0.83	Total	259	0.01			
Standard Error	0.00						
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.31)	0.76	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.12	0.48	2.35	0.02	0.18	2.05	0.18	2.05
USD/CHF	(0.45)	0.47	(0.95)	0.34	(1.38)	0.48	(1.38)	0.48
JPY/CHF	(0.04)	0.02	(1.71)	0.09	(0.08)	0.01	(0.08)	0.01
EUR/CHF	0.39	0.05	8.67	0.00	0.30	0.48	0.30	0.48

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[10] Note: Data retrieved from Bloomberg Terminal

		SGD Reference Currencies 2010					
Regression Statistics		ANOVA					
Multiple R	0.89		df	SS	MS	F	Significance F
R Square	0.79	Regression	4	0.01	0.00	244.87	0.00
Adjusted R Square	0.79	Residual	254	0.00	0.00		
Standard Error	0.00	Total	258	0.01			
Observations	259						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(2.27)	0.02	(0.00)	(0.00)	(0.00)	(0.00)
CNY/CHF	0.49	0.17	2.95	0.00	0.16	0.82	0.16	0.82
USD/CHF	0.24	0.17	1.41	0.16	(0.09)	0.57	(0.09)	0.57
JPY/CHF	(0.09)	0.03	(3.29)	0.00	(0.14)	(0.04)	(0.14)	(0.04)
EUR/CHF	0.31	0.03	9.61	0.00	0.24	0.37	0.24	0.37

		SGD Reference Currencies 2011					
Regression Statistics		ANOVA					
Multiple R	0.93		df	SS	MS	F	Significance F
R Square	0.86	Regression	4	0.02	0.01	405.29	0.00
Adjusted R Square	0.86	Residual	255	0.00	0.00		
Standard Error	0.00	Total	259	0.03			
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.18	0.86	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.32	0.21	1.55	0.12	(0.09)	0.73	(0.09)	0.73
USD/CHF	0.18	0.21	0.86	0.39	(0.24)	0.60	(0.24)	0.60
JPY/CHF	(0.02)	0.05	(0.38)	0.70	(0.11)	0.07	(0.11)	0.07
EUR/CHF	0.48	0.03	13.70	0.00	0.41	0.55	0.41	0.55

		SGD Reference Currencies 2012					
Regression Statistics		ANOVA					
Multiple R	0.81		df	SS	MS	F	Significance F
R Square	0.65	Regression	4	0.00	0.00	117.10	0.00
Adjusted R Square	0.65	Residual	251	0.00	0.00		
Standard Error	0.00	Total	255	0.00			
Observations	256						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(1.49)	0.14	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.43	0.13	3.32	0.00	0.17	0.68	0.17	0.68
USD/CHF	0.15	0.14	1.12	0.26	(0.12)	0.42	(0.12)	0.42
JPY/CHF	0.04	0.03	1.21	0.23	(0.02)	0.10	(0.02)	0.10
EUR/CHF	0.35	0.13	2.61	0.01	0.09	0.61	0.09	0.61

		SGD Reference Currencies 2013					
Regression Statistics		ANOVA					
Multiple R	0.86		df	SS	MS	F	Significance F
R Square	0.75	Regression	4	0.00	0.00	184.25	0.00
Adjusted R Square	0.74	Residual	252	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.87	0.38	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.27	0.23	1.16	0.25	(0.19)	0.72	(0.19)	0.72
USD/CHF	0.35	0.23	1.51	0.13	(0.11)	0.81	(0.11)	0.81
JPY/CHF	0.09	0.02	3.99	0.00	0.05	0.14	0.05	0.14
EUR/CHF	0.23	0.07	3.38	0.00	0.10	0.36	0.10	0.36

SGD Reference Currencies 2014								
Regression Statistics		ANOVA						
Multiple R	0.86		*df*	*SS*	*MS*	*F*	*Significance F*	
R Square	0.74	Regression	4	0.00	0.00	179.84	0.00	
Adjusted R Square	0.73	Residual	256	0.00	0.00			
Standard Error	0.00	Total	260	0.00				
Observations	261							

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.56)	0.58	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.19	0.10	1.97	0.05	0.00	0.38	0.00	0.38
USD/CHF	0.38	0.10	3.80	0.00	0.18	0.58	0.18	0.58
JPY/CHF	0.21	0.03	7.23	0.00	0.15	0.26	0.15	0.26
EUR/CHF	0.49	0.11	4.58	0.00	0.28	0.70	0.28	0.70

SGD Reference Currencies 2015								
Regression Statistics		ANOVA						
Multiple R	0.97		*df*	*SS*	*MS*	*F*	*Significance F*	
R Square	0.95	Regression	4	0.05	0.01	1130.22	0.00	
Adjusted R Square	0.95	Residual	250	0.00	0.00			
Standard Error	0.00	Total	254	0.05				
Observations	255							

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	0.38	0.71	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.49	0.12	4.01	0.00	0.25	0.74	0.25	0.74
USD/CHF	0.16	0.13	1.22	0.22	(0.10)	0.41	(0.10)	0.41
JPY/CHF	0.05	0.05	0.91	0.36	(0.05)	0.15	(0.05)	0.15
EUR/CHF	0.26	0.03	7.89	0.00	0.19	0.32	0.19	0.32

Appendix 11: PHP Reference Currencies 2006-2015[11]

