THE CORRELATION BETWEEN FOREIGN EXCHANGE RATES AND BEARING EXPORT VALUE OF PT. SKF INDONESIA

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DECLARATION OF ORIGINALITY

I declare this thesis, entitled “The Correlation between Foreign Exchange Rates and Bearing Export Value of PT. SKF Indonesia” is, to the best of my knowledge and belief, an original piece of work that has not been submitted, either in whole or in part, to another university to obtain a degree.

Cikarang, Indonesia, 31 August 2010

Neysa Mesiana Oroh
ABSTRACT

There are several indicators to measure company condition which does international trade, and one of them is by seeing export value and fluctuation of foreign exchange rates. Export value is normally related to the company’s performance which does international trade. When the performance of company is good, the company sales will upward of the target issued by the company. However, if the company performance is not good, the company sales will downward of the target. The fluctuation of foreign exchange rates is one important thing that can affect company performance especially the company that is doing international trade.

The objective of this research is to find out whether there is a significant correlation between foreign exchange rates and bearing export value of PT. SKF Indonesia within period January 2008 – June 2010. Samples are acquired from reliable sources using internet. To have a perfect research, the writer used quantitative research methodology which was analyzed by using simple linear regression analysis with SPSS as the calculation software. In this research, the writer used secondary data to gather all the necessary result of this analysis.

The result explains that there is a medium correlation between foreign exchange rates and bearing export value of PT. SKF Indonesia. From the result of this analysis, the correlation between foreign exchange and bearing export value of PT. SKF Indonesia is (-0.403). From this analysis, PT. SKF Indonesia will know that there is medium correlation between foreign exchange rates and bearing export value at PT. SKF Indonesia. And also it is recommended to pay attention to other factors other than fluctuation of foreign exchange rates so that they can take preventive action to keep bearing export value increasing.
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I. INTRODUCTION

1.1. Background of Study

Over many years, it could be seen that many countries have progressively opened their economy to international trade, either through the multilateral trading system, increasing regional cooperation or as part of outward-oriented domestic reform programs. The system with the third world being merely the exporter of raw materials and the importers of manufacturers have been going beyond. International trade nowadays backed by the Internet has created the efficiency for raising standards and conditions of living. It has enabled all nations to produce on a higher efficiency scale. It has helped increase productivity. It has allowed the instant spread of knowledge and ideas so that the range of choices available to consumers has expanded continuously. Some people would dispute that international trade has been a major driver of global economic growth since the end of the Second World War. Trade expansion boosted post-war economic recovery in the leading economies of today. (http://www.bis.org/review/r090626d.pdf)

International trade is a crucial role of globalization. The nation that did not do international trade, would limit them in doing business. The international trade itself is divided into 2 parts, which are export and import. Import means transaction of brings products and services into a country from abroad. Export is about transaction of selling the product and services to another country.

Indonesia as developing country convinced that export as a pioneer of economic growth. The correlation of export and economic growth become an economic issue for recent time. After the monetary crisis in 1998, the Indonesia’s economic condition is showing a slow but significant change to the better level. It can be seen from the stable price of daily needs in the market that shows the stability of
the inflation rate in Indonesia. Besides, the value of Rupiah against US Dollar in exchange rate also becomes stable. It shows the development of Indonesia’s economic condition.

The currencies of most industrialized countries are today freely convertible to one another, at a ratio subject to daily fluctuations. This ratio, the number of units of the currency that is exchangeable for a unit of another, is known as the exchange rate. The fact that every exchange rate has a corresponding inverse is frequently a source of confusion. Consequently, a statement that the exchange rate has gone up or down requires further clarification, because it is meaning depends on how the exchange rate is defined. To avoid confusion, one can use such phraseology as “the exchange value of the dollar went up or down in terms of other currencies. (Kreinin, 2006)

PT. SKF Indonesia supports the local market and international market to supply industrial bearings for automotive. SKF group reach 1st rank company that supply bearing in the world so that PT. SKF Indonesia also has to maintain that reputation in this sector business. PT. SKF Indonesia is an exporter of bearing for automotive industry to many countries such as India, Malaysia, Singapore, Asia Pacific, and many more. (www SKF.co.id)

In this trade, PT. SKF Indonesia and PT. SKF in export’s destination country already decided about payment transaction based on the agreement of both company. U.S. Dollar is called as a vehicle currency because it is often used to accomplish trading between foreign currencies. This international trade is not going to use Indonesian Rupiah but U.S. Dollar. Exchange rate is one of the economic indicators that can be affecting the amount of export value. An exchange rate measures the value of one currency of another currency. In this case, if the Indonesian Rupiah depreciates against the U.S. Dollar, it means that the U.S. Dollar is strengthening relative to the Indonesian Rupiah, called as appreciation. A decline in a currency’s value can be called depreciation.
The strengthening or weakening of an exchange rate can be affected of export value. When Rupiah depreciates against dollar, the export value will increase. But if Rupiah is strengthening against U.S. Dollar, the export value will decrease. In this research, the writer finds that the strengthening of Rupiah against U.S. Dollar decreases the bearing export value but there was not always decreasing of export value. In fact on March 2008, Rupiah was weakening against U.S. Dollar as much as IDR 166 from previous month and the bearing export value itself was decreased as much 23632 pieces. But in July 2008, there was strengthening Rupiah against U.S. Dollar as much as IDR 107, and the export value was significant decreasing about 184291 pieces.

Here the writer wants to analyze whether there is correlation between the foreign exchange rates and bearing export value of PT. SKF Indonesia. Therefore, the writer would like to write a thesis with title: “THE CORRELATION BETWEEN FOREIGN EXCHANGE RATES AND BEARING EXPORT VALUE OF PT. SKF INDONESIA.”

1.2. Company Profile

SKF GROUP
SKF Group is the leading global supplier of products, solutions and services within rolling bearings, seals, mechatronics, services and lubrication systems. Services include technical support, maintenance services, condition monitoring and training.

The SKF Group
SKF was founded in 1907, and grew at a rapid rate to become a global company. As early as 1920, the company was well established in Europe, America, Australia, Asia and Africa. Today, SKF is represented in more than 130 countries. The company has more than 100 manufacturing sites and also sales companies supported by about 15,000 distributor locations. SKF also has a widely used e-business marketplace and an efficient global distribution system.
Research and development

Technical development, quality and marketing have been in focus at SKF since the very start. The Group's efforts in research and development have resulted in numerous innovations, forming bases for new standards, products and solutions in the bearing world. In 2008, the number of first filings of patent applications was 179.

Five technology platforms

SKF groups its technologies in five platforms: Bearings and units, Seals, Mechatronics, Services, and Lubrication Systems. By utilizing capabilities of all or some of the platforms, SKF develops tailor-made offers for each customer segment, helps customers improve performance, reduces energy use and lowers total costs, while bringing increased added value and higher price quality to SKF.

SKF IN INDONESIA

In Indonesia, SKF started the business in Surabaya, by 1928 through a Distributor and the main business activity was to support the local market to supply Industrial Bearings. SKF Indonesia has two business entities. First one is PT SKF Indonesia that is under Electrical Divisions, located in Cakung, Jakarta Timur. This entity covers manufacturing, sales and service for Two Wheeler OEM and after market. Other one is PT SKEFINDO PRIMATAMA, which is under Service Division, located in Sudirman, Jakarta. This entity covers Industrial Bearings, Maintenance Products, Condition Monitoring Products and services.

1.2.1. PT SKEFINDO PRIMATAMA

Since 1987, PT Skefindo Primatama has represented SKF in Indonesia. The company is responsible for providing customer-focused solutions to Indonesian manufacturing and process industries either directly or through its extensive network of independent distributors.
SKF technology is at work throughout the country in such diverse applications as giant steel and paper mills in large cement mills, in offshore oilrigs and in millions of motorbikes.

SKF’s specialized engineering knowledge of rotating machinery maintenance is helping customers in optimizing asset utilization and improving overall plant reliability.

