CHAPTER 3
METHODOLOGY

3.1 Data

HDI (Human Development Index) represents to human development (the quality of life or represent human well - being). Collected from Human Development Report which published by United Nations Development Programme. CPI (Corruption Perception Index) collected from Transparency International Corruption Perception Index. Others economic variables are collected from World Bank (world development indicators) And collecting all data annually 10 years 2000 - 2010.

Size of the population is the selected 79 countries from around the world ranked from HDI based year 2000, starting from the highest score.

3.2 Model

In this study there are two equations in the system as following model:

$$CPI_{i,t} = F(HDI_{i,t}, EXPG_{i,t}, GCPF_{i,t}, TAXREV_{i,t}, UMG_{i,t}) \quad (3.1)$$

$$HDI_{i,t} = F(CPI_{i,t}, HEXG_{i,t}, IPSFG_{i,t}, LIFE_{it}, MYS_{i,t}, RGBG_{i,t}, UBPG_{i,t}, GNIG_{i,t}) \quad (3.2)$$

Where

$CPI_{i,t}$ is Corruption Perception Index of ith
(0 = high corruption) (10 = low corruption)

$HDI_{i,t}$ is Human Development Index of ith
(1 = high human developed)(0 = low human developed)

$EXPG_{i,t}$ is growth rate of government expenditure of ith

$GCPF_{i,t}$ is gross capital formation of ith (% of GDP)

$TAXREV_{i,t}$ is tax revenue of ith (% of GDP)

$UMG_{i,t}$ is growth rate of unemployment of ith

$GNIG_{i,t}$ is growth rate of Gross National Income of ith

$HEXG_{i,t}$ is growth rate of health expenditure of ith

$IPSFG_{i,t}$ is growth rate of improved sanitation facilities of ith

$LIFE_{i,t}$ is life expectancy at birth of ith (years)

$MYS_{i,t}$ is mean years schooling of ith (years)

$RGBG_{i,t}$ is growth rate in ratio of girls boys in education of ith

$UBPG_{i,t}$ is growth rate of urban population of ith

3.3 Data Analytical methods and Estimation

In order to study the impacts of economic variable Corruption Perception Index and Human Development Index also study the linkage of these variables by testing for stationary first and then estimate by using GMM estimator.

3.3.1 Panel Unit Root Test

Every variables in this study were tested by employing Levin, Lin, and Chu (LLC) (2002), Breitung(2000), Hadri(1999), Im, Pesaran and Shin (2003) and Fisher Type Test. After that compare the results and choose the best type which given data with the same level associated with I(0) or I (1). If which variable is not in the same level as others, it would be eliminated because it does not meet the criteria for analysis. So to find specific information with I (0) or I (1) in order to estimate the model.

3.3.2 Estimation

The GMM estimator was employed for this study to estimate the impacts on human development by effects from economic variables and the corruption. At the same time, also see the effect of human development on the level of corruption as well. The economic variables are represented by growth rate of government expenditure ($EXPG_{i,t}$), gross capital formation ($GCPF_{i,t}$), tax revenue ($TAXREV_{i,t}$),

growth rate of Gross National Income ($GNIG_{i,t}$), growth rate of health expenditure ($HEXG_{i,t}$) and growth rate of unemployment ($UMG_{i,t}$). The others are variables which indicate development such that growth rate of improved sanitation facilities ($IPSFG_{i,t}$), life expectancy at birth ($LIFE_{i,t}$), mean years schooling ($MYS_{i,t}$), growth rate in ratio of girls boys in education ($RGBG_{i,t}$), growth rate of urban population ($UBPG_{i,t}$). The relation between human development and corruption could be one way or two way relationships surround with economic variables. For more interpreting the linkage of their relation see assumption and hypotheses below;

Accordance with equation (3.4), the Corruption Perception Index is a function of Human Development Index, government expenditure, gross capital formation, tax revenue and growth rate of unemployment. And equation (3.5) Human Development Index is a function of Corruption Perception Index, health expenditure, improved sanitation facilities, life expectancy at birth, mean years schooling, growth rate in ratio of girls boys in education, gross national income per capita and growth rate of urban population.