PHP Reference Currencies 2006							
Regression Statistics		ANOVA					
Multiple R	0.87		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.75	Regression	4	0.01	0.00	187.63	0.00
Adjusted R Square	0.74	Residual	252	0.00	0.00		
Standard Error	0.00	Total	256	0.01			
Observations	257						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.94)	0.35	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.90	0.26	3.40	0.00	0.38	1.41	0.38	1.41
USD/CHF	0.02	0.26	0.08	0.94	(0.50)	0.54	(0.50)	0.54
JPY/CHF	0.04	0.05	0.86	0.39	(0.05)	0.14	(0.05)	0.14
EUR/CHF	(0.11)	0.12	(0.92)	0.36	(0.34)	0.12	(0.34)	0.12

PHP Reference Currencies 2007							
Regression Statistics		ANOVA					
Multiple R	0.70		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.49	Regression	4	0.01	0.00	60.23	0.00
Adjusted R Square	0.48	Residual	251	0.01	0.00		
Standard Error	0.01	Total	255	0.01			
Observations	256						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.50)	0.13	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.22	0.32	0.71	0.48	(0.40)	0.85	(0.40)	0.85
USD/CHF	0.70	0.33	2.13	0.03	0.05	1.35	0.05	1.35
JPY/CHF	(0.14)	0.08	(1.75)	0.08	(0.29)	0.02	(0.29)	0.02
EUR/CHF	0.63	0.19	3.33	0.00	0.26	1.00	0.26	1.00

PHP Reference Currencies 2008							
Regression Statistics		ANOVA					
Multiple R	0.85		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.73	Regression	4	0.02	0.00	173.02	0.00
Adjusted R Square	0.72	Residual	257	0.01	0.00		
Standard Error	0.01	Total	261	0.03			
Observations	262						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.50	0.13	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.00	0.24	0.02	0.98	(0.47)	0.48	(0.47)	0.48
USD/CHF	0.84	0.24	3.50	0.00	0.37	1.31	0.37	1.31
JPY/CHF	(0.03)	0.04	(0.65)	0.52	(0.11)	0.06	(0.11)	0.06
EUR/CHF	0.21	0.08	2.80	0.01	0.06	0.36	0.06	0.36

PHP Reference Currencies 2009							
Regression Statistics		ANOVA					
Multiple R	0.85		*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.72	Regression	4	0.01	0.00	162.34	0.00
Adjusted R Square	0.71	Residual	255	0.01	0.00		
Standard Error	0.00	Total	259	0.02			
Observations	260						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.30)	0.77	(0.00)	0.00	(0.00)	0.00
CNY/CHF	2.12	0.83	2.57	0.01	0.50	3.75	0.50	3.75
USD/CHF	(1.15)	0.82	(1.40)	0.16	(2.77)	0.47	(2.77)	0.47
JPY/CHF	(0.13)	0.04	(3.51)	0.00	(0.21)	(0.06)	(0.21)	(0.06)
EUR/CHF	0.08	0.08	1.07	0.29	(0.07)	0.24	(0.07)	0.24

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[11] Note: Data retrieved from Bloomberg Terminal

PHP Reference Currencies 2010							
Regression Statistics		ANOVA					
Multiple R	0.80		df	SS	MS	F	Significance F
R Square	0.65	Regression	4	0.01	0.00	116.61	0.00
Adjusted R Square	0.64	Residual	254	0.00	0.00		
Standard Error	0.00	Total	258	0.01			
Observations	259						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.85)	0.39	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.77	0.27	2.81	0.01	0.23	1.31	0.23	1.31
USD/CHF	0.18	0.28	0.65	0.52	(0.36)	0.72	(0.36)	0.72
JPY/CHF	(0.20)	0.04	(4.66)	0.00	(0.29)	(0.12)	(0.29)	(0.12)
EUR/CHF	0.20	0.05	3.77	0.00	0.09	0.30	0.09	0.30

PHP Reference Currencies 2011							
Regression Statistics		ANOVA					
Multiple R	0.93		df	SS	MS	F	Significance F
R Square	0.87	Regression	4	0.03	0.01	434.56	0.00
Adjusted R Square	0.87	Residual	255	0.00	0.00		
Standard Error	0.00	Total	259	0.03			
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.38	0.71	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.58	0.21	2.72	0.01	0.16	1.01	0.16	1.01
USD/CHF	0.22	0.22	1.00	0.32	(0.21)	0.65	(0.21)	0.65
JPY/CHF	(0.08)	0.05	(1.62)	0.11	(0.17)	0.02	(0.17)	0.02
EUR/CHF	0.26	0.04	7.16	0.00	0.19	0.33	0.19	0.33

PHP Reference Currencies 2012							
Regression Statistics		ANOVA					
Multiple R	0.31		df	SS	MS	F	Significance F
R Square	0.09	Regression	4	0.00	0.00	6.53	0.00
Adjusted R Square	0.08	Residual	251	0.00	0.00		
Standard Error	0.00	Total	255	0.00			
Observations	256						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(1.13)	0.26	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.55)	0.23	(2.39)	0.02	(1.01)	(0.10)	(1.01)	(0.10)
USD/CHF	0.49	0.24	2.02	0.04	0.01	0.97	0.01	0.97
JPY/CHF	0.16	0.06	2.93	0.00	0.05	0.28	0.05	0.28
EUR/CHF	0.60	0.24	2.49	0.01	0.13	1.07	0.13	1.07