SKF competence is applied in industrial facilities around Indonesia, providing everything from machine maintenance products and services to sophisticated online condition monitoring systems for critical machinery.

Our focus - at PT Skefindo Primatama - is to provide customers with solutions developed from our unequalled experience and knowledge-solutions, which ultimately make our customers more competitive and profitable.

1.2.2. PT SKF INDONESIA

PT SKF Indonesia, a wholly owned subsidiary of SKF AB, Sweden, was incorporated in 1997 with its registered and business office at Jl. Tipar-Inspeksi Cakung Drain, Cakung Barat, Jakarta Timur 13910, Indonesia.

SKF Indonesia is a company that consists of manufacture and business unit, dealing in ball bearings products, providing technical support and customer-focused solutions. With SKF technology, this company has been successfully meeting demands of the two-wheeler market, end-users and OEM segments throughout Indonesia. This is evident from the establishment of a strong network of distributors and dealers throughout Indonesia.

Our commitment - at PT SKF Indonesia - is to ensure that the quality of its products, services and support constantly meet customers’ requirements in accordance with SKF standards. The Company also gears itself towards
developing strong working partnership with its customers, and sustains an effective and efficient operation to maintain and enhance its high quality image.

SKF achieved the ISO 9001 certification since 1996 and upgraded to QS 9000 in 1999. Now, SKF had improved the quality system under ISO/TS 16949 certification, since March 2004. This is a part of our commitment to ensure our quality - The SKF quality.

Vision, Mission, and Values
Vision : To equip the world with SKF knowledge.
Mission : Being the preferred company:
   - For our customers, distributors and suppliers.
     Providing high valued and leading products, services, and engineering knowledge solutions in this industry.
   - For our employees.
     Creating satisfying working environment, where every effort is being appreciated, idea is being appraised, and personal right is being respected.
   - For our shareholders.
     Delivering value to shareholders through sustained revenue growth.
1.3. Problem Identified

The problems identified realized that there is a correlation between foreign exchange rates and bearing export value. Here, the bearing export value will be defined as the amount of bearing export that PT SKF Indonesia can supply to other country.
Based on the research, the writer found that there is the declining of bearing export value in PT. SKF Indonesia. Bearing export value was unstable from July 2008 – April 2009. There is the significant declining of export on July 2008, October – December 2008, and March - April 2009.

So, the writer decided to choose “The Correlation of between Foreign Exchange Rates and Bearing Export at PT SKF Indonesia period January 2008 – June 2010 for investigation” to figure out why the amount of bearing export was declining during July 2008 – April 2009.

1.4. Statement of Problem

In this study, writer provided answer for the problem stated below:

1. Is there a significant correlation between foreign exchange rates and bearing export value at PT SKF Indonesia?

2. How do foreign exchange rates and bearing export value at PT SKF Indonesia correlate each other?
1.5. **Research Objective**

The research objective based on the research will be covering about the correlation between foreign exchange rates and bearing export value of PT SKF Indonesia for period January 2008 – June 2010 using monthly data.

1.6. **Significance of Study**

In making this research, there are some significance that the writer hopes to meet for PT SKF Indonesia, academic community, and the writer.

1. **PT SKF Indonesia**
   - Based on the process of research, PT SKF Indonesia is capable to get the end result or explanation about if there is a correlation between foreign exchange rates and bearing export value.

2. **Academic community**
   - This can be a literature for the next researcher and an alternative for next batch as guidance in writing thesis, especially for international business major.

3. **Writer**
   - It is very important to the writer to complete the part of bachelor degree graduation requirement. By doing this thesis, the writer could also see whether there is correlation between foreign exchange rates and export value of PT SKF Indonesia or not.

1.7. **Theoretical Framework**

The writer would like to use this concept to analyze the correlation of foreign exchange rates and bearing export value.
From the figure above, the writer will analyze and focus on the foreign exchange rates as the factor that affect to export value. The writer wants to prove that foreign exchange rates and export value is correlating each other.

1.8. **Scope and Limitation**

This research will not analyze everything on economic growth indicator, but only foreign exchange rates. The area of research is limited only at PT SKF Indonesia.
1.8.1. Scope of the Study

This research is analyzed the correlation between foreign exchange rates and the export number of bearing value at PT SKF Indonesia. The writer only chose foreign exchange rates for factor of correlation in this research.

1.8.2. Limitation of the Study

This area of this research is limited only at PT SKF Indonesia. The writer would like to focus on the monthly bearing export value of PT SKF Indonesia from January 2008 – June 2010. It is because the export activity in PT SKF Indonesia started on January 2008 until present.

1.9. Assumption and Hypothesis

The hypothesis as a part of research itself is to describe about the problem statement and to conduct this research. The variables that will be analyzed, as dependent variable is PT SKF Indonesia’s Bearing Export Value year January 2008 – June 2010 and as independent variable is Foreign Exchange Rates year January 2008 – June 2010.

The hypothesis that writer intended to test is:

\[ H_0 \]: There is no significant correlation between Foreign Exchange Rates and The Export Number of Bearing at PT SKF Indonesia.

\[ H_1 \]: There is significant correlation between Foreign Exchange Rates and The Export Number of Bearing at PT SKF Indonesia.

If the level of significant is smaller than 0.05, the \( H_1 \) is accepted and if the significant level is bigger than 0.05, the \( H_1 \) is rejected.
## 1.10. Definition of Terms

- **International trade**: exchange of capital, goods, and services across international borders or territories.

- **Export**: the selling of products made in one’s own country for use or resale in other countries.

- **Foreign exchange**: the act of trading different nation’s moneys.

- **Exchange rate**: the price of one nation’s money in terms of another nation’s money.

- **Hypothesis**: with reference to statistical inference, a statement about one or more population

- **Dependent variable**: the element that measure in the experiment and what is affected during the experiment.

- **Independent variable**: the element used to predict the value of the dependent variable in a regression model.

- **r**: coefficient of correlation, measures the degree or strength of the linear relationship in a regression equation.

- **Coefficient of determination**: the coefficient of determination measures the percentage of variability in $Y$ that can be explained through knowledge of variable (differences) in the independent variable $X$.

- **Correlation analysis**: the analysis of the strength of the linear relationship between two data series.
II. LITERATURE REVIEW

2.1. International Trade

2.1.1. What is International Trade

International trade is trade between residents of two countries. The resident’s may be individuals, firms, non-for-profit organizations, or the firm’s organizations (Griffin, 2005). International trade allows manufacturers and distributors to seek out products, services, and components produced in foreign countries. Trade also enables firms to acquire resources that are not available at home. Besides providing consumers with a variety of goods and services, international trade increases incomes.

2.1.2. Absolute Advantage Theory

The Scottish economist Adam Smith developed the trade theory of absolute advantage in 1776. A country that has an absolute advantage produces greater output of a good or service than other countries using the same amount of resources. Smith stated that tariffs and quotas should not restrict international trade; it should be allowed to flow according to market forces. Contrary to mercantilism Smith argued that a country should concentrate on production of goods in which it holds an absolute advantage. No country would then need to produce all the goods it consumed. The theory of absolute advantage destroys the mercantilist idea that international trade is a zero-sum game. According to the absolute advantage theory, international trade is a positive-sum game, because there are gains for both countries to an exchange. Unlike mercantilism this theory measures the nation's wealth by the living standards of its people and not by gold and silver. (http://www.rulemic.com/absol.html)
2.2. Export

Based on Hubbard (2006), exports are goods and services produced domestically but sold to other country. Exports are critical to a country’s financial health and stimulate additional demand for products, thus generating income employee.

According to Daniels, Radebaugh, and Sullivan (2009), export refers to the sale of goods or services produced by a company based in one country to customers that reside in a different country.

