CHAPTER III

RESEARCH METHODOLOGY

A. Types and Sources of Data

The data used in this study is secondary data sourced from the Badan Pusat Statistik (BPS). The data covered in this research is the GRDP data of Pemalang District in 2010-2016 on Constant Price Base, as well as data of Central Java Province's GRDP in 2010-2016 on Constant Price Base, along with other secondary data that relevant to the purpose of writing this thesis.

B. Research Variables

Variable means research subject that a characteristic, number, or quantity that increases or decreases over time, or takes different values in different situations or research subject that become a focus point in research. In this study, variable as a subject of research include:

a. Economic Growth Rate

Economic growth rate is an increase in GRDP, regardless whether that increase larger or smaller than population growth, or whether changes in economic structure are valid or not. Economic growth rate is measured by GRDP growth indicators from year to year, which is expressed in percent per year. This analysis is used to determine regional development seen from GRDP growth each year.

Economic growth is an increase in the capacity of an economy to produce goods and services compared from one period of time to another. It can be measured in nominal or real terms, or can be called adjusted for

inflation. Traditionally, aggregate economic growth is measured in terms of Gross National Product (GNP) of Gross Domestic Product (GDP), although alternative metrics are sometimes used.

In simplest terms, economic growth refers to an increase in aggregate productivity. Often, but not necessarily, aggregate gains in productivity correlate with increase average marginal productivity. This means the average labor in a given economy becomes, on average, more productive. It is also possible to achieve aggregate economic growth without an increased average marginal productivity through extra immigration or higher birth rates.

b. Growth of Economic Sectors

Growth of economic sectors is growth from value of goods and services from every sector of economywhich calculated from GRDP at constant market prices in 2010-2016 and expressed as a percentage.

c. Gross Regional Domestic Product (GRDP)

Is a subnational gross domestic product for measuring the size of that region's economy. In production perspective, GRDP is total value of net production of goods and services produced by various production units within a region during time period is one year. That unit of production grouped by nine sectors.

Regional grossdomestic product (GRDP) is conceptually equivalent to gross domestic product (GDP); the latter measures newly created value through production by residentproduction units(or residents in short) in the

domestic economy, while for the former measures newly created value through production by regional production units (or regionalresidentsin short) in the regional economy.

In this research using GRDP at constant market price, that market prices based on year selected at 2010 until 2016. Calculating using this constant market price because has been cleared from inflation element.

d. Economic sectors

Economic sectors means sector that forming GRDP number that has a big role in determining rate of economic growth. In this case, Central Bureau of Statistic divide that economic sectors become nine sectors as explained in above.

One classical breakdown of economic activity distinguishes three sectors:

1) Primary: involves the retrieval and production of raw materials, such as corn, wood, coal, and iron. (A coal miner and a fisherman would be workers in the primary sectors).

2) Secondary: involves the transformation of raw or intermediate materials into goods example manufacturing steel into cars, or textiles into clothing into goods e.g. manufacturing steel into cars, or textiles into clothing. (A builder and a dressmaker would be workers in the secondary sector).

3) Tertiary: involves the supplying of services to consumers and business, such as baby sitting, cinema, and banking. (A shopkeeper and an accountant woul be workers in the tertiary sector).

e. Component of share

Is GRDP growth in a region if its growth is equal to increment of GDP province during certain time period. The final component of SSA is the Competitive Share (CS) indicator. The competitive share component is often viewed by researchers as the most imprtant of three because it is only SSA variable which can be directly influenced by the local population. The CS component measures the growth in an industry locally and nationally; and the result, gigure represents the regionscompetitiveness for that industry.This measurement is calculated by "multiplying local employment in each economic sector by difference in growth rate of that sector locally and nationally" (Hustedde et al. 2005, 36).

f. Component of net shift

Is component of value to indicate deviations from Nj in the regional economy.

g. Component of *differential shift*

Is a component to measure Shift Net used by certain sectors that are growing faster or slower in a region concerned in comparison with the province.

h.   Component of *proportional shift*

Is a component that used to produce number of Shift Netto as a result of GRDP that concerned change. Component has positive value if that region specialize in a sector which at the provincial level is growing rapidly, and has negative value when specializes in a sector at the provincial level is growing slowly.

