STANDARDS AND TECHNICAL REGULATIONS IN AGRICULTURE: IMPACTS ON INDONESIA'S EXPORTS TO COUNTRIES OF THE EUROPEAN UNION

THESIS

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By

Ayu Wulan Sagita
NPM. 0606011343

MASTER OF PLANNING AND PUBLIC POLICY
UNIVERSITY OF INDONESIA
Depok, 2008

APPROVAL OF THESIS

Name	: Ayu Wulan Sagita
Student Register Number	: 0606011343
Program	: Master of Planning and Public Policy
Specialization	: Globalization Economics
Title of Thesis	: Standards and Technical Regulations in Agriculture: Impacts on Indonesia's Exports to Countries of the European Union.

Depok, January, 2008

Approved by,

Supervisor,

Dr. Widyono Soetjipto

Director,
Master Program of Planning and Public Policy

Dr. B. Raksaka Mahi

STATEMENT OF AUTHORSHIP

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Name	:	Ayu Wulan Sagita
Student Number	:	0606011343
Document	:	Thesis
Title	:	Standards and Technical Regulations in Agriculture: Impacts on Indonesia's Exports to Countries of the European Union
Date	:	January 09, 2008
Advisor/Supervisor	:	Dr. Widyono Soetjipto

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Ayu Wulan Sagita

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ABSTRACT

Among the various types of non-tariff barriers to trade, standards and technical regulations measure imposed by trading partners is one of the determinants to Indonesia's export activities that often have been neglected. Problem in meeting the standards (the terms "standards" and technical regulations" are used interchangeably throughout this study) has always been on the top three of developed countries' complaints to the agriculture-based imports from Indonesia. On the other hand, stricter imposition of standards has now also being applied by several importing countries, including the European Union (EU), which have been the main importers of Indonesian agricultural products.

This study covers Indonesia's export activities to four partner countries in EU, on four selected agricultural commodity groups during the periods of 1990-2005. Export activities were analyzed with a single-country Gravity Model approach (Chevassus-Lozza, et al., 2005) which uses the constant elasticity of substitution (CES) utility function in deriving an operational gravity model. Standards are included as the variables of trade restrictiveness, parameterized by stocks of standards developed both by the Indonesia as exporter, and EU countries as importers. Estimation for the model was done through the Seemingly Unrelated Regression (SUR) for disaggregated pooled data.

The results of analysis shows that a single-country gravity model used in this study is able to assess the impacts of standards measures on Indonesia's export activities in the selected commodity groups. An increase of foreign specific standards imposition reduces Indonesia's exports by 0.07 per cent, thus, act as trade deterrence and lead to competition disadvantage for Indonesia. On the other hand, an increase of National Standards of Indonesia imposition gives role to competitive advantage and increases Indonesia's exports by 0.03 per cent.

***Keywords**: standards, export, agriculture, gravity model*

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"..Nothing is ever as simple as it seems.."

-Murphy's Laws-

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CHAPTER I
INTRODUCTION

1.1. Background of the Study

Among the various types of non-tariff barriers to trade, standards and technical regulations measure imposed by trading partners is one of determinants to Indonesia's export activities that often have been neglected. Problem in meeting standards (from this point, the terms "standards" and technical regulations" are used interchangeably throughout this paper) has always been on the top three of developed countries' complaints to the agriculture-based imports from Indonesia. Exports from Indonesia often fail to fulfill the minimum level of quality standards requirements. As an example, The Ministry of Trade (2006) reports only 20 per cent of Indonesia's coffee exports is categorized as high quality products (grades 1 and 2), about 65 per cent has average level of quality (grades 3 and 4) and the rest 15 per cent has low level of quality (grades 5 and 6). In other case, cocoa bean exports are often suffered by automatic detention due to the sanitary and phytosanitary problems. These kind of condition, usually leads to lower value of pricing in world's market.

On the other hand, stricter imposition of standards is now also being applied by several importing countries, including the European Union (EU), which have been the main importers of Indonesian agricultural products. Thus, some well-established sectors that are highly export dependant might be hurt by these new and stricter standards.

Nevertheless, despite the increasing concerns on standards to Indonesia's trade activities, up to now; there have been few studies that directly observe the impacts of standards measures to Indonesia's export performance. Therefore, by incorporating standards measures

as one of the trade restrictions in exports, this study may provide more information on how much Indonesia may possibly gain and loss regarding the impacts of standards measures on Indonesia's exports. In addition, it may also serves as the bases in reviewing the compatibility of Indonesian Standards to face challenges from the standards measures imposed by the countries of EU.

1.2. Objectives of the Study

The study aimed to assess the roles of standards for Indonesia exports in several agricultural commodity groups, as it is assumed that standards are among the factors that determined the entry of products into markets in several EU countries. More specifically, the objectives are:

- To analyze the impact of foreign (countries of EU) standards measures to Indonesia's exports in agriculture.
- To analyze the impact of Indonesian National Standards measures to Indonesia's exports in agriculture.

1.3. Scope of the Study

The study covers Indonesia's trade activities in agricultural sectors. The analysis for the bilateral trade activity in these sectors is derived from the main assumption that trade is determined by the consumer's demand and the level of competitiveness of product exported. In this study, standards (stocks) developed both by the Indonesia as exporter and EU countries as importers are included as the proxy of trade restrictions.

Following Swann et al. (1996) and Moenius (2004), here the measure of standards stocks is the number of documents that specify the

details of standards for a particular commodity group, country, and year. In general, we count one document as one standard. Standards stocks available in each country are considered to represent the frequency of standards applied at the entrance to the markets. Referring to Swann et al. (1996), the measure of strength in standards obliged us to assume that standards have equal weight. While in practice a standards count is likely to be quite a 'mixed bag', which also common for other count measures, such as patent counts. Nevertheless, it should be underlined also that standard-setting involves a costly input of science, technology, skilled human resources and other institutional properties. Consequently, it seems unlikely that a particular standard will have negligible economic value. The process of writing standards is likely to promote the exchange of science and technical information between countries and its publications does provide suitable indicator for standards development in a country.

The standards observed here are those which designed to support quality performance, published by national standards bodies. For instance, in Indonesia, standards used in the analysis are those developed by Badan Standardisasi Nasional (BSN) that publishes National Standards of Indonesia (SNI). Note also that most standards published by such bodies usually only cover the minimum quality standards that are voluntary to be complied, although in some cases they might be adopted by governments as technical regulations (which make them to be mandatory).

The commodity groups and trading partners are selected to support the assumption for the model tested, which gives a focus on the trade activities on agricultural sector between Indonesia and the EU countries for the period of 1990-2005. These periods of observation are considered sufficient to capture development of standards and technical barrier to trade agreement in the world trade. The countries

of EU being analyzed are the four most important markets for Indonesia; France, Germany, Netherlands, and the United Kingdom.

Meanwhile, the commodity group included in this study is specified to 4 kind of commodities that have been the major contributors to the Indonesia agricultural exports; namely coffee, cocoa, tea, and pepper. These commodities share about 25.9 per cent to the total agricultural exports. Trade classification for commodities is based on the International Trade Classification (SITC) Rev.3. While the classifications on standards, are in accordance to the International Classification for Standards (ICS).

1.4. Methodology

The primary export activities were analyzed with the Gravity Model approach, by modifying the model constructed by Chevassus-Lozza, et al (2005) that uses the *constant elasticity of substitution* (CES) expenditure system in deriving an operational gravity model. The model includes competitiveness factor is in accordance to the export behavior of selected commodities, while standards variable is introduced as one of the proxy of trade restrictions. Estimation for the model was done through Seemingly Unrelated Regression (SUR) for disaggregated pooled data analysis.

1.5. Data and Sources

Data required to construct the Gravity Model was related to the determinant of bilateral trade flows and trade restrictions between Indonesia and EU countries. Mainly, data analysis process was done subject to the export-import activities of the observed agricultural-based commodity groups and trade restrictions of tariffs and standards measures. The data was obtained from the following sources:

COMTRADE statistics database for commodity trade (www.comtrade.org), FAOSTAT statistics division (www.faostat.org) for the export-import prices of primary commodity, DISTANCE (www.distance.com) for distance between countries, World Trade Organization database (www.wto.org) for information on tariffs and non-tariff barriers. While the annual statistics data on standards was obtained from: BSN (www.bsn.org) for Indonesian National Standards, BSI (www.bsi.uk) for British Standards, DIN (www.din.de) for German Standards, AFNOR (www.afnor.fr) for French Standards, and NEN (www.nen.nl) for Dutch Standards.