Another definition of export is the selling of products made in one’s own country for use or resale in other countries. (Griffin, 2005)

2.2.1. Types of export

According to Daniels, Radebaugh, and Sullivan (2009), there are two types of export:

- Direct export
  Daniels, Radebaugh, and Sullivan (2009) explain goods and services sold to an independent intermediary outside of the exporter’s home country, which then sells the product in the export market to the final customer.

- Indirect export
  Daniels, Radebaugh, and Sullivan (2009) explain that indirect export is sold to an intermediary in the domestic market, which then sells the product in the export market to the final consumer.

2.3. Foreign Exchange

2.3.1. Foreign Exchange Rates

The activities of transaction within a country are financed by their own currency, an exchange rate is the price of one currency in terms of another which is used to convert value from one to another (Kreinin, 2006).
Many exchange rates diverge from day by day in response to change in supply and demand conditions in the foreign exchange markets. As we have seen in the several years ago about the international transaction activities require payment or the receipts in foreign currencies, and it could be input in the converted area to the domestic currency through the exchange rates, which themselves are subject to change, especially must be based on the domestic trade. (Radcliffe, 1997).

2.3.2. Exchange rate market

Were explained about foreign exchange market as the place where currencies are traded and the exchange rate are determined. London, New York, and Tokyo are the biggest market. Because when we have seen that the all transaction in market adds up to $1.5 trillion per day. (Kreinin, 2006)

The main reason for the establishment of foreign exchange market is to have a uniform rate for the currency listed in the market. Foreign exchange is very similar to stock market, but the differences is that, here in the foreign exchange the exchange takes place with respect to the currencies. Though foreign exchange fetches the good demand in the market, the currency prices also finds fluctuation in the market. With more number of customers and traders, foreign exchange serves the purpose for which it is established and offers better opportunity to come up with different and more number of foreign currencies as per their requirement. (www.articlebase.com) and (www.wikipedia.org)

a. Economic Condition: The condition of economic in a country that I can forecast for the next year economic activity in order to make a development country.

b. Monetary Policy: The regulation of the money supply and interest rates by a central bank, such as the federal reserves Board in the U.S., Bank of Indonesia, in order to control inflation and stabilize currency. Monetary policy is one the two government can impact the economy. By impacting the
effective cost of money, the Federal Reserve can affect the amount of money that is spent by consumers and business.

c. Fiscal Policy: is the use of government spending and revenue collection to influence the economy, fiscal policy can be contrasted with the other main type of economic policy, monetary policy, which attempts to stabilize the economy by controlling interest rates and the supply of money. The two main instruments of fiscal policy are government spending and taxation. Changes in the level and composition of taxation and government spending can impact on the following variables in the economy:

- Aggregate demand and the level of economic activity;
- The pattern of resource allocation;
- The distribution of income.

2.3.3. Foreign Exchange

An exchange rate between currencies varies continually and often sustainable, according to the Foreign Exchange is market where exchange of currencies takes place for another currency. Foreign exchange is the exchange activity takes place between currencies and provides liquidity and accessibility to the traders availing the service provided. Foreign exchange is referred as a market or network that provides service to the customers or traders all over the world. Foreign exchange is the market where exchange of currencies takes place for more and different number of foreign country.

Foreign exchange is nothing but buying and selling of foreign currencies in exchange of another. In the foreign exchange market, more of number of foreign currencies will be exchanged by the members ant other traders with fluctuations of market price. The rate of exchange fixed for the foreign currency varies as per the demand and fluctuation of foreign exchange market. Foreign currencies will be exchanged based on the requirement and demand for other foreign currency. The difference in the rate of foreign currencies will be made on the political,
economic factors and with reference to the stability of the market. (http://www.articlebase.com/)

2.3.4. Demand and Supply of Foreign Currencies

When the exchange value of currency is permitted by the government the freely on the foreign exchange markets (without any government intervention), it is know as a freely fluctuating or a floating exchange rate. (It is also sometimes referred to as a clean float.) In such a situation, market forces determine each exchange rate at the level that clears the market. A floating currency is said to appreciate when its exchange values increases and to depreciate when its exchanged value decreases. (Kreinin, 2006)

According to Baumol and Blinder (2006), a nation’s currency is said to appreciate when exchange rates change so that a unit of its currency can buy more units of foreign currency. Besides, a nation’s currency is said to depreciate when exchange rates change so that a unit of its currency can buy fewer units of foreign currency.

2.3.5. Exchange Rate System

According to Pugel (2007), there are some types of exchange rates system:

- Free Floating Exchange Rate
  The simplest system is the floating exchange rate system without intervention by governments or central bankers. The spot price of foreign currency is market-driven, determined by the interaction of private demand and supply for that currency. The market clears itself through the price mechanism. What makes the floating exchange rate rise or fall over time? To answer we need to know the forces that shift the supply and demand curves. Again, let’s focus on the demand curve. The demand curve is shifted by a variety of changes in the economy. In a floating-rate system, if for any reason the demand curve for foreign currency shifts to the right (representing increased demand for foreign money), and the supply curve
remains unchanged, then the exchange rate value of the foreign currency rises.

- **Managed Floating Exchange Rate**
  The value of the pound determined by market demand for and supply of the currency Central banks may try to iron out big changes in exchange rates on a day-to-day basis. Some currency market intervention might be considered as part of macro-economic demand management.

- **Fixed Exchange Rate**
  The other main foreign exchange regime is the fixed exchange rate system. Here, officials strive to keep the exchange rate virtually fixed (or pegged) even if the rate they choose differs from the current equilibrium rate. Their usual procedure under such a system is to declare a narrow “band” of exchange rates within which the rate is allowed to vary. If the exchange rate hits the top or bottom of the band, the officials must intervene.

Changes in exchange rates are given various names depending on the kind of exchange rate regime prevailing. Under the floating-rate-system a fall in the market price (the exchange rate value) of a currency is called a depreciation of that currency; a rise is an appreciation. We refer to a discrete official reduction in the otherwise fixed par value of a currency as a devaluation; revaluation is the antonym describing a discrete raising of the official par. Devaluations and revaluations are the main ways of changing exchange rates in a nearly fixed-rate system, a system where the rate is usually, but not always, fixed.

**2.3.6. The role of Central Banks**

Each country has a central bank responsible for the policies affecting the value of its currency, although countries with currency boards independent from the central bank use the currency board to control the value of the currency. For
example, the central bank in India is the Reserve Bank if India. Japan’s central bank is the Bank of Japan. In the European Union, the European Central Bank now coordinates the activities of each member country’s central bank to establish a coming monetary policy in Europe.

2.3.7. The Contemporary International Currency System

- Fluctuating Currencies
  Of the major currencies, the U.S. dollar, the euro, the British pound, the yen, and the Canadian and Australian dollars are allowed to float, with their exchange rates determined by demand-and-supply conditions.

Often the monetary authorities of each country intervene in the foreign exchange market in order to smooth out fluctuations, to maintain orderly conditions, or to prevent their currency’s exchange rate from moving upward or downward to a degree that they consider excessive or undesirable.

When an excess of inpayments over outpayments pushes up to exchange value of the currency by an amount the authorities consider excessive, the central bank sells its country’s currency in exchange for foreign currencies to moderate the rise. In doing so it increases its international reserves as well as its domestic money supply. As money supply raises, interest rates decline and the currency rise in money supply, it can offset that by selling government bonds on the open market, using sterilized foreign currency intervention. In effect the central bank buys foreign currencies in exchange for domestic bonds. Conversely, when, say, and outflow of capital pushes the exchange value of the currency downward, the central bank may moderate the decline by selling foreign currencies in exchange for the country’s currency. As a result, money supply declines, interest rates rise, and currency depreciation is moderated.
Floats subject to government intervention are known as managed or “dirty” floats, as distinguished from free or “clean” floats, which occur when no official intervention takes place. But even under heavily managed floats there is no official commitment to maintain fixed limits to the fluctuations. In sum, floats can be free or managed, and under a managed intervention can be sterilized (where the domestic money stock is shielded from intervention and held unchanged) or unsterilized. Most floating currencies are on a managed float regime with sterilized intervention.

