

The Economic Factors That Affect a Change of Thai Baht Exchange Rate

Pitchayapa Siriratana

International Trade, Master's Degree Economics School Shanghai University, Shanghai, China

Abstract This article gives research study about the different factors that affect to the change of selected currencies between the exchange rates of Thai Baht (THB) against the US dollar (USD), Japanese Yen (JPY) and Chinese Yuan (CNY) by using Thai Baht (THB) as the base currency to analyse through multiple regressive analysis and monthly exchange rates data of the independent factors which are Balance of Payment (BOP), Costumer Price Index (CPI), Interest rates (IN), Business Sentiment Index by Components (BSI) and Foreign Direct Investment (FDI) which this would be benefited to relevant field in order to reducing exchange rate risks.

Keywords Factors that affect a change of currency, Exchange rate, Thailand currency, Currency exchange, Exchange rate theories

1. Introduction

In the globalization, every country has currency different from others; general use in particular country, but when trading between countries happened an "Exchange currency". This foreign exchange market plays an important role in country's trade performance. Moreover, the volatility of the exchange rate often influences the overall economic performance through the balance of payment and the policy about import or export conditions. The status of the exchange rate situation impacts to the microeconomic in term of the policy and also common news that every household should be following because it can be effect or cause of groceries, gas, fuel prices rising to the personal loan and etc. Thus, the exchange rate is one of the most critical determinants of a country's relative level of economic health. For general, currency exchange will be an activity when we buy, sell or exchange something from aboard. However, exchange rates also play a vital role in a country's level of trade, which is critical to most every free market economy in the world. For this reason, exchange rates are among the most watched, analysed, and governmentally manipulated economic measures. Thus these reasons lead to this study which mainly focus on factors that effect on Thai Baht (THB) currency and US dollar (USD), Japanese Yen

(JPY) and Chinese Yuan (CNY) or Renminbi (RMB) which are the top-three trading partners with Thailand.

For this study, Thailand is the base or a home currency which will show the symbol as the "direct quote." As an illustration, a direct quote uses a variable amount of Thai Baht (THB) that required to buy or sell one unit of US dollar (USD), 100 units of Japanese yen (JPY) and one unit of Chinese yuan (CNY). A lower exchange rate means a domestic currency (THB) becomes stronger since the price of foreign currencies (USD, JPY, or CNY) is falling. Besides, the lower of the exchange rate as Thai Baht (THB) is a home currency means Thai Baht (THB) is appreciation against foreign currency.

The US dollar (USD, \$), a global currency is the one that accepted for worldwide trade. As in there is some of the world's currencies are accepted for most international transactions. US dollar refers monetary unit of the United States of America (USA), the biggest economies of the world with the total value of 20.4 trillion US dollar, the latest value in April 2018. (MIF, 2018) Moreover, USD is the official currency or global currency when we do the exchange to others currency. There is some more of the most popular in this world; the U.S. dollar, the Euro, and the Yen. Among these the U.S. dollar is the most popular since it makes up 64 percent of all known central bank foreign exchange reserves and because of that reason makes it becomes the global currency, even though it does not hold an official global title.

The Yen (Japanese: 円 symbol: ¥; code: JPY) is the official currency of Japan. It is the third most traded currency in the foreign exchange market after the United States dollar

* Corresponding author:

pitchaps@outlook.com (Pitchayapa Siriratana)

Published online at <http://journal.sapub.org/economics>

Copyright © 2020 The Author(s). Published by Scientific & Academic Publishing

This work is licensed under the Creative Commons Attribution International

License (CC BY). <http://creativecommons.org/licenses/by/4.0/>

and the euro. Also, widely used as a reserve currency after the U.S. dollar, the euro, and the pound sterling. [15] Although, the Japanese yen has risen again (2018, Aug) that is partial because of a slightly shifted in central-bank policy in Tokyo and dollar and quite fluctuated because of no growing sign in the Japan economic in recently which investors picture it as a haven, it has been boosted by uncertainty over trade and global growth [16], but as a haven, due to political worries such as the prelude to the Brexit vote, investors tend to gravitate toward, the Japanese yen still be the major currencies in the world and one of the top-list chosen by investors which has relation with Thailand economy.

The Yuan (sign: ¥; Chinese: 元) is the base unit of several former and present-day Chinese currencies. The ISO 4217 standard code for renminbi is CNY. It's has been growing in China economy brings so much more essential on CNY, and it is worth watching by the world. According to China plans to open up its market further and promote free global trade and investment, China has inked bilateral currency swap agreements with over 30 countries and regions since late 2008 to facilitate cross-border trade and investment. The data from international financial transaction agency SWIFT showed that about 1.66 percent of global payments processed in January 2018 were denominated in yuan, edging up slightly from the previous month but still lower than a record high of over 2 percent, there have been signs that international institutions are warming to the Chinese currency. However, Central banks in European countries including France and Germany are including the yuan in their forex reserve mix. However, a survey by the Bank of China showed about 60 percent of the surveyed 3,000-plus overseas firms and financial institutions mulls using yuan or increasing its usage, basically, the use of yuan on digital platforms has been growing fast as Chinese mobile payment platforms like Alibaba's Alipay and Tencent's WeChat Pay keep promoting a cashless society, according to a SWIFT report. For foreign firms, it increasingly pays to use Chinese yuan. In sum, using the yuan in trade and investment will make it easier and cheaper for foreign firms to do business with China while including the yuan into investment portfolios will help optimize investment structure and return.

For Thailand economic information, Thailand is the 20th largest export economy in the world. [4] and the second largest economy in ASEAN after Indonesia, is an upper middle-income country with an open economy, a gross domestic product (GDP) of \$479 billion, and 3.9% growth in 2017. (USexport.gov, 2018). GDP per capita \$6,593.82. (World Bank, 2018) Thai Baht (THB) value is around 33.57 THB/USD average five years (OFX, 2018) In 2017. Thailand shipped US\$236 billion worth of goods around the globe in 2017. The top export destinations of Thailand are China amounted to \$29.3 billion or 12.4% of its overall exports. As we can summarize in the following table.

Table 1. Thailand Economic Data as of 2017

No.	2017 Thailand economic data (official currency: Thai Baht, THB)		
1	GDP	479	Billion USD
2	GDP in 2017	3.90%	from 2016
3	GDP per capita	6,593.82	USD
4	Export value	236	Billion USD
	4.1 China	12.40%	of export value (\$29.3 billion)
	4.2 USA	11.20%	of export value (\$26.4 billion)
	4.3 Japan	9.40%	of export value (\$22.2 billion)
5	Import value	225	Billion USD
	5.1 China	19.90%	of import value (\$44.8 billion)
	5.2 Japan	14.40%	of import value (\$32.4 billion)
	5.3 USA	6.70%	of import value (\$15.1 billion)

Obviously, the major trade partners of Thailand are China, Japan and USA. For China, major exports are rubber product, plastic granules, computer equipment, chemical components and cassava products whilst Thailand is the most export value market in ASEAN for Japan which are automobiles equipment and components.

The issue that involved in the exchange rate situation is not only impact to international trade but some situations also leads to the financial crisis. As in, the top five of financial crises listed by Peter Bondarenko, in the topic of "the World's Most Devastating Financial Crises" through the website "Britannica" said,

The crisis no.1 which run by the earliest year is "The Credit Crisis of 1772" also known as the credit crisis of 1772 or the panic of 1772, was a peacetime financial crisis which originated in London and then spread to other parts of Europe, such as Scotland and the Dutch Republic. The crisis was precipitated by the failure of banks in London and Scotland, which caused crashes in the stock markets of London, Amsterdam, and Paris. Especially hard hit was shared of the East India Company, already facing financial troubles. In September, it defaulted on its payments to the British Treasury, harming the financial situation of the British government. To raise money, Parliament passed the Tea Act of May 1773, which served to extend the East India Company's monopoly to cover America. This made it possible for the East India Company to circumvent American merchants and sell tea directly to Americans, undercutting existing free trade in tea with the Dutch, and raising the specter of the East India Company gaining a monopoly in America in other goods as well. [42]

Next crisis has signed since 1920s "The Great Depression of 1929–39". The story was begun after the end of World War I in 1918, the United States became a rich country and became one of the world's great powers. There are many industrial factories. Despite the booming economy, the United States also has problems in hidden countries that is the United States reduced the number of troops in their army

to four million people. So, that leads to the resulting in a large number of former soldiers flooding into the domestic labour market. Other than that, during that time, the new purchase way becoming popular, it is buying with credit purchases or paying with instalments so it was the age of "Buy now, Pay later", but it seems like the purchase of instalments is not limited to just everyday products. People also buy shares with the money that they borrowed from other. From the booming of stock market in that era was the beginning of one of the biggest economic crises ever. Buying shares on margin in 1929 can be done by placing a 10% margin, which is a hundred thousand but can trade for one million. Between April and September, 1929, the Dow Jones Index has jumped from 300 points to almost 400 points, representing an increase of 25% in just 6 months. October 24, 1929, or "Black Thursday", was the day the stock price began to fall sharply, with the opening price falling immediately by 4.6% and falling as low as 11% during the day. But this crisis is not over yet, the price began to fall again and this time it fell faster and stronger than before. On Tuesday 29 October 1929, known as "Black Tuesday", the Dow fell by 30% in one day. "Black Tuesday" is the worst day for the US economy before the crisis in 2008. This quick and intense downturn has affected the entire chain including the investors themselves, which have been exhausted by the Force Sell, and even not enough to pay back for the broker's interest. Brokers also have a lot of bad debts because their customers did not pay and after Black Tuesday, Dow Jones prices dropped more than 70%. The bank was in crisis because during the stock market boom, they lent money to people who borrowed money to buy shares, and the bank also risked buying the shares as well. The United States has flourished because of confidence in the stock market and when it plummeted, consumer's confidence is gone. The destruction of the stock market also causes people to lack confidence in the bank. Many people flock to withdraw money from the bank at the same time, which we call this "Bank Run" phenomenon. On March 4, 1933, Roosevelt took the post of President Hoover. The concept that Roosevelt focuses on solving this problem was called 3R, which is Relief, Recovery and Reform. Then after World War II (1939-1945), the U.S.A became the world economic and political power later. [43]

