

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **A. Theoretical Framework**

##### **1. Rubber Price**

Rubber is an indispensable resource. It is required in the manufacturing of many industrial and consumer products, such as tires, gloves, elastics, and hoses to name just a few important applications.

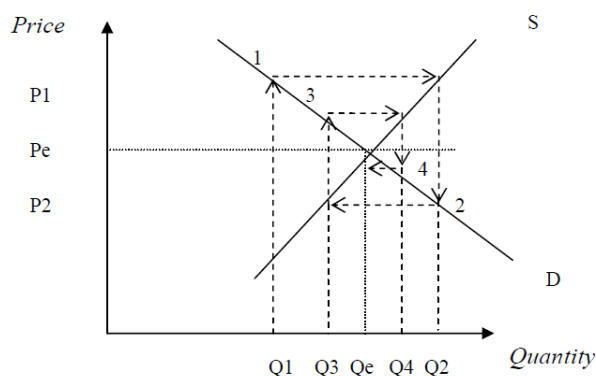
Rubber is a primary commodity. Rubber is a primary commodity. It is an agricultural commodity that is the raw material that is the basis of industrial production. Currently, most of the manufacturing countries are developing countries such as Thailand, Indonesia, Malaysia, etc., which will be produced and exported to industrial countries rather than manufacturing for domestic use, because of the inadequacy of natural rubber to produce finished products due to the need for advanced technology. It is necessary to import a lot of foreign technology.

According to Pisitsupakul (2016), she said that the factors determining the movement of the price of rubber in the country will be consistent with the economic situation. And it depends on the factors and actions, such as the underlying demand in the rubber stock. The

increase in rubber stocks both domestically and internationally is a negative impact on the price of rubber in Thailand. This is due to the demand for synthetic rubber which is a replacement for natural rubber. When the price of synthetic rubber is much higher. Synthetic rubber users are increasingly turning to natural rubber, resulting in higher prices for NR rubber. Part of this is due to supply fundamentals, due to production policy. The main producers are Thailand, Indonesia, and Malaysia. The purpose is to reduce the amount of natural rubber in the world market. To increase world rubber prices (Pisitsupakul, 2016).

**a. Cobweb Theory**

Prices of some goods, especially agricultural and livestock products show certain fluctuations from season to season. One of the reasons for the fluctuations is the price late reaction from the producer to the price (Boediono, Ekonomi Mikro, 1993).



Source: (Boediono, Ekonomi Mikro, 1993)

**Figure 2.1**  
**Cobweb Theory**

The figure 2.1 shows the graph of Cobweb Theory on demand conditions which is more elastic than supply. If in season 1 the number of harvests and offered to the market is  $Q_1$ . Because the harvest cannot be stored for too long, then the amount must be sold out during the season. With demand curve  $D$ , then the price that occurs in the market in season 1 is  $P_1$ .

Furthermore, at current prices the producers plan their production for the season 2 ( $P_1$  price is considered by the producer to remain in effect at season 2). On the basis of its curve, at a price as high as  $P_1$  the amount of production to be offered is  $Q_2$ . Assume the planned output can always be achieved appropriately. So in season 2 there will be an output of  $Q_2$  and this sum will be offered at the market price occurring in season 2 is  $P_2$  (the intersection between the  $D$  curve and the vertical line of  $Q_2$ ).

With the  $P_2$  price then the producers plan their production for season 3, and this means plotting output as much as  $Q_3$ . In season 3 the output of  $Q_3$  is harvested and everything is sold to the market. This will give rise to the  $P_3$  price level (intersection between the  $D$  curves) and make it the basis for the production plan of season 4, and so on. If this process continues to run then eventually the price will reach the equilibrium point that is  $P_e$ . This process is called the Cobweb process (Boediono, 1993).

According to Nuchra Rakkandi (2003) discuss the Cobweb Theory that studies the nature of pricing for the agricultural market, importance of agricultural price changes. Especially of rubber the nature of the cycle. So, shows the cyclical or unstable price movement, no direction, predict difficulties, and flexibility depends on supply and demand. In the production of agricultural products, Farmers will use current price as determinants or incentives to produce agricultural products. But because the production of goods takes time to season, it may take several month or years to produce. Therefore, the decision to produce most agricultural products will be in the higher price range. At some time, it will yield a lot, as result agricultural products are lower. And when the agricultural price drops, in this case the price will increase. This is because the price of agricultural products is changing according to the demand and supply in the market. The Cobweb theories are divided into 3 types such as Elasticity of demand over supply, and the elasticity of demand is less than supply and act (Rakkandi, 2003).