PHP Reference Currencies 2013							
Regression Statistics		ANOVA					
Multiple R	0.30		df	SS	MS	F	Significance F
R Square	0.09	Regression	4	0.00	0.00	6.45	0.00
Adjusted R Square	0.08	Residual	252	0.01	0.00		
Standard Error	0.01	Total	256	0.01			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.65	0.52	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(1.31)	0.53	(2.48)	0.01	(2.36)	(0.27)	(2.36)	(0.27)
USD/CHF	1.56	0.54	2.90	0.00	0.50	2.62	0.50	2.62
JPY/CHF	0.05	0.05	0.84	0.40	(0.06)	0.15	(0.06)	0.15
EUR/CHF	0.07	0.16	0.45	0.65	(0.24)	0.38	(0.24)	0.38

PHP Reference Currencies 2014							
Regression Statistics		ANOVA					
Multiple R	0.20		df	SS	MS	F	*Significance F*
R Square	0.04	Regression	4	0.00	0.00	2.81	0.03
Adjusted R Square	0.03	Residual	256	0.00	0.00		
Standard Error	0.00	Total	260	0.00			
Observations	261						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.19)	0.23	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.31)	0.22	(1.40)	0.16	(0.74)	0.12	(0.74)	0.12
USD/CHF	0.42	0.23	1.82	0.07	(0.04)	0.87	(0.04)	0.87
JPY/CHF	0.02	0.07	0.31	0.76	(0.11)	0.15	(0.11)	0.15
EUR/CHF	0.40	0.25	1.64	0.10	(0.08)	0.89	(0.08)	0.89

PHP Reference Currencies 2015							
Regression Statistics		ANOVA					
Multiple R	0.16		df	SS	MS	F	*Significance F*
R Square	0.03	Regression	4	0.00	0.00	1.61	0.17
Adjusted R Square	0.01	Residual	250	0.04	0.00		
Standard Error	0.01	Total	254	0.04			
Observations	255						

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	0.33	0.74	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.57	0.47	1.21	0.23	(0.36)	1.50	(0.36)	1.50
USD/CHF	(0.61)	0.50	(1.23)	0.22	(1.58)	0.37	(1.58)	0.37
JPY/CHF	0.28	0.19	1.45	0.15	(0.10)	0.66	(0.10)	0.66
EUR/CHF	(0.25)	0.12	(2.03)	0.04	(0.49)	(0.01)	(0.49)	(0.01)

Appendix 12: KRW Reference Currencies 2006-2015[12]

KRW Reference Currencies 2006								
Regression Statistics			ANOVA					
Multiple R	0.21			df	SS	MS	F	*Significance F*
R Square	0.05		Regression	4	0.00	0.00	3.04	0.02
Adjusted R Square	0.03		Residual	252	0.01	0.00		
Standard Error	0.01		Total	256	0.01			
Observations	257							

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(1.17)	0.24	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.91	0.66	1.39	0.17	(0.38)	2.21	(0.38)	2.21
USD/CHF	(0.94)	0.66	(1.42)	0.16	(2.24)	0.36	(2.24)	0.36
JPY/CHF	0.35	0.12	2.85	0.00	0.11	0.59	0.11	0.59
EUR/CHF	(0.07)	0.29	(0.25)	0.80	(0.65)	0.50	(0.65)	0.50

KRW Reference Currencies 2007								
Regression Statistics			ANOVA					
Multiple R	0.21			df	SS	MS	F	*Significance F*
R Square	0.05		Regression	4	0.00	0.00	2.98	0.02
Adjusted R Square	0.03		Residual	251	0.01	0.00		
Standard Error	0.01		Total	255	0.01			
Observations	256							

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	0.79	0.43	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.10)	0.34	(0.31)	0.76	(0.76)	0.56	(0.76)	0.56
USD/CHF	(0.04)	0.35	(0.12)	0.91	(0.73)	0.65	(0.73)	0.65
JPY/CHF	(0.08)	0.08	(0.93)	0.36	(0.24)	0.09	(0.24)	0.09
EUR/CHF	0.38	0.20	1.92	0.06	(0.01)	0.78	(0.01)	0.78

KRW Reference Currencies 2008								
Regression Statistics			ANOVA					
Multiple R	0.40			df	SS	MS	F	*Significance F*
R Square	0.16		Regression	4	0.01	0.00	12.47	0.00
Adjusted R Square	0.15		Residual	257	0.07	0.00		
Standard Error	0.02		Total	261	0.09			
Observations	262							

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00	0.00	1.25	0.21	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.47)	0.78	(0.60)	0.55	(2.00)	1.06	(2.00)	1.06
USD/CHF	0.65	0.78	0.83	0.41	(0.88)	2.18	(0.88)	2.18
JPY/CHF	(0.70)	0.14	(5.04)	0.00	(0.97)	(0.43)	(0.97)	(0.43)
EUR/CHF	0.31	0.25	1.24	0.22	(0.18)	0.79	(0.18)	0.79

KRW Reference Currencies 2009								
Regression Statistics			ANOVA					
Multiple R	0.37			df	SS	MS	F	*Significance F*
R Square	0.14		Regression	4	0.01	0.00	10.05	0.00
Adjusted R Square	0.12		Residual	255	0.05	0.00		
Standard Error	0.01		Total	259	0.06			
Observations	260							

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(0.00)	0.00	(0.65)	0.52	(0.00)	0.00	(0.00)	0.00
CNY/CHF	3.58	2.57	1.39	0.17	(1.48)	8.65	(1.48)	8.65
USD/CHF	(3.80)	2.56	(1.48)	0.14	(8.84)	1.25	(8.84)	1.25
JPY/CHF	(0.38)	0.12	(3.26)	0.00	(0.61)	(0.15)	(0.61)	(0.15)
EUR/CHF	0.81	0.24	3.33	0.00	0.33	1.29	0.33	1.29