While no. 3 happened in the next 35 years later, called "The OPEC Oil Price Shock of 1973" the origin of the Oil Crisis goes back to around 1971. The US dollar was something that everyone wanted because it was tied the value to gold. The measure of binding the dollar to gold is known as the Bretton Wood system, but this system had many limitations, such as the maintaining an appropriate amount of money in the system. Ultimately, this rule was abolished in 1971 by US President Richard Nixon at that time. The United States was buying oil with its own dollar that no longer supports by gold. Therefore, the disadvantage is the world's largest oil producer. That is the OPEC countries then they decide not to send oil to the United States since 1973. That made oil prices soar from 3 US dollar to 12

US dollar. Then, Oil has become the most value thing and gas stations were shut down a lot because there had no fuel in the dispenser including production's price increasing, many companies cannot bear the cost of production, some places have to reduce staff. Not to mention the stock market, the S&P 500 index dropped about 40%. (Investerest, 2019). This was considered the heaviest decline of the stock market since the Great Depression in the 1930s. The oil crisis caused many countries to turn to reduce oil consumption. For this reason, the price mechanism in the world crude oil market has adjusted again by the demand and supply law. The price of crude oil gradually decreased as less demand was used and the search for alternative energy increased in the 1980s. These factors forced OPEC to reallocate oil production quota to maintain profitability not to be too much reduced from the original. [45]

Next is no.4 "The Asian Crisis of 1997", The Asian financial crisis is the financial collapse of the Thai baht after the Thai government was forced to float the baht due to lack of foreign currency to support its currency peg to the U.S. dollar. The crisis began in Thailand when the value of the baht fell as a result of the decision of the Thai government which General Chavalit Yongchaiyudh is Prime Minister back then. In reason of the crisis was 1.) Current account deficit, during the period of Thai economic growth continuously, Thailand's current account has been in deficit since 1987. Until 1996, Thailand faced a current account deficit of 14,350 million US dollars. This was a result of exports that contracted by 1.9% from a high growth of 24.82% in the previous year. That situation reflecting the high income-dependent on an Export country to boost up the economic and development. 2) The problem of foreign debt, financial liberalization in 1989-94 made Thailand able to rely on foreign capital conveniently without foreign exchange risk because the currency has been fixed at 25 baht per US dollar. Banks and financial institutions were saw the profit gap from borrowing money aboard and lent to investors in domestic. At the end of 1997, Thai external debt increased to a high level of 109,276 million US dollars. Especially short-term foreign debt which accounts for 65% of total foreign debt and the ratio of reserves to short-term debt is low at only 70.40%. 3) related to the previous reason, because of easily making loans then it leads to an over-investment and bubbles in the real estate business. On the other hand, the real estate business has grown tremendously during the years 1987-1996, whether housing, office buildings, golf courses or agricultural gardens as entrepreneurs are borrowing from abroad and raising funds in the primary market. Wealth of the country that is hot easily to invest in real estate projects nationwide. Moreover, they continuously rising property prices cause speculation which has attracted a lot of people to invest in the business until it becomes a bubble economy. 4) Operational efficiency of financial institutions, before the crisis, the credit approval process of financial institutions was lax. Without considering the feasibility of the project or the complete ability to reimburse. Credit approval for related parties or persons

Politicians are widespread. The free float capital movement without effective preparation or supervision while still using a fixed exchange rate system was cause the financial and economic system of the country to become unstable. The money supply in the system increased due to the inflow of foreign capital when the national bank tried to absorb the liquidity by selling bonds which made the interest rate that already high, not reduced then causing more capital to flow in. In addition, the Thai financial institution regulatory standards were inadequate, which made it impossible to quickly and accurately investigate the laxities of loans. Regulatory rules are not strict enough to make financial institutions have a strong financial status. 5) Attack on the Baht, the economic problems accumulated in such a long time that causing foreign investors to take advantage of the Thai Baht. Attacking currency by setting up funds called hedge funds such as the Quantum Fund, overseen by George Soros and other speculators. [46] After trying to persuade for almost half a year, from having attacked the baht continuously until unable to fight on July 2, 1997. The government announced floating the Baht on that day which causing the Baht to depreciate immediately from 25 baht to 32 baht per US dollar and set the most weakness record at the level of 56 baht per US dollar. That was made Thailand's GDP jumped to the lowest from 2.6 percent in 1997 to -2.2 percent in 1998. Stocks fell from the 1,410.33 point in January 1996, leaving only 207 points in September 1998. It had a chain effect to various businesses, resulting in a reduction in the number of layoffs. Finally, need to loan from the IMF worth more than 510,000 million Baht to be a reserve in the treasury. Excluding loans for "Financial Institutions Development Fund" or FIDF that worth over 1.14 trillion Baht to help support financial institutions not to fall. Other than that, the benefit from the depreciation of Thai Baht was goes to exports business as a cheaper price. Thailand economy getting slowly better after that. During the crisis, Thailand had a public debt burden which puts the country in a state of bankruptcy before the collapse of the currency. When the crisis expands to the most countries in Southeast Asia. it has fallen, the price of other assets and causing private debt to increase lead to the mane of "Asian Financial Crisis" or Tom Yum Khoong which is the most popular dish from Thailand, the origin of the crisis. [26]

The latest crisis was "The Financial Crisis of 2007-08" or the Subprime crisis, also well known as Hamburger Crisis. Since 2002 that the economic crisis began in the United States and affecting worldwide apparently. The Federal Reserve saw the cut in interest rates to help slow the economy and unfortunately, the decrease in interest caused private investment to expand even that was help an increasing the rate of consumption and investment of the people because of the economy was blooming, the resulting was the creation of housing's demand. The mortgage market for housing was larger than 60% of all US economic activity and it was continually expanding. As financial institutions had a policy to increase loans for people who want to own a home can easily buy a house. At those time did not require

any collateral but able to borrow money to buy a house with "Subprime Mortgages" loans or "loans given to low-performing debtors". For this reason, there was enormous loans in the economy. Although in 2004, the FED was rose interest rates to reduce the heat of the property market already but not very effective because financial institutions were still crazy about releasing credits. In meanwhile, when a bad infection flows into the capital market with something called Collateralized Debt Obligation (CDO). Financial institutions sold their debtors' port to an investment companies such as Goldman Sach or Morgan Stanley. They are responsible for collecting various loans, including home loans, car loan, business loans, educational loans, etc. come to guarantee the investment products called "CDO Bonds", sold to both large investors and institutions and a set of debt. The return of CDO will depend on the combination of assets used as collateral in issuing such financial instruments. Which will come out in sets like normal products. That means all risks of borrowing were directly transferred to investors. It was no longer a risk for financial institutions or investment banking. The CDO would not be worth investing without someone rating out that debt. "Credit Rating Company" was the one who changed the bad CDO by giving the rating to it. And then in 2006, the real estate market began falling because of the house prices have skyrocketed for a long time. The fund that invested in this system were catastrophically losing. The employment numbers have dramatic decreased because every company wants to save their costs to survive. The stock markets around the world have been affected because capitals flow out to a safe place. As a result, the price of gold and oil rose very high from the period before the crisis. [47]

Since July 2, 1997, after the Asian financial crisis or know as Tom Yum Goong crisis, Thailand start to use "Managed Float system" to control exchanged rate in domestic instead of "Fixed Exchange Rate" as before. The managed float system means Thai Baht value can change according to demand and supply in the world market and also can be affected by other economic factors which we will find out more in the next chapters. Therefore, in the present, Thailand is using a managed-float exchange rate regime by which the value of the Thai Baht is determined by market forces, allowing the currency to move in line with economic fundamentals.

Thus, this study will focus on what possibility factors that effect to the changes of rate in terms of macro-economic including exporters and importers and other parts who involved with the currencies exchange rate, and it is might possible that we can make a model forecast of the change cause.

A country's foreign exchange rate provides a window to its economic stability, which is why it is always watched and analyzed. One of the outstanding articles from Compare Remit [17] examines some of the leading factors that influence the variations and fluctuations in exchange rates and explains the reasons behind their volatility as follow; Inflation Rates, Government Debt, Interest Rates, Terms of

Trade, Country's Current Account / Balance of Payments, Political Stability & Performance, The expectation of expansion or recession, and Speculation.