## **2. Export**

Export is the activity of selling and sending goods from the origin country to other countries. These activities can bring the flow of expenditure will be flowed into the enterprise sector. Furthermore, the aggregate expenditure will increase; this is because the export

activities of goods and services, and therefore the national income will also increase. If net exports in a positive state, the aggregate expenditure will also increase. Then this will increase the national income and employment (Sadono, 2013).

Exports are one of the components in aggregate spending on the open-economy. Aggregate expenditure in an open economy means that the household expenditure on domestic production, investment, government spending, spending on import goods and foreigners who spend the export goods. The aggregate expenditure can be expressed by this following formula:

$$AE = C_{dn} + I + G + (X-M)$$

Another theory that is used in the export is the basic theory of export. The basic theory is that the economic basis that is developing from the basis export becomes the city basis. From all of the theories, all are stressing on demand from external sides. On the city theory, there is a division which is its environment and external.

In export theory, it can be described as the autonomic factor. It means that export is a factor to increase the income and economic growth directly. To reach the high export level, then it needs the strategy to increase the appropriate export value and appropriate investment with the high technology to be implemented punctually (Rahardjo, 2013).

### **a. International Trade Theory**

International trade theories are simply different theories to explain international trade. Trade is the concept of exchanging goods and services between two people or entities. *International trade* is then the concept of this exchange between people or entities in two different countries (Dunung, 2012).

I begin a brief discussion of economic doctrines known as mercantilism that prevailed during the seventeenth and eighteenth centuries. I then go on to discuss the theory of absolute advantage, developed by Adam Smith. It remained, however, for David Ricardo, writing some 40 years after Smith, to truly explain the pattern of and the gains from trade with his law of comparative advantage. The law of comparative advantages is one of the most important laws of economics, with applicability to nations as well as to individuals and used for exposing many serious fallacies in apparently logical reasoning.

The Mercantilists believed that a nation could gain in international trade only at the expense of other nations. As a result, they advocated restrictions on imports, incentives for export, and strict government regulation of all economic activities.

According to Adam Smith, trade between two nations is based on absolute advantage. When one nation is more efficient than (or has an absolute advantage over) another in the production of one commodity but is less efficient than (or has an absolute disadvantage with respect to) the other nation in producing a second commodity, then both nations can gain by each specializing in the output with the other nation for the commodity or its absolute disadvantage. By this process, resources are utilized in the most efficient way and the output of both commodities will rise. This increase in the output of both commodities measures the gains from specialization in production available to be divided between the two nations through trade. (Salvatore D.)

According to David Ricardo introduced the law of comparative advantage. This postulates that even if one nation is less efficient than the other nation in the production of both commodities, there is still a basis for mutually beneficial trade (as long as the absolute disadvantage that the first nation has with respect to the commodities). The less efficient nation should specialize in the production and export of the commodity in which its absolute disadvantage is smaller. (This is the commodity of its comparative advantage.) Ricardo, however, explained the law of comparative advantage in terms of the labor theory of value, which is unacceptable.

According to Gottfried Haberler came to the “rescue” by explaining the law of comparative advantage in terms of the opportunity cost theory. This states that the cost of a commodity is the amount of a second commodity that must be given up to release just enough resources to produce one additional unit of the first commodity. The opportunity cost of a commodity is equal to the relative price of that commodity and is given by the (absolute) slope of the production possibility frontier. A straight-line production possibility frontier reflects constant opportunity cost.

### **3. Exchange Rate**

Exchange rates are the amount of one currency you can exchange for another (Amadeo, 2017). According to Gary R. Evans, *exchange rates* define the rate or ratio of which one of these currencies can be exchanged for any other at any given point in time (Evans, 2014).

**a.** According to the book from Mankiw (2007), he distinguishes the exchange rate by two types, namely;

- Nominal exchange rate defines as the respective price of domestic currency against the foreign country, or commonly known as the exchange rate.
- Real exchange rate defines as the respective price of domestic goods comparing to foreign goods.



