Chapter 3
Research Methodology

3.1 Introduction

Methodology is an important part of the research and it is used to know what are the methods applied for the analysis of the study. In this chapter the research methodology is discussed and adopted to fulfill the objective of this study is i.e. analyses the trends of GSDP of Haryana and structural changes with growth of each sector. This study includes primary, secondary and tertiary sectors for analysis.

3.2 Collection of data

This study is based on secondary data. The data has been collected from various government organizations such as department of Economic and Statistical analysis of Haryana, Census of India and different annual reports. The study has been covering sixteen years data from the period 2000-01 to 2015-16 for the purpose of exploration of trend of GSDP and structural change with growth rate of each sector. To construct the MLI and NAV has been used the data from the period of 2004-05 to 2011-12.

There are 22 districts in the state of Haryana, but the 22nd District i.e. Dadri has been framed recently and its data is included in the district Bhiwani. Thus this study has considered only 21 districts for analysis.

3.3 Estimation Methods

To achieve the proposed objectives, the collected data has been properly analyzed by using appropriate statistical methods. There are diverse objectives in study which needs different statistical methods for analysis.

To fulfill the first objective, the percentage method has been utilized in this study. It helps to analyses the trends of per capita income and sectoral share in state domestic product of Haryana.

For second objective the index of MLI (Multi Lilien Index) and NAV (Norm Absolute Value) with GSDP of Haryana has been calculated. Various indicators of the GSDP have been used.

3.3.1 NAV (Norm of absolute values)

The first index for measuring the structural change is the NAV following by Dietrich, Calculated as shown below:

$$\text{NAV} = 0.5 \sum_{i=1}^{n} |Xij - Xis| 35$$

Where,

NAV= Norm of absolute values

Xi= Sectoral shares.

S and t are time periods

To compute this index, firstly we need the sectoral shares (Xi) between two point of times, s and t. Then the absolute amounts of these differences are summed up and divided by two. It ensures that the range of the index is from 0 to 1. In this method 0 denotes no structural change while 1 denotes maximum structural change. NAV index summaries the overall change in the distribution of economic activities across overall sectors. In implication of this calculation the two levels of decompositions will be used. At first, economy will be divided into three sectors agriculture, industry and service. Further it will be divided in 13 sub sectors.

3.3.2 MLI (Multi Lilien Index)

Stamer (1999) modified the Lilien index to fulfill the characteristics of a metric, where output shares used rather than employment shares (uses in lilien index to measure standard deviation of the growth rate of employment.

$$\text{MLI} = \sqrt[2]{Xit.Xis\left(ln\frac{Xit}{Xis}\right)}\ 2\ \text{Xis}>0 \text{ and Xit}>0$$

Where,

MLI=Multi Lilien Index

X_{is} are the output share of sector I at time period s.

3.3.3 Growth rate

Growth rate is the rate of increase in size per unit time. Calculating Per cent Growth Rates the per cent change from one period to another which is calculated from by formula:

$$\text{GR} = \frac{Xt-Xt-1}{Xt-1}*100$$

Where,

GR = Growth Rate

Xit= Present value

Xt-1 = Past value

The annual percentage growth rate is simply the per cent growth divided by N, the number of years.

3.3.4 Standard deviation

It shows how much variance or dispersion is there from the "average" (mean or expected/budgeted value). A Standard deviation estimate is based on a sample. In the excel SD is calculated by the following formula:

$$SD = \sqrt{variance}$$

$$Variance = \sum(X - \bar{X})2/N$$

Where,

i = Number of observations