- The Role of the U.S. Dollar
  Contemporary arrangements no longer peg the major currencies to the dollar as was the policy under Bretton Woods. As a result, the dollar is now a fluctuating currency as well. The system no longer requires a common denominator; hence neither the dollar nor any other asset performs that function. But the dollar still occupies a central role in the system, performing some functions carried over from the Bretton Woods era:

1. Although no longer a common denominator, the dollar retains a reference role for exchange rates, as countries measure their fluctuations in terms of the dollar.

2. The Dollar is the main intervention currency for currencies on a managed float regime. Central banks buy and sell dollars on their respective foreign exchange markets to influence their exchange rates. Most single-currency peggers peg their currencies to the dollar and fluctuate along with it. Only an asset or currency that is widely used in the private sector can serve as intervention currency for stabilizing the exchange rate, for only such a currency can be bought and sold by central banks on their respective foreign exchange markets.
3. The dollar is the main official reserve currency, as central banks require dollar reserves to intervene in their respective markets. To some extent this role is also played by the euro and the yen. The United States maintains its foreign currency reserves in Euros and yen.

4. The dollar is the main vehicle currency. A trader may not be able to convert Israeli Shekels to Norwegian crowns because there is hardly a market between these two currencies. But she can convert the shekels into dollars and the dollars to crown, as there is always an active market for dollars in each country.

5. Finally, the dollar is the main international transactions currency for the private sector. People and institutions the world over maintain dollar accounts in banks in their own countries, known as Eurodollar (not to be confused with Euros). International transactions that do not involve the United States are often billed and/or financed with dollars. Prices of international commodities, such as oil, use dollar quotation. And United Nations trade statistics are also reported in dollars. It is the existence of this vast private market for dollars in foreign countries that enables central banks to buy and sell dollars in their own markets to influence their exchange rates. In other words, it is this feature of the dollar that lets it functions as and intervention currency.

2.4. Demand Theory

According to Baumol and Blinder (2006), the quantity demanded is the number of units of a good that consumers are willing and afford to buy over a specified period of time. Different price will result in different quantity of demands. As the price of a product rises, the quantity demanded will normally falls. When the quantity demanded falls, the quantity demanded will normally rises. Other things are being equal or held constant. From the explanation, we can see that demands move the opposite towards the price.
When there is a change in an influencing factor other than price, there may be a shift in the demand curve to the left or to the right, as the quantity demanded increases or decreases at a given price. For example, if there is a positive news report about the product, the quantity demanded at each price may increase, as demonstrated by the demand curve shifting to the right:

![Figure 2.1. Demand Curve](http://en.wikipedia.org/wiki/Demand_curve)

2.5. **Bearing**

2.5.1. **What is bearing**

A bearing is a device to allow constrained relative motion between two or more parts, typically rotation or linear movement. Bearings may be classified broadly according to the motions they allow and according to their principle of operation as well as by the directions of applied loads they can handle.

(http://en.wikipedia.org/wiki/Bearing_(mechanical))
2.5.2. Bearing types

There are many different types of bearings:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Friction</th>
<th>Stiffness</th>
<th>Speed</th>
<th>Life</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plain bearing</strong></td>
<td>Rubbing surfaces, usually with lubricant; some bearings use pumped lubrication and behave similarly to fluid bearings.</td>
<td>Depends on materials and construction, PTFE has coefficient of friction (~0.05\text{-}0.35), depending upon fillers added</td>
<td>Good, provided wear is low, but some slack is normally present</td>
<td>Low to very high</td>
<td>Moderate (depends on lubrication)</td>
<td>Widely used, relatively high friction, suffers from stiction in some applications. Depending upon the application, lifetime can be higher or lower than rolling element bearings.</td>
</tr>
<tr>
<td><strong>Rolling element bearing</strong></td>
<td>Ball or rollers are used to prevent or minimize rubbing</td>
<td>Rolling coefficient of friction with steel can be (~0.005) (adding resistance due to seals, packed grease, preload and misalignment can increase friction to as much as 0.125)</td>
<td>Good, but some slack is usually present</td>
<td>Moderate to high (often requires cooling)</td>
<td>Moderate to high (depends on lubrication, often requires maintenance)</td>
<td>Used for higher moment loads than plain bearings with lower friction</td>
</tr>
<tr>
<td><strong>Jewel bearing</strong></td>
<td>Off-center bearing rolls in seating</td>
<td>Low</td>
<td>Low due to flexing</td>
<td>Low</td>
<td>Adequate (requires maintenance)</td>
<td>Mainly used in low-load, high precision work such as clocks. Jewel bearings may be very small.</td>
</tr>
<tr>
<td>Bearing Type</td>
<td>Description</td>
<td>Friction at Zero Speed</td>
<td>Friction at Low Speed</td>
<td>Maintenance</td>
<td>Range of Movement</td>
<td>Remarks</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>-----------------------</td>
<td>-------------</td>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Fluid Bearing</td>
<td>Fluid is forced between two faces and held in by edge seal.</td>
<td>Zero</td>
<td>Very high</td>
<td>Very high</td>
<td>Very high</td>
<td>Can fail quickly due to grit or dust or other contaminants. Maintenance free in continuous use. Can handle very large loads with low friction.</td>
</tr>
<tr>
<td>Magnetic Bearings</td>
<td>Faces of bearing are kept separate by magnets (electromagnets or eddy currents).</td>
<td>Zero</td>
<td>Low</td>
<td>No practical limit</td>
<td>Indefinite. Maintenance free.</td>
<td>Active magnetic bearings (AMB) need considerable power. Electrodynamic bearings (EDB) does not require external power.</td>
</tr>
</tbody>
</table>

*Stiffness is the amount that the gap varies when the load on the bearing changes, it is distinct from the friction of the bearing.*


2.5.3. SKF Bearing

About SKF Bearing

SKF Group is one of the leading global suppliers of products, solutions and services within rolling bearings, seals, mechatronics, services and lubrication.
systems. Services include technical support, maintenance services, condition monitoring and training.

The SKF Group
SKF was founded in 1907, and grew at a rapid rate to become a global company. As early as 1920, the company was well established in Europe, America, Australia, Asia and Africa. Today, SKF is represented in more than 130 countries. The company has more than 100 manufacturing sites and also sales companies supported by about 15,000 distributor locations. SKF also has a widely used e-business marketplace and an efficient global distribution system.

Types of bearings
One way to categorize bearings is by the type of rolling element they use. Using this method, there are five types of bearings:

- Ball bearings
- Cylindrical roller bearings
- Needle roller bearings
- Tapered roller bearings

- Spherical roller bearings

Figure 2.2 Bearing Types

source: http://www.skfbearingonline.com/about
III. METHODOLOGY

3.1. Research Method

Based on methodology, there are two types of research, which are qualitative research and quantitative research. Quantitative research is measurements that are recorded on a naturally occurring numerical scale (Mc Clave, et. al., 2008). Quantitative research is a research that uses numerical data or data that use numbers to prove or disapprove a hypothesis of a research.

In this research, the writer uses quantitative research. By this research the writer uses secondary data, it makes data easily to be converted into number and analyzed through mathematical expression in order to generate result from the research.

The element in quantitative analysis is variable. Render, Stair, and Hanna (2006) define variable as measurable quantity that may vary or is subject to change. There are two types of variable, which are dependent variable and independent variable. Dependent variable is the variable to be predicted. The value of this is said to be dependent upon the value of an independent variable, which is sometimes called explanatory variable.