CHAPTER II
STANDARDS AND TECHNICAL REGULATIONS IN THE AGRICULTURAL TRADE

2.1. The Nature of Standards

Referring to Moenius (2004), standards (the term that is used in this paper) are product and process specifications intended to harmonize the treatment of intermediates in the production process or the attributes of final goods.

David (1987) in Hudson and Jones (2003) offers taxonomy of standardization. First, there are standards for minimal admissible attributers (e.g. safety levels and product quality). Second, there are standards for reference, i.e. definitional standards (e.g. currencies, weights, measures and dimensions of materials and products). Last, there are standards for interface compatibility (e.g. screw threads, codes and the physical design of interfaces). Meanwhile, Wilson (2001) in Ponte (2004) classifies standards systems into three broad categories: mandatory, voluntary and private.

Standards are mandatory when they are set by governments in the form of regulation. These may affect trade flows by placing technical requirements, testing, certification and labelling procedures on imported goods. Governments can rely on standard enforcement through *ex post* liability rules that allow punitive damages to be awarded to the buyer in case of non-compliance, or they can adopt *ex ante* measures, such as requiring information or banning a product not matching technical standards from being imported (Caswell and Henson, 1997).

Voluntary standards arise from a formal coordinated process in which key participants in a market or sector seek consensus. The International Standardization Organization (ISO) has established over 7,000 voluntary standards. Sectoral organizations can also establish voluntary standards that apply to their members. Voluntary standards are usually verified through third-party auditing.

Private standards are developed and monitored internally by individual enterprises. What often distinguishes them from mandatory and voluntary standards is their lack of third party verification, and a lower degree of transparency and participation of affected stakeholders.

2.2. Benefits of Standards

Although standards are mainly designed and implemented to achieve the legitimate interests of consumer protection, they can be beneficial both for consumer and for producer (Stephenson, 1997). Standards can improve information flows between producer and consumer about characteristics and quality of products, thereby facilitating market transactions. Standards facilitate comparisons by consumers across products with common essential characteristics. Products that fulfill certain standard can compete directly with each other in one market and this will enhance competition. Thus, rather than facing the 'higher price equals to higher quality' condition, the consumers can concentrate on price alone since the similar products in the market now have equal quality. Further, consumers will be able to interface different kind of products that have compatible standards. In addition, standards also contribute to the higher level of health and safety for consumer, as well as environmental protection.

For producers, standards can drive the efficiency of their productivity as the quality of production activities improves. When production

activities run according to standards, they allow the sustainable and efficient production. Producers will then able to maintain the quality of their products as well as reducing cost in inventories and this leads to the economies of scale. As the result, the producer can sell their products with lower prices and be more competitive in the market. Consumers that already have information of the needs will continue asking for the guarantee that the products have sufficiently fulfilled the voluntary standard. Thus, whenever producers want to be able to compete, their products must fulfill the standard.

2.3. Economic Effects of Standards Measures

Despite the important role of standards to trade activities in the way that they are designed to enhance the improvement in quality and efficiency of producers, Stephenson (1997) describes that standards can act both as trade facilitation and as barrier.

When the trading countries have the same level of standards, the flow of export can improve. When government allows the market to determine product characteristics or processes (except as needed in cases of extreme and high risk), standards can promote economies of scale in production. This is particularly true when government also allow inefficient firms to close or merge with stronger ones. (Maskus and Wilson 2001).

On other hand, export can be frustrated and impeded if a country fails to meet another's standards. In such condition, standards act as barrier to trade.

Concerning the empirical finding on these opposite roles of standards, Roberts, et al. (1999) explains that standards and other technical barriers may affect trade activities through three different

mechanisms; regulatory protection effects, supply alteration effect, and demand alteration effect.

Regulatory protection effect refers to additional costs that are necessary in order to meet the technical requirements. Giving the fact that a regulation gives some rents to the domestic sector, (mandatory) standards work as a tariff. However, unlike tariff, it does not provide tariff revenues for the government budget, which in turn generates a deadweight loss. Maskus and Wilson (2001) describes that standards are often non-transparent and in some cases needlessly force firms to duplicate testing and certification costs. Regulations may be drafted to exclude both domestic and foreign entrants into a particular market. This serves then to support entrenched monopolies. Finally, standards may be stronger than necessary to achieve a optimal levels of social protection, imposing excessive costs on consumers and reducing net welfare. As the result, there will be price difference arising from the introduction of new technical regulation and the effects of this difference for international trade.

Supply alteration effect refers to the impact of the changes in imports resulting from technical barriers to trade on the domestic supply as well as to the costs/benefits of the uniformity of standards. Here, the benefits of standards might be express, for instance, from the direct improvement in consumer's health. More important however, supply shift can induce new regulations on market structure and the degree of competition, which eventually can affect the size of market and producer's rents as well as create new equilibrium in a given sector (Fisher and Serra, 2000).

Demand alteration refers to the effect of new regulations on the information available to consumers, which can raise the demand for the analyzed good. This creates a number of benefits. Introduction of standards improves transparency and reduces the cost of acquiring of

information. The information can be related to quality (that the imported product meets a particular standard) or to geographical origin (which gives consumers additional knowledge about expected characteristics). This reduces the asymmetry information between consumer and producer. Thus, technical standards can be treated as a public good. Existence of standards makes products more similar which in turn increases elasticity of substitution and makes the market more competitive. All these effects may lead to higher welfare, which at least partially offsets protectionist character of regulations.

2.4. The Importance of Standards to Export

2.4.1. Standards as Prerequisite for Access to Market

Global market conditions nowadays require countries to meet more defined, diverse, and sometimes unexpected and personalized consumer tastes and societal preferences. These requirements might express the consumer demands, and represented by a mix of informal rules reflected in certain sectors of trade, as well as formal rules arranged within the context of national regulatory frameworks.

Wilson et al. (2003) explains that failure to comply with voluntary standards driven by demand, may hinder consumer acceptance, but not necessarily block access to export markets. While the failure to comply standards that are mandatory in international or national law (mostly technical regulations), may prohibit a product or service from being sold in given markets.

2.4.2. Standards as Determinant of Competitive Advantage or Disadvantage

Countries that evolves standards environment is basically utilizing potential opportunities to their competitive advantage since many of the emerging public and private standards act as a necessary bridge between increasingly demanding consumer requirements and the participation of distant suppliers.

Meanwhile, the challenge inherent in compliance with standards may actually provide a powerful incentive for the efficiency of export supply chains and give greater clarity to the necessary and appropriate management functions. Part of the costs of compliance could be considered necessary investments, while an array of foreseeable and unforeseeable benefits might arise from the adoption of different technologies or management systems. At this condition, rather than degrading the comparative advantage, enhancement of capacity to meet stricter standards could, potentially, create new forms of competitive advantage. Hence, the process of standards compliance could conceivably provide the basis for a more sustainable and profitable trade over the long-term.

Swann et al. (1996) describes that government might recognize that the development of national standards systems can increase perceptions of quality and improve trade performance. Standards of any type can generate a trading advantage, either through raising quality or by creating opportunities for economies of scale. The argument applies to both international and country-specific standards.

Nevertheless, a contra perspective due to the implementation of country-specific standards sees it in pessimistic way that they may inhibit trade and competition (Lecraw, 1987; Shumer et al., 1992; Swann et al., 1996). Whenever a country imposed country-specific

standards on products, then export markets for the products will be hard to find. At the same time, it is also difficult for foreign producers to meet such standards and they may act as a barrier to imports. Yet, it is not inconceivable that the bureaucratic and administrative burden imposed on domestic firms by such standards could actually make them less able to compete against imports. This possibility, which might be called the 'competitive disadvantage' hypothesis, is more prominent in political circles than in the formal literature. The results of empirical studies regarding roles and impacts of standards measures on a country exports, as described by Moenius (2004), are specified in Table 2.1.

Table 2.1. Roles and Impacts of Standards Measures on Exports

Roles of Standards		Impacts of Standards Measures		
		Country-specific Standards Importer (EU)	Country-specific Standards Exporter (INA)	Mutual Recognition Arrangement
Non Tariff Barriers	Competition Disadvantages	+	-	?
	Standardization Trap	-	-	+
Competitive Advantage		-	+	?
Loss of Variety		+	?	-

Source: Moenius (2004)

Technically, a standard may do one or more of three things. Certain level of quality (a minimum quality) standards place limit on the degree of product risk faced by consumer-a distributional effect-as well as helping to combat 'lemons' type market failures-an efficiency effect (Ackerlof, 1970; Swann, 1996)

2.4.3. Standards as Instruments of Commercial Policy

Roberts et al. (1999) in Jaffee et al. (2004) describe a useful classification scheme for technical trade barriers associated with agricultural and food products, by dividing potential policy instruments into three categories, namely: (1) full or partial import bans; (2) technical specifications, including product and process standards, and; (3) information remedies, including packaging and labeling requirements and controls on voluntary (health and other) claims.

