CHAPTER II

METHODOLOGIES

Empirical Methods

The instability and market concentration are the methodologies that will be used to analyze the stability and concentration of Thai orchid exports in Japanese, Italian, and American markets and ascertains the relationships between the instability and market concentration of Thai orchid exports in these markets by regression analysis.

2.1 Stability Index

Theoretical approach

To analyze the stability index of Thai export values in the world markets, Japanese, Italian, and American markets. The stability index is the opposite meaning of instability index that has the significant meaning and methodology as follows.

The instability of export value means that the actual export value has fluctuation from the general trend of export value in a short-term.

The major composite variable that is very important to the analysis method is the export proceeds from the sales of Thai orchid flowers to other countries. The orchid-flowers export proceeds of Thailand depend upon values, quantities, and prices of Thai orchids, in term of monetary values.

The export proceeds should be adjusted for changes in the value of money. This measurement has to do with the time period, using annual data. One of the main reasons of using data is that quarterly or monthly data are not available for many countries. The measure should show typical year-to-year relative changes corrected for trend influences. The result would be the average year-to-year percentage change, adjusted for trend (Coppock, 1962).

Empirical methods of the stability are as follows.

There method used to measure instability index that have some details as follows (Sukhontapatipark, 1975).

An average percentage deviation from the least square trend line.

This formula, method, gets from the statistical estimation of the whole data calculated as follows.

a) To calculate the least squares trend line of the export values during the year of studying.

By $$X'_t = a + bt \qquad (2.1)$$

Where

X'_t is the linear least-square equation that is trend export line equation which getting from the regression analysis of the actual exports of Thai orchids in the year of study, 1970-1997.

a, b = constant variable

t = years of study

b) To calculate an absolute (to prevent the positive and negative sign which can be zero values of total sum) variation between the actual annual value and the trend value.

where

$(X_t - X'_t)$ is the actual export that deviated from the trend export line in every year which needed to study, and then

c) To get the percentage of the results in (b) in each year.

Make the different value of each pair $(X_t - X'_t)$ into the form of percentage, standard form in every unit, and weighted them with X'_t

d) To calculate the average percentage of the results in (c).

$$I = \frac{\sum_{t=1}^{N} \left| 100(X_t - X_t') / X_t' \right|}{N} \qquad (2.2)$$

X_t = export values in year t,

N = no. of years,

I = instability index

- When sum these absolute values and average them with the range year of study, this result is the instability index in each range of time of study.

The usefulness of this instability analysis is that the instability index will show the opposite meaning of stability index of Thai orchid exports, which less instability is preferable to more instability.

This study is concerned with the instability indexes of export values of Thai orchids into Japanese, Italian, American and the world markets, it is very useful to know which country contributed more or less to instability.

The growth rates of Thai orchid exports to the three major countries may effect the export values of the exporters and the orchid production in Thailand.

The high instability and slow growth rates of foreign trade of Thai orchids are subject to economic development of Thailand. These can be the important problems to the country. The major effects are that the instability of Thai orchid exports can have the direct effects on productions of the orchid-growers and the export values of Thai orchid exporters, and then the others consequence effects, such as saving, investment, employment, balance-of-payment and per capita income of Thailand.

Falls or slow rates of export growth of Thai orchids may involve efficiency and dislocations in production, price effects and the same effects as instability of exports.

2.2 Market Concentration Index

Concentration theory (Burgess, 1989)

Market concentration is the most frequently used to measure the market structure that the attraction of market concentration is easily understood. Concentration is the single most important attribute of market structure.

Theoretical considerations, the greater the number of firms and the more uniform they are in size, the greater the degree of competition likely to be present. **The measurement of concentration should seek to capture these two elements, the number of firms and their size distribution.** The main assumption is that the greater the similarity in firm size, the greater the competition. The higher the numerical value of the index, the greater the expected level of competition.

Concentration measures the degree of market domination (by a few traders). The measurement of concentration is a matter of the highest importance. Concentration is affected by two factors:

1. The numbers of firm in the market.
2. The relative size of the firms.

Concentration changes, that are faced with several factors which influence both the number and the relative size of the firms in the market. These factors can be divided into two forces: natural and artificial forces (Burgess, 1989).

The levels of concentration and the change or stability in it are indicators of the past history and present trends in market structure and behavior. An analysis of the market is never really complete unless it looks at past levels of concentration as well as the present levels.

Empirical Methods

This study chooses concentration method of Herfindahl index to measure the degree of concentration index of Japanese, Italian, and American markets for orchid imports for the better following reasons (Burgess, 1989).