Based on the topic of this research, which is “the correlation between foreign exchange rates and bearing export value of PT. SKF Indonesia”, the writer used monthly data for both variables. In this research the writer wants to find out the correlation between Foreign Exchange Rates and Bearing Export Value of PT. SKF Indonesia period January 2008 – June 2010. In this research, the writer uses foreign exchange rates as independent variable and bearing export value as dependent variable.
In order to understand the correlation between two variables, the writer uses coefficient approach to predict the correlation and regression analysis to support evaluating data. Regression analysis is used to find the equation that stand for the relationship between the variables itself. This research only uses one independent variable, so the writer uses simple linear regression model by SPSS 15.0 to support reliability data.

3.2. Research Framework

Figure 3.1 Research Framework

*Source: Constructed by the writer*
• Collecting the data
This step is about process of preparing and collecting all data. In this research, there are two data, which are foreign exchange rates period January 2008 – June 2010 and bearing export value of PT. SKF Indonesia period January 2008 – June 2010. The writer got bearing export value data from PT. SKF Indonesia and foreign exchange rates from Bank Indonesia (http://www.bi.go.id).

• Linier regressions analysis
This research is conducted simple linier regression to analyzed two variables. The formula of simple linier regression model will be symbolized in equation bellow.

\[ Y = \beta_0 + \beta_1 \chi + \varepsilon \]  
(3-1)

Where:
\[ Y \quad = \quad Bearing \; Export \; Value \; (dependent \; variable) \]
\[ \chi \quad = \quad Foreign \; Exchange \; Rate \; (independent \; variable) \]
\[ \beta_0 \quad = \quad Intercept \]
\[ \beta_1 \quad = \quad Slope \; of \; regression \; line \]
\[ \varepsilon \quad = \quad Random \; error \]

Regression analysis is used primarily for the purpose of predication. The goal in regression analysis is to develop a statistical model that can be used to predict the values or dependent or response variable based on values of at least one explanatory or independent variable (Render, Stair, Hanna, 2009). This research focus is on simple linier regression – a statistical technique that uses a single numerical independent variable X to predict the numerical dependent variable Y.
Coefficient of Correlation

To discover any relationship between independent variable and dependent variable, Pearson’s correlation statistical (Hasan, 2004) tool is used.

\[
r = \frac{n \sum xy - \sum x \sum y}{\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)}}
\]

(3-2)

Where:

- \( n \) = the number of paired observation
- \( \sum X \) = the x variable summed
- \( \sum Y \) = the y variable summed
- \( (\sum X^2) \) = the x variable squared and the squares summed
- \( (\sum X)^2 \) = the x variable summed and the sum squared
- \( (\sum Y^2) \) = the y variable squared and the squares summed
- \( (\sum Y)^2 \) = the y variable summed and the sum squared
- \( \sum XY \) = the sum of the products of X and Y

The Pearson product-moment correlation coefficient can be valued between +1 and −1. The + and − signs are used for positive linear correlations and negative linear correlations. There are the values of coefficient correlation:

- Perfect positive linear correlation (r = +1)
- Positive correlation (0 < r < 1)
  - Positive values indicate a relationship between x and y variable such that as value for x increases, and also y increases.
- No correlation (r = 0)
- Negative correlation (0 > r > -1)
- Perfect negative correlation (r = -1)
This is the parameter of Pearson Product Moment correlation for positive correlation:

**Table 3.1. Correlation Parameter for Pearson Product Moment Method**

<table>
<thead>
<tr>
<th>r</th>
<th>Correlation Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.80 – 0.99</td>
<td>Very High Correlation</td>
</tr>
<tr>
<td>0.60 – 0.80</td>
<td>High Correlation</td>
</tr>
<tr>
<td>0.40 – 0.60</td>
<td>Medium Correlation</td>
</tr>
<tr>
<td>0.20 – 0.40</td>
<td>Low Correlation</td>
</tr>
<tr>
<td>0.01 – 0.20</td>
<td>Very Low Correlation</td>
</tr>
</tbody>
</table>

The next tool that is needed to interpret the relationship between those variables is coefficient of determination. The tool gives more easily interpretation meaning where the proportion of the total variation in the dependent variable Y is explained by the variation in the independent variable X.

\[ r^2 = (\text{coefficient of correlation})^2 \]  

(3-3)

- **Interpretation of data analysis**
  The writer used this step to know the result of the research. In analyzing the data, the writer uses SPSS 15.0 and interprets the output from SPSS.

- **Research conclusion and recommendation**
  The evaluation of the problem is answered by the research and data analysis.

### 3.3. Research Time and Place

The writer uses secondary data for this research. This research was conducted in PT SKF Indonesia on Wednesday, July 28, 2010 about Bearing Export Value of PT SKF Indonesia period January 2008 – June 2010, and for Foreign Exchange

3.4. **Research Instrument**

The writer has to find the tools that will be useful and make it easier when did this research and calculate the data until get specific result.

3.4.1. **Instrument for Data collection**

The collecting of data should be systematic. If the data is not systematic, it will be difficult for the writer in finishing this research. The writer used secondary data when did this research. The data used are:

- The monthly data of foreign exchange rates taken from the official website of Bank Indonesia, which is the bank that arranges banking business in Indonesia.
- The bearing export value taken from PT. SKF Indonesia, which is the company that I used as problem in this research.
<table>
<thead>
<tr>
<th>Month</th>
<th>Foreign Exchange Rate (X)</th>
<th>Export Value (Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-08</td>
<td>9291</td>
<td>80630</td>
</tr>
<tr>
<td>Feb-08</td>
<td>9051</td>
<td>97946</td>
</tr>
<tr>
<td>Mar-08</td>
<td>9217</td>
<td>74325</td>
</tr>
<tr>
<td>Apr-08</td>
<td>9234</td>
<td>117278</td>
</tr>
<tr>
<td>May-08</td>
<td>9318</td>
<td>140330</td>
</tr>
<tr>
<td>Jun-08</td>
<td>9225</td>
<td>185991</td>
</tr>
<tr>
<td>Jul-08</td>
<td>9118</td>
<td>1700</td>
</tr>
<tr>
<td>Aug-08</td>
<td>9153</td>
<td>66824</td>
</tr>
<tr>
<td>Sep-08</td>
<td>9378</td>
<td>89842</td>
</tr>
<tr>
<td>Oct-08</td>
<td>10995</td>
<td>21262</td>
</tr>
<tr>
<td>Nov-08</td>
<td>12151</td>
<td>15770</td>
</tr>
<tr>
<td>Dec-08</td>
<td>10950</td>
<td>3200</td>
</tr>
<tr>
<td>Jan-09</td>
<td>11355</td>
<td>68350</td>
</tr>
<tr>
<td>Feb-09</td>
<td>11980</td>
<td>7940</td>
</tr>
<tr>
<td>Mar-09</td>
<td>11575</td>
<td>15790</td>
</tr>
<tr>
<td>Apr-09</td>
<td>10713</td>
<td>34071</td>
</tr>
<tr>
<td>May-09</td>
<td>10340</td>
<td>152288</td>
</tr>
<tr>
<td>Jun-09</td>
<td>10225</td>
<td>782720</td>
</tr>
<tr>
<td>Jul-09</td>
<td>9920</td>
<td>778778</td>
</tr>
<tr>
<td>Aug-09</td>
<td>10060</td>
<td>732601</td>
</tr>
<tr>
<td>Sep-09</td>
<td>9681</td>
<td>430799</td>
</tr>
<tr>
<td>Oct-09</td>
<td>9545</td>
<td>614926</td>
</tr>
<tr>
<td>Nov-09</td>
<td>9480</td>
<td>657770</td>
</tr>
<tr>
<td>Dec-09</td>
<td>9400</td>
<td>674056</td>
</tr>
<tr>
<td>Jan-10</td>
<td>9365</td>
<td>858745</td>
</tr>
<tr>
<td>Feb-10</td>
<td>9335</td>
<td>957692</td>
</tr>
<tr>
<td>Mar-10</td>
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</tr>
<tr>
<td>Apr-10</td>
<td>9012</td>
<td>422614</td>
</tr>
<tr>
<td>May-10</td>
<td>9180</td>
<td>594627</td>
</tr>
<tr>
<td>Jun-10</td>
<td>9083</td>
<td>733870</td>
</tr>
</tbody>
</table>

*Source: Constructed by the writer*
3.4.2. Instrument for Data Analysis

Data analysis is an important step in doing analysis to prove this research by mathematical ways. The writer uses SPSS software for windows to get the result because it is very reliable software to use. This software can help the writer easily to analyze the data and decide whether the hypothesis should be rejected or not.