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[12] Note: Data retrieved from Bloomberg Terminal

KRW Reference Currencies 2010

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.48						
R Square	0.23	Regression	4	0.01	0.00	18.59	0.00
Adjusted R Square	0.21	Residual	254	0.02	0.00		
Standard Error	0.01	Total	258	0.03			
Observations	259						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.11	0.91	(0.00)	0.00	(0.00)	0.00
CNY/CHF	1.05	0.59	1.78	0.08	(0.11)	2.21	(0.11)	2.21
USD/CHF	(1.43)	0.60	(2.40)	0.02	(2.61)	(0.26)	(2.61)	(0.26)
JPY/CHF	(0.30)	0.09	(3.13)	0.00	(0.48)	(0.11)	(0.48)	(0.11)
EUR/CHF	0.57	0.11	5.05	0.00	0.34	0.79	0.34	0.79

KRW Reference Currencies 2011

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.42						
R Square	0.17	Regression	4	0.00	0.00	13.48	0.00
Adjusted R Square	0.16	Residual	255	0.02	0.00		
Standard Error	0.01	Total	259	0.02			
Observations	260						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.57	0.12	(0.00)	0.00	(0.00)	0.00
CNY/CHF	0.59	0.50	1.17	0.24	(0.40)	1.58	(0.40)	1.58
USD/CHF	(0.81)	0.51	(1.58)	0.12	(1.82)	0.20	(1.82)	0.20
JPY/CHF	(0.35)	0.11	(3.16)	0.00	(0.57)	(0.13)	(0.57)	(0.13)
EUR/CHF	0.50	0.08	5.92	0.00	0.33	0.66	0.33	0.66

KRW Reference Currencies 2012

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.09						
R Square	0.01	Regression	4	0.00	0.00	0.56	0.69
Adjusted R Square	(0.01)	Residual	251	0.03	0.00		
Standard Error	0.01	Total	255	0.03			
Observations	256						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.52)	0.61	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.78)	0.60	(1.29)	0.20	(1.97)	0.41	(1.97)	0.41
USD/CHF	0.92	0.64	1.44	0.15	(0.34)	2.18	(0.34)	2.18
JPY/CHF	(0.11)	0.15	(0.72)	0.47	(0.40)	0.18	(0.40)	0.18
EUR/CHF	(0.24)	0.63	(0.39)	0.70	(1.48)	0.99	(1.48)	0.99

KRW Reference Currencies 2013

Regression Statistics		ANOVA					
			df	SS	MS	F	Significance F
Multiple R	0.08						
R Square	0.01	Regression	4	0.00	0.00	0.39	0.82
Adjusted R Square	(0.01)	Residual	252	0.01	0.00		
Standard Error	0.01	Total	256	0.01			
Observations	257						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	(0.00)	0.00	(0.40)	0.69	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.32)	0.64	(0.51)	0.61	(1.57)	0.93	(1.57)	0.93
USD/CHF	0.22	0.65	0.34	0.73	(1.05)	1.49	(1.05)	1.49
JPY/CHF	0.06	0.07	0.89	0.37	(0.07)	0.19	(0.07)	0.19
EUR/CHF	0.11	0.19	0.56	0.58	(0.27)	0.48	(0.27)	0.48

KRW Reference Currencies 2014							
Regression Statistics			ANOVA				

Regression Statistics			df	SS	MS	F	Significance F
Multiple R	0.18						
R Square	0.03		Regression	4	0.00	0.00	2.15	0.08
Adjusted R Square	0.02		Residual	256	0.01	0.00		
Standard Error	0.01		Total	260	0.01			
Observations	261						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	1.01	0.31	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.95)	0.33	(2.85)	0.00	(1.60)	(0.29)	(1.60)	(0.29)
USD/CHF	0.91	0.35	2.61	0.01	0.22	1.60	0.22	1.60
JPY/CHF	0.03	0.10	0.28	0.78	(0.17)	0.22	(0.17)	0.22
EUR/CHF	0.28	0.37	0.74	0.46	(0.46)	1.01	(0.46)	1.01

KRW Reference Currencies 2015							
Regression Statistics			ANOVA				

Regression Statistics			df	SS	MS	F	Significance F
Multiple R	0.06						
R Square	0.00		Regression	4	0.00	0.00	0.25	0.91
Adjusted R Square	(0.01)		Residual	250	0.06	0.00		
Standard Error	0.02		Total	254	0.06			
Observations	255						

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.00	0.00	0.13	0.90	(0.00)	0.00	(0.00)	0.00
CNY/CHF	(0.35)	0.57	(0.61)	0.54	(1.48)	0.78	(1.48)	0.78
USD/CHF	0.28	0.60	0.47	0.64	(0.90)	1.47	(0.90)	1.47
JPY/CHF	0.11	0.23	0.45	0.65	(0.36)	0.57	(0.36)	0.57
EUR/CHF	(0.08)	0.15	(0.50)	0.62	(0.37)	0.22	(0.37)	0.22