Full or partial bans are the most trade-restricting measures. Total bans are typically used when there are great risks associated with certain plant and animal health problems and where no cost-effective eradication/mitigation measures are available. Partial bans may permit trade only in certain seasons or to/from certain countries or regions. Both technical specifications and informational remedies will normally apply both to imports and domestic supplies. Their effects on trade will derive from the relative abilities of different suppliers to comply with these measures, the varied incidence of compliance costs and how each affects the relative competitiveness of different suppliers.

2.4. The WTO Agreements in Non tariff Barriers (NTB)

According the WTO, agreements on Non-tariff Barrier were designed to address some of the concerns to international trade by ensuring technical regulations, standards, and conformity assessment procedures are prepared, adopted and applied in a 'trade friendly' manner and do not result in or unjustifiable discrimination against imported goods. The agreements seek to promote transparency in the standards development process and promote principles of national treatment, non discrimination, and use of sound science as the basis of standards. The bases of agreements aim to:

1. Encourage the adoption of measures of specific principles in the application of standards.
2. Prevent discrimination between members when identical or similar condition prevail, and reduce restrictions to the international trade.
3. Promote measures based on international guidelines and common risk assessment techniques.
4. Encourage standards based on broad base principles participation and consensus.
5. Provide a mechanism for addressing issues related to developing country capacity to meet compliance costs.

There are two types of agreements in the WTO subject to agriculture sector, especially those that related to health-related trade restrictions; the Sanitary and Phytosanitary (SPS) Agreement and the Agreement on Technical Barriers to Trade (TBT) Agreement. The two agreements are differed by the scopes of the two agreements.

The SPS Agreement establishes the principles upon of which a member of WTO might legitimately assert that its measure are 'necessary' to protect human, animal, and plant life or health from certain specific risks. Referring to the WTO studies, the SPS measures typically deal with:

- additives in food or drink
- contaminants in food or drink
- toxic substances in food or drink
- residues of veterinary drugs or pesticides in food or drink
- certification: food safety, animal or plant health
- processing methods with implications for food safety
- labeling requirements directly related to food safety
- plant/animal quarantine

- declaring areas free from pests or disease
- preventing disease or pests spreading to or in a country
- other sanitary requirements for imports (e.g. imported pallets used to transport animals)

The TBT Agreement covers all technical requirements, voluntary standards and the procedures to ensure that these are met (called conformity assessment procedures), except when these are SPS measures as defined by the SPS Agreement. TBT measures could cover any subject, from regulation to ship and ship equipment, to the shape of food packages. To give some examples pertaining to human health, TBT measures could include pharmaceutical restrictions, or the labeling of cigarettes. Most measures related to human disease control are under the TBT Agreement, unless they concern food safety or diseases which are carried by plants or animals (such as rabies). In terms of food, labeling requirements dealing with nutrition claims, quality and packaging regulations are not considered to be SPS measures and hence are normally subject to the TBT Agreement. However, labeling requirements dealing with food safety are considered to be SPS measures. To be more specific, TBT measures typically deal with:

- labeling of composition or quality of food, drink and drugs
- quality requirements for fresh food
- volume, shape and appearance of packaging
- packaging and labeling for dangerous chemicals and toxic substances, pesticides and fertilizer
- regulations for ships and ship equipment
- etc.

Both the WTO Agreements on the application of SPS and TBT measures, in many ways, related one to another. Both agreements recognize the rights of WTO member countries to establish technical regulations and to apply those regulations to imported products and

acknowledge that right by laying down rules governing the development and application of such regulations, using a certain number of similar provisions. For the most part, the coverage of the two agreements is complementary.

The agreements recognize the rights of importing countries to implement these measures and state importing countries' obligation to provide scientific justification for basing rules. They also state Member countries' obligation to establish enquiry points and provides opportunities for response to those that notify the intent to promulgate new SPS and TBT measures. Signatories are encouraged to adopt internationally recognized standards but are free to apply stricter standards.

CHAPTER III
THE INDONESIA'S EXPORT PERFORMANCE WITH REGARDS TO THE COUNTRIES OF EU

Coffee, cocoa, tea, and spices are considered to be among commodity groups that have been Indonesia's major agricultural exports in the period of 1998-2005 (FAO, 2007). Together, these groups accounted for 25.9 per cent of all agricultural exports. Other major exports are contributed by products of tree crops, including palm and coconut products (33.8 per cent), rubber (18.6 per cent), and high valued fruits and vegetables (5.8 per cent). Nevertheless, the contribution of Indonesia's exports in coffee, cocoa, tea, and pepper to the world market have been fluctuated during 1990-2006 period (Figure 3.1.), with highest market share in 1990.

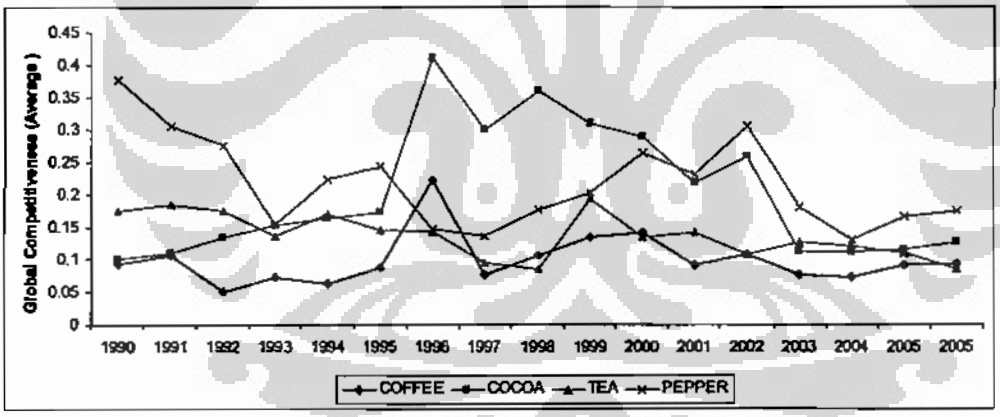

Figure 3.1. Share of the selected Indonesian agro-based commodities in world market (1990-2006)
Source : COMTRADE statistics database for commodity trade
Data has been aggregated to 3 digits level of SITC.3

3.1. Production Capacity for Export

The annual quantity of products exported is determined by the domestic production. Table 3.2. shows that for the period of 1990-2006, the production capacities for the total supply of agricultural

product exports have increased for several commodities group. Coffee and cocoa products have slightly increasing value in the quantity produced, while tea and pepper are showing a relatively stable condition.

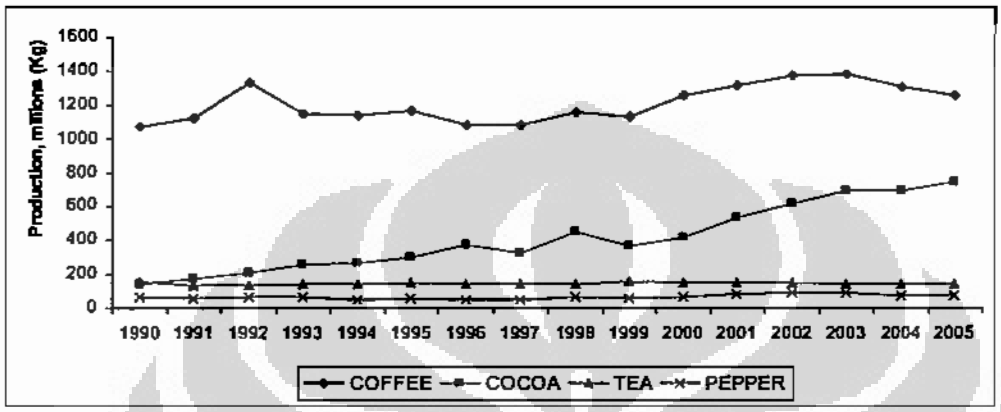

Figure 3.2. Total Production of Selected Agro-based Commodities in Indonesia (1990-2005)
Source: The Ministry of Agriculture of Indonesia, Agricultural Statistics Database, 2007.

The coffee production has been rising along with extend of production area. The growth of coffee production probably has been relatively small during 1990-2005, but the volume has been increasing three times compared in 1990s. The production growth and productivity of smallholders have been increasing significantly compared to large estates. In 1999, the average smallholders productivity were 626,70 kg per hectares, increased more than 100 kg per hectares than in 1980s, while the productivity of large estates were relatively stable (The Ministry of Agriculture, 2001).