3.4.3. Instrument for Data Gathering

The writer used a literature review from any source such as journals, articles, books, and internet to collect the data.

3.5. Sampling design

3.5.1. Independent Variable

The independent variable of this research is foreign exchange rates that were acquired from the official website of Bank Indonesia. The writer decides to take the sample size from January 2008 – June 2010 in monthly period in order to get more significant result.

3.5.2. Dependent Variable

The dependent variable of the research is the bearing export value of PT. SKF Indonesia that was acquired from PT. SKF Indonesia. The sample size is from January 2008 – June 2010 in monthly period.

3.6. Testing of hypothesis and Data Analysis

3.6.1. Assumptions

The data analysis for this research is simple linear regression analysis. The analysis output can be used for hypothesis testing to see whether the model will be linear or not (Sulaiman, 2004). Before analyzing the data, the assumptions must be tested to get the BLUE result (Best Linear Unbiased Estimator). Based on BLUE criteria, some test must be taken:
• Normality
Normality is considered as a test in determining that the data gathered is showed in the normal distribution or not. Data normality is the basic assumption in multivariate analysis. Normality test can be done by using the Histogram and Normal P-P distribution. Through histogram, the data should show the belt shape of data distribution (no skewed to the left or right). Through normal P-P distribution, normal distribution will be shown in the diagonal line. If the actual data plotting is located in the diagonal line or close to it, it means the data is normal distributed and otherwise. (Berenson et al, 2005)

• Linearity
Linearity is used to analyze the relationship between the variables is linear. For linear regression, it is evaluated by plotting the residuals on the vertical axis against the corresponding X values of the independent variable of the horizontal axis.

• Homoscedasticity test
Sulaiman (2004) explains that individuals can use visual method to prove the homoscedasticity by seeing the distribution of residual value towards predicted value. If the distribution does not make any shape like increasing or decreasing pattern, then the homoscedasticity test is fulfilled.

• Autocorrelation test
Autocorrelation is the correlation that happens between the variables from the observation data in the time series. If autocorrelation happens in the regression model, the sample will not be able to be used to predict the value of dependent variable toward particular independent variable. To see the existence of autocorrelation of dependent variable can be shown from the value of Durbin-Watson that is in the range of tolerance between -2 until 2.
3.6.2. Testing the Hypothesis

Hypothesis testing can be conducted with linear regression analysis. In this regression the testing method implemented is T-test. The hypothesis testing used t-test to see the influence of each independent variable in regression model towards the dependent variable (Berenson et al, 2006). In comparing value of significant t (sig t) each independent variable with significant standard which is \( \alpha = 0.05 \). If the significance T is more than \( \alpha = 0.05 \), thus \( H_0 \) is accepted, it means foreign exchange rates as independent variable have no correlation towards bearing export value as dependent variable. Besides, if the significance T is less than \( \alpha = 0.05 \), thus \( H_1 \) is accepted, it means foreign exchange rates as independent variable have correlation towards bearing export value as dependent variable.

Hypothesis that is used are:

\[ H_0 \] : There is no significant correlation between Foreign Exchange Rates and The Export Number of Bearing at PT SKF Indonesia.

\[ H_1 \] : There is significant correlation between Foreign Exchange Rates and The Export Number of Bearing at PT SKF Indonesia.

\[ H_0 : \beta_l = 0, \text{ if significance } t > 0.05, \text{ accept } H_0 \]

\[ H_1 : \beta_l \neq 0, \text{ if significance } t < 0.05, \text{ accept } H_1 \]
IV. ANALYSIS OF DATA AND INTERPRETATION OF RESULT

In this chapter, the writer explains the result of the research through data analysis and the interpretation of the result. The data analysis that used to find correlation between both variables is done by using SPSS software. All data analysis will show the result in tables and charts.

4.1. Data Collection

4.1.1. Foreign Exchange Rates

The writer uses foreign exchange rates as independent variable for this analysis. The data was acquired from Bank Indonesia (http://www.bi.go.id). It shows about the data collection for foreign exchange rates period January 2008 – June 2010. The data of foreign exchange rates are summarized in the figure and table below.

![Foreign Exchange Rates (January 2008 - June 2010)](http://www.bi.go.id)

**Figure 4.1 Foreign Exchange Rates (January 2008 – June 2010)**

*Source: Bank Indonesia (http://www.bi.go.id)*
Table 4.1 Foreign Exchange Rates

<table>
<thead>
<tr>
<th>Month</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>9291</td>
<td>11355</td>
<td>9365</td>
</tr>
<tr>
<td>February</td>
<td>9051</td>
<td>11980</td>
<td>9335</td>
</tr>
<tr>
<td>March</td>
<td>9217</td>
<td>11575</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>December</td>
<td>10950</td>
<td>9400</td>
<td></td>
</tr>
</tbody>
</table>


4.1.2. Bearing Export Value of PT. SKF Indonesia

The writer uses bearing export value as dependent variable for this analysis. The data itself was acquired from PT. SKF Indonesia. The writer decides to use the data from January 2008 – June 2010 to see whether there is a significant effect from foreign exchange rates to bearing export value of PT. SKF Indonesia. The data of bearing export values are summarized in the figure and table below.
Figure 4.2 Bearing Export Value (January 2008 – June 2010)

Source: PT. SKF Indonesia

Table 4.2 Bearing Export Value

<table>
<thead>
<tr>
<th>Month</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>November</td>
<td>15770</td>
<td>657770</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>3200</td>
<td>674056</td>
<td></td>
</tr>
</tbody>
</table>

Source: PT. SKF Indonesia
The figure 4.2 and table 4.2 above shows the quantity of bearing export value per month starting January 2008 – June 2010. There is an unstable fluctuation starting from January 2008 – April 2010. From the beginning of 2008, the export value started to rise to 185991 pieces on June 2008 and fell down to 1700 pieces on July 2008. After steeply rose on November 2008, it steeply fell down again to 3200 pieces on December 2008. On June 2009, bearing export value rose to 782720 pieces and suddenly fell down to 430799 pieces on September 2009. On February 2010, bearing export value started to rise to the peak as many 957692 pieces but on April 2010, the bearing export value was going down to 422614. This unstable export value become the reason why the writer decided to take this data to correlate with foreign exchange rates, to know if there is correlation between foreign exchange rates and bearing export value of PT. SKF Indonesia.

4.2. Simple Linear Regression (Output from SPSS)

Table 4.3. Descriptive Statistics Table

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>BearingExportValue</td>
<td>343880.9</td>
<td>339026.71810</td>
<td>30</td>
</tr>
<tr>
<td>ExchangeRate</td>
<td>9881.5000</td>
<td>940.06767</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: SPSS

Table 4.3. shows the calculation result of means and standard deviation for bearing export value and foreign exchange rates. The average bearing export value of PT. SKF Indonesia from period January 2008 – June 2010 with a total sample of 30 months is 343880.9 with a standard deviation of 339026.71810, whereas the exchange rate has the average exchange rates of 9881.5000 with standard deviation of 940.06767.
4.3. Regression Analysis

4.3.1. Coefficient of Correlation

Below is the data from SPSS, which shows the correlation of foreign exchange rates as independent variable to bearing export value of PT. SKF Indonesia as dependent variable.