**b.** According to the book from Dominick Salvatore, he examines the purchasing-power parity (PPP) theory and evaluates its usefulness in explaining exchange rates. The purchasing-power parity (PPP) theory was elaborated and brought back into use by the Swedish economist Gustav Cassel in order to estimate the equilibrium exchange rates at which nations could return to the gold standard after the disruption of international trade and the large changes in relative commodity prices in the various nations caused by World War I. There is an absolute and a relative version of the PPP theory; These will be examined in turn.

- Absolute Purchasing-Power Parity Theory postulates that the exchange rate between two currencies is equal to the ratio of the price level in the two countries. Specifically:

$$R = \frac{P}{P^*}$$

When  $R$  is the exchange rate or spot rate and  $P$  and  $P^*$  are, respectively, the general price level in the home nation and in the foreign nation. So that a given commodity has the same price in both countries when expressed in terms of the same currency (the law of one price).

- Relative Purchasing-Power parity Theory, postulates that the change in the exchange rate over a period of

time should be proportional to the relative change in the price levels in the two nations over the same time period. Specifically, if we let the subscript 0 refer to the base period and subscript 1 to a subsequent period, the relative PPP theory postulates that

$$R_1 = \frac{P_1/P_0}{P^*_1/P^*_0} \cdot R_0$$

Where  $R_1$  and  $R_0$  are respectively, the exchange rates in period 1 and in the base period. (Salvatore D.)

#### **4. Production**

Production refers to the process of changing production factors into outputs. From the definition of production, it can be seen that the inputs referred to our land, capital, labor, and entrepreneurs. It also refers to all raw materials and intermediate goods that enter into the process of production. The output is not only the final product that can be consumed but also includes Intermediate Products the Intermediate Product will have to go through the production process again to get the final product. And the output also means services such as transportation, storage of goods to eat every.

A factor of production is an economic term that describes the inputs that are used in the production of goods or services in order to make an economic profit. The factors of production include land,

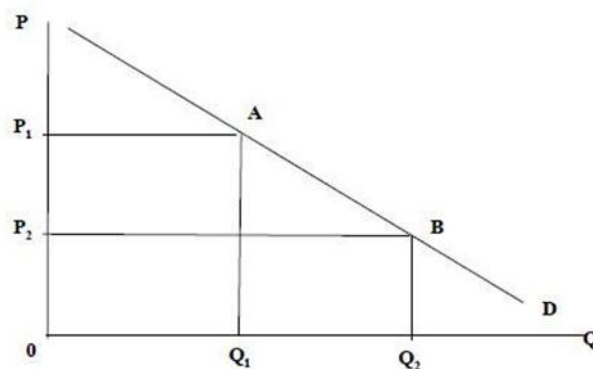
labor, capital, and entrepreneurship. These production factors are also known as management, machines, materials and labor, and knowledge has recently been talked about as a potential new factor of production. (Invertopedia, n.d.)

### a. Demand Supply and Equilibrium Theory

Demand and supply are related to rubber prices. Changes in demand, supply and equilibrium can cause price volatility of rubber.

#### 1) Demand Theory

Demand is need for goods or services of consumers at any one time. Consumers have the power to buy and meet that need. The types of demand are effective demand, potential demand, direct demand, derived demand, individual demand, market demand, and firm demand. Each type of demand is different, depending on the consumer.



**Figure 2.2**

**Demand curve**

Demand is a rule that discusses the relationship between price levels and demand levels that must be correlated in the opposite direction, ie, if the price level rises. As a result, the demand for goods and services is reduced, called the Law of Demand. Demand will be determined by factors such as Direct Determinant and Indirect Determinant.

a) Direct Determinant included the price level of that product in the market (Price:  $P_x$ ) when the price of goods and services rise. The purchase of goods and services is reduced. And if the price of goods and services decreased. The purchase of goods and services will increase.

b) Indirect Determinant included:

- Income, When the consumer's income changes, the volume of purchases of goods and services will change. This may be possible in two cases:

Case 1: Normal Goods and Luxury Goods. That is, if revenue increases, the volume of purchases of goods and services will increase, so the relationship between revenue and purchase volume and the estimated in the same direction.