First, the Herfindahl index takes into account all the firms in the market.

Second, the Herfindahl index reflects the existing inequality between each firm in the market and every other one.

If HHI is approaching 0, it shows that each country exports the same values of orchids or has the same market shares in Japan, Italy, and America.

If HHI is approaching 1, it means that some countries export a high value of orchid flowers, but some countries export only a few values in Japan, Italy, and America (high degree of monopoly power or monopoly position).

Herfindahl-Hirschman index (HHI) (Ferguson et al, 1988; 1994).

This is calculated by summing the squares of the market shares (output of the firm divided by total output) of all firms in the market:

$$HHI = {}^{n}\sum_{i=1} S_i^2 \qquad (2.3)$$

(where S_i^2 = the square of the market share of the i^{th} firm, measured as that firms output divided by total output; n = the number of firms in the market).

The Herfindahl index is popular measured of dispersion of firm size that originally suggested by O. C. Herfindahl in his 1950 Columbia University Ph. D. Dissertation entitle "Concentration in the Steel Industry." (Clarkson et al, 1962). The Herfindahl summary index is defined as the sum of squares of the sizes of firms in an industry, where size is the percentage of total industry assets. In other words, it is equal to

$$\text{Herfindahl index} = {}^{N}\sum_{i=1}(Xi / T)^2 \qquad (2.4)$$

Where N = the number of firms

Xi = the absolute size of individual firm i

T = the total size of the market

The fraction Xi / T is simply the percentage of total industry assets, sales, or other variables accounted for by the i^{th} firm. When all firms are of equal size, the index becomes 1/N. If there is only one firm in the market, the Herfindahl index is equal to 1 (Clarkson et al, 1962).

This index would be close to zero when there are a large number of equal-sized firms; and 1 under monopoly. This means that the more the distribution of market shares deviates from perfect equality, the higher the value of the index will be (Shughart, 1990).

The HHI has been developed in the hope of reflecting in a single number the entire size distribution of firms. The definition of this index (H-index) by Burgess, 1989 is as follow. Herfindahl Index is a measure of concentration that also reflects the number of firms and the inequality in their market shares. The Herfindahl index is a weighted sum of the market shares of the all firms in the market. The actual weights are determined by the market structure; the weight assigned to each firm's market share is the particular value of the firm's own market share.

The data for the Herfindahl or H-index has been more difficult to obtain than data for the concentration ratio has been. Between the two measures of concentration, which is the better one. Among economists and statisticians, the Herfindahl index is widely regarded as superior to the concentration ratio as follows (Burgess, 1989).

This study chooses concentration method of Herfindahl index for the reasons. First, the H-index takes into account all the firms in the market. CR_n (concentration ratio, Ferguson et al, 1988; 1994) includes information only for the largest n firms (the exclusion of the smaller firms will not significantly affect the accuracy of the index). Second, the H-index reflects the existing inequality between each firm in the market and every other one, while CR_n reflects only the inequality between two groups of firms, the leading n firms and the rest.

2.3 Data Collection

This study will use primary data and secondary data, primary data by interviewing Thai orchid exporters; about the problems for orchid exports in prices,

quality of Thai orchids, customer countries, the methods for exports, and the competitive countries in the world markets.

The secondary data by gathering time series data through statistical year books from the related official government as following.

- Reports from the office of Agricultural Economics,

- Researches of Thai orchids from Kasetsart University,

- Department of Agricultural Education Technique; time series data of Thai orchid plants by species from 1992-1996.

- Department of Customs; time series data of Thai orchid exports from 1970-1997,

- Department of Business Economics; time series data of Thai orchid exports from 1970-1997 and the lists of the export companies of Thai orchids from 1992-1997, the methods for exports. Time series data of import values of orchid-flower of Japan from 1993-1997.

- Department of Foreign Trade; quantity and value exports of Thai orchids in European market, Japanese market, and American market, and the problems of Thai orchid export cause by GSP and Plant Quarantine (insects and diseases) in the world markets.

- Department of Agricultural Extension by interviewing the head of Sub-division of Flowers and Ornamental Plant about the marketing and marketing channel of Thai orchids in Japanese, Italian, and American markets. The data of problems of Thai orchid exports, the export companies and planted areas of orchids in Thailand from 1988-1997, researches about Thai orchid exports.

- American Business Information Center, time series data of orchids import values of USA. from 1993-1997 and the information of U.S. Custom Service (import and export procedures of U.S.).

- European Business Information Center (EBIC, Thailand), time series data of orchids import values of Italy from 1992-1997.