THE CAUSAL RELATIONSHIP BETWEEN PRICE AND EXPORT TOWARDS THE PEPPER PRODUCTION IN SARAWAK

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This project is submitted in partial fulfillment of the requirements for the degree of Bachelor of Economics with Honours
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Statement of Originality

This work described in this Final Year Project, entitled "**The causal relationship between price and export of pepper towards the pepper production in Sarawak**" is to the best of the author's knowledge that of the author except where due reference is made.

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ABSTRACT

"THE CAUSAL RELATIONSHIP BETWEEN PRICE AND EXPORT OF PEPPER TOWARDS THE PEPPER PRODUCTION IN SARAWAK"

BY:

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Price and export of pepper have been identified as the main factors to motivate the pepper production in Sarawak. As Sarawak is the main producer of pepper in Malaysia, so the trend of pepper production in Sarawak will definitely influence the aggregate pepper production in Malaysia. By using the time series data from 1991 until 2005, three tests were going to be conducted such as the ADF unit root test, Johansen Cointegration test and also the Granger Causality test. The Granger Causality test analysis revealed that the price and export showed a positive relation with unidirectional pattern towards the pepper production in Sarawak. However, as the black pepper had most significant impact for pepper in Sarawak so uniquely this study revealed that black pepper export do influence the production of pepper in Sarawak. As the production increased, therefore this will influenced the capacity to supply for pepper export. Perhaps by identifying the strong relation of these two factors toward the production it might help to improve the trend of production in line to accomplish the Ninth Malaysian Plan that is to enhance the agricultural production.

ABSTRAK

“HUBUNGAN PENYEBAB ANTARA HARGA DAN EKSPORT LADA TERHADAP PENGELUARAN LADA DI SARAWAK”

OLEH:

SHEILA ANAK ANDY

Tingkat harga and eksport merupakan antara faktor utama yang mempengaruhi tingkat pengeluaran lada di Sarawak. Oleh kerana Sarawak merupakan pengeluar utama lada di Malaysia, maka tingkat pengeluaran lada di negeri ini turut mempengaruhi pengeluaran agregat lada di Malaysia. Dengan menggunakan data siri masa dari tahun 1991 hingga 2005, terdapat tiga ujian yang telah dijalankan iaitu Ujian Kepegunan ADF, Ujian Kointegrasi Johansen dan juga Ujian Penyebab Granger. Analisis ujian penyebab Granger menunjukkan bahawa kedua-dua harga dan eksport mempunyai hubugan secara langsung dalam pengeluaran lada. Namun, memandangkan lada hitam mempunyai pengaruh yang lebih kuat, maka secara uniknya didapati bahawa export bagi lada hitam mempengaruhi tingkat pengeluaran lada di Sarawak. Peningkatan dalam tingkat pengeluaran seterusnya akan mempengaruhi penawaran untuk eksport lada. Setelah melihat hubungan yang kukuh antara kedua-dua faktor ini dalam mempengaruhi pengeluaran lada, maka ini akan menjadi asas untuk mempertingkatkan pengeluaran lada selari dengan Rancangan Malaysia Ke-9 iaitu untuk menigkatkan hasil pengeluaran pertanian negara.

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LIST OF ABBREVIATIONS

ADF ……..……..…..…….Augmented Dickey Fuller

AICC …….……..Akaike Minimum biased- Corrected Information Criterion

ARMA ……..…Autoregressive Moving Average

DOA …….……Department of Agriculture

IPC …….…..….International Pepper Community

PB …….……Black Pepper Price

PMB …….……Pepper Marketing Board

PRO ……..Pepper Production

PW …….White Pepper Price

RM ……...…… Ringgit Malaysia

UNCTAD ……...United Nations Conference Trade and Development

VECE ……..Vector Error Correction Estimates

XB …….Black Pepper Price

XW ……..……...White Pepper Price

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Peppers, commonly known as the king of spices, had been cultivated in Sarawak for more than a hundred years. In Sarawak, the extensive planting of pepper was believed to have started in 1990's though pepper cultivation had started in the 1856. Pepper, which is also known as "*Piper nigrum L"* is the most-widely used spice for food flavoring as well as ingredient in sauces, seasoning and condiment. These spices are mostly-favoured by those who favor spicy food especially the Indians and also Malays who are known for their various types of spicy foods.