Case 2: Inferior Goods. That is, if revenue increases, the volume of purchases of goods and services

will decrease. And if revenue decreases, the volume of purchases of goods and services will increase, so the relationship of income and quantity of purchases of goods and services is in the opposite direction.

- Changing in Price of the Related Goods, the relationship between price and volume of purchase of goods and services can be considered in two cases:

Case 1: Substitute Products. When the price of a substitute product changes This will result in the same amount of purchases of goods and services in the same direction, although the price level of the original products and services will not change.

Case 2: Complement. When the price of a replacement product changes, the volume of purchases of goods and services will be in the opposite direction, even if the price level of the original product or service is not changed.

- Income Distribution between House Hold, in each country, there is a great disparity of income because some of the population in the country are very high income and very low income, so the behaviour of purchasing goods and services is completely different. And some services for

those who have high incomes will increase and some purchases of goods and services for low-income people will decrease.

- Population Size, As the population grows, demand for goods and services increases, and these populations have the power to buy.
- Taste, the amount of purchases and services and tastes are related in the same direction. If the product is very popular, the demand will increase.
- Seasonal, purchases of goods and services can be attributed to seasonal changes.

These determinants of demand can be written as a mathematical equation called demand functions that express the relationship between the determinants of demand and demand for goods and services.

$$Q_x^d = f(P_x)$$

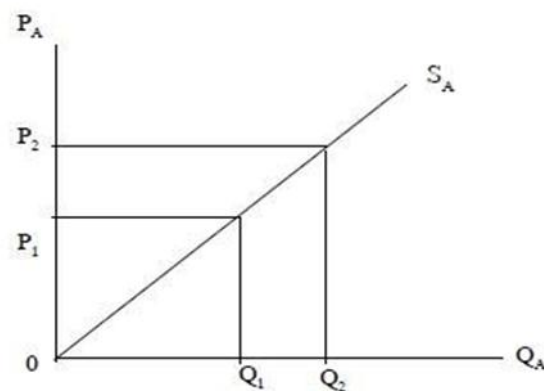
And from that determinant, it can be written as a demand function.

$$Q_x^d = f(P_x, I, P_y, D_i, P_z, T, S)$$

From the above equation, it can be assumed that the quantity of purchase of goods and services depends on the price, Product of average income level of consumers, Prices of related products and services, Income distribution of households, Size of the population, tastes and seasons.

## 2) Supply Theory

Supply is the quantity demanded to sell at one price level over a certain period of time. Supply has rules that deal with price levels and the quantity of products and services that need to be related in the same direction: if the price level rises, the volume of goods and services is increased. It's called the law of supply.



**Figure 2.3**

### **Supply curve**

The supply function equation shows the relationship between the demand for product and service offering and the determinant of the demand quantity.

$$SA = f(PA)$$

The deterministic factor can be written as a demand function.

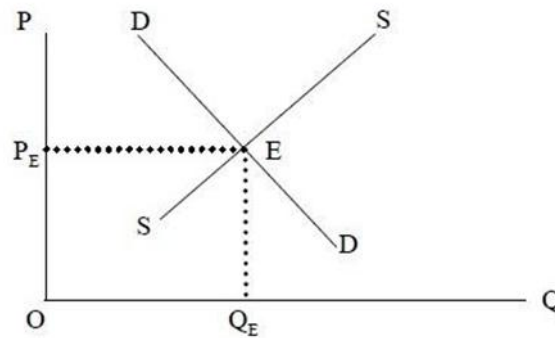
$$SA = f(PA, PB, C, T, W)$$

Based on the above equation, the demand for product and service offerings depends on Product price, factor Cost of production, technology and other relevant factors.

### 3) **Equilibrium Theory**

Equilibrium is the point at which buyers and sellers agree to trade at the same price and quantity without change is called the equilibrium, which is the intersection of supply and demand. And the price that buyers and sellers are willing to trade is called equilibrium and equilibrium prices and equilibrium prices at the price level agreed between buyers and sellers, and the quantity offered is equal to the quantity offered for sale, called market equilibrium.