Appendix 13: JPY Comovement Coefficients

Thailand	JPY	USD
1988	0.05	1.03
1989	0.03	0.98
1990	0.01	1.01
1991	0.01	1.00
1992	0.06	0.95
1993	0.02	0.96
1994	0.01	0.92
1995	0.04	0.91
1996	0.05	0.89
1997	0.12	0.71
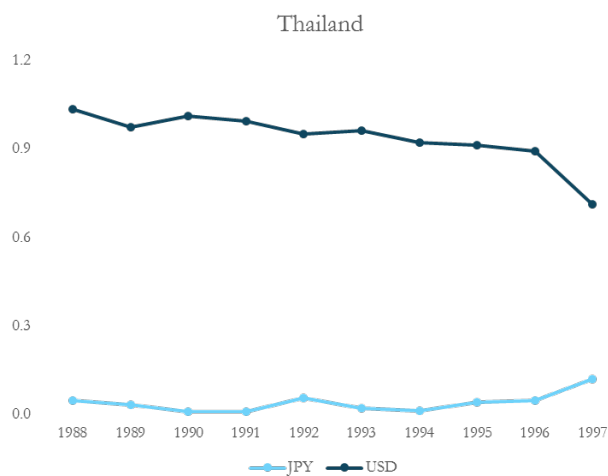
Taiwan	JPY	USD
1988	0.02	0.98
1989	0.09	0.94
1990	0.02	0.98
1991	0.02	0.96
1992	0.03	1.01
1993	0.01	0.98
1994	0.01	0.99
1995	0.06	0.99
1996	0.01	0.98
1997	0.06	1.01

Thailand

Taiwan
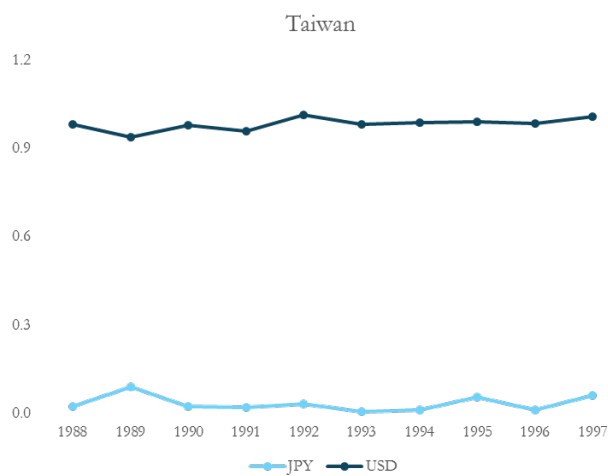
Singapore		
	JPY	USD
1988	0.01	0.99
1989	0.00	1.01
1990	0.00	1.00
1991	0.03	0.99
1992	0.02	0.90
1993	0.07	0.82
1994	0.13	0.84
1995	0.13	0.79
1996	0.08	0.83
1997	0.11	0.80
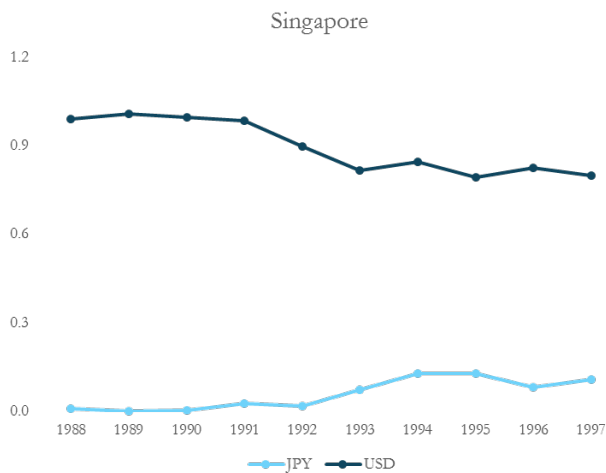
Korea		
	JPY	USD
1988	0.01	0.21
1989	0.01	0.07
1990	0.05	0.00
1991	0.14	0.15
1992	0.07	0.07
1993	0.00	0.01
1994	0.03	0.23
1995	0.00	0.05
1996	0.25	0.06
1997	0.00	0.19

Singapore

Korea

Appendix 14: CNY Comovement Coefficients

Thailand		
	CNY	**USD**
2006	0.35	0.31
2007	1.28	0.02
2008	0.31	0.56
2009	1.65	0.74
2010	0.28	0.61
2011	0.65	0.17
2012	0.44	0.21
2013	0.42	0.40
2014	0.12	0.66
2015	0.29	0.51

Thailand

Malaysia		
	CNY	**USD**
2006	1.03	0.14
2007	0.18	0.70
2008	0.69	0.26
2009	3.66	2.75
2010	1.19	0.10
2011	1.46	0.48
2012	0.33	0.32
2013	1.64	1.86
2014	0.03	0.05
2015	1.16	1.15

Malaysia
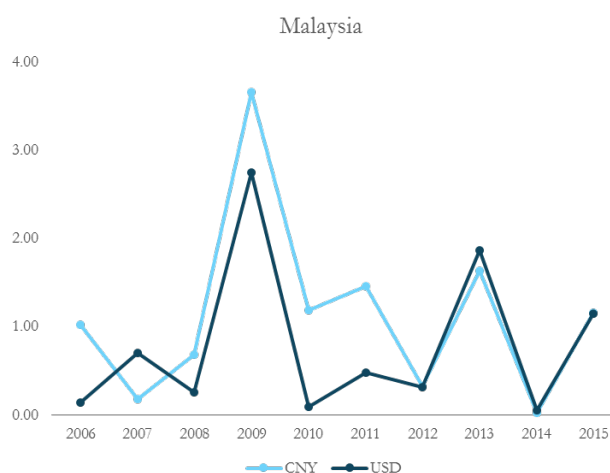
Indonesia		
	CNY	**USD**
2006	1.08	0.27
2007	0.14	0.80
2008	0.84	0.12
2009	5.74	4.68
2010	0.31	0.70
2011	0.58	0.28
2012	1.13	1.16
2013	1.78	2.16
2014	0.02	0.10
2015	0.79	0.75