Pepper grown in Malaysia is predominantly in Sarawak, contributing for 95 percent of the production with some plantings in neighbouring Sabah and Johor (Borneo Bulletin Weekend, Spices and Condiment, 2006). That is why pepper had become one of the commodities that contribute to a large number to the Sarawak Commodity Export. However, annual revenues contributions of pepper to the Malaysian economy is not significant relative to the contributors of the major revenues earners (Ng and Kanbur , 1993).

The Sarawak pepper consists of the black and white pepper, where the differences among these two are the way in which they were being processed (Liew et. al. 2000). Black and white peppers consist of two main components, the volatile oil and the pungent components, commonly known as piperine. Black pepper contains about 0.6

- 2.6 percent essential oil that has the aromatic flavour of black pepper but not the pungency. The level varies depending on the source, maturity and variety. According to Zahara Merican (1985), black pepper is prepared by drying mature barriers of *Piper nigrum* under the sun for about 3 to 10 days, while the white pepper is produced by rotting the ripe or nearly ripe berries in running water in order to remove the pulp and pericap before the drying process begins.

The government is concerned with the potentiality of Sarawak pepper in market, so both of these peppers need to be processed carefully in order to keep up the quality of pepper so that better product of pepper can be produced in the end. According to Tiong and Ng (1994) in their paper, they had differentiated the production process for both black and white high quality peppers. For a creamy white pepper, the first process starts form hand picking of the ripe berries. Next, it will be threshed by motorized threshers to separate the stalks from the berries. Then, the process follows with removing the undersized and immature berries. After that, those good quality berries has to be soaked in tank with clean circulating water. In order to remove the pericarp, the retted berries need to be wash-offed and later being dried for 3 to 4 days.

Meanwhile, for naturally clean black pepper, the process starts with harvesting the mature green berries. The stalks separator process is the same as the white pepper process as the second step of the process. Next is the process of dipping berries in hot clean water for 2 or 3 minutes, which later will be dried by mechanical dryer within 24 hours to reduce mature level to below 12 %. After ensuring that the pepper

is totally dry, only then it will be packed in hermitically-scaled bags and then stored in a clean place.

Below is a table obtained from a research done by Tan (1993), whereby he had come up with the spice descriptions. In this table we can differentiate the quality between these two types of pepper. In addition, according to Tan (1993), the harvesting time for pepper in Malaysia is from April to July for these white and black peppers. In others countries, the harvesting period for pepper is different. For example, India harvests its pepper from December until March and for Brazil, it is done during August until November. Meanwhile, for Indonesia, the harvesting time for pepper is from July until September, which is after the harvesting period for pepper in Malaysia.

Table 1.1: Pepper Descriptions

DESCRIPTION	**BLACK PEPPER**	**WHITE PEPPER**
Appearance	Bold size and free form mold	Bold size
Colour	Uniform dark brown and black	Greyish-white
Flavour and arome	Hot and biting	Penetrating and pungent
Heat Level	Piperine is the major constituent	

Source: Adopted from Spice Description in "Pepper Products and its Development" by Tan (1993)

The pepper plantations in Sarawak's are more concentrated in certain districts like Kuching, Samarahan, Sri Aman, Betong and Sarikei Divisions. The present estimated planted area is about 13,000 ha (Pepper Marketing Bulletin, 2006). Currently, the major or the largest plantation areas of pepper in Sarawak is at Simunjan, followed by the Sarikei and Sri Aman districts. But it seems like the plantation areas for these crops are not consistently increasing as there are a few places showing reduction of numbers of plantation areas and some had also been closed down.

Previously, pepper productions are based on the price itself. So when the pepper price decreases, the production of pepper also decreases. This is probably because most of the farmers prefer to plant other commodities of which they can gain more profit and increase their income. In the 80's, the production of pepper had experienced extreme decline, due to the economic transformation from agriculture or primary sector to the secondary sector, which focused on the industrialization and manufacturing sector. However, in the middle of 90's the pepper production starts to increase until it reaches the highest production and this results oversupply of the pepper in the world market. But then, a few years later the trend of decreasing pepper production continues.