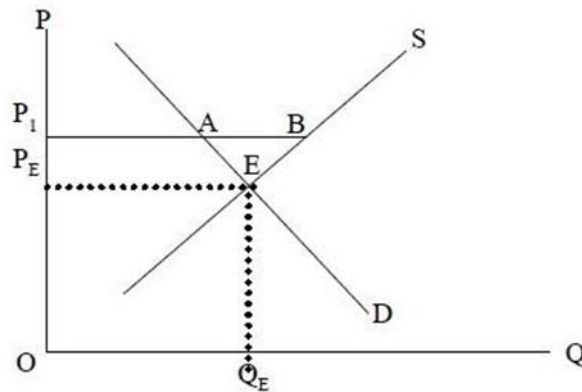




**Figure 2.4**

**Market Equilibrium curve**

The point at which buyers and sellers agree to trade at the same price and quantity without change is called the equilibrium, which is the intersection of demand and supply lines, and the price at which buyers and sellers are willing to trade is called equilibrium price (OPE). And the volume of goods at the level that the offer volume is equal to the offer volume is the equilibrium (OQE). In some cases, there is no difference in the quantity offered for sale and offering. That is, the price level is higher than the equilibrium price.

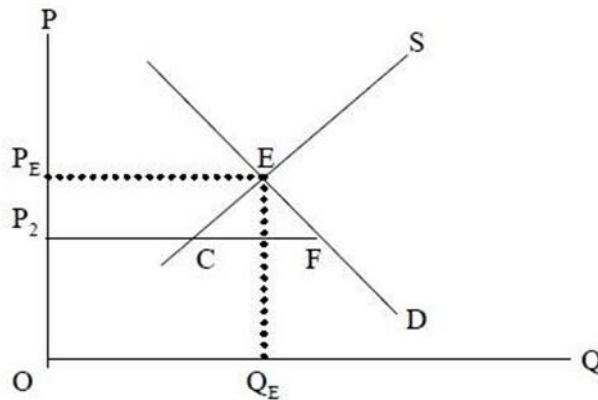


**Figure 2.5**

**Excess Supply curve**

At the price level ( $OP_1$ ), the quantity offered ( $P_1A$ ) and the quantity offered ( $P_1B$ ). The demand for sales is more than the demand for purchase as  $AB$ . So,  $AB$  is the amount of residual goods sold, also known as excess supply. If prices are allowed to work fully when excess supply is reached, some producers will be forced to lower prices. This makes some consumers decide to buy more. Excess supply will be reduced, respectively, until the excess supply is lost. The quantity offered is equal to the quantity offered or in equilibrium.

In some cases, if the quantity offered for sale and offering is not the same, the price level is below the equilibrium price.



**Figure 2.6**

**Excess Demand curve**

At the price level ( $OP_2$ ), the quantity of offer purchase ( $P_2F$ ) and the quantity of offer sale ( $P_2C$ ). Demand for purchase is more than the demand for sale  $CF$ . So,  $CF$  is excess demand. when demand exceeds demand, some consumers are willing to buy at higher prices, and some sellers are willing to sell more because of higher prices. As a result, the demand for excess surged and fell into equilibrium.

**B. Literature Review**

Study about the rubber price (the price of Thailand) research had been conducted by some other research in each country. Each research comes with different analysis tools and results. Here are some researches on Rubber price in several countries:

No.	Name/Title	Analysis Tool	Research output	Similarity/Difference
1.	(Thamma-Apiroam, 2010). on The Determinants of Ribbed Smoked Rubber Sheet No. (Thamma-Apiroam, 2010) <sup>3</sup> Price Volatility in The Agricultural Futures Exchange of Thailand.	Used secondary data, EGARCH (1, 1) model, and Multiple Regression Model.	The objective of this research aims to examine the determinants of RSS3 price volatility in AFET. By the result of multiple regression models show that there is the positive relationship between RSS3 price volatility in AFET and trending volume, RSS3 price volatility in the Songkhla Central Rubber Market, Bath per U.S. Dollar exchange rate volatility and RSS3 price volatility in TOCOM. For the results of EGARCH (1,1) model show that there is the positive relationship only trading volume and time to expiration. For negative relationship is found in open interest and negative shock influences on higher price volatility.	The similarity of them are they have same exchange rate thai bath to Us dollar , used secondary data, and used Multiple regression model. The difference of them are the used EGARCH(1, 1) model.
2.	(Kittichtipan , 2014). on “factors affect on para rubber prices in Thailand”	Used secondary data, Multiple Linear Regression Analysis by the Stepwise Regression Producedur	In this thesis objective is to study the factors that effect to the three categories of Para rubber in Thailand, i.e., Latex, sheet rubber and Ribbed smoked sheet 3. That result of this research are the factor analysis by Orthogonal Method via Varimax,	The similarities of them are they have same secondary data, and used Multiple regression models. The differences of them are they