Table 4.4. Coefficient of Correlation

<table>
<thead>
<tr>
<th></th>
<th>Bearing Export Value</th>
<th>Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>Bearing Export Value</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Exchange Rate</td>
<td>-.403</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td>Bearing Export Value</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td>Exchange Rate</td>
<td>.014</td>
</tr>
<tr>
<td>N</td>
<td>Bearing Export Value</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Exchange Rate</td>
<td>30</td>
</tr>
</tbody>
</table>

*Source: SPSS*

The coefficient of correlation is (-0.403). It shows a negative relation between foreign exchange rates and bearing export value of PT. SKF Indonesia. It can also mention that the correlation between foreign exchange rates and bearing export value is medium correlation, since the coefficient of correlation ranges from -1 to 1. This negative weak correlation means that the increasing of foreign exchange rates will decrease bearing export value and the decreasing of foreign exchange rates will increase bearing export value.

4.3.2. Normality Test

Normality test is used to see whether the distribution of data from the independent and dependent variable is normal or not. Normality test can be measured by seeing the figure of normal probability plot. A good linear regression means that the distribution of data is normal or close to normal.
From the normal probability plot above, it shows that the dots are distributed near the line and it follows the diagonal direction of the line. The result of the normal probability plot shows that the distribution is normal.

Besides the normal probability plot, normality test can also be measured by seeing the histogram. To test the normality of the variables, it can be done by comparing a histogram of the residual to a normal probability curve. The result of the histogram of the residual should be bell shape and resembles the normal distribution.
From the histogram above, it shows that the bell shape is in the middle, not skewed to left or right. Thus, this program fulfills the normality assumption.

**4.3.3. Homoscedasticity Test**

Homoscedasticity can be seen by looking at the distribution of residual values towards the predicted values in the scatter plot. If the distribution does not make any increasing or decreasing pattern, then the homoscedasticity assumption is fulfilled.
Figure 4.5. Scatter plot

Source: SPSS

Figure 4.5. shows the scatter plot and the distribution of the dots. As seen from the figure above, the distribution of the dots does not make any increasing or decreasing pattern. Thus, the assumption of homoscedasticity is fulfilled.

4.3.4. Autocorrelation Test

Autocorrelation is the correlation test occurs between the variables from the observation data in time series. A good regression model should not show any autocorrelation. Autocorrelation can be seen from the value of Durbin-Watson. According to Santoso (2008), autocorrelation does not happen in a regression model if the value of Durbin – Watson is in the range -2 and +2.
Table 4.5. Regression Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.403</td>
<td>.163</td>
<td>.133</td>
<td>315714.955</td>
<td>.163</td>
<td>5.441</td>
<td>1</td>
<td>28</td>
<td>.027</td>
<td>.380</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), ExchangeRate
b. Dependent Variable: BearingExportValue

Source: SPSS

Table 4.5. shows that the value of Durbin – Watson for this research is 0.380. Thus, no autocorrelation happens in the regression model since the value exists between -2 and +2. The Durbin – Watson value also shows that this regression model is valid.

4.3.5. Coefficient of Determination

Coefficient of determination ($R^2$) shows how big the impact of the independent variable on the dependent variable has. The higher of $R^2$ value means the bigger the independent variable can explain the dependent variable.

The table 4.5. shows that the $R^2$ value of the regression model is 0.163. It explains that 16.3% of the fluctuation of bearing export value as dependent variable is explained by the foreign exchange rates as independent variable, whereas the other 83.7% is explained by other variables.

Table 4.5 also shows that the value of Standard Error of the Estimate (SEE) is 315714.955. Based on table 4.3. The value of Standard Deviation (STD) is 3339026.71810. The value of Standard Error of the Estimate is lower than Standard Deviation (SEE < STD) means the value of SEE is good to be used as a prediction value to show how big the bearing export value is.
4.4. Testing Hypothesis

According to Berenson et al (2006), T-test is used in this analysis to see whether there is a significant correlation between foreign exchange rates as independent variable and bearing export value of PT. SKF Indonesia as dependent variable.

T-Test has the parameter whether the hypothesis should be rejected or accepted. Since the value of α used is 0.05, the sig. T value should be lower than 0.05 for the H₁ to be accepted and reject H₀. If the value of sig. T is higher than 0.05, then the H₁ will be rejected and H₀ will be accepted. In this research, the hypothesis used is:

H₀ : β = 0, if significant t > 0.05, accept H₀
H₁ : β ≠ 0, if significant t < 0.05, reject H₀

Table 4.6. Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>5.4E+011</td>
<td>1</td>
<td>5.423E+011</td>
<td>5.441</td>
<td>.027a</td>
</tr>
<tr>
<td>Residual</td>
<td>2.8E+012</td>
<td>28</td>
<td>9.968E+010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.3E+012</td>
<td>29</td>
<td></td>
<td>5.441</td>
<td>.027a</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), ExchangeRate
b. Dependent Variable: BearingExportValue

Source: SPSS

Table 4.5 shows the sig. F value is 0.027. It means that the sig. F value is lower than 0.05. Therefore, in this research H₀ will be rejected. It simply means that there is a significant correlation between foreign exchange rates and bearing export value of PT. SKF Indonesia.
Table 4.7. Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>95% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>1781315</td>
<td>618944.1</td>
<td>2.878</td>
<td>.008</td>
<td>513465.215</td>
</tr>
</tbody>
</table>

a. Dependent Variable: BearingExportValue

Source: SPSS

Based on table 4.7, when the writer compares the value of t above with t value in the table, it can be seen that the constant t value (-2.333) is lower than t value in t table 2.052, and the sig. (0.027) is less than α (0.05). The significance shows that the data is valid. The detail explanation can be seen in the below figure:

Figure 4.6 Coefficient Regression for T-Test

Source: Constructed by the writer

Based on the figure 4.6 above, if the hypothesis test of t-test value ranged between -2.052 to 2.052, the writer must accept H₀ which means that there is no correlation between exchange rate to export quantity; whereas if the hypothesis
test of t-test value ranged outside -2.052 and or 2.052, the data shows there is relationship or correlation between foreign exchange rates to bearing export value.

And the research of SPSS program shows the t value of -2.333 that placed in the left side of -2.052 that is smaller than t table of 2.052. So, the conclusion is to reject $H_0$, and accept $H_1$. It means there is significance correlation between foreign exchange rates and bearing export value of PT. SKF Indonesia.

From the table 4.6. the writer takes the assumption that the regression model which can be used is as follows:

$$Y = 1781315 + (-145.467) X$$

Export = 1781315 + (-145.467) foreign exchange rates

4.5. Interpretation of Data

In this analysis, the writer found that there is a negative medium correlation between foreign exchange rates as independent variable and bearing export value of PT. SKF Indonesia as dependent variable. The result shows there is a weak impact on foreign exchange rates towards bearing export value. The variable of foreign exchange rates is valid to predict bearing export value. This weak correlation indicates that if foreign exchange rates increases, bearing export value will decrease, and if foreign exchange rates decreases, export value will increase.

The result of this research shows that foreign exchange rates could only affect bearing export value 16.3%. The bearing export value of PT. SKF Indonesia is explained by other variables or factors with 83.7%. One of the factors may be the economic condition of Indonesia is not doing well, that it may affect the welfare of companies within Indonesia. Changes of rules and regulations may also have
an impact to the companies because the rules and regulations may affect the production process of the companies.

Other factor that may affect the bearing export value of PT. SKF Indonesia is the level of Indonesia’s domestic demand of bearing. PT. SKF doesn't only fulfill the demand for bearings export but also for the domestic market. When the demand for domestic market increases, demand for bearing export value will decrease because PT. SKF Indonesia will fulfill demand for domestic first. So, the bearings export value of PT. SKF Indonesia is also affected by Indonesia’s domestic demand of bearing.
V. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

After conducting the analysis of this research to see whether there is correlation between foreign exchange rates as independent variable and bearing export value of PT. SKF Indonesia as dependent variable with the period of January 2008 – June 2010 by monthly data, it comes up with a conclusion. The conclusion of this research related to the statement of the problems of this research:

“Is there any significance correlation between foreign exchange rates and bearing export value at PT SKF Indonesia?”