As other soft commodities, the price of pepper tends to move in a cyclical way and instability in prices of pepper is unexpected every year. This will definitely raise the price risks for the producers especially for the farmers, exporters and also the pepper organizations. They need to be aware or get ready due to the unexpected declining of

the pepper prices. If the pepper price is rising each year, this will benefit them but what concerns most is the serious decline of the pepper price. At the same time, the number of people who involved in the pepper plantations is getting lesser each year. Perhaps, we have a numerous labour force but are lacking of local labour who are interested in working in the agriculture sector. Most of them prefer to work in the industrial and services sectors.

In terms of the government's role to boost the pepper market, we can see that every country that produces pepper has its own pepper institutions and various plans or programmes had been implemented to improve their pepper market performance. The fact that pepper is an important cash crop for a large number of relatively poor smallholders has led the governments to intervene in the pepper market in several ways (UNCTAD 1995). For example, Sarawak government provides a lot of incentives for the local pepper producers and has given the responsibility to the Pepper Marketing Board (PMB)[1] to improve the pepper research and development (R&D) and increase the number of the pepper productions.

The federal government, through another purchasing organization, also undertakes price support actions from time to time. The PMB itself is a buyer and exporter, regulating the practices of private traders and exporters in respect of quality assessment; however the PMB itself buys at the prevalent market prices. At times,

[1] Pepper trade in Sarawak is regulated by the Pepper Marketing Board (PMB), a federal government agency established to implement the Pepper Marketing Scheme. At the export level, all Sarawak pepper export must be inspected and certified for quality by the PMB in accordance with its prescribed standard grades.

the government tried to influence pepper prices, often taking on the price risks that is the risk of having to subsidize the production or export.

1.1 Problem Statement

According to Bong and Saad (1986), they noted that there had been a decline of pepper production in Sarawak by about 54 percent since 1979, due to the problems of low prices, serious outbreak of diseases and pests, and high cost of production. Export of Sarawak's pepper also showed a decreasing performance as reported by the Pepper Marketing Board (2006). In addition, Sarawak's peppers are being exported to developed countries such as Japan, Singapore, Europe and also the United States. Japan is the main country, which remains as the largest importer of Sarawak's pepper. About 95 percent of the pepper traded globally is in the form of black and white peppercorns. While the remaining 5 percent is made up of pepper oleoresin, pepper oil, green pepper and ground pepper. This decreasing performance of the Sarawak's pepper export is due to the difficulty in penetrating new markets, tariff and non-tariff barriers, and competition from new producers (Lau and Tiong, 1993). As a result, those who only depend solely on pepper cultivation as their main source of income will suffer.

Due to the problems occurred, several questions could arise. The pepper production and export had decreased tremendously throughout the year. But the price of pepper itself became more expensive and more valuable for the pepper planters in Sarawak. This has become the main issue for this research. We need to examine the main

factors that contribute to the trend of the Sarawak's pepper productions regardless of other factors such as good pepper vines, pepper diseases, plantation areas involved and effect of using pesticides which had not being included in this research. Besides, the different of the two types of pepper also being considered in order to determine which is favourable in the pepper market.

In spite of the fact that the Pepper Marketing Board (PMB) had come up with various strategies to improve and sustain the quality of the pepper, for example through the *"Skim Pemeringkatan Mutu Berkanun"*, but we can see there is still a declining trend in the export of Sarawak's pepper. To further upgrade the quality and performance of Sarawak's pepper, the PMB had identified the potential of pepper in the market as it has its own specialty for the value-added pepper product and also the new uses of pepper. So, this research aims at identifying the influence of price and export for two different types of pepper (black and white peppers) towards the pepper production and find out the type of pepper which will be the most significant factor in influencing the pepper production in Sarawak.