		<p>e, the Factor Analysis with Principle Component Analysis, and Orthogonal Rotation by Varimax to reduce the number of independent variables, to remove multicollinearity problem.</p>	<p>the six related factors are determined. Such six factors elucidate the variance of the 27 independent variable by 89.129%. Then the Multiple Regression Analysis by stepwise regression procedure is used to find out for the relationship model between the 3 categories of Para rubber price and independent variables. The above regression equation can explain approximately the change in the 3 kinds of the Para rubber prices by 89.6%, 91.5% and 92.3%</p>	<p>have three dependent variable and Factor Analysis with Principle Component Analysis, and Orthogonal Rotation by Varimax to reduce the number of independent variables.</p>
3.	<p>(Aongkasin) on “Affected Rubber Price Decline and Quality of Life Change of People”.</p>	<p>Used Qualitative Research, Content Analysis and Descriptive Analysis.</p>	<p>The result of this study found that the affects of rubber prices decline. The people in Chaiya district, Surat Thani Province have suffered difficulties of daily life more and more. As a result, quality of life and body health, quality of life and state of mind, quality of life and social relationships, and quality of life with environmental are decline</p>	<p>The similarities of them are they have same rubber price variable. The differences of them are they used qualitative research, and content analysis.</p>
4.	<p>(Kongsawatkeat, 2013) on “Economic policies affecting the price reporting</p>	<p>Used secondary data, and Multiple Regression Analysis.</p>	<p>In this thesis the conclusions at least 1 factor influencing the variables include MPI, IR and the FOB’s price of Ribbed Smoked Sheets No.3 was related to the price of Ribbed</p>	<p>The similarity of them are they have same exchange rate Thai bath to Us dollar , used</p>

	system in the agricultural futures exchange of Thailand case study: Ribbed smoked sheets No.3”.		Smoked Sheet No.3 in Agricultural Futures Exchange of Thailand in Positive direction while the TOCOM’s price of Ribbed Smoked Sheets No.3 was in negative direction significantly. The other 4 independent variables: GDP, IR, Exchange rate and NYMEX were not significant in affecting the price of Ribbed Smoked Sheets No.3 in the Agricultural Futures Exchange of Thailand (AFET) as the hypothesis set.	secondary data, and used Multiple regression model. The difference of them are the dependent variables(RS S3) and independent variables are GDP, Inflation rate, Interest rate, NYMEX, the FOB’s price of Ribbed Smoked Sheets No.3, the TOCOM’s price of Ribbed Smoked Sheets No.3, and MPI.
5.	(Lina fatayati Syarifa, 2016) on “ Low Rubber Price Impact on Socio Economic Condition of Rubber Smallholders in South Sumatera”.	Survey method by taking samples of farmers, used primary data, and secondary data.	The result of this thesis showed that low rubber prices had given impacts to the decrease of farmers’ income per month, the decrease of investment by farmers, the decrease of farmers’ purchasing power, as well as the changes of income source of farmers. Moreover, there had been changes of land use from rubber farming to other crops. Therefore, it was needed some effort to be able to survive in low rubber prices	The similarity of them is they have same rubber price. The differences of them are they used primary data, survey method. And the resource of data from Indonesia.