Indonesia

Taiwan		
	CNY	**USD**
2006	1.17	0.26
2007	0.23	0.75
2008	0.60	0.33
2009	2.85	1.89
2010	1.00	0.02
2011	0.75	0.22
2012	0.55	0.47
2013	1.05	0.06
2014	0.32	0.68
2015	0.59	0.44
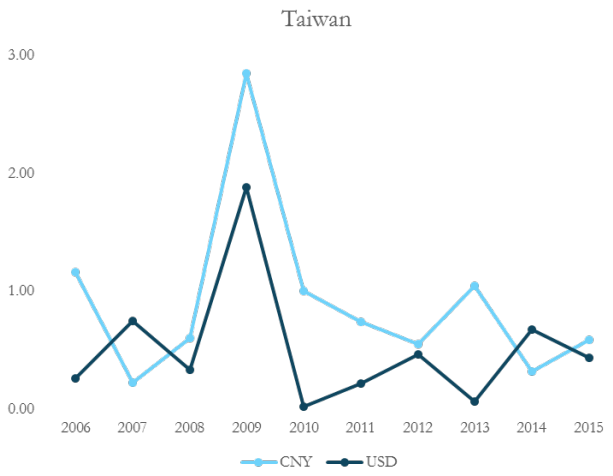
Singapore		
	CNY	**USD**
2006	0.64	0.91
2007	0.06	0.71
2008	0.53	0.16
2009	1.12	0.45
2010	0.49	0.24
2011	0.32	0.18
2012	0.43	0.15
2013	0.27	0.35
2014	0.19	0.38
2015	0.49	0.16

Taiwan

Singapore
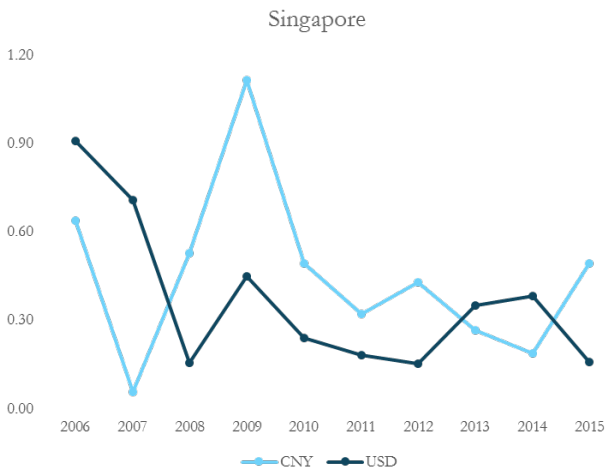
Philippines		
	CNY	USD
2006	0.90	0.02
2007	0.22	0.70
2008	0.00	0.84
2009	2.12	1.15
2010	0.77	0.18
2011	0.58	0.22
2012	0.55	0.49
2013	1.31	1.56
2014	0.31	0.42
2015	0.57	0.61
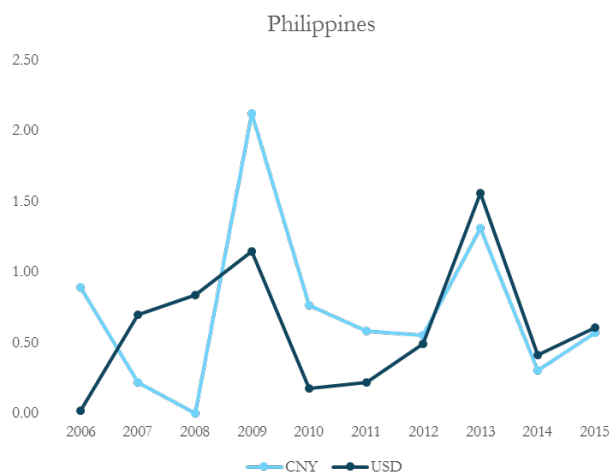
Korea		
	CNY	USD
2006	0.91	0.94
2007	0.10	0.04
2008	0.47	0.65
2009	3.58	3.80
2010	1.05	1.43
2011	0.59	0.81
2012	0.78	0.92
2013	0.32	0.22
2014	0.95	0.91
2015	0.35	0.28

Philippines
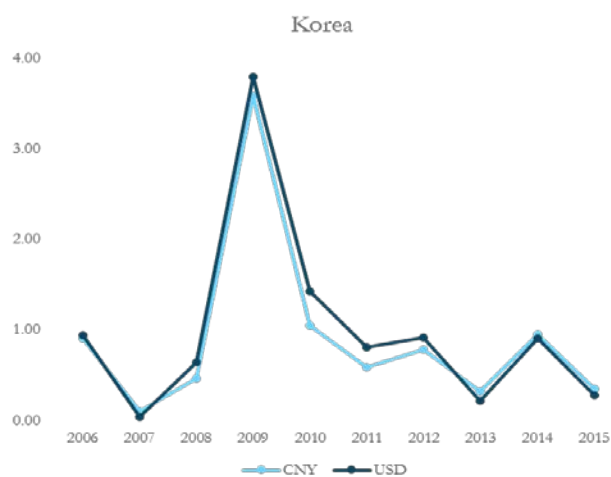
Korea

Appendix 15: Bilateral Trade[13]