Meanwhile, the growth of Indonesia's cocoa production over the past 15 years has been remarkable rising with an annual average increase of over 20 per cent. The majority of this increase has come from smallholders producing at very low costs. Smallholders now account for approximately 82 per cent of production, compared to just 10 per cent in 1980 (The Ministry of Agriculture, 2007). In addition, the

country's infrastructure combined with minimal government intervention has created a highly efficient marketing system that results in growers receiving more than 75% of the export price. Currently, Indonesia has the lowest production costs of the world's major producers.

Given such conditions, it can be stated that to the selected commodity groups, changes in Indonesia's exports for the period 1990-2005 must have been affected by other factors outside the production.

3.2. European Union Market for Indonesia's Exports

The EU represents one of the world's largest markets for agricultural products. It is a particularly attractive and important market for exporters throughout the world, including Indonesia. Among the EU-15 countries, France, Germany, Netherlands, and the United Kingdom have been the traditional markets and positioned as the main destinations of Indonesia's agricultural exports. From Table 3.1., it is shown that, outside tea exports, the average export developments to these countries have decreased up to 50 per cent during the period of 1990-2005.

The France has been the smallest market for Indonesia's exports in the overall trades, while trades with other countries have been based on priorities to specific products. For instance, the volume of coffee exported to Germany have been the biggest among the four countries, spices (pepper) exported more to Netherlands, and most tea exported to EU have been absorbed by the UK market. These of export priorities are correlated to the demand factors that differentiated by consumption patterns in each markets.

Table 3.1. Export Development towards the Countries of EU, 1990-2005 (volume, in metric tons)

COFFEE				
YEAR	FR	DE	NL	UK
1990	4.94	131.47	42.96	14.33
1995	0.94	32.95	5.19	16.47
2000	2.84	47.66	3.34	11.20
2005	4.24	78.76	1.80	16.44
COCOA				
YEAR	FR	DE	NL	UK
1990	0.26	16.31	14.86	0.67
1995	0.70	32.34	14.37	4.41
2000	2.68	13.91	6.41	1.86
2005	9.23	1.64	7.66	9.87
TEA				
YEAR	FR	DE	NL	UK
1990	0.33	4.09	6.28	5.40
1995	0.78	3.62	6.69	7.12
2000	0.02	6.23	6.16	16.16
2005	0.00	7.37	6.42	13.84
PEPPER				
YEAR	FR	DE	NL	UK
1990	1.11	0.00	7.35	0.80
1995	1.59	4.25	3.79	0.57
2000	1.28	1.52	6.09	0.11
2005	0.10	1.58	1.95	0.22

Source : COMTRADE statistics database for commodity trade
data has been aggregated to 3 digits level of SITC.3, except pepper uses 4 digits.

3.2.1. Consumption Patterns

The selected commodity groups have been rooted and widely accepted in EU society. These, lead to the specific consumption behaviors of EU consumers compared to other markets. Coffee and tea are well-known daily drinks, while cocoa and pepper are common in daily consumption and food industries.

Coffee

According to the International Coffee Organization (ICO), the annual per capita quantity consumed in EU is the highest in the world (around

500-1,000 cups). However, in 2005, the European coffee market shows decreasing trends of consumption quantity. Nevertheless, changes are relatively small comparing to quantity consumed in the previous years, while other products (cocoa, tea, and pepper) are consumed more in 2005.

Tea

Despite its traditional image as one of the world's largest consumers of tea, Britain's tea drinking habit is waning. The UK is in fact still the largest tea market in Western Europe, representing 86.9 per cent in overall volume terms and 92.6 per cent of volume sales of black tea. In 2000, sales of tea fell in UK by 0.1 per cent, as the market has seen a decline in sales of mainstream black tea bags. Meanwhile, elsewhere in Europe, a different picture is emerging. In France, sales of tea grew in the year 2000 by 7.7 percent and by 2005 increased from 14 million liters to 21 million liters, an increase of 8.4 per cent since 2001. Black tea still represents the largest part of the French market with a 50 per cent share of total volume. Standard black represents 21.43 per cent, and specialty black accounts for 28.57 per cent. Green tea now accounts for 10.72 per cent while fruit and herbal infusions account for 21.43 per cent. Meanwhile, the rest of EU countries market remained grew vary slightly in 2005.

Cocoa

The major Western Europe cocoa industry ground over a million tons of cocoa beans, close to a third of the world cocoa production, with the Netherlands alone accounting for 450,000 tons, which makes it the most important processor of cocoa beans in the world (ICCO, 2007). Downstream, the Dutch cocoa trade and cocoa-processing industries together handle one million tons of Cocoa products. Other major European players in the cocoa trade and processing are Germany, the United Kingdom and France.

3.2.2. Market Share of Imports from Indonesia

Although trade activities in agricultural sectors between Indonesia and the countries of EU have begun for centuries, Indonesia has not been the major trade partners to these countries (indicated by the low share of Indonesian product in the markets). Table 3.2. shows that most of imported products from Indonesia still hold theirs share below 10 per cent in most markets.

Table 3.2. Share of the Selected Agro-products from Indonesia in EU markets (1990-2005)

COFFEE				
YEAR	FR	DE	NL	UK
1990	6.81%	7.70%	2.33%	9.54%
1995	0.26%	4.35%	3.11%	11.44%
2000	0.77%	5.64%	2.01%	7.33%
2005	1.34%	7.93%	1.07%	9.83%
COCOA				
YEAR	FR	DE	NL	UK
1990	0.38%	5.59%	2.22%	0.35%
1995	0.29%	7.72%	2.95%	2.02%
2000	0.82%	3.65%	1.10%	0.90%
2005	2.67%	0.37%	1.11%	4.99%
TEA				
YEAR	FR	DE	NL	UK
1990	3.86%	14.81%	17.93%	3.04%
1995	5.26%	10.80%	27.93%	4.17%
2000	0.12%	17.33%	23.36%	10.24%
2005		6.86%	15.78%	8.85%
PEPPER				
YEAR	FR	DE	NL	UK
1995	7.21%	24.11%	32.37%	9.09%
2000	11.90%	8.71%	39.11%	2.59%
2005	4.99%	7.87%	16.84%	6.60%

Source : COMTRADE statistics database for commodity trade

The strongest shares of Indonesian products, above ten per cent during 1990-2005 periods, have been achieved in Dutch market, for tea and pepper. In the overall EU markets, coffee imported from Indonesia even has lost their share for the last 15 years. For cocoa products, the increases of shares have only been gained in France, which increased from 0.38 per cent in 1990 to 2.23 per cent in 2006.

In Netherlands that has been the greatest importer of world's cocoa, Indonesia have only contributed below 3 per cent to market since 1990. While for pepper, Indonesia has lost its competitiveness in most of its markets, indicated by the continuous decline of its shares that reached more than 50 per cent of shares lost from 1990 to 2006.

3.2.3. Price Competitiveness

Despite the fact that EU countries gain better if they do imports (of selected commodity groups) from Indonesia rather than producing in their countries. Price still can be the important factors as relative price ratios between imports and exports reflect the scale of comparative advantages and gains from trade.

Table 3.3. shows the average import price of raw commodities (unprocessed products). The average import prices vary among products and across countries. Nevertheless, the price differences have not been significant and the annual changes in all countries followed the similar trends affected by the world price. In 1995, the price of imports of coffee bean in all EU countries reached the highest level (over 3 US $/kg), but decreased to below 2 US $/kg in 2005. The average cocoa, tea, and pepper import prices have increased about 0.5 US$/kg from 1995 to 2005.

Table 3.3. Import Price of the Unprocessed Products*, (US $/kg)

COFFEE				
YEAR	FR	DE	NL	UK
1990	1.40	1.76	1.56	1.57
1995	2.88	3.26	3.20	3.17
2005	1.77	1.79	1.94	1.82
COCOA				
YEAR	FR	DE	NL	UK
1990	1.35	1.35	1.38	1.37
1995	1.56	1.48	1.49	1.49
2005	1.72	1.71	1.58	1.56

Table 3.3. Import Price of the Unprocessed Products*..continue

TEA				
YEAR	FR	DE	NL	UK
1990	1.80	1.81	1.88	1.95
1995	2.87	2.85	2.78	2.75
2005	2.26	2.03	1.97	2.60
PEPPER				
YEAR	FR	DE	NL	UK
1990	5.20	2.16	1.80	2.11
1995	4.05	3.49	1.74	1.74
2005	5.85	2.53	2.11	1.76

Source: FAOSTAT | © FAO Statistics Division 2007
*coffee and cocoa bean, tea leaf, and un-crushed pepper

The export prices are mainly affected by the domestic factors, such as production capacity and government policy (which usually connected to the export tax), but they also affected by the world prices. In Table 3.4., it can be shown that the export prices of the commodity groups have fluctuated during 1990-2005 periods, while the annual trends differ among commodities.