In the aims of finding the affective factors on the change of currencies, this studies also lead to believe that different currency might have the same factors that can be affected and forecast the exchanged rate. As in, a model in this study will use multiple regression analysis, data 120 months 10 years (from 2007-2016). From the last decade, many crisis happened all over the world which is directly connected as the reason for currencies fluctuated. Therefore, the data in this study will cover the past crisis time and current issue. The paper consists of four part, firstly providing an introduction which also included in this part gathering with related research study or papers, then scope and hypothesis of the study. The second part is about the economic model calculation then, the third part will summarize and show the result include any suggestion from the research. However, please take a good look at footnotes, which will show more description of some vocabularies that make the reading this paper easier and smoothly. Lastly, in summary providing a conclusion and recommendation.

1.1. Purpose of the Study

To analyse the different independent factors that effects to the changes of 3 (three) selected currencies which are THB/USD, THB/JPY, and THB/CNY in order to be benefited for who are involved in Thailand by reducing exchange rate risks.

1.2. Scope of Study

By using monthly exchanged rate data between THB/USD, THB/JPY, and THB/CNY from 2007-2016 database (120 months) in order to achieve the purpose as above mentioned through Multiple Regression Analysis as the method and all secondary quantitative data as an input or variables data and using the Balance of Payment (BOP), Costumer Price Index (CPI), Interest rate (IN), Business Sentiment Index by components (BSI), and Foreign Direct Investment (FDI).

1.3. Related Theories

1.3.1. Purchasing Power Parity (PPP)

PPP is the very first conventional theory for international trade from the basic concept that compares different countries' currencies through a "basket of goods." In another word, the same amount in different countries, two currencies are in equilibrium or at per when a basket of goods is priced the same in both countries.

The relative version of PPP is calculated with the following formula:

Purchasing Power Parity (PPP)

$$S = \frac{P_1}{P_2} \quad (1)$$

Where:

S; represents the exchange rate of currency 1 to currency 2.

P_1 ; represents the cost of good x in currency 1.

P_2 ; represents the cost of good x in currency 2.

1.3.2. Relative Purchasing Power Parity (RPPP)

RPPP is an expansion of the purchasing power parity theory to include changes in inflation over time. The theory holds that inflation will reduce the real purchasing power of a nation's currency.

Relative Purchasing Power Parity (RPPP)

$$S_1 = S_0 \times \frac{1+I_f}{1+I_d} \quad (2)$$

Where:

S_0 ; represents spot exchange rate at the beginning of the period.

S_1 ; is the spot exchange rate at the end of the period.

I_f ; expected annualized inflation rate for a foreign country.

I_d ; expected annualized inflation rate for a domestic country.

1.3.3. The Fisher Effect

The Fisher effect is an economic theory created by economist Irving Fisher that describes the relationship between inflation and both real and nominal interest rates. The Fisher effect states that the real interest rate equals the nominal interest rate minus the expected inflation rate.

$$r = i - \pi^e \quad (3)$$

1.3.4. International Fisher Effect (IFE)

International Fisher Effect is a theory that combined the concept of The Fisher effect and PPP theory stating that the expected disparity between two currencies is approximately equal to their countries' nominal interest rates. (Investopedia, 2018).

By calculation we can do as;

$$E = \frac{i_1 - i_2}{1 + i_2} \approx i_1 - i_2 \quad (4)$$

Where:

E; represents the % change in the exchange rate

i_1 ; represents country A's interest rate

i_2 ; represents country B's interest rate

1.3.5. Interest Rate Parity (IRP) and Covered Interest Rate Parity (CIRP)

Interest rate parity is a theory that suggests a strong relationship between interest rates and the movement of currency values. The way to predict what a future exchange rate will be simply by looking at the difference in interest rates in two countries. (LEMKE, 2018)

$$F = S \times \left(\frac{1+i_f}{1+i_d} \right) \quad (5)$$

Where:

i_d ; is the interest rate in the domestic currency or the base currency.

i_f ; is the interest rate in the foreign currency or the quoted currency.

S; is the current spot foreign exchange rate.

F; is the forward foreign exchange rate.

1.4. Literature Review

There are some studies that say that the specific factors which effects to the fluctuation of the exchange rate and as the results, they are most likely around 5 to 8 major factors. Those are also related to the existing theories, for example, in the country that has high purchasing ability effect to high inflation then the currencies will be more depreciated in the nearly future. In another factor that common use is the Interest rate according to Investopedia said, higher interest rates offer lenders in an economy a higher return relative to other countries. Therefore, higher interest rates attract foreign capital and cause the exchange rate to rise. From the theory, import and export also relate to the variability of the exchange rate, but from the studied in Pakistan, one study from University Islamabad found that the import and export have less impact to the object below than Inflation rate and Economic growth. [29] Political Stability and Economics are another factor that most economists give the weight on, these two factors are essential and have a relationship back and forth to each other. From the theories that referred above, many factors can influence the variations and fluctuations in exchange rates, but also each currency has a different character, and different factor can be affected.

As the exchange rate is vital as mentioned so this topic is still an all-time interesting and attractive topic for economics students and researchers that's why there are some related studies which will mention about it below in this part, however, the study that conducted the information about Thai Baht currency has not that popular, and no one does about the THB with USD, JPY, and CNY yet.

Mr. Sariz Nathapakti (2017), he used the Multiple Regression and Ordinary Least Squares: OLS methods to find out the economic factors relating to the exchange rate between Myanmar Kyat and Thai Baht. The Economic factors included a balance of trade (BOT), consumer price index (CPI), stock index (SI) and Money Supply M1 (M1) by collecting data from Jan 2013 to Jan 2017. As the result showed that the balance of trade (BOT) and the exchange rate between Myanmar Kyat and Thai Baht had a negative relationship. Consumer price index (CPI) and the exchange rate between Myanmar Kyat and Thai Baht had a positive relationship. Though, the stock index (SI) and Money Supply M1 (M1) did not have a significant relationship with the exchange rate between Myanmar Kyat and Thai Baht.

Dr. Somyos Avakiat and Dr. Sittiporn Prawatrungruang (2015), They studied the Influencing of Important Factors on Exchange Rate of Thai Baht against the US Dollar, Thai Baht against the Euro, and Thai Baht against the Yen by using monthly data total 120 months (from Jan 2005-Dec 2014) and Multiple Regression as the method. The outcome of the study lead illustrated that the inflation rate was the factor that affected exchange rates between the Thai Baht against the US dollar, Euro and Yen in the same direction by statistically significant at a 95 percent confidence level. The

other factors included the current account, the export value of goods from Thailand - United States, Thailand - the European Union and the value of exports of Thailand - Japan were factors which did not affect exchange rates between the Thai Baht against the US dollar, Euro, Yen by statistically significant at the 95 percent confidence level.

Miss Nipaporn Chotipeaksawan (2011), studied factors that affect the change of Thai currency against US dollar, Euro and Yuan by using monthly data from Jan 2001 to May 2011 total 125 months. She used Multiple Regression and Ordinary Least Squares: OLS as a model. According to her study, it has been found that Inflation (INF) is a factor affecting the exchange rate between the Baht to US dollar, Baht to Euro and the Baht against the Yuan in the same direction, at a significant level of 95%. For the interbank interest rate (IBR) variable is a factor that affects the exchange rate between the Baht and Euro in the opposite direction at the .05 level, 95% confidential whilst there is no effect on the exchange rate between the Baht and US dollar and the Baht per Yuan. Her study is the primary model to this research, which in this study will develop in the perspective of currencies and factors, including the period are different that can affect the different result.

Miss Somjai Panjan and Miss Wilailuck Thaiutsa (2007), their research studied in exchange rate forecasting between Baht and Thailand important transaction currencies (USD, JPY, GBP) which was focused on how to forecast the exchange rate by using three methods were Relative Purchasing Power Parity, International Fisher Effect and Exponential Smoothing method which a last method is a statistical tool. Regarding to the comparison between forecasting and actual exchange rates insisting by the value of MAD, RMSE, and MAPE, it could be concluded that Exponential Smoothing Method was better accuracy fitting for forecasting Relative Purchasing Power Parity (RPPP) theory while International Fisher Effect (IFE) was not fitting at all.

Miss Chureeporn Jeabna (2006), she used different factors to study about the relationship and the changing of the exchange rate and also created the model to forecast the currencies. The different factors were the interest rate of Thailand, the interest rate of the United States of America, the inflation rate, the average gold price, and the total export (million baht). Her study used the method of Quantitative Approach in Correlation, Coefficient, Multiple Regression, and One-Sample Statistic of t-test by used monthly data from January 2001 to October 2006 in order to analyze. The study found that the average of gold price has a connection with exchange rate changed cause in US dollars and it can be used to create the equation for forecasting the rate with an error value of not more than 1.3 Baht while the total exports are correlated with changed in Pound sterling exchange rates at the confidence level of 95%. The model that can predict the Pound with having an error, not over 2.91 baht per 1 Pound Sterling. And the last model is Thai Interest rate correlated with exchange rate fluctuations of Japanese Yen at the confidence level of 95% and make for the forecasting

model of having an error, not over 0.01 baht per 1 Yen of Japan.