1.2 Objectives of the study

The general objective of this paper is to empirically investigate the relationship between pepper production in Sarawak and (i) the pepper prices and (ii) the export of pepper; for both white and black peppers. The dependent variable is the pepper production while the independent variables are price and export for both black and white peppers. The specific objectives are as follows:

1.2.1 to examine the long run inter-relationship between the price, export and production of pepper in Sarawak

1.2.2 to examine the causality pattern between the prices, export and production of pepper in Sarawak

(Note : In this research, pepper refer to white and black pepper)

1.3 Rational Of the Study

In this research, we can see that the trend of production for pepper depends on several factors. Firstly, whether it is being influenced by the price itself, which consists of the price for both black and white pepper, and secondly the annual total export of both types of pepper, from 1991 until 2005. By implementing this research; it can provides the government with a framework on ways to improve and expand the pepper markets. As we can see, though Sarawak pepper is the main contributor for this spices in Malaysia, the production is experiencing a declining trend which might affect every party involved, especially the farmers.

As a main supplier of pepper in Malaysia, Sarawak represents most of the pepper product in the market locally and internationally. However the decreasing number of the pepper production is worrying. So, we need to improve the trend of production for this spices as this also became one of the thrust in the Ninth Malaysian Plan; whereby to increase the agricultural production and encourage the optimal utilization

of existing resources. If Sarawak aspires to remain as the main supplier for pepper in Malaysia or the Asian region, and look forward to venture into the international market, perhaps depth research on this crop could be most feasible to detect the main problems that threaten the pepper industries recently.

For one, PMB and the government could come up with new policies to improve the pepper productions in Sarawak, to remain as one of the main contributors for these spices. Besides Malaysia (Sarawak), there are also other contributors for pepper such as India, Sri Lanka, Indonesia, Madagascar and Brazil. Not only that, hopefully through the findings of this study, those organizations involved in pepper production can improve their quality of productions and at the same time, boost their productivity so that the pepper industry can sustain in future. As different peppers play different roles in determining the pepper market, this paper can therefore shed light in the pepper market and indicates the types that show a higher demand and also discover the potentiality to boost the global market.

It is noted that very few researches involved in the research on Sarawak peppers. Hence, this research is hoped to enable us to have a better view on the industry and improvement in various aspects can be carried out.

1.4 Scope of the Study

In this research paper, by using the data obtained from various issues of the Pepper Marketing Bulletin by Pepper Marketing Board and also the data from the Sarawak

Agriculture Department, several tests are going to be pursued in order to analyze the data and the issues that occur in the pepper industries. At the same time, the tests will provide more accurate answers in order to achieve the objectives of this research. Besides, from those tests that are going to be implemented, the differences as well as the similarities of the findings of the previous researchs by other researchers also can be revealed. A number of 280 observations (from the first quarter of 1991 until the forth quarter of 2005) are being used in this study. In addition, the Sarawak pepper export and pepper price itself, which consists of the white and black peppers play the role as the responsive variables to the pepper production in Sarawak.

The unit root test will be implemented in order to test the stationary of the time series data for each before preceded to the other test. Five variables that are going to be examined such as the pepper prices which consist price of white and black pepper, the export of white and black pepper and the pepper productions in Sarawak. After ensuring the time series data for each variable are stationary, only then the Cointegration Test will be proceeded whereby this test will examine the long-run relationship among the variables. There are two types of test under the cointegration test, namely the Max-Eigen Value test and also the Trace test. So, in order to derive an accurate result, both tests are going to be applied. Next, Granger Causality test will be applied in order to identify the causality and patterns relationships between all the variables.

In chapter two, literature review on previous research will be discussed and the findings will be highlighted. The third chapter deals with methodology, which explains the sampling method, theoretical framework and data analysis, which involves several empirical tests.

Meanwhile, in chapter four, the findings will be reported and the results will be discussed based on other researchers' findings. Then, the conclusion for this study will be reported in the final chapter, focusing on how significant the influence of pepper price and export towards the pepper production in Sarawak, especially for the two different types of pepper. Undoubtedly, the findings of this study are important to the Sarawaks's economy as pepper industries have the potential to be the main generator for the Sarawak's agricultural sector.