Table 3.4. Export Price of Unprocessed Products*, (US $/kg)

YEAR	COCOA	COFFEE	TEA	PEPPER
1990	0.99	1.05	1.80	1.70
1995	1.20	2.70	2.66	1.22
2000	0.74	1.08	3.75	1.17
2005	1.27	1.25	1.73	1.27

Source: FAOSTAT | © FAO Statistics Division 2007
*coffee and cocoa bean, tea leaf, and un-crushed pepper

3.2.4. Trade Restrictiveness

Despite the success in penetrating to the EU market, Indonesia has been concerned with agricultural protection policy of the EU (Chee Peng Lim 1997). The two major irritants in Indonesia-EU agricultural trade relations have been the variable levies/tariffs, and discriminatory measures against tropical products (such as cocoa, vegetable oils, fruits, tobacco and coffee) that compete with the products from the African, Caribbean and Pacific countries (ACP countries). These

discriminatory measures have usually included tariffs to protect ACP exporters.

Following tariff barriers, the non-tariff barriers – including standards and technical regulations-measures have been imposed strictly by EU due to the high quality and safety requirements of their consumers.

3.2.4.1. Tariffs

Tariff escalation in agricultural markets is a major factor for exporting countries, hindering export growth and diversification into processed products. The EU and other developed countries reduced agricultural tariffs by an average of 35 per cent. In the major import markets, escalation is most evident in tropical raw materials, cocoa, coffee, tea, sugar, and fruit.

Tariffs on processed coffee are relatively low in the EU, which applies an average duty of 9 per cent for higher levels of processed coffee. In the cocoa sector, the EU has a bound rate of 0 per cent for cocoa beans, but a 7.7 per cent, and 15 per cent ad valorem duty on cocoa powder and chocolate crumb containing cocoa butter respectively. Nevertheless, because of tariff escalation, imports from Indonesia are mainly still non-processed products, in the form of un-roasted green coffee beans and cocoa beans, rather than manufactured coffee and cocoa/ chocolate products.

Meanwhile in tea sector, the EU charges a 3.4 per cent duty on processed tea, which is considered as the lowest among developed countries. The reduction of dutiable tea products was slightly below the overall average reduction of 37 per cent.

3.2.4.2. Non-tariff; Standards and Technical Regulations

Although standards measures in agricultural products of EU are mainly directed to the sanitary and phytosanitary requirements, the technical issues still considered to be important as both type of standards complementary one to another. Figure 3.3. to 3.6. show that there have been significance development that vary in each EU countries due to the technical requirements that shall be fulfilled by products in order to be accepted by consumers in EU markets.

The important thing that should be noticed here is that despite the common agricultural policy (CAP) exist in EU region, and the agreement to hold similar standards, each countries are allowed to developed their own specific standards which latter must be notified to EU commission. Thus, exporting to countries of EU must in accordance to countries specific standards.

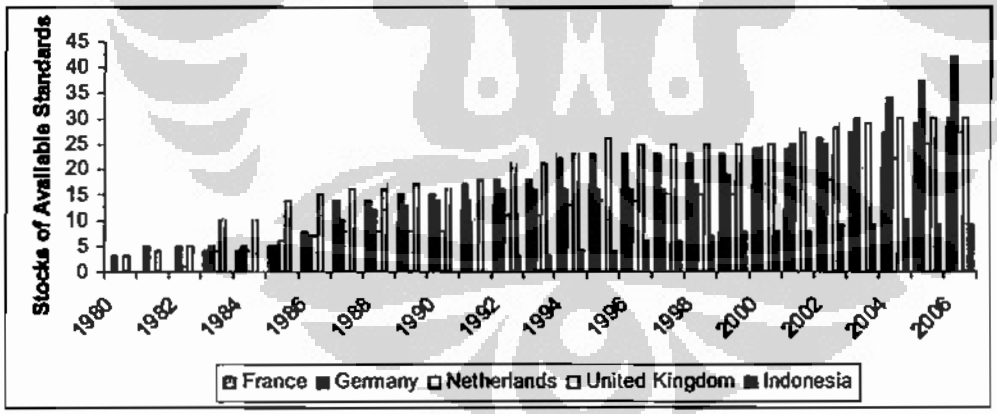

Figure 3.3. Standards Development in Coffee Products
Source : compiled from BSI, DIN, NEN, AFNOR and BSN (1980-2007)

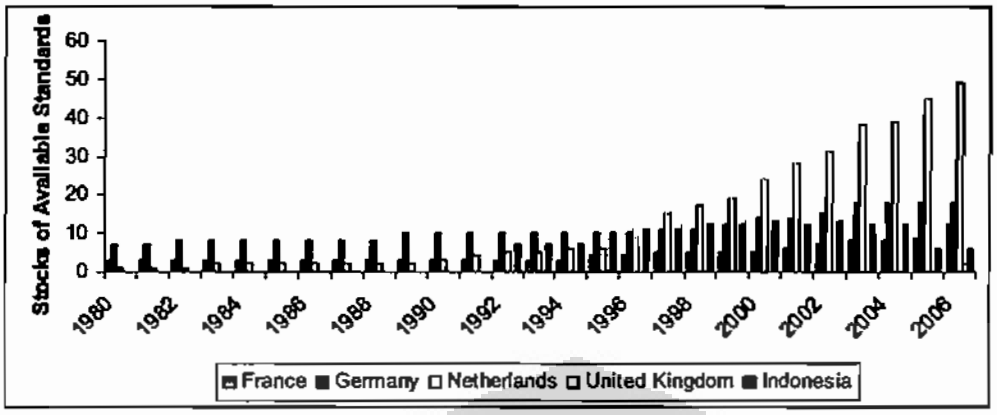

Figure 3.4. Standards Development in Cocoa Products
Source : compiled from BSI, DIN, NEN, AFNOR and BSN (1980-2007)

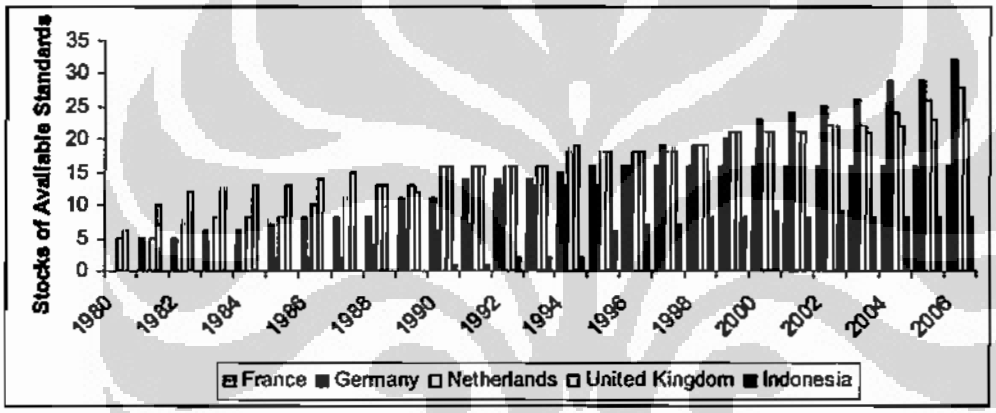

Figure 3.5. Standards Development in Tea Products

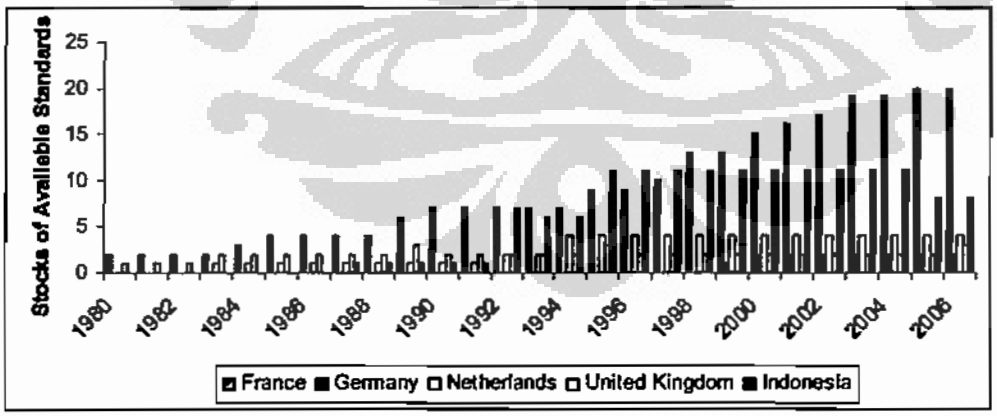

Figure 3.6. Standards Development in Pepper Products
Source : compiled from BSI, DIN, NEN, AFNOR and BSN (1980-2007)

CHAPTER IV
THEORITICAL FRAMEWORK OF GRAVITY MODEL AND BILATERAL TRADE FLOWS

4.1. Fundamental of the Gravity Model

The gravity equation (The Law of Universal Gravitation) proposed by Newton in 1687 has been a popular formulation for statistical analyses of bilateral flows between different spatial entities. Basically, it held the attractive force between two objects i and j, given by:

$$F_{ij} = G\frac{M_i M_j}{D_{ij}^2}$$

The notation above is defined as; F_{ij} is the attractive force, M_i and M_j are the masses, D_{ij} is the distance between the two objects, G is a gravitational constant depending on the units of measurement for mass and force.