1.5. Factor in the Study

From those theories and literature review above, the way to choose the factors in this study in the subject to avoid what has studied but did not relate to the exchange rate or less effect to that. In the same time, it must be related to the theories. Therefore, the factors that have been choosing are;

1.5.1. Consumer Price Index (CPI)

CPI is an average change of price level from the market basket of consumer goods and service purchased by household. The standard of living can be lower if inflation is rising. That means in the same amount of money; a consumer can buy less than before. From PPP theory, the obvious idea is the law of one price, which means the same product should have the same price around the world. On the other hand, the exchange rate will be adjusted to make sure that the price will be at the same level. For example, if a cup of coffee in the country A is \$2, country B is ¥5, so the exchange rate should be \$1 equal to ¥2.5. For Thailand movements of the Costumer Price Index (CPI) data during the time period of study show as the following figure.

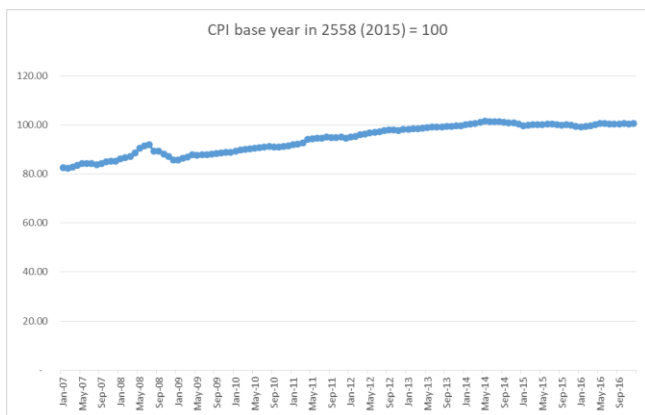


Figure 1. Thailand Costumer Price Index (CPI) (Jan 2007- Dec 2016)

1.5.2. Balance of Payment (BOP)

The balance of payments (BOP) is a statement of all transactions made between entities in one country and the rest of the world over a defined period, such as a quarter or a year. [32] BOP of a country reveals its financial and economic status also can be used as an indicator to determine whether the country's currency value is appreciating or depreciating. The BOP statement also can help the Government to decide on fiscal and trade policies because it provides important information to analyse and understand the economic, financial dealings of a country with other countries. BOP can be separate to three accounts; (1) the current account includes any products and services for consumption purposes. (2) The capital account; tracking the movement of capital that is going in-and-out of the country for investment proposes. (3) Financial account records the

payment flow and change of the ownership in the foreign assets and liabilities, which includes direct investment, portfolio investment, and reserve asset. That explanation can be linked to the Relative Purchasing Power Parity (RPPP) theory. For the moving of the Balance of Payment (BOP) data during the time period of study show as the following figure.

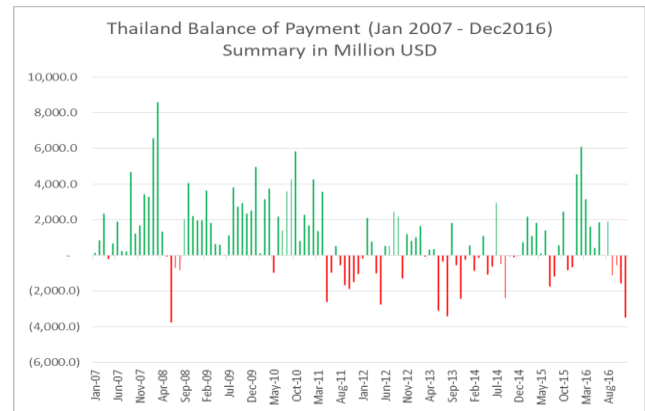


Figure 2. Thailand Balance of Payment (Jan 2007- Dec 2016)

1.5.3. Policy Interest (IN)

IN is an interest rate that the monetary authority (i.e., the central bank) sets in order to influence the evolution of the main monetary variables in the economy (i.e., consumer prices, exchange rate or credit expansion, among others). The policy of interest rate determines the levels of the rest of the interest rates in the economy since it is the price at which private agents-mostly private banks-obtain money from the central bank. These banks will then offer financial products to their clients at an interest rate that is normally based on the policy rate. [31] Bank of Thailand (BOT) Assistant Governor Paiboon Kittisrikangwan has the perception through the powerful tool of controlling the country's economy as "The central bank must consider implementing its monetary policy with caution. The interest policy adopted by the bank must focus more on enhancing long-term stability than on responding to what happens in the short run," he said. The relationship between inflation and interest rates is "In general, as interest rates are reduced, people can borrow more money. The result is that consumers have more money to spend, causing the economy to grow and inflation to increase. The opposite holds, through for raising an interest rate. As an interest rate is increased, consumers tend to save as returns from savings are higher. With less disposable income being spent as a result of the increase in the interest rate, the economy slows and inflation decreases" said Jean Folger through Investopedia. [33] Yet, it is another factor that has the direct relation to the exchange rate supported by Purchasing Power Parity (PPP), Relative Purchasing Power Parity (RPPP), Fisher Effect and International Fisher Effect theory. For the moving of the policy interest rate (IN) during the time period of study shows as the following figure.

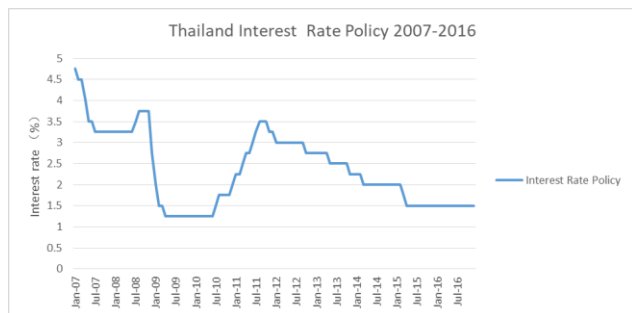


Figure 3. Thailand Interest Rate Policy (Jan 2007- Dec 2016)

1.5.4. Business Sentiment Index (BSI)

Business Sentiment Index (BSI) is compiled from the Bank of Thailand (BOT) survey data of 1,010 from Mid-Large size businesses (authorized capital is more than 50 million baht). The business type of sample survey is in production lines such as textile goods production houses, food, beverage and tobacco factories, machinery components factories and etc. and non-production line business such as construction companies, wholesale companies, retail-sale companies, Traveling, Hotels, Transportation companies, etc. The questionnaires are sent out during the last week of the previous month and are compiled by the third week of the reference month.

Below is the interpretation of the index:

Index = 50 indicates that business sentiment remains stable

Index > 50 indicates that business sentiment has improved

Index < 50 indicates that business sentiment has worsened

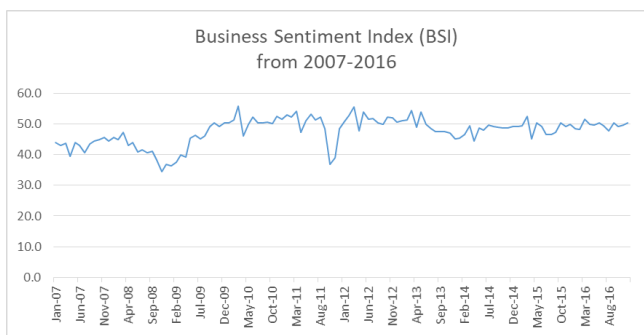


Figure 4. Thailand Business Sentiment Index (Jan 2007- Dec 2016)

This index is a crucial index and can be reflected in the entrepreneur's point of view in the real economic situation. The questionnaires of the survey combined both qualitative and quantitative data by using the Diffusion Index Method as in the USA, Japan, and Europeans. For the statistic test, BSI and another macro-economy index such as Industrial production index, Private sector investment, and economic expansion found that Cross-Correlation is between 0.5-0.7. Although the Bank of Thailand's data, the BSI index has a relationship with the macroeconomic indicators at a moderate level as well. Nonetheless, it has the ability to use as a guideline index in the short term which can explain the

rate of GDP change at a certain level, mainly when economic fluctuations occur and political instability. The reliable source for those factors is mainly from the Bank of Thailand (BOT). For the moving of the Business Sentiment Index (BSI) data during the time period of study, show as the following figure.

1.5.5. Foreign Direct Investment (FDI)

The ownership of production facilities in a foreign country. To be classified as FDI, a foreign investor has to own at least 10 percent of a local company. Otherwise, if the ownership is less than 10 percent of the value of the local company, the investment is classified as portfolio investment which it could be in manufacturing, services, agriculture, or other sectors. It could have originated as green field investment (building something new), as acquisition (buying an existing company) or joint venture (joint ownership with a local company).