C.   Data Analysis Method

To analyze the economic structure and identification of base sector is done qualitatively and quantitatively. Qualitative analysis will be presented descriptively, while quantitative data will be processed by using several methods, among others; (a) *Shift-Share*; (b) *Location Quotient*; (c) *Klassen Typology*; (d) *Growth Ratio Model* (GRM); (e) *Overlay* Analysis

1.   Shift-share.

Shift-Share analysis is used to analyze and to know the shift and role of the economy in the region. The method is used to observe the structure of the economy and its shift by emphasizing the growth of the sector in the region, which is compared with the same sector at the higher or national level. The analysis can be used to assess the shifts in regional economic structures in relation to the improvement of higher-rise regional economies. The regional economy dominated by slow-growing sectors will grow below the regional economic growth rate above it. To assess the performance of various economic sectors that develop in an area and compare with regional and national economies, *Shift-Share* can be used as an analytical technique. With

this technique, in addition to observing deviations from various regional economic performance comparisons, the competitive advantage of a region can also be known through *Shift-Share* analysis techniques (Thoha and Soekarni, 2000: 52)

The *Shift Share* analysis method begins by measuring the change in gross added value or GDP of a sector-i in a region-j (Dij) by formulation (Soepono, 1993):

$$\boldsymbol{Dij = Nij + Mij + Cij}$$ .... (1)

In this study the variables used are:

$$Dij = E{*}ij - Eij$$ .... (2)

$$Nij = Eij \cdot rn$$ .... (3)

$$Mij = Eij\,(rin - rn)$$ .... (4)

$$Cij = Eij\,(rij - rin)$$ .... (5)

Where :

Dij : Changes in sector i output variables in region j

Nij : The Influence of Economic Growth Reference

Mij : The mix industry of sector i in region j

Cij : Competitive advantage of sector i in the region j

In a sense, rij, is relatively representative of the District growth rate and the rate of growth of the provincial region, each defined as follows:

$$rij = \frac{(E{*}ij - Eij)}{Eij}$$ .... (6)

$$rin = \frac{(E{*}in - Ein)}{Ein}$$ ....(7)

$$rn = \frac{(E*n - En)}{En} \quad \text{.. (8)}$$

Where:

Eij : The GRDP of sector/sub sector-i in region j (District)

Ein : The GRDP of sector/sub sector-i in region n (Province)

En   : Total income in region n (Province)

E*ij : Last year GRDP of sector/sub sector-i in region j (District)

E*ij : Last year GRDP of sector/sub sector-i in region j (Province)

E*n : Last year otal income in region n (Province)

rij   : The growth rate of sector i in region j (District)

rin   : The growth rate of sector i in region n (Province)

rn   : The growth rate of total income in region n (Province)

Lincolin Arsyad (2010) explains, basically a *shift-share* analysis describes the performance and productivity of sectors in the economy of a region by comparing it with the performance of the larger (provincial/national) sectors. This analysis compares the rate of growth of the regional economic sectors (city/district) with a higher rate of economic growth (province). This analysis provides data on the performance of the economy in three interrelated fields:

- Regional economic growth is measured by analyzing aggregate sectoral employment change compared to changes in the same sector in the economy that is used as a reference.

- *Proportional Shift* measures the relative change, growth or decrease, in the area compared to the larger economy used as a reference.

- A *Differential Shift* helps in determining the extent of the competitiveness of local industries with the economies that serve as a reference.

2. *Location quotient.*

   Location Quotient is an analytical technique used to complement *Shift-Share* analysis. In general, this analysis is used to determine the base and non-base sectors, with the aim of looking at the comparative advantage of a region in determining its superior sector. In this technique, according to Tarigan (2007) economic activities of a region can be divided into two groups, namely:

   - The base sector is an economic sector that capable of meeting the needs of both the domestic market and the outside market of the region itself. This means that the sector in its activities able to meet the needs of their own regions and other areas and can be used as a leading sector.