Tinbergen (1962) then proposed that similar functional form could be applied to international trade flows analysis. This general gravity law for social interaction may be expressed in similar notation:

$$F_{ij} = G\frac{M_i^{\alpha} M_j^{\beta}}{D_{ij}^{\theta}}$$

Notation is defined as F_{ij} is the 'flow' from origin i to destination and may also represent total volume of interactions between i and j (i.e. the sum of the flows in both directions). M_i and M_j are the relevant economic sizes of the two locations. D_{ij} is the distance between the locations. Note that we return to Newton's Law, if $\alpha = \beta = 1$ and $\theta = 2$.

4.1.1. Types of Economic Masses

The economic sizes of the exporting and importing countries, M_i and M_j, are usually measured with gross domestic product, with the estimated coefficients usually close to the predicted value of one. In monetary flow measurement (e.g. export values), M is usually the gross domestic product (GDP) or gross national income (GNI, formerly GNP) of each location. For flows of people, it is more natural to measure M with the populations. The gravity equation can also be thought of as a kind of short-hand representation of supply and demand forces. If country i is the origin, then M_i represents the total amount it is willing to supply to all customers. Meanwhile, M_j represents the total amount destination j demands.

4.1.2. Distance

Mostly, distance is always measured in the gravity model formula. This formula approximates the shape of the earth as a sphere and calculates the minimum distance along the surface. Distance is also important in explaining trade between economies, as it might act as a sort of tax wedge, imposing trade costs, and resulting in lower equilibrium trade flows. Head (2003) explains the importance of distance to trade that mainly connected to costs involved as following;

1. Distance is a proxy for transport costs. Shipping costs (freight charges and marine insurance) can go a long way towards explaining why distance matters.
2. Distance indicates the time elapsed during shipment. For perishable goods the probability of surviving intact is a decreasing function of time in transit.
3. Synchronization costs. When factories combine multiple inputs in the production process, they need those inputs to arrive in time or

bottlenecks emerge. One possibility is to use warehouses to keep inventories of each input but this approach suffers from various drawbacks (land costs, technological obsolescence, fashion changes, and low pressures for quality control). Sourcing inputs from nearby lowers synchronization costs.

4. Communication costs. Distance may act as "proxies for the possibilities of personal contact between managers, customers, and so on; that much business depends on the ability to exchange more information, of a less formal kind, than can be sent over a wire."
5. Transaction costs. Distance may also be correlated with the costs of searching for trading opportunities and the establishment of trust between potential trading partners.
6. "Cultural" distance." It may also be that greater geographic distances are correlated with larger cultural differences. Cultural differences can restrict trade in many ways such as inhibiting communication, generating misunderstandings, clashes in negotiation styles, etc.

In certain cases, however, using directly measured distance suffers from the shortcoming assumption that the distance is directly related to cost of trade, thus, distance variable of the gravity model is then often weighted by other factor involved to the cost and measured as remoteness indicator. Brulhart and Kelly (1999) in Robert (2003) weighted their remoteness indicator by trading partner's GNP. This GNP weighting resulted in higher remoteness value for economies with higher GNP values than economies with lower GNP values. Roberts (2003) specifies a proximity indicator that weights the geographical distance between trading partners and the relative wealth of the individual CAFTA economies to the rest of the world.

4.1.3. Other Variables

Different with GDP, GDP per capita or distance, a dummy variable does not take real values, but rather takes only the value 0 or 1. Other dummy variables such as, common language, common border, common historical background (common colonization), are generally added to the equation.

Aitkin (1973) introduced a dummy variable to his equation in measuring the impact of being a member of Regional Trade Agreements (RTA). He gave the value of 1 to variable represent countries that are the members of the same economic bloc, while countries that do not belong to the bloc take value of 0.

4.2. Development on the Gravity Model and Trade Flows

Incorporating trade flows to the Gravity model is not a new story. Oguledo and Macphee (1994) in Rahman (2003) captured that the gravity model has been applied to a wide variety of goods and factors of production moving across regional and national boundaries under different circumstances since the early 1940s. Feenstra et al. (2001) also argues that a gravity-type equation can arise from a wide range of models, though they have subtly different implications for the coefficient estimates. Their empirical work for differentiated goods delivers results consistent with the theoretical predictions of the monopolistic competition model. Helpman (1998) concludes that the primary advantage of using gravity models is to identify determinants influencing volume of trade, as well as some underlying causes for trade. Further, he suggests that product differentiation can be considered above and beyond factor endowments. More considerable amount of literatures has been published regarding such analysis.

As the first versions of gravity model, Tinbergen (1962) and Pöyhönen (1963) in Sanso et al. (1993) conclude that exports are positively affected by the income of the trading countries and that distance can be expected to negatively affect exports. Anderson (1979) applies product differentiation and assumes Cobb-Douglas preferences and that products are differentiated by country of origin. Anderson concludes that his application of the gravity model is an alternative to cross-section budget studies and consumers differentiate according to origin of goods. Meanwhile, Bergstrand (1985) assumes CES preferences and applies the Armington assumption. When Bergstrand tests his assumption for product differentiation he concludes that empirically, price and exchange rate variables have significant effects on aggregate trade flows. His estimates indicate that goods are not perfect substitutes and that imported goods are closer to being substitutes for each other than substitutes for domestic goods. His empirical results indicate that the gravity equation is a reduced form of a partial subsystem of a general equilibrium model with nationally differentiated products.

Later, Deardorff (1995) derived the gravity model in the framework of a Heckscher-Ohlin model. By simplifying an earlier approach made by Anderson (1979), he presumes that the same preferences hold, not only for traded goods like Anderson, but for all goods. Deardorff (1998) managed to prove that the gravity model is consistent with several variants of the Ricardian and Heckschser-Ohlin models.

Aguilar (2006) explored the use of a gravity model to evaluate the determinants of trade for specific products in agricultural trade, defined at the 8-10 digits SITC-level. Emlinger, et al. (2006) developed a model based on the new developments of the gravity trade model, focuses on the difficulties Mediterranean countries face in entering the EU market, compared to other EU partners and considering the relative impact of the different trade costs.

Moenius (1999), following Swann et al. (1996), used a gravity model to study the effects of technical barriers on international trade. He analyzed the role of standards depending on that imposes those standards and whether such standards are common for exporting and importing country. The results suggest that the existence of common standards is beneficial for bilateral trade, and that such situation affects negatively trade of food products but positively trade of industrial goods.

Finally, Chevassus-Lozza et al. (2005) modified and applied the gravity model developed by Anderson and van Wincoop (2004), in assessing the role of non-tariff barriers (NTBs) for new EU member states exports in the food sector. The model includes specific variables to designate NTBs. They proposed an alternative for the well-known measurement problem of the complex NTBs system. The assessment is based on a sector specific gravity model, which was enhanced with inclusion of different categories of NTBs: sanitary and phytosanitary measures (SPS), quality measures and import certificates.

4.3. The Modified Gravity Model for Export Flow (Chevassus-Lozza, et al, 2005)

Regarding the Chevassus-Lozza's study (2005), it appears that the properties of this modified gravity model are particularly suitable for this study. The model not only captures effects of tariff and non tariff barriers to trade volume, but also manages to breakdown the endowment factors into particular bilateral and global competitiveness. The bilateral and global competitiveness which derived from price competitiveness and market shares, are considered to be determinants of exports for Indonesia's agricultural commodities. For these reasons, this study adopts the model proposed by Chevassus-Lozza, et al.