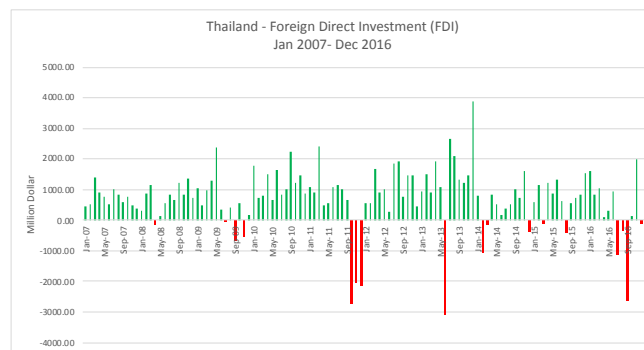


Figure 5. Thailand-Foreign Direct Investment (Jan 2007- Dec 2016)

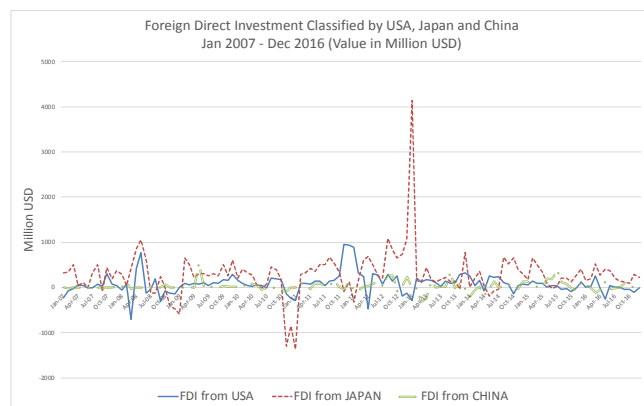


Figure 6. Foreign Direct Investment classified by US, Japan and China Jan 2007-Dec 2016 (Value in Million USD)

Consider FDI is an important element of Thailand's economic development, and the country is one of the major FDI destinations in its region according to the truth that Manufacturing and financial and insurance activities attract nearly 70% of all FDI inflows. Also, an investments in real estate, commerce and information and communication are important too. Since the rights of borrowers and creditors have been strengthened as well as the system of land administration. The country has taken steps to clarify corporate governance, ownership and control structures by

enacting legislation requiring companies to appoint independent members of the board of directors and to establish an audit committee. Thailand continues to offer more incentives to invest in advanced technologies, innovative activities and research and development through the Investment Promotion Act, and the Eastern Economic Corridor (EEC) Act, which offers benefits to investors in this zone (tax subsidies, right to land ownership, issuing of visas), should provide further support to FDI flows in the upcoming years. [48] Thailand's top 5 attractiveness indicators for the IMD's World Competitiveness Executive Opinion Survey, Thailand's business friendly environment consistently was given as the first and most important factor.

FDI investment applications exceeded the BOI's targets in 2016, totaling THB 584 billion. Of these applications, 925 projects were approved, bringing total foreign investment of THB 358 billion. 64 percent of the approved applications (594 projects) were for 100 percent foreign-owned projects, the remainder being made up by franchising agreements as well as mergers and acquisitions.

Japan was the leading country of origin of FDI into Thailand; 284 projects contributed THB 80 billion of FDI in 2016. The main driver for this is the automotive industry, with Toyota, Isuzu, Nissan, and Honda all having considerable manufacturing and assembly operations in Thailand. The second largest foreign investor was China, which contributed THB 54 billion in 106 projects last year. The top five was rounded off by the Netherlands, the US, and Australia. [50]

Rankings for Thailand

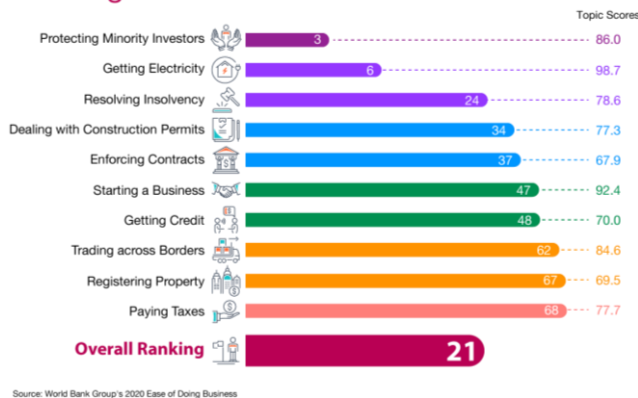


Figure 7. Thailand got 21st. place out of 190 countries from Global Competitive Index 4.0 ranking by World Bank Group's

However, in 2020, Foreign direct investment (FDI) applications from China, valued at U.S. \$8.6 billion, comprised almost half of total foreign investment applications in 2019, \$16.7 billion, according to data from Thailand's Board of Investment (BOI). "China became the number one foreign investor for the very first time," BOI Secretary-General Duangjai Asawaschinatachit said while presenting the statistics at the Foreign Correspondents' Club of Thailand in Bangkok. Japan was the second most active suitor in 2019, with investment applications valued at \$2.4 billion, followed by Hong Kong, Switzerland and Taiwan.

The United States, which topped the chart in 2018, followed by Japan, then China, did not make top five in 2019.

According to the World Economic Forum, Thailand's Global Competitive Index 4.0 ranking improved to 38th place (out of 140 countries) in 2018, up from 40th place a year earlier, while the World Bank Group's 2020 Ease of Doing Business report ranking Thailand 21st out of 190 countries, up six places from the previous year. Among areas in this report which showed the greatest improvement was a reduction in the number of steps required and amount of time needed for obtaining construction permits, and the score for ease of shareholder suits that in turn helped improve the ranking for protecting minority investors. Thailand's topical score for getting electricity was an outstanding 98.7 (out of 100), which earned it 6th position in that category. [49]

1.6. Benefits from the Study

Firstly, to know a potential possibility and be aware of the factors that apparently impact to the important currencies in Thailand which can lead to money in an outflow from the economy and finally it can be effective to the overall economy, also for the future, the study of this model can be extended to predict other currencies, which can reduce the risk of currency fluctuation for planning cash and currency management ahead. Moreover, the currency's study is the basic knowledge of business running. The understanding of logic for the change of currency will be advantaged to extend the picture and helpful for future development in the world economy.

2. Data Introduction and Model Calculation

2.1. Data and Definitions

From the related studies mentioned above, most of the studies was focused on macro-economic factors, and the most prevalent factors are inflation and interest rate, which will be tested in this study too. However, from many suggestions before, it's suggest to follow the time-lapse data method and also other factors such as the country's credit rating or Consumer Confidence Index might be affected by the change of currencies too. Therefore, this study will use major economic factors along with indirect economic indicators following below information.

2.1.1. USD (U.S. Dollar)

Symbol is USD, meaning/calculation; the exchange rate between the THB and the USD in a direct quotation form calculate the average monthly of a commercial bank. Bank of Thailand (BOT), www.bot.or.th as source.

2.1.2. JPY (Japanese Yen)

Symbol is JPY, the exchange rate between the Thai Baht (THB) and Japanese Yen in a direct quotation form.

Calculate the average monthly of a commercial bank. Bank of Thailand (BOT), www.bot.or.th as source.

2.1.3. CNY (Chinese Yuan)

Symbol is CNY, the exchange rate between Thai Baht (THB) and Chinese yuan in a direct quotation form. Calculate the average monthly of a commercial bank. Bank of Thailand (BOT), www.bot.or.th as source.

2.1.4. Consumer Price Index

Symbol is CPI, the measurement of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. In Thailand, the most important categories in the consumer price index are Food and non-alcoholic beverages (36 percent of total weight), Transportation and communication (24 percent) and Housing and furnishing (23 percent). Others include: Medical and personal care (6 percent); recreation and education (6 percent). Division of Trade Information and Economics Indices, Ministry of Commerce, www.indexpr.moc.go.th/price/ as source.

2.1.5. Balance of Payment

Symbol is BOP, summary of economic transactions in monthly data between residents and non-residents that takes place during a specific period. Balance of payments consists of 3 accounts Current Account, Capital and Financial Accounts and net errors & omissions. Bank of Thailand (BOT), www.bot.or.th as source.

2.1.6. Interest Rate

Symbol is IN, policy interest rate announced by the Bank of Thailand monthly. Bank of Thailand (BOT), www.bot.or.th as source.

2.1.7. Business Sentiment Index by Components

The symbol is BSI, The BSI was developed by the Bank of Thailand (BOT). The diffusion index is made up of six components: production, total order books, investment, production cost, performance, and employment. The public and government sector use them as indicators which help guide directions for the economy on a short-term basis. These indexes are also instrument that the public sector utilizes as an additional aid to their policy planning as well as a tool that the business sector can use to adapt their tactics to improve their production performance. Bank of Thailand (BOT), www.bot.or.th as source.

2.1.8. Foreign Direct Investment

Symbol is FDI, a foreign direct investment (FDI) is an investment made by a firm or individual in one country into business interests located in another country. Generally, FDI takes place when an investor establishes foreign business operations or acquires foreign business assets in a foreign company. However, FDIs are distinguished from portfolio investments in which an investor merely purchases equities

of foreign-based companies. Bank of Thailand (BOT), www.bot.or.th as source.

2.2. Hypothesis

From the number of theories, many factors can influence a currency but the fact that “each currency can be affected by different factors or not,” which is the vital question for this study. Also, to reflect the purpose of this study, the hypothesis will cover all the questions from.

2.2.1. Each Currency must be at Least One Factor That Influent the Exchange Rate

H0; No independent factor can affect the exchange rates.

H1; At least one independent factor can affect the exchange rates.