3.4 Hypotheses

The hypotheses are following:

$$CPI_{i,t} = \beta_0 + \beta_1 HDI_{it} + \beta_2 TAXREV_{i,t} + \beta_3 EXPG_{i,t} + \beta_4 GCPF_{i,t} + \beta_5 UMG + \varepsilon_{i,t} \qquad (3.3)$$

a) Corruption and Economic variables

Hypothesis 1: Corruption Perception Index and tax revenue

Hypothesis is the effect of tax revenue on Corruption Perception Index is positive $TAXREV \xrightarrow{+} CPI$, tax revenue has a positive significant on CPI. The raising in tax revenue in a percentage of GDP result from reducing in tax evasion or individuals corrupt so that more tax revenue collected means less corrupt occurred, remind that high score of CPI means less corruption (TI, 2010).

Hypothesis 2: Corruption Perception Index and government expenditure

Hypothesis is government expenditure has a positive effect on corruption means corruption created by public sector in government projects that required a huge

budget. Corrupt is infiltrate through government spending on their projects. Thus a huge number of expenditure implies there is highly corrupt as well (M. Haque 2007).

Hypothesis 3: Corruption Perception Index and gross capital formation

Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements, and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings (World Bank). Refer to the meaning of GCPF and recall Haque (2007) that corruption is behind in public investment implies gross capital formation for invest in projects or public spending also related to corruption. Assume that there is a positive relationship between gross capital formation and corruption. Increasing in a number of national capital formation related to an increase in level of corruption.

Hypothesis 4: Corruption Perception Index and Unemployment

There is an indirect relationship between corruption and unemployment rate linkage by poverty or inequality. One standard deviation in corruption increase the Gini coefficient of income inequality by 11 points (Economics of Governance, 2003) and poverty or inequality has a major source from high rate of unemployment (Harding and Richardson, 1998). So, that the hypothesis is unemployment has a positive effect on corruption or negative on CPI.

b) Human Development on Corruption

Hypothesis 5: corruption is a serious problem that obstructs national's development so, that hypothesis is a negative relationship between corruption and human development. So that, HDI should be increase as well as CPI, high CPI score means less corruption.

$$HDI_{i,t} \xrightarrow{+} CPI_{i,t}$$

The next are assumptions of HDI function

$$HDI_{i,t} = \beta_6 + \beta_7 CPI_{i,t} + \beta_8 HEXG_{i,t} + \beta_9 IPSF_{i,t} + \beta_{10} LIFE_{i,t} + \beta_{11} MYS_{i,t} + \beta_{12} RGBG_{i,t} + \beta_{13} UBPG_{i,t} + \beta_{14} GNIG_{i,t} + \varepsilon_{i,t} \quad (3.4)$$

c) Human Development and Some Social Development Variables

Hypothesis 6: Human Development and Health Expenditure

Health care expenditure contributes to health outcome that is one dimension of human development. Hypothesis is an increase in health care expenditure leads to an increase in health outcomes then raise the HDI so that, $HEXG_{i,t}$ is positive significance with $HDI_{i,t}$. Increase in health care expenditure is significantly associated with large improvement in infant mortality but only marginally in relation to life expectancy (Nixon J, Ulmann P, 2006).

Hypothesis 7: Human Development and Urban population growth

In this study UBPG show countries urbanization. According to Panudulkitti (2008), found that the positive effect of urbanization on the HDI varies and depends upon regions and level of development. Holding other things constant when 10 percentage points increase in urbanization will increase in the HDI by 0.01 percentage point. Thus, assume that $UBPG_{i,t}$ has a positive effect on $HDI_{i,t}$.

d) Human Development Index and it's components: in order to completing Human development model this model included 3 basic dimensions of human development health, education and income following HDI formula $HDI = f(Health, Education, Income)$ (UNDP).

- Health

Hypothesis 8: Life expectancy at birth is a measurement for better in health and healthier also advantage for potential work lead to a good quality of life. Hypothesis follows Human Development Index formula increasing in $LIFE_{i,t}$ results in an increasing in $HDI_{i,t}$.

Hypothesis 9: Human Development and Improved Sanitation Facilities

Improvement in sanitation facilities indicates improved health care services which support in health dimension. Hypothesis is $IPSFG_{i,t}$ has a positive significant relationship with $HDI_{i,t}$.