(2005) for assessing the export flows of Indonesia to the countries of EU.

4.3.1. Assumptions to the Model

Note that the model uses the CES expenditure system, with assumptions for the export flows of selected commodities: (1) all good are differentiated by place of origin; (2) the supply of product are being fixed, and; (3) consumer demand being defined by a CES utility function.

Meanwhile, the consumer follows a two-step budgetary procedure; (1) total import demand is defined by the importing country's consumers by choosing between imported products; (2) import demand is differentiated by country of origin.

Later, the model assumes that the first step is already done, thus the total demand of import already defined. Therefore, the focus of analysis is on the second step of budgetary constraints; the import demand is differentiated by the representative consumers from country *j* who maximize the utility function of CES type for the product *k* with the geographical repartition of its imports from countries *i*.

4.3.2. CES Expenditure and Budget Constraint

The utility function of consumer in country *j* is as the following:

$$U_{jk} = \left[\sum_{i} b_{ik}^{\frac{1-\sigma}{\sigma}} \cdot M_{ijk}^{\frac{(\sigma-1)}{\sigma}} \right]^{\frac{\sigma}{(\sigma-1)}} \qquad (1)$$

Where :

j represents the importing country, i is the exporting country, and k is the product traded.

M_{ijk} is the quantity of imported product by country j originating from i.

b_{ik} is the parameter represents the level of consumers' preference for import of good k originating from i.

σ is the elasticity of substitution of imports of country j.

The utility function is subject to the budget constraint. Explaining this, the total expenditure is defined in the first step of budgetary procedure as below:

$$m_{jk} = \sum_i P_{ijk} M_{ijk} \qquad (2)$$

Where:

m_{jk} is the total expenditure of j for the imported product k.

P_{ijk} is the price of product k originating from i, which is paid by consumer in j.

Since P_{ijk} contains the trade costs, which are not directly observable, it is different from the exporter's supply price P_{ik}. Trade costs are all costs needed in getting product to a final user, which may act as factor of trade resistance. Thus, $P_{ijk} = P_{ik} \cdot T_{ijk}$, with T_{ijk} is the bilateral trade resistance (cost factors), that might include tariffs, transport costs, and non-tariff barriers.

Further, x_{ijk} as the nominal value of exports from i to j for product k is explained as:

$$x_{ik} = P_{ijk} \cdot M_{ijk} \qquad (3)$$

And the total value of exports of i is then on product level, x_{ik}:

$$x_{ik} = \sum_j x_{ijk} \qquad (4)$$

Solving the consumer utility function (1) given the budget constraint (2), the nominal demand x_{ijk} of product *k*, originating from *i*, by the consumers in region *j* is obtained as follows:

$$x_{ijk} = \left(\frac{b_{ik} P_{ij} T_{ijk}}{P_{jk}} \right)^{(1-\sigma)} m_{jk} \qquad (5)$$

P_{jk} refers to country *j*'s CES index price for product *k*, related to *j*'s overall import price of product *k*.

From equation (4) and (5), the total value of exports of *i* on product level (x_{ik}), with the market clearance condition can be explained as:

$$x_{ik} = \sum_j x_{ijk} = \left(b_{ik} P_{ik}\right)^{1-\sigma} \sum_j \left(\frac{T_{ijk}}{P_{jk}} \right)^{1-\sigma} m_{jk} \qquad (6)$$

4.3.3. Selected Specification for Exports

In order to fulfill the requirements of Gravity Model equation, the model follows Anderson and Van Wincoop (2004) approach, by solving the scale prices ($b_{ik} P_{ik}$) from market clearing condition in equation (6).

Defining Y_{wk} as the total world trade for product k (defined also as sum of total imports for product *k* of all countries), then $Y_{wk}=\sum_j m_{jk}$.

Further, by assuming the size of income shares of respective *j* as $\theta_{jk}=\frac{m_{jk}}{Y_{wk}}$, and by involving user price component, $\Pi_{jk}\equiv\left(\sum_j\left(\frac{T_{ijk}}{P_{jk}}\right)^{1-\sigma}\theta_{jk}\right)^{\frac{1}{(1-\sigma)}}$, the equation of bilateral trade equation can be obtained as:

$$x_{ijk}=\frac{x_{ij}\,m_{ij}}{Y_{wk}}\left(\frac{T_{ijk}}{\Pi_{ik}\,P_{jk}}\right)^{1-\sigma} \qquad (7)$$

4.3.4. Elements of Competitiveness

Index Π_{ik} is then described as:

$$\Pi_{ik}=\left(\sum_j\left(\frac{P_{ijk}}{P_{jk}P_{ik}}\right)^{1-\sigma}\theta_{jk}\right)^{\frac{1}{(1-\sigma)}}=\left(\frac{1}{P_{ik}}\right)^{1-\sigma}\left(\sum_j\left(\frac{P_{ijk}}{P_{jk}}\right)^{1-\sigma}\theta_{jk}\right)^{\frac{1}{(1-\sigma)}} \qquad (8)$$

This bilateral model particularly introduces the bilateral and global competitiveness function. The price competitiveness of *i* on the market *j* for product *k*, is interpreted as $\Psi_{ijk}=\frac{P_{ijk}}{P_{jk}}$.

From this, the index of global price competitiveness of *i* on all of its market, Ψ_{ik} is derived as follows:

$$\Psi_{ik} = \left(\sum_j \left(\frac{P_{ijk}}{P_{jk}} \right)^{1-\sigma} \theta_{ik} \right)^{\frac{1}{(1-\sigma)}} = \left(\sum_j \left(\Psi_{ijk} \right)^{1-\sigma} \theta_{ik} \right)^{\frac{1}{(1-\sigma)}} \qquad (9)$$

Defining $\Phi_{ijk} = \frac{P_{ik}}{P_{jk}}$ as cost-competitiveness of *i* on the market *j*, the gravity equation elements of competitiveness is introduced as follows:

$$x_{ijk} = \frac{x_{ik} m_{jk}}{Y_{wk}} \left(T_{ijk} \frac{\Phi_{ijk}}{\Psi_{ik}} \right)^{1-\sigma} \qquad (10)$$

The ratio $\frac{\Phi_{ijk}}{\Psi_{ik}}$ compares the competitiveness of *i* on *j* to its global competitiveness. If *i* is more competitive on the market *j* than on all its other markets, this may stimulate its bilateral trade with *j*. On the other hand, if *i* is less competitive on *j* than on its other markets, this will lead to the reduction of bilateral trade between *i* and *j*.

From here, the gravity equation is developed by defining $X_{ik} = \frac{x_{ik}}{P_{ik}}$ as the total quantity of export *i* for *k*, with P_{ik} representing the price of total export of *i* on the product *k*; $M_{jk} = \frac{m_{jk}}{P_{ijk}}$; $X_{ij} = \frac{x_{ijk}}{P_{ijk}}$; and $\frac{P_{ik}}{P_{wk}} \equiv \Psi_{ik}$, the equation (10) now becomes:

$$X_{ijk} = \frac{M_{jk} X_{ik}}{Y_{wk}} \left(\frac{T_{ijk} \Phi_{ijk}}{\Psi_{ik}} \right)^{-\sigma} \qquad (11)$$

CHAPTER V
METHODOLOGY

5.1. Model Specification

By putting together the equation (11) in the previous chapter for a pooled data analysis, the final model used for bilateral trade analysis becomes:

$$X_{ijk} = \frac{M_{jk} \cdot X_{ik}}{Y_{wk}} \left(\frac{T_{ijk} \Psi_{ijk}}{\Phi_{ik}} \right)^{-\sigma} \qquad (12)$$

The gravity model was then developed by the principal that the bilateral trade restrictiveness (T_{ijk}) maybe composed into three factors: distance, tariff, and standards measures.

Distance (d_{ijk}) between Indonesia (i) and its trading partners (j) is considered as the proxy of transport cost. Later, by referring to Roberts (2004), the distances are weighted by the exchange rates factor. Thus, distance variable is presented in the form of proximity ($dprox_{ijk} = d_{ijk} \, x \, er_i$), with $dprox_{ijk}$ is the calculated proximity and er_i is the annual exchange rates of Indonesia to US dollar. Also, tariff (t_k) and the non-tariff barriers are included. The non-tariff barriers consist of ST_{ik} -standards developed by i and ST_{jk} -standards developed by j. Therefore, the overall trade restrictiveness become $T_{ijk} = (dprox_{ijk}^{\rho} t_k^{\tau} ST_{ik}^{\theta} ST_{jk}^{\psi})$.