2.2.2. Each Currency can be Affected by Different Factors (USD, JPY, CNY)

H0; All three currencies (USD, JPY, and CNY) can be affected by the same factors.

H1; All three currencies (USD, JPY, and CNY) can be affected from the at least one different factor.

To prove the hypothesis, we will use Multiple Regression as the method and all secondary quantitative data as input or variables data.

2.3. The Method

This study used Multiple Regression with 95% confidential level, calculated through the statistic program by “ENTER” method. Revised the time series-data by using the Correlogram test (Correlogram and Q-statistic) then using dot graph to generate the data which should not be a slope graph or an exponential graph after that used Cook’s distance method for checking the Outlier data. Then, checked the “Autocorrelation problem” by checking the correlation value between the dependent factors which should not have more than 0.8 correlation and using Durbin-Watson value, if Durbin-Watson is in the value between 1.5-2.5 can be summarized as independent factors that be used in the study do not correlate with each other. Checking the relation between factors by looking at the Pearson correlation method.

2.4. The Regression Model and the Result

2.4.1. The Model Equation

For the multiple regression, the equation is

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \quad (1)$$

From the hypothesis, the equation can be defined as,

y = Exchange rate between Thai baht (THB) and U.S. dollar (USD), Japanese Yen (JPY) or Chinese Yuan (CNY).

β_0 = Coefficients

X_1 = Consumer Price Index (CPI)

X_2 = Balance of Payment (BOP)

X_3 = Policy interest rate (IN)

X_4 = Business Sentiment Index by Components (BSI)

X_5 = Foreign Direct Investment (FDI)

2.4.2. The Regression Model

The multiple regression of the THB/USD.

$$\text{THB/USD} =$$

$$\beta_0 + \beta_1 \text{CPI} + \beta_2 \text{BOP} + \beta_3 \text{IN} + \beta_4 \text{BSI} + \beta_5 \text{FDI} \quad (2)$$

The equation can be defined as,

y = Exchange rate between THB and USD

β_0 = Coefficients

X_1 = Consumer Price Index (CPI)

X_2 = Balance of Payment (BOP)

X_3 = Policy interest rate (IN)

X_4 = Business Sentiment Index by Components (BSI)

X_5 = Foreign Direct Investment (FDI)

The equation result from the table below;

Table 2. Descriptive Statistics of THB/USD

	Mean	Std. Deviation	N
THB/USD ((Baht per 1 USD))	32.9507	1.8617	114
CPI	94.4393	5.7387	114
BOP	1046.8526	2147.1241	114
IN	2.2763	0.8033	114
BSI	47.8956	4.2434	114
FDI	806.1448	848.5968	114

Table 3. Factors Correlations by the Pearson method of THB/USD

	THB/USD	CPI	BOP	IN	BSI	FDI
THB/USD	1					
CPI	-0.13	1				
BOP	0.054	-0.392	1			
IN	-0.347	-0.296	-0.079	1		
BSI	-0.498	0.499	-0.073	-0.278	1	
FDI	-0.235	-0.015	0.1	0.084	0.037	1

$$\text{THB/USD} = 48.216 + (0.015 * \text{CPI}) + (-0.0000742 * \text{BOP}) + (-1.160 * \text{IN}) + (-0.287 * \text{BSI}) + (-0.000367 * \text{FDI}) \quad (3)$$

For the ten years data from 2007-2016, only Interest rate (IN) and Business Sentiment Index by components (BSI) variable can be used to describe the THB/USD exchange rate. As the table 3; Descriptive table shows that the dependent variable, the exchange rate of THB/USD has Mean as 32.9507, Standard Deviation is 1.8617.

Evidently, there is no Multicollinearity between factors by checking the correlations table has no factor that has any connection between each other more than 0.8. Also, the Durbin-Watson value which got calculated the value as 1.684. From the statistic standard if Durbin-Watson value is in between 1.5-2.5 can be concluded that the independent factors do not have autocorrelation between each other.

To analyze the factors that influent THB/USD exchange rate, only Interest Rate (IN) and Business Sentiment Index by components (BSI) are influent the THB/USD exchange

rate in the opposite way. Those IN and BSI can be explained by the theories that mentioned above through literature review, increasing of Interest rate and business performance lead to strengthen of home currency. Other than that, for the other independent variables even they are not significant in the model as the information at the above table but from the literature review.

Table 4. Coefficients between THB/USD and other factors

Coefficient	Unstandardized		Standardized		Sig.
	β	Std. Error	Beta	t	
(Constant)	48.216***	2.579		18.694	0
CPI	0.015	0.028	0.046	0.531	0.597
BOP	-0.0000742	0	0.001	0.011	0.991
IN	-1.160***	0.166	-0.501	-6.979	0
BSI	-0.287***	0.034	-0.653	-8.424	0
FDI	-0.000367	0	-0.167	-2.513	0.13

Thus, those signes (+/-) in front of the numbers can be represented the direction of exchange rate's changing. If the Policy Interest Rate (IN) changed 1 unit, the THB/USD would be oppositely changed -1.160 unit. The same thing will happen with Business Sentiment Index by components (BSI). If the Business Sentiment Index by components (BSI) changed either increase or decrease 1 unit, the THB/USD would be moved -0.287 unit respectively to the opposite way.

To summarize the result, an increasing of Interest Rate (IN) and Business Sentiment Index by components (BSI) will bring the result as the appreciation of THB/USD exchange rate and the decreasing of those factors will make THB/USD exchange rate to be depreciation.

The multiple regression of the THB/JPY.

$$\text{THB/JPY} =$$

$$\beta_0 + \beta_1 \text{CPI} + \beta_2 \text{BOP} + \beta_3 \text{IN} + \beta_4 \text{BSI} + \beta_5 \text{FDI} \quad (4)$$

The equation can be defined as,

y = Exchange rate between THB and JPY.

β_0 = Coefficients

X_1 = Consumer Price Index (CPI)

X_2 = Balance of Payment (BOP)

X_3 = Policy interest rate (IN)

X_4 = Business Sentiment Index by Components (BSI)

X_5 = Foreign Direct Investment (FDI)

The equation result from the table below;

Table 5. Descriptive Statistics of THB/JPY

	Mean	Std. Deviation	N
THB/JPY (Baht per 100JPY)	34.587	3.8998	87
CPI	91.871	5.315	87
BOP	1350.513	2231.697	87
IN	2.56	0.9117	87
BSI	47.37	4.8676	87
FDI	932.5239	822.145	87

Table 6. Factors Correlation by the method of THB/JPY

	THB/JPY	CPI	BOP	IN	BSI	FDI
THB/JPY	1					
CPI	-0.17	1				
BOP	0.226	-0.297	1			
IN	-0.287	-0.175	-0.233	1		
BSI	0.086	0.569	-0.021	-0.305	1	
FDI	-0.195	0.273	0.035	-0.118	0.184	1

Table 7. Coefficients between THB/JPY and other factors

Coefficients					
	Unstandardized		Standardized	t	Sig.
Model	β	Std. Error	Beta		
(Constant)	47.249***	7.963		5.934	0
CPI	0.169	0.098	-0.231	-1.728	0.088
BOP	-0.000059	0	0.104	0.937	0.351
IN	-1.174***	0.465	-0.274	-2.524	0.014
BSI	-0.138	0.101	0.172	1.363	0.177
FDI	-0.001	0	-0.2	-0.1916	0.059

THB/JPY =

$$47.249 + (0.169 \cdot \text{CPI}) + (-0.000059 \cdot \text{BOP}) + (-1.174 \cdot \text{IN}) + (-0.138 \cdot \text{BSI}) + (-0.001 \cdot \text{FDI}) \quad (5)$$

Only interest rate (IN) independent variables can be used to describe the THB/JPY exchange rate. As the table 6; Descriptive table shows that the dependent variable, the exchange rate of THB/JPY (one Thai Baht per 100 Japanese Yen) has Mean as 34.587, Standard Deviation is 3.8998.

There is no Multicollinearity between factors by checking the correlations table has no factor that has a relationship between each other more than 0.8. Also, the Durbin-Watson value which got calculated the value as 2.235. From the statistic standard if Durbin-Watson value is in between 1.5-2.5 can be concluded that the independent factors do not have autocorrelation between each other.

These information leads to analyse that the influent THB/JPY exchange rate is only Interest Rate (IN) that influent the THB/JPY exchange rate in the opposite way which can be explained by the theories that mentioned above through literature review, increasing of interest rate leads to stronger value of home currency. Other than that, for the other independent variables even they are not significant in the model as the information that showed in the above table but from the literature review, the other studied and theories some of them also using Consumer Price Index (CPI), Balance of Payment (BOP) and Foreign Direct Investment (FDI) as the independent studied.

For the word description, those signness (+/-) in front of the numbers can be represented the direction of exchange rate's changing. If the Policy Interest Rate (IN) changed to increase 1 unit, the THB/JPY would be oppositely changed -1.174 unit.

In conclusion, an increasing of Interest Rate (IN) will

bring the result as the apprication of THB/JPY exchange rate and the decreasing of Policy Interest Rate (IN) factors will make THB/JPY exchange rate to be depreciation.