Finding:

Based on the result, the correlation between foreign exchange rates and bearing export value of PT. SKF Indonesia is (-0.403). The correlation of foreign exchange rates is medium correlation. This negative correlation means that the increasing of foreign exchange rates will decrease bearing export value and the decreasing of foreign exchange rates will increase bearing export value.

“How do foreign exchange rates and bearing export value at PT SKF Indonesia correlate each other?”

Finding:

According to simple linear regression analysis, the result indicates that there is significance correlation between foreign exchange rates and bearing export value of PT. SKF Indonesia. The result shows that the correlation of foreign exchange rates and bearing export value of PT. SKF Indonesia is 16.3%.
5.2. Recommendation

After finishing the analysis and giving the conclusion of this research, the writer would like to give some recommendations for management of PT. SKF Indonesia and next researcher.

5.2.1. Management of PT. SKF Indonesia

Based on the result of this research, there is a medium correlation between foreign exchange rates and bearing export values of PT. SKF Indonesia. So, for the management of PT. SKF Indonesia, they should be able to predict the fluctuation of other variables that happen in the macroeconomic other than the fluctuation of foreign exchange rates. The other variables such as domestic demand, inflation rate, interest rate, GDP, and etc. may also have a big effect to the production, revenues and export activity of PT. SKF Indonesia. Besides, the writer also suggests the company to increase the production of bearing so that they can meet the demand of international and domestic market too.

5.2.2. Next Researcher

It is important for the next researcher to have reliable data. So it is suggested that they have longer observation period in order to have more samples. More samples will show better and clearer result.

This research only involves bearing export value of PT. SKF. Indonesia, and it might not be enough to represent the situation that happens in the companies in the same industry. So, it is recommended for next researcher to make the research about other bearing companies export value in general in order to represent the general case in Indonesia.

Besides, it is recommended to next researcher to add more independent variables like inflation rate, interest rate, GDP and others in researching the factors that affect the export value.
REFERENCES

Books


**Internet**


# APPENDICES

Data Collection of Foreign Exchange Rates period

<table>
<thead>
<tr>
<th>Month and Year</th>
<th>Foreign Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2008</strong></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>9291</td>
</tr>
<tr>
<td>February</td>
<td>9051</td>
</tr>
<tr>
<td>March</td>
<td>9217</td>
</tr>
<tr>
<td>April</td>
<td>9234</td>
</tr>
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<td>May</td>
<td>9318</td>
</tr>
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</tr>
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<td>July</td>
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<td>August</td>
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<tr>
<td>October</td>
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<td>December</td>
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<td><strong>2009</strong></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>11355</td>
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<tr>
<td>February</td>
<td>11980</td>
</tr>
<tr>
<td>March</td>
<td>11575</td>
</tr>
<tr>
<td>April</td>
<td>10713</td>
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<td>May</td>
<td>10340</td>
</tr>
<tr>
<td>June</td>
<td>10225</td>
</tr>
<tr>
<td>July</td>
<td>9920</td>
</tr>
<tr>
<td>August</td>
<td>10060</td>
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<tr>
<td>September</td>
<td>9681</td>
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<td>October</td>
<td>9545</td>
</tr>
<tr>
<td>November</td>
<td>9480</td>
</tr>
<tr>
<td>December</td>
<td>9400</td>
</tr>
<tr>
<td><strong>2010</strong></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>9365</td>
</tr>
<tr>
<td>February</td>
<td>9335</td>
</tr>
<tr>
<td>March</td>
<td>9115</td>
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<td>April</td>
<td>9012</td>
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<tr>
<td>May</td>
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</tr>
<tr>
<td>June</td>
<td>9083</td>
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</table>

*Source: Bank Indonesia (http://www.bi.go.id)*
Data Collection of Bearing Export Value of PT. SKF Indonesia

<table>
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<th>Month and Year</th>
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<td>2008</td>
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<tr>
<td>March</td>
<td>74325</td>
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<tr>
<td>April</td>
<td>117278</td>
</tr>
<tr>
<td>May</td>
<td>140330</td>
</tr>
<tr>
<td>June</td>
<td>185991</td>
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<td>July</td>
<td>1700</td>
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<td>August</td>
<td>66824</td>
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<tr>
<td>September</td>
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<td>21262</td>
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<td>November</td>
<td>15770</td>
</tr>
<tr>
<td>December</td>
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</tr>
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<td>2009</td>
<td></td>
</tr>
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<td>January</td>
<td>68350</td>
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<td>February</td>
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<td>March</td>
<td>15790</td>
</tr>
<tr>
<td>April</td>
<td>34071</td>
</tr>
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</tr>
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<td>July</td>
<td>778778</td>
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</tr>
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<td>December</td>
<td>674056</td>
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<tr>
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<td>858745</td>
</tr>
<tr>
<td>February</td>
<td>957692</td>
</tr>
<tr>
<td>March</td>
<td>903693</td>
</tr>
<tr>
<td>April</td>
<td>422614</td>
</tr>
<tr>
<td>May</td>
<td>594627</td>
</tr>
<tr>
<td>June</td>
<td>733870</td>
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*Source: PT. SKF Indonesia*
**SPSS TABLES AND FIGURES OUTPUT**

## Regression

[DataSet0]

### Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>BearingExportValue</td>
<td>343880.9</td>
<td>339026.71810</td>
<td>30</td>
</tr>
<tr>
<td>ExchangeRate</td>
<td>9881.5000</td>
<td>940.06767</td>
<td>30</td>
</tr>
</tbody>
</table>

### Correlations

<table>
<thead>
<tr>
<th></th>
<th>BearingExportValue</th>
<th>ExchangeRate</th>
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</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1.000</td>
<td>-.403</td>
</tr>
<tr>
<td>Sig. (1-tailed)</td>
<td></td>
<td>.014</td>
</tr>
</tbody>
</table>

### Variables Entered/Removed

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ExchangeRate</td>
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</tr>
</tbody>
</table>

- All requested variables entered.
- Dependent Variable: BearingExportValue

### Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
<th>Durbin-Watson</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>.403a</td>
<td>.163</td>
<td>.133</td>
<td>315714.955</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Predictors: (Constant), ExchangeRate
- Dependent Variable: BearingExportValue
## ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>5.4E+011</td>
<td>1</td>
<td>5.423E+011</td>
<td>5.441</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>2.8E+012</td>
<td>28</td>
<td>9.968E+010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3.3E+012</td>
<td>29</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), ExchangeRate
b. Dependent Variable: BearingExportValue

## Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>95% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>Sig.</td>
<td>Lower Bound</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>1781315</td>
<td>618944.1</td>
<td>2.878</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>ExchangeRate</td>
<td>-145.467</td>
<td>62.364</td>
<td>-.403</td>
<td>-2.333</td>
</tr>
</tbody>
</table>

a. Dependent Variable: BearingExportValue

## Coefficient Correlations

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<thead>
<tr>
<th>Model</th>
<th>Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tr>
<tr>
<td></td>
<td>Covariances</td>
</tr>
</tbody>
</table>

a. Dependent Variable: BearingExportValue
## Casewise Diagnostics

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Std. Residual</th>
<th>Bearing ExportValue</th>
<th>Predicted Value</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
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<td>-349149</td>
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<td>2</td>
<td>-1.162</td>
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a. Dependent Variable: Bearing Export Value

## Residuals Statistics

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a. Dependent Variable: Bearing Export Value
Charts

Histogram

Dependent Variable: BearingExportValue

Mean = -5.69E-16
Std. Dev. = 0.983
N = 30
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: BearingExportValue

Observed Cum Prob

Expected Cum Prob

0.0 0.2 0.4 0.6 0.8 1.0

0.0 0.2 0.4 0.6 0.8 1.0
Scatterplot

Dependent Variable: BearingExportValue

Regression Standardized Residual

Regression Standardized Predicted Value