   - Non-base sector is an economic sector that is only able to meet the needs of the region itself, this sector is known as non-leading sector.

   This theory further states that because the base sector produces goods and services that can be sold out of areas that increase the income of the area,

then in a chain will increase investment which means creating new jobs. The increase in revenues not only boosted demand for base industries, but also raised demand for non-base industries. On the basis of this theory, the base sector needs to be prioritized to be developed in order to spur regional economic growth.

This technique is used to identify internal potential that owned by a region which some basic sector and which sector is non basic sector. Basically, this technique shows a relative comparison between the ability of one sector among some regions researched by the ability of same sector in wider region. That relative comparison can be expressed mathematically as follows:

$$LQ = \frac{si/Ni}{S/N} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (9)$$

Or through

$$LQ = \frac{si/S}{Ni/N} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (10)$$

Where:

Si : The GRDP of sector/sub sector-i of Pemalang District

S : Total GRDP of Pemalang District

Ni : The GRDP of sector/sub sector-i of Central Java Province

N : Total GRDP of Central Java Province

Based on the calculation of LQ, it can be analyzed and summarized as follows:

a. If LQ > 1 then it is a base sector, it means that the certain sector specialization of Pemalang Distict is higher than the Cental Java.

b. If LQ = 1, the rate of Pemalang District specialization is the same as at Central Java.

c. If LQ < 1 then it is is a non-base sector, it means that the certain sector specialization of Pemalang Distict is lower than the Central Java.

3. *Klassen typology.*

   Klassen Typology is used to find the description of the pattern and structure of economic growth of each sector. *Klassen Typology* basically divides the economic sector based on two main indicators, namely the sector economic growth and per capita income of the sector. Through this analysis, there are four characteristics of different economic growth patterns and structures, namely: high growth and high income, high income but low growth, high growth but low income, and also low growth and low income (Kuncoro and Aswandi, 2002: 27-45) and (Radianto, 2003: 479-499).

   There are four classifications in the *Klassen Typology* analysis result, which are:

   1. *Rapid Developed Sector* is a sector that has economic growth rate and per capita income higher than the average.

   2. *Pressed Developed Sector* is a sector that has a higher per capita income, but its economic growth rate is lower than average.

3. *Fast Developing Sector* is a sector that have high levels of growth, but rate per capita is lower than average.

4. *Underdeveloped Sector* is a sector that have low levels of economic growth and a low level of per capita income.

In the analysis, there are four classifications of economic sectors which have different characteristics, namely, developed sector, potential sector, growing sector, relatively underdeveloped sector that can be seen in Table 3.1.

Table 3.1
Economic Sector Classification According to *Klassen Typology*

GRDP per capita (y) / Growth Rate (r)	$y_i > y$	$y_i < y$
$r_i > r$	Rapid Developed Sector	Fast Developed Sector
$r_i < r$	Pressed Developed Sector	Low Developed Sector

Explanation :

r = Growth average of the economic sector

y = GRDP per capita average of the sector

ri = Economic growth of the sector in District that observed

yi = GRDP per capita of the sector in District that observed

rn = Economic growth of the sector in Provincial level

yn = GRDP per capita of the sector in Provincial level

4. *Growth ratio model* (GRM) analysis.

The *Growth Ratio Model* (GRM) Analysis is an alternative analytical tool used in the description of the economic activities of regional and city planning derived from by modifying the *Shift Share* model (Yusuf, 1999). This model of analysis is derived from the initial equations of the main components in *Shift Share* analysis, namely *Differential Shift* and *Proportional Shift*.

GRM analysis is done by comparing the growth of a sector in the district/city with the same sector growth in the province. The GRM analysis is divided into 2, ie the Growth Ratio Analysis of Studied Area (district/city) and Growth Ratio Analysis of Reference Area (province).