The multiple regression of the THB/CNY.

$$\text{THB/CNY} = \beta_0 + \beta_1 \text{CPI} + \beta_2 \text{BOP} + \beta_3 \text{IN} + \beta_4 \text{BSI} + \beta_5 \text{FDI} \quad (6)$$

the equation can be defined as,

y = Exchange rate between Thai Baht (THB) and Chinese Yuan (CNY).

β_0 = Coefficients

X_1 = Consumer Price Index (CPI)

X_2 = Balance of Payment (BOP)

X_3 = Policy interest rate (IN)

X_4 = Business Sentiment Index by components (BSI)

X_5 = Foreign Direct Investment (FDI)

The equation result from the table below;

Table 8. Descriptive Statistics of THB/CNY

	Mean	Std. Deviation	N
THB/CNY (Baht per 1 CNY)	5.036	0.32	118
CPI	94.281	5.867	118
BOP	999.217	2160.474	118
IN	2.324	0.844	118
BSI	47.758	4.295	118
FDI	751.382	946.437	118

Table 9. Factors Correlations by the Pearson method of THB/CNY

	THB/CNY	CPI	BOP	IN	BSI	FDI
THB/CNY	1					
CPI	0.728	1				
BOP	-0.264	-0.391	1			
IN	-0.534	-0.354	-0.076	1		
BSI	0.057	0.504	-0.061	-0.318	1	
FDI	-0.08	-0.05	0.186	0.04	0.065	1

Table 10. Coefficients between THB/CNY and other factors

Coefficients					
	Unstandardized		Standardized	t	Sig.
Model	β	Std. Error	Beta		
(Constant)	2.818***	0.296		9.523	0
CPI	0.046***	0.003	0.836	14.424	0
BOP	-0.00002949	0	0.002	0.02	0.968
IN	-0.150***	0.018	-0.395	-8.151	0
BSI	-0.037***	0.004	-0.49	-9.506	0
FDI	-0.0000036	0	0.01	0.224	0.823

THB/ CNY =

$$2.818 + (0.046 \cdot \text{CPI}) + (-0.00002949 \cdot \text{BOP}) + (-0.150 \cdot \text{IN}) + (-0.037 \cdot \text{BSI}) + (-0.0000036 \cdot \text{FDI}) \quad (7)$$

Obviously from above data, except only the Balance of

Payment that not significant in the model of THB/CNY exchange rate. For other three independent factors, Consumer Price Index (CPI), Interest rate (IN) and Business Sentiment Index by components (BSI) variables all can be used to describe the THB/CNY exchange rate. As the table 9; Descriptive table shows that the dependent variable, the exchange rate of THB/CNY has Mean as 5.036, Standard Deviation is 0.320.

Also, can say there is no Multicollinearity between factors by checking the correlations table has no factor that has a relationship between each other more than 0.8. Also, the Durbin-Watson value which got calculated the value as 2.233. From the statistic standard if Durbin-Watson value is in between 1.5-2.5 can be concluded that the independent factors do not have autocorrelation between each other.

There are three out of five independent factors are influent the THB/CNY exchange rate which are Consumer Price Index (CPI), Interest Rate (IN) and Business Sentiment Index by components (BSI). By only the Consumer Price Index (CPI) that influent the THB/CNY exchange rate in the same direction. The effect in the same direction means increasing of CPI influences an increasing of THB/CNY too which can be called the THB/CNY will depreciation cause from increasing of CPI that can be explained by the Law of one price and the Relative Purchasing Power Parity (RPPP) theories. For the IN and BSI also influence the change of THB/CNY exchange rate but in the opposite way. For the Balance of Payment (BOP) and Foreign Direct Investment (FDI) which are not significant in the model as the information in the above table but from the literature review, the other studied and theories some of them also using those factors to study as the independent factors.

In another words, those signess (+/-) in front of the numbers can be represented the direction of exchange rate's changing. If the Consumer Price Index (CPI) changes 1 unit, the THB/CNY exchange rate would be move +0.046 per unit. For the Policy Interest Rate (IN) changed 1 unit, the THB/CNY would be oppositely changed -0.150 unit. The same thing will happen with Business Sentiment Index by components (BSI) that increasing of the independent available will influent as -0.037 unit.

To summarize, an increasing of Consumer Price Index (CPI) will bring the result as a depreciation of THB/CNY exchange rate. While an increasing of the Policy Interest Rate (IN) and Business Sentiment Index by components (BSI) will bring the result as the appreciation of THB/CNY exchange rate. In the opposite way, a decreasing of Consumer Price Index (CPI) will make THB/CNY exchange rate to be appreciation but decreasing of the Policy Interest rate (IN) and the Business Sentiment Index by components (BSI) will influence the THB/CNY exchange rate to be depreciation.

3. Summary

From the results of the study above, in the first hypothesis,

there is sufficient evidence at the 5% significance level to reject the claim that no independent factor can affect the exchange rates. For the second hypothesis, there is sufficient evidence at the 5% significance level to reject the claim that all of three currencies (USD, JPY, and CNY) can be affected from the same factors. For more clear explanation,

3.1. The Factors That Affect Changes in Thai's Baht and US Dollar Exchange Rate

The Policy Interest Rate (IN) and Business Sentiment Index by components (BSI) had the impact to changes of exchange rate in the opposite direction and significantly affected changes at the 95 percent confidence level. To state this in term of macroeconomic, if there is an increase of IN or BSI, then the exchange currency of THB/USD will be appreciated. For the decreasing of IN or BSI will influence THB/USD to be depreciated. So, in the overall model, all the factors (CPI, BOP, IN, BSI and FDI) can be used to predict THB/USD exchange rate as 53%. However, there are still have other factors that should be considered and can explain the model in another 47% which understandable because the currency can be drives by multi factors related to the previous researches. THB/USD is the less fluctuated compares with those two exchanges rate. Lastly, another point for THB/USD, this exchange rate got effect from only domestic factors (IN, BSI) because those BOP and FDI are not significant through the calculation.

3.2. The Factors That Affect Changes in Thai's Baht and Japanese Yen Exchange Rate

The Policy interest rate (IN) was the only factor that influenced to the change of THB/JPY exchange rate and it affects in the opposite direction at significantly affected changes at the 95 percent confidence level. For the macroeconomic, if there is an increase of IN then, the exchange currency of THB/JPY will be appreciated. Contrastly with a decrease of IN will brings the result as the depreciation of THB/JPY exchange rate whilst the others selected factors are not significant with the calculated model. From figure 6 which shows the FDI value, Japan was invest in Thailand the most, compare to the others two countries. Thus, the people who has more involved in Thailand-Japan trading can be closely focus on the interest rate which easily to control because it less independent factor got involved. However, there is must have others independent factors still to explain the THB/JPY since the selected factors can described the equation for less than 30%.

3.3. The Factors That Affect Changes in Thai's Baht and Chinese Yuan Exchange Rate

The Consumer Price Index (CPI), Policy interest rate (IN) and Business Sentiment Index by components (BSI) had the effect of changes in the exchange rate. However, the increasing of CPI will influence the THB/CNY exchange rate to be a depreciation. While the increasing of IN and BSI will make the appreciation of the exchange rate. Those

results will show in the contrastly way if the independents factors are decreased. For the decreasing of CPI will influence the exchange rate of THB/CNY to appreciation but for the decreasing of IN and BSI will influence the exchange rate of THB/CNY to depreciation. While China is the most value trade partner with Thailand both in term of export and import but the THB/CNY currencies got fluctuated by many factors which hard to control the exchange rate. Therefore, the suggestion for people who need to due with Chinese such as department stores, hotels, tourism places, export-importers or investors better consider hedging as a tool to manage the exchange rate risk. The result from the study also can be predict that Chinese Yuan might not able to be the main currency for trading in recently years because its easily fluctuate by many factors. However, those selected independent factors, CPI – IN – BOP – BSI -FDI can described the THB/CNY as 79%.

4. Conclusions

This research selected four independent factors to study the affect of the Thailand exchange currency (Thai Baht)

against three most important trade partners Thailand that are USA, Japan and China. The result shows that, more one than one factor affects the fluctuation of the selected currencies and different exchange rate, got influenced by different factors.

However, there is one interesting point of factor that will influence all the selected exchange rate which is the Policy Interest Rate (IN), wheter it is the exchange rate between Thai Baht against US dollar (THB/USD), Thai Baht against Japanese Yen (THB/JPY) or Thai Baht against Chinese Yuan (THB/CNY). The movement of the selected exchange rates also follow the studies theories as the increasing of the interest rate will influence the home currency to be an appreciation while the decreasing of the interest rate will be depreciated the home currency (in this researched refers to Thai Baht). This sensitive factor which could affect to every exchange rate, The Policy Interest rate (IN), is closely managed by the Bank of Thailand (BOT). To be summary, the movement of the Policy Interest rate will be influence to every exchange rate in the same way.