Japan Bilateral Trade Flows				
	Singapore	**Other Asia, nes**	**Thailand**	**Rep. of Korea**
1988	$0	$0	$5,886,597,673	$27,925,172,224
1989	14,422,797,568	0	11,234,904,700	30,905,323,281
1990	16,858,260,480	0	14,117,590,767	31,211,699,396
1991	19,218,830,848	0	16,174,991,848	33,475,888,128
1992	20,025,781,760	0	17,593,766,294	31,056,980,992
1993	24,176,587,776	0	20,266,475,389	31,579,600,896
1994	29,394,312,192	0	24,163,244,149	38,911,278,080
1995	35,554,781,184	0	31,105,500,729	49,652,912,128
1996	34,094,017,713	0	29,817,161,610	47,214,543,872
1997	32,121,201,379	40,807,277,792	24,714,544,497	42,677,192,704

All Bilateral Trade Flows				
	Singapore	**Other Asia, nes**	**Thailand**	**Rep. of Korea**
1988	$0	$0	$20,283,012,525	$112,375,382,016
1989	94,375,759,872	0	45,864,426,595	123,812,460,570
1990	113,506,103,296	0	56,504,807,676	134,855,225,309
1991	125,047,009,280	0	66,100,732,162	153,389,670,400
1992	135,636,750,336	0	73,166,782,126	158,389,780,480
1993	159,235,956,736	0	83,475,329,102	166,026,076,160
1994	199,493,836,800	0	99,755,639,065	198,350,200,832
1995	242,766,553,088	0	127,314,916,360	260,169,351,168
1996	256,347,747,557	0	127,994,280,114	280,046,837,760
1997	257,429,743,003	238,540,602,368	120,940,967,154	280,765,235,200

% of Bilateral Trade w/ Japan				
	Singapore	**Other Asia, nes**	**Thailand**	**Rep. of Korea**
1988	*NA*	*NA*	*29.0%*	*24.8%*
1989	*15.3%*	*NA*	*24.5%*	*25.0%*
1990	*14.9%*	*NA*	*25.0%*	*23.1%*
1991	*15.4%*	*NA*	*24.5%*	*21.8%*
1992	*14.8%*	*NA*	*24.0%*	*19.6%*
1993	*15.2%*	*NA*	*24.3%*	*19.0%*
1994	*14.7%*	*NA*	*24.2%*	*19.6%*
1995	*14.6%*	*NA*	*24.4%*	*19.1%*
1996	*13.3%*	*NA*	*23.3%*	*16.9%*
1997	*12.5%*	*17.1%*	*20.4%*	*15.2%*

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[13] Note: Data retrieved from United Nations Comtrade database: Bilateral trade defined as *"All" trade flows and "Total-Total of all HS commodities"*

China Bilateral Trade Flows						
	Phillippines	**Singapore**	**Taiwan**	**Indonesia**	**Malaysia**	**Thailand**	**Korea**
2006	$8,497,053,619	$53,702,438,865	$76,590,462,820	$14,980,466,448	$27,521,842,397	$25,391,356,660	$118,015,773,169
2007	9,982,758,753	60,832,757,094	94,579,332,199	18,233,388,457	34,285,548,589	31,852,407,520	145,010,283,861
2008	10,030,273,090	64,835,668,869	94,579,332,199	26,885,704,716	39,059,213,676	36,043,639,377	168,315,865,213
2009	6,994,317,571	52,229,891,544	81,995,761,651	25,501,497,159	36,349,803,502	33,153,231,866	140,948,923,025
2010	10,678,761,771	70,016,125,856	117,181,354,800	36,116,828,117	45,737,035,098	45,712,608,720	188,410,928,944
2011	12,606,834,771	80,677,224,552	133,019,204,210	49,153,191,182	54,531,655,372	57,983,604,226	220,615,982,829
2012	13,295,515,739	83,080,391,753	126,452,120,462	51,046,569,494	58,465,942,434	63,856,194,345	215,104,598,720
2013	15,622,073,072	92,059,041,814	128,555,520,516	52,450,947,488	64,504,023,739	64,968,679,492	228,920,947,880
2014	18,317,373,994	95,920,033,989	134,824,397,085	48,230,324,546	63,544,991,461	63,592,243,097	235,398,856,872

All Bilateral Trade Flows						
	Phillippines	**Singapore**	**Taiwan**	**Indonesia**	**Malaysia**	**Thailand**	**Korea**
2006	$101,488,107,092	$510,520,410,228	$426,697,671,386	$162,272,641,704	$291,796,278,354	$260,617,779,096	$634,836,726,202
2007	109,965,318,288	562,452,352,631	478,672,299,663	188,574,301,534	323,300,700,300	299,260,880,012	728,318,761,570
2008	84,313,539,296	657,956,233,730	508,548,241,984	266,288,379,017	354,363,294,141	356,689,149,261	857,274,019,357
2009	109,497,207,266	515,617,129,362	388,304,664,791	213,359,537,296	280,770,110,822	288,331,958,055	686,612,738,133
2010	108,461,372,030	662,658,300,653	538,708,537,408	293,568,035,978	363,497,384,235	379,989,112,092	891,588,626,738
2011	111,734,812,970	775,274,121,265	605,537,405,483	381,123,475,362	414,593,648,809	459,617,605,762	1,079,614,121,740
2012	117,345,004,516	788,115,908,257	589,323,351,252	381,883,891,292	423,703,136,459	479,435,132,525	1,067,430,045,288
2013	122,403,234,212	783,265,410,922	591,188,590,690	369,360,008,144	434,302,030,717	481,570,421,729	1,075,191,529,347
2014	129,528,623,749	776,015,991,803	605,870,772,868	354,392,707,088	443,074,122,393	458,028,203,742	1,098,631,751,088