Mathematically, *Differential Shift* and *Proportional Shift* can be written as:

$$Dij = \left[\frac{\Delta Eij}{Eij\ (t)} - \frac{EIR}{EIR\ (t)} \right] Eij\ (t) \dots\dots\dots\dots\dots\dots\dots (11)$$

$$Pij = \left[\frac{\Delta EIR}{EIR\ (t)} - \frac{\Delta ER}{ER\ (t)} \right] Eij\ (t) \dots\dots\dots\dots\dots\dots\dots (12)$$

From the above equation, we can obtain formulas from the following calculations:

$$\Delta EIR = EIR\ (t+n) - EIR\ (t) \dots\dots\dots\dots\dots\dots (13)$$

$$\Delta ER = ER\ (t+n) - ER\ (t) \dots\dots\dots\dots\dots\dots\dots (14)$$

Where:

ΔEij : Changes in income of sector i in study area over time period

ΔE_{IR}: Changes in income of sector i in the reference area

ΔE_R : Change of GRDP in reference area

E_{ij} : Income of sector i in the study area

E_{IR} : Income of sector i in reference area

E_R : GRDP in the reference area

t+n : year between two periods

5. *Overlay* analysis.

The *Overlay* analysis intended to determine sectors or economic activities of potential based on criteria of growth and contribution criteria by combining the results of *Growth Ratio Model* (GRM) and method of *Location Quotient* (LQ). This method has four (4) possibility, namely:

- Growth (+) and contribution (+) shows an activity that is dominant both from growth and contribution.

- Growth (+) and contribution (-) shows an activity which growth is dominant but smaller contribution. This activity needs to be further improved its contribution to become dominant activity.

- Growth (-) and contribution (+) shows an activity which growth is small but big contribution. This activity is very possible that an activity is in decline.

- Growth (-) and contribution (-) shows an activity which is not potential even from growth criteria and from contribution.

D. Operational Definiton of Variable

1. Economic potential.

   Economic potential that meant in this research is everything that belongs to the areas that might or should be developed so that it will continue to be a source of livelihood of the local people and even can help to regional economy as a whole to grow by itself and continuously (Tarigan, 2007).

2. Gross regional domestic product (GRDP).

   Gross Regional Domestic Product (GRDP) is the amount of value-added goods and services produced of all economic activities in a region (BPS, 2010). The GRDP is one indicator for the economic development in a region. The GRDP is calculated based on current prices and at constant prices. GRDP seen in this study based on 2010-2016 at constant prices.

3. Economic growth.

   Growth in this case is the average of RGDP growth since year 2010-2016 were calculated using the formula:

   a. For growth by industrial use: $(E * ij - Eij)/Eij$

   b. For growth by GRDP use: $(E * j)/Ej$

   Where :

   E = Output

   I = Industrial (sector)

   J = District/city

   *last year

4. Per capita income.

Income per capita is one of the indicators used to describe the macro level of social welfare. The higher GDP is acceptable to the population in a region, the welfare of the people in the region can be said to be good. With per capita income can be seen picture of income received by each population. Per capita income is generated by dividing regional revenue by the number of mid-year population.

5. Economic sector.

Referring to the data issued by BPS District/City (in this case, Pemalang District) , there are seventeen (17) economic sectors studied, this is all of economic sectors, namely: agriculture, forestry and fishery sectors; mining and cultivation sectors; the processing industry sector; electricity and gas procurement sector; water supply, waste management and waste recycling sectors; construction sector; wholesale and retail trade sectors; transportation and warehousing sectors; the sector of accommodation and drinking; the information and communication sector; the financial services and insurance sector; real estate sector; the company's service sector; governmental, defense and compulsory social security sector; education services sector; the health services and social activities sector; as well as other service sector.

6. Economic activity.

In the regional economic studies there is a term called the economic activity. In this study is the economic activity that is the base of economic activity and economic activity base.