For the relationship of each independent variable and the selected currencies will be shown in the following table;

Table 11. If the independent variables increase, the currency will be

	CPI	BOP	IN	BSI	FDI
THB/USD	No Significant	No Significant	Appriciation	Appriciation	No Significant
THB/JPY	No Significant	No Significant	Appriciation	No Significant	No Significant
THB/CNY	Depre-ciation	No Significant	Appriciation	Appri-ciation	No Significant

Table 12. If the independent variables decrease, the currency will be

	CPI	BOP	IN	BSI	FDI
THB/USD	No Significant	No Significant	Depreciation	Depreciation	No Significant
THB/JPY	No Significant	No Significant	Depreciation	No Significant	No Significant
THB/CNY	Appriciation	No Significant	Depreciation	Depreciation	No Significant

In conclusion, more than one factor will influence the exchange rate. also, each exchange rate will get influence by different factors. As the table 11 shows that, the exchange rate of Thai Baht against US dollar (THB/USD) got influenced by Policy Interest rate (IN) and Business Sentiment Index (BSI). While the exchange rate of Thai Baht against Japanese Yen (THB/JPY) got influence by only the Policy Interest rate (IN), the last selected exchange rate is Thai Baht against Chinese Yuan (THB/CNY) got influence by three factors as The Consumer Price Index (CPI), Policy interest rate (IN) and Business Sentiment Index (BSI). And even Balance of Payment (BOP) and Foreign Direct Investment (FDI) seem to involve and have relation with the exchange rate but the research shown that there is no relationship between those two factors and the selected exchange currencies.

REFERENCES

- [1] Investopedia. (2018, Feb 20). Retrieved from Investopedia: <https://www.investopedia.com/terms/g/gdp.asp>.
- [2] (2018, Feb 21). Retrieved from Bureau of Budget Thailand: http://www.bb.go.th/bbweb/?page_id=6039.
- [3] (2018, Feb 21). Retrieved from Office of the National Economic and Social Development Board: http://www.nesdb.go.th/main.php?filename=develop_issue.
- [4] IMF. (2018, Apr 18). Retrieved from World Economic Forum: <https://www.weforum.org/agenda/2018/04/the-worlds-biggest-economies-in-2018/>.
- [5] (2018, Jul 17). Retrieved from Focus economics: <https://www.focus-economics.com/countries/thailand>.
- [6] WRC. (2018, Aug 05). Retrieved from Worlds Richest Countries: http://www.worldsrichestcountries.com/top_thailand_imports.html.

- [7] (2018, Aug 05). Retrieved from USexport.gov: <https://www.export.gov/article?id=Thailand-market-overview>.
- [8] (2018, Aug 05). Retrieved from World Bank: <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=TH>.
- [9] (2018, Aug 06). Retrieved from OFX: <https://www.ofx.com/en-au/forex-news/historical-exchange-rates/yearly-average-rates/>.
- [10] (2018, Aug 06). Retrieved from Investopedia: <https://www.investopedia.com/terms/f/foreign-exchange-markets.asp>.
- [11] Settlements, B. f. (2013, Sep). Triennial Central Bank Survey. Foreign exchange turnover in April 2013: preliminary global results, p. 3.
- [12] (2018, Aug 11). Retrieved from Travelex: <https://www.travellex.com/currency/current-world-currencies>.
- [13] Record, N. (2018, Aug 11). Currency Overlay. Retrieved from Wikipedia: https://en.wikipedia.org/wiki/Foreign_exchange_market#cite_note-1.
- [14] (2017, May 22). Retrieved from Thairath: <https://www.thairath.co.th/content/947752>.
- [15] Settlements, B. f. (2015). Foreign exchange turnover in April 2013: preliminary global results.
- [16] Chiu, J. (2018, Aug 10). Markets; Japan's Yen Bucks the Regional Trend. Retrieved from The Wall Street Journal: <https://www.wsj.com/articles/japans-yen-bucks-the-regional-trend-1533878824>.
- [17] (2018, Aug 13). Retrieved from CompareRemit: <https://www.compareremit.com/money-transfer-guide/key-factors-affecting-currency-exchange-rates/>.
- [18] (2018, Aug 13). Retrieved from Business Dictionary: <http://www.businessdictionary.com/definition/subprime-crisis.html>.
- [19] (2018, Jul 11). Retrieved from The Economist: <https://www.economist.com/news/2018/07/11/the-big-mac-index>.
- [20] Law of one price theory by Investopedia. (2018, Aug 23). Retrieved from Investopedia: <https://www.investopedia.com/terms/l/law-one-price.asp>.
- [21] Faculty of Economics MJU. (2018, 09 14). Retrieved from Meajo University: <http://www.econ.mju.ac.th/>.
- [22] LEMKE, T. (2018, Apr 30). What you need to know about interest rates and currency exchange rates. Retrieved from The Balance: <https://www.thebalance.com/what-is-interest-rate-parity-4164249>.
- [23] Jan, I. (2018, Jan 22). Interest Rate Parity. Retrieved from xplained: <https://xplained.com/301933/interest-rate-parity>.
- [24] (2018, Sep 15). Retrieved from Cambridge.dictionaries: <https://dictionary.cambridge.org/dictionary/english/arbitrage>.
- [25] (2018, Sep 15). Retrieved from Businessdictionary: <http://www.businessdictionary.com/definition/hedging.html>.
- [26] 1997 Asian financial crisis. (2018, Sep 15). Retrieved from Wikipedia: https://en.wikipedia.org/wiki/1997_Asian_financial_crisis#cite_note-1.
- [27] (2018, Sep 15). Retrieved from Bank of Thailand: <https://www.bot.or.th/Thai/FinancialMarkets/ForeignExchangeMarket/Pages/default.aspx>.
- [28] TWIN, A. (2018, Aug 10). 6 factors that influence exchange rates. Retrieved from Investopedia: <https://www.investopedia.com/trading/factors-influence-exchange-rates/>.
- [29] Parveen, S., Khan, A. Q., & Ismail, M. (2012). ANALYSIS OF THE FACTORS AFFECTING EXCHANGE RATE VARIABILITY IN PAKISTAN. Academic Research International. Retrieved from https://www.researchgate.net/publication/319701268_Analysis_of_the_Factors_Affecting_Exchange_Rate_Variability_in_Pakistan.
- [30] CNN, T. Y. (2018, Aug 08). What is bitcoin? Retrieved from <https://money.cnn.com/infographic/technology/what-is-bitcoin/index.html>.
- [31] (2019, Jun 13). Retrieved from Focus Economics: <https://www.focus-economics.com/economic-indicator/policy-interest-rate>.
- [32] Kenton, W. (2019, Feb 11). Retrieved from Investopedia: <https://www.investopedia.com/terms/b/bop.asp>.
- [33] Folger, J. (2019, Feb 06). Retrieved from Investopedia: <https://www.investopedia.com/ask/answers/12/inflation-interest-rate-relationship.asp>.
- [34] (2019, Dec 11). Retrieved from Royal Thai Embassy, Beijing: <https://thaiembbeij.org/th/republic-of-china/thai-relations-china/>.
- [35] (2018, Jul). Retrieved from ThaiBizChina: <https://thaibizchina.com/figure-publication/thai-chinese/thai-chinese-trade-statistics/>.
- [36] (2019, Dec 11). Retrieved from Embassy of Japan in Thailand: <https://www.th.emb-japan.go.jp/th/relation/index.htm>.
- [37] (2017, Feb). Retrieved from Department of International Trade Promotion of Thailand (Japan office): https://www.ditp.go.th/contents_attach/162768/162768.pdf.
- [38] (2017, Sep 13). Retrieved from Thansettakij: <https://www.thansettakij.com/content/207209>.
- [39] (2019, Dec 11). Retrieved from Royal Thai Embassy, Washington D.C.: <https://thaiembdc.org/history-of-relations/>.
- [40] (2019, 12 11). Retrieved from Office of the United States Trade Representative: <https://ustr.gov/countries-regions/south-east-asia-pacific/thailand>.
- [41] (2019). Retrieved from China Daily HK: <https://www.chinadailyhk.com/articles/30/29/54/1494830096596.html>.
- [42] (2019, Dec 12). Retrieved from Mises Wiki: https://wiki.mises.org/wiki/Crisis_of_1772.
- [43] Trader 4.0. (2019, Jul 11). Retrieved from Medium.com: <https://medium.com/@Trader4.0/>.
- [44] Investerest. (2019, 12 12). Retrieved from ลงทุนศาสตร์ – Investerest: <http://www.investerest.co/economy/oil-crisis/>.
- [45] (2008, Jun 30). Retrieved from Thailand Industry: http://www.thailandindustry.com/indust_newweb/news_previeview.php?cid=3892.
- [46] Stock2Morrow. (2017, Jun 29). Retrieved from

Stock2Morrow: <https://www.stock2morrow.com/article-detail.php?id=1034>.

[47] Naipunguen. (2018, Jul 18). Retrieved from Aommoney: <https://aommoney.com/stories/mrpunngern/>.

[48] (2020, Feb 07). Retrieved from Santandertrade: <https://santandertrade.com/en/portal/establish-overseas/thailand>

[nd/foreign-investment](#).

[49] (2020, Feb 07). Retrieved from Thailand Borad of Investment: https://www.boi.go.th/index.php?page=thailand_rankings.

[50] Handley, H. (2017, Feb 17). Retrieved from <https://www.aseanbriefing.com/news/thailand-2017-changing-investment-landscape/>.