			conditions.	
6.	(Chetadavisut, 2007) on The Impact on the Natural Rubber Price in Thailand.	Used the secondary data and Wilcoxon Signed-rank test model	In this research indicate that the independent variables are the price fluctuation and the fluctuation of rubber ribbed smoked sheet no.(RSS3). And dependent variable is the price rubber ribbed smoked sheet no.3. The study indicate that the price fluctuation and the fluctuation of rubber ribbed smoked sheet no.3 (RSS3) before opening the market and after opening the market in forward doesn't significant. And the forward price of RSS3 and the daily price of RSS3 at FOB Bangkok have had a direct relationship at the significant level.	The similarity of them is they have same used secondary data. The differences of them are they used Wilcoxon Signed-rank test, different independent and dependent variables.
7.	(Thamteang, 2008) on An analysis of the price of Thai Rubber in View of the World Oil Crisis.	Used the secondary data and analysis using regression model.	In this research including the independent variables are the world price of crude oil and synthenic consumption in the world. And the dependent variable is the FOB's price of Ribbed Smoked Sheets No.3. This research indicate that the rubber price have relationship in the same direction with world price of crude oil. And the fluctuation of crude oil	The similarity of them is they have same used secondary data, and using regression model. The difference of them are they independent and dependent variables.

			is a important factor in determinant of rubber price in Thailand.	
8.	(Mulyana, 2016) on “Determinant Analysis for Rubber Export in Indonesia”.	The data for this study was obtained from secondary sources using time series data.	This research indicates that a significant relation between production level, exchange rate and export quantity in the lag time. Indonesia earned substantial foreign exchange from crumb rubber exports. However, major fluctuation in the export earning has raised concern about the country’s future growth potentials and self sustainability.	The similarities of them are they have same independent variables, exchange rate, production, and export. The differences of them are they used time series data and the resource of data from Indonesia.
9.	(M.kannan, 2013) on “The Determinants of Production and Export of Natural Rubber in India”.	The data for this study was obtained from secondary sources using time series data.	This research aim to assess the determinant for rubber export in Indonesia. This research indicates that a significant relation between production level, exchange rate and export quantity in the lag time. Indonesia earned substantial foreign exchange from crumb rubber exports. However, major fluctuation in the export earning has raised concern about the country’s future growth potentials and self sustainability.	The similarity of them are they have same independent variables, exchange rate, production, and export. The difference of them are they used time series data and the resource of data from Indonesia.



10.	(Padungseri wi, 2010) On Factors affecting rubber export volume in Thailand.	Used secondary data, using multiple regression analysis, and OLS method.	The research aims to study the factors affecting rubber export volume in Thailand for period January 2000 – December 2009. The factors that led to the study were export prices of Thailand, The exchange rate Thai bath to US dollar, The rubber crop production index, Interest rates on loans to farmers. The result of this research, The factors that affect the export of rubber in Thailand is the rubber crop production index. Relationship in the same direction and meet the hypothesis.	The similarity of them are they have same independent variables (exchange rate thai bath to US dollar, The rubber crop production index), used secondary data, used Multiple regression analysis, and OLS methode. The difference of them are the dependent variables.
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### C. Hypothesis

Based on the theory and previous research, this temporary hypothesis should be tested to find the truths, which are:

- 1) Export of rubber has a negative effect on Rubber price (the price of Thailand) in the period of study.
- 2) Exchange rate Thai bath to US dollar has a negative effect on Rubber price (the price of Thailand) in the period of study.
- 3) Rubber Production has a negative effect on Rubber price (the price of Thailand) in the period of study.

#### D. Research Framework

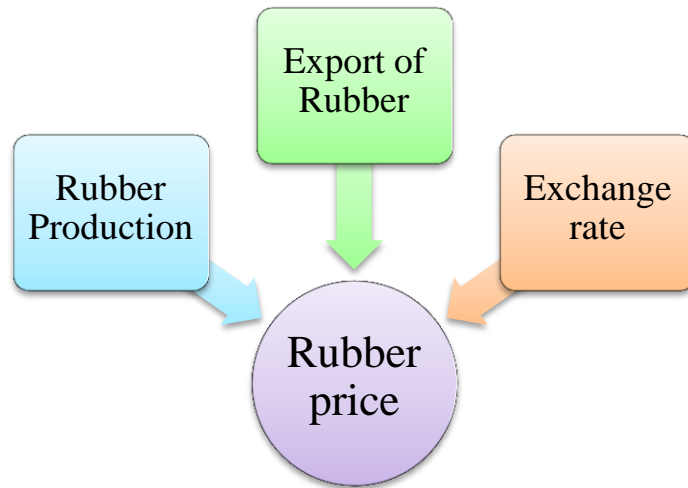


Figure 2.7

Research Framework