- Education

In this study, two variables used for educational dimension are mean years schooling $MYS_{i,t}$ and ratio of girls boys in education $RGBG_{i,t}$, Assume that both has a

positive effect on HDI. People who obtained higher level in education will expand their opportunities to get a better job. This is the cause that provides them a better life. Furthermore, in theory of human capital interpreted that human capital as an average knowledge in the labor that necessary in the production function (Lucas, 1988), and accumulate of capital in knowledge cause the externalities (positive externalities) to the economic growth (the theory of externalities). Thus, education is important not only the factor to increase people welfare but also the key factor which leads to economic growth.

Hypothesis 10: $MYS_{i,t}$ has a positive effect on HDI.

Hypothesis 11: $RGBG_{i,t}$ has a positive effect on HDI.

- Income

Hypothesis 12: Gross National Income per capita GNI per capita indicates the average level of income. It is a measurement in term of money which can indicate decent standard of living people consume goods and services to maintain their life. Income is one three factors of human development and appears in formula of HDI (UNDP). So that $GNIG_{i,t}$ is a positive significant.

- Corruption on Human Development

Hypothesis 13: is similarly with effect of human development on level of corruption. The reverse of two-way relationship is the same. Assume that corruption has a negative effect on human development.

$$CPI_{i,t} \xrightarrow{+} HDI_{i,t}$$

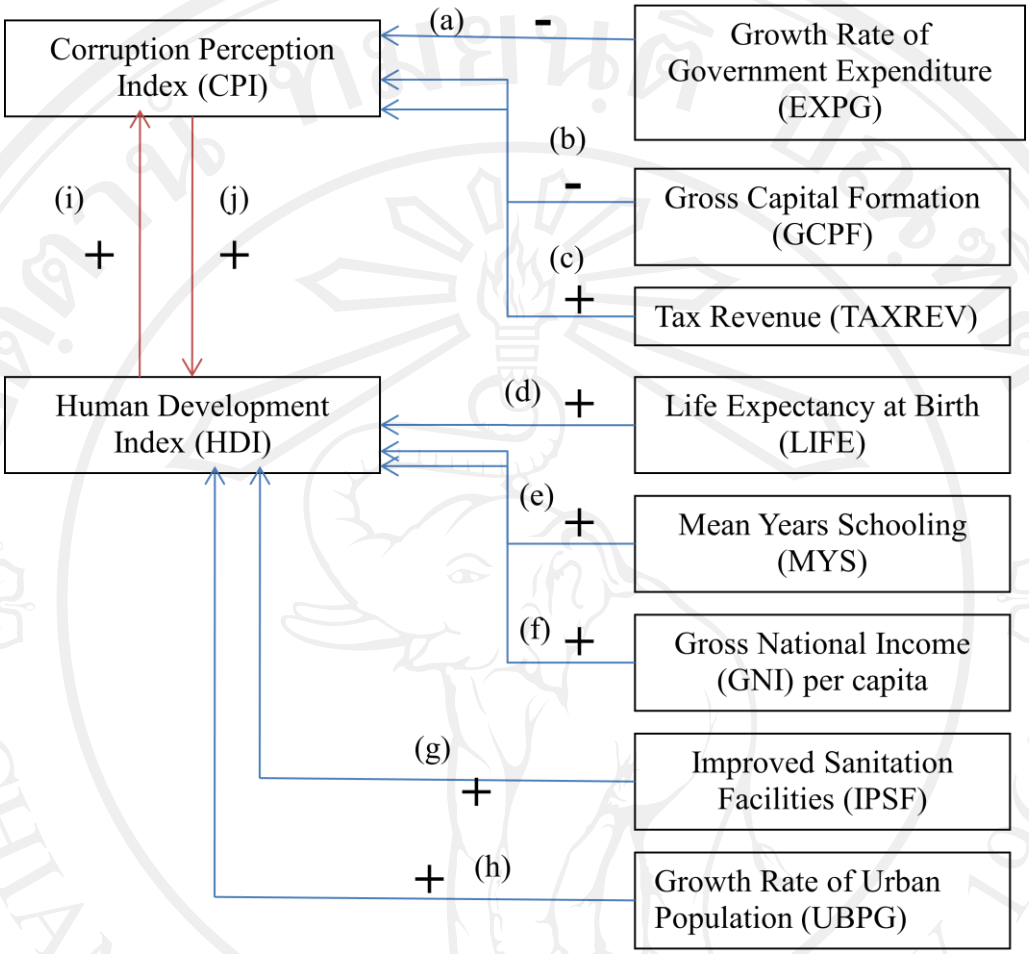

Figure 3.1 Hypotheses of the study