% of Bilateral Trade w/ China						
	Phillippines	**Singapore**	**Taiwan**	**Indonesia**	**Malaysia**	**Thailand**	**Korea**
2006	8.4%	10.5%	17.9%	9.2%	9.4%	9.7%	18.6%
2007	9.1%	10.8%	19.8%	9.7%	10.6%	10.6%	19.9%
2008	11.9%	9.9%	18.6%	10.1%	11.0%	10.1%	19.6%
2009	6.4%	10.1%	21.1%	12.0%	12.9%	11.5%	20.5%
2010	9.8%	10.6%	21.8%	12.3%	12.6%	12.0%	21.1%
2011	11.3%	10.4%	22.0%	12.9%	13.2%	12.6%	20.4%
2012	11.3%	10.5%	21.5%	13.4%	13.8%	13.3%	20.2%
2013	12.8%	11.8%	21.7%	14.2%	14.9%	13.5%	21.3%
2014	14.1%	12.4%	22.3%	13.6%	14.3%	13.9%	21.4%

Appendix 16: Export Similarity[14]

	Japan	Philippines	Singapore	Taiwan	Indonesia	Malaysia	Thailand	Korea
	Export Similarity w/ Japan 1988-1997							
1988	100%	38.3%	74.9%	NA	24.7%	49.8%	NA	66.0%
1989	100%	40.5%	76.0%	64.7%	27.0%	54.8%	52.7%	65.0%
1990	100%	40.3%	75.5%	66.7%	26.4%	57.8%	56.7%	66.5%
1991	100%	57.8%	76.5%	67.0%	27.7%	63.1%	59.0%	69.2%
1992	100%	41.4%	80.5%	68.2%	28.4%	66.6%	61.2%	70.4%
1993	100%	42.8%	83.0%	71.2%	29.8%	72.4%	63.3%	72.3%
1994	100%	44.8%	88.1%	72.7%	31.4%	77.1%	66.3%	76.6%
1995	100%	44.8%	90.8%	77.0%	33.5%	79.7%	68.0%	82.9%
1996	100%	80.3%	88.7%	78.7%	35.6%	80.4%	73.4%	83.4%
1997	100%	86.2%	89.6%	79.7%	36.6%	81.6%	75.3%	81.5%

	China	Philippines	Singapore	Taiwan	Indonesia	Malaysia	Thailand	Korea
	Export Similarity w/ China 2006-2014							
2006	100%	71.9%	66.8%	88.1%	52.5%	73.2%	82.7%	78.9%
2007	100%	70.5%	67.5%	88.0%	50.5%	74.3%	83.7%	79.4%
2008	100%	71.4%	68.2%	87.1%	47.9%	60.1%	83.6%	80.6%
2009	100%	72.7%	69.8%	86.6%	49.0%	74.7%	82.6%	82.3%
2010	100%	63.6%	69.9%	87.7%	45.5%	72.4%	81.9%	82.5%
2011	100%	67.7%	66.2%	87.1%	41.7%	68.2%	78.4%	80.4%
2012	100%	77.0%	65.5%	85.9%	42.6%	66.6%	78.5%	79.5%
2013	100%	76.7%	67.7%	83.9%	43.6%	66.5%	79.9%	77.9%
2014	100%	73.3%	68.1%	82.7%	47.1%	67.5%	80.0%	77.0%

[14] Note: Data retrieved from United Nations Comtrade Database: Goods defined at SITC 1-digit level

Appendix 17: Multiple Regression[15]

Comovement Coefficients 1988-1997,2006-2014								
Regression Statistics			ANOVA					
Multiple R	0.46			*df*	*SS*	*MS*	*F*	*Significance F*
R Square	0.21		Regression	6	8.90	1.48	3.72	0.00
Adjusted R Square	0.16		Residual	82	32.70	0.40		
Standard Error	0.63		Total	88	41.60			
Observations	89							

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	(1.02)	1.87	(0.55)	0.586	(4.74)	2.70	(4.74)	2.70
% Bilateral Trade w/ China or Japan	**37.11**	**20.94**	**1.77**	**0.080**	**(4.54)**	**78.77**	**(4.54)**	**78.77**
Volume of Bilateral Trade	(5.66E-12)	1.88E-12	(3.01E+00)	3.48E-03	(9.40E-12)	(1.92E-12)	(9.40E-12)	(1.92E-12)
GDP of China or Japan	(1.29E-14)	1.17E-14	(1.10E+00)	2.74E-01	(3.62E-14)	1.04E-14	(3.62E-14)	1.04E-14
Dollar Index	(0.01)	0.02	(0.34)	0.732	(0.05)	0.03	(0.05)	0.03
Export Similarity	**2.21**	**0.65**	**3.41**	**0.001**	**0.92**	**3.50**	**0.92**	**3.50**
(China=1 Japan=0)	0.72	0.29	2.47	0.015	0.14	1.30	0.14	1.30

Equation	Comovement Coefficient =-1.02+37.11*% Bilateral Trade w/ China or Japan-5.66E-12*Volume of Bilateral Trade-1.29E-14*GDP of China or Japan-0.01*Dollar Index+2.21*Export Similarity+0.72*(China=1 Japan=0)

[15] Note: Excludes 2009 data points of Malaysia, Indonesia, and Korea due to abnormally high currency volatility

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