Following Kristjánsdóttir (2005) and Beers *et al.* (1999) on Földvári (2005) which applied the gravity equation to a single-country perspective analysis; exporting country is denoted with (i), while the trading partner is denoted with (j). However, since it is clear that this

research applies to one export country only (Indonesia), there is no need to identify the export country specifically, the subscript (i) is therefore left out. Export therefore only varies by trading partner (j) and type of commodity (k). Thus, by putting the variables as time variant, the log-linear regression form with regard to the gravity model of Indonesia's export becomes:

$$\ln X_{jkt} = \beta_0 + \beta_1 \ln M_{jkt} + \beta_2 \ln X_{kt} + \beta_3 \ln Y_{wkt} + \beta_4 \ln dprox_{jk} + \beta_5 \left(\ln \Psi_{jkt} - \ln \Phi_{kt}\right) + \beta_6 \ln t_{kt} + \beta_7 \ln ST_{kt} + \beta_8 \ln ST_{jkt} + \varepsilon_{jkt} \quad (13)$$

Denote that variables specifications are:

- j refers to the importing countries, and t is the period of series analysis.
- X_{jkt} is variable for export from Indonesia to j. Here a regression is run on exports to different commodity k, over time t.
- M_{jkt} is variable for total import of in country j.
- X_{kt} is the total export from Indonesia.
- Y_{wkt} is total world trade (the total imported by all countries from the world).
- $dprox_{jk}$ is the distance proximity between Indonesia and country j for each commodity k. It is a exchange rates-weighted sea distances between shipping ports used for commodity-specific export-import activities in each countries. For instance, the distance between Indonesia to France for coffee export is measured from Belawan to Marseilles, while distance between Indonesia and Netherlands for cocoa export is measured from Ujung Pandang to Rotterdam. The aim of these distinctions is to enrich data available from cross section identifiers of pooled data analysis.

- t_{kt} is the average applied tariffs for each commodity k.
- Ψ_{jkt} is the bilateral competitiveness, represented by the bilateral relative prices, $\frac{P_{kt}}{P_{jkt}}$, that is the ratio between the export price in Indonesia to the market *j* and the import price of *j*.
- Φ_{tkt} is the index of global competitiveness of Indonesia on all its market. It is the weighted average of the competitiveness of Indonesia on each market *j*, and the weight being calculated as the share of market *j* in the total trade of products. Notes: here the weighted average of the competitiveness is calculated only from world's top 5 markets, since it is represents more than 75% of market share and considered sufficient enough for index calculation.
- Referring to Swann et al. (2003), the specific standards developed by Indonesia and *j* are captured by (ST_{kt})- stocks of standards developed by Indonesia and (ST_{jkt})- stocks of standards developed by each EU countries. The elimination of commodity groups with no standards ($\ln ST_{kt} = \propto$) and ($\ln ST_{jkt} = \propto$) from the estimation is avoided by transforming the standards variable to $ST_{kt} = (ST_{kt} + 1)$, and $ST_{jkt} = (ST_{jkt} + 1)$. Standards stocks are the total number of standards inherent, without regarding the types of standards (voluntary and mandatory). The stocks of standards available in each country represent the frequency of standards applied at the entrance to the markets.
- ε_{jkt} is the error term and is assumed to be normally distributed with mean zero.

5.2. Hypothesis for Parameter Signs

The following signs were hypothesized for the estimation parameters in the log-linear regression model (13):

- β_0 as constant, the sign is not defined in order; β_1 and $\beta_2 > 0$; $\beta_1 + \beta_2 = 1$, referring to the theoretical gravity model that imposes unitary income elasticities.
- $\beta_4 = p\ (-\sigma) < 0$ with $\sigma > 1$ the CES elasticity: the larger the distance between *i* and *j*, the more important the transport cost and the lower the trade flow between the two countries;
- $\beta_5 = (-\sigma) < 0$; the bilateral competitiveness is negatively related to export flow as the highest the price of the exporting country on the market, the lowest the volume of trade; while related to the global competitiveness, less competitive is the exporting country on its other markets, more it will trade with a given bilateral partner;
- The sign of $\beta_6 < 0$; the larger the tariff would result in exports reduction;
- The signs of β_7 and β_8 are not defined in advance. These show that they may act as a barrier in a first instance, when product do not meet certain standards, while, as soon as the standards are met, it may facilitate the trade.

5.3. Procedures of Model Estimation

5.3.1. Data Structure

Data used for model estimation was unbalanced pooled data. The utilization of pooled data here was aimed to control for individual heterogeneity and non stationarity, and also to improve efficiency in model estimation. The pooled consisted by time series observation ranges from 1990 to 2005, while cross sectional entities covered four partner countries in the EU; France (FR), Germany (DE), Netherlands (NL), and United Kingdom (UK), and four specific commodity groups in

accordance to the three digits classification of SITC.3; namely coffee (071), cocoa (072), tea (073), and pepper (0751). Note here, the classification for pepper uses the 4 digits of STIC.3 to exclude capsicum-based pepper commodity. Hence, model estimation was run by using 16 cross-section units and 16 years period of analysis (256 observations).

The data required in analyzing trade activities for the gravity model was:

- The quantity of export (from Indonesia to EU countries), in kilograms.
- The total quantity of export (from Indonesia to world), in kilograms.
- The total quantity of import (by EU countries), in kilograms.
- The total quantity of world trade (total imports of all countries), in kilograms.
- The relative export price faced by exporters in Indonesia, in $ US/unit of quantity.
- The relative import price faced by importers in EU countries, in $ US/unit of quantity.

The trade restriction required information on:

- Distances between shipping ports in used for commodity-specific export-import activities in each country.
- The 1990-2005 average applied tariffs of EU for each commodity. The values are different for each commodity, but equal for each country applied by all country observed.
- The specific information on standards needed is the stocks of standards of the EU and Indonesia National Standards for each commodity observed. One thing that always being questioned about the accountability of standards count, as mentioned by Swann et al. (1996), the measure of strength in standards obliged us to assume that standards have equal weight. While in practice,

a standards count is likely to be quite a 'mixed bag', which also common for other count measures, such as patent counts. Nevertheless, it should be underlined also that standard-setting involves a costly input of science, technology, skilled human resources and other institutional properties, and consequently it seems unlikely that a particular standard will have negligible economic value. The process of writing standards is likely to promote the exchange of science and technical information between countries and its publications does provide a suitable indicator for standards development.

5.3.2. Model Estimation and Justification

5.3.2.1. Estimation

The model was estimated with the Seemingly Unrelated Regression (SUR) method for pooled data analysis by using the student version of Eviews 4.0 statistical software, which automatically estimates a feasible GLS specification correcting for both cross-section heteroskedasticity and contemporaneous correlation. SUR method was considered sufficient for model estimation since it was assumed that the all commodities being analyzed belong to the same commodity group and their export activities connected one to another.

Technically, SUR estimation also allows the error terms to be correlated across separate but related regressions and uses the correlation between error terms to improve the estimates (Zellner, 1962 and Conniffe, 1982). Since the student version of Eviews 4.0 does not report separate measures for each regression equation and only presents the fixed effect intercepts (constants), thus, the final estimates would not be in the form of separate equations, rather that a single equation (same elasticities) with different intercept for each

pooled individuals. With these fixed effect intercepts the model incorporate the differences between cross sectional entity, but stays constant over time.

5.3.2.2. Justification

Test for Data Pooling

The model was first compared to the one estimated by the usual OLS estimation to see whether the decision on taking account the individuality is appropriate, which is judged by the restricted F (Chow) test. The test indicates the probability of a false rejection of the null hypotheses that the model imposes a common intercept for all individuals (Gujarati, 2003). The null and alternative hypotheses were assumed:

Ho : ***the intercepts and slope coefficients are constant across individuals***
H1 : ***the intercepts and slope coefficients are vary across individuals***

The test for null hypothesis is explained as:

$$F_{m,n-v} = \frac{\left(RSS_R - RSS_{UR}\right)}{m} \Big/ \frac{\left(RSS_{UR}\right)}{\left(n-k\right)}$$

$$= \frac{R^2_{UR}}{m} \Big/ \frac{\left(1-R^2_{UR}\right)}{\left(n-k\right)}$$

Degrees of freedom are given by deflators in numerator and denominator, while RSS_R and RSS_{UR} are the residual sum squares from the restricted and unrestricted models respectively. *k* is the number of explanatory variables (including intercepts), *m* = is the number of restrictions, and *n* is the number of observation.

Test for Model Significance

Next, the overall statistical significance in estimation to the selected model was done by using Wald test for coefficient restriction. The test indicates the probability of a false rejection of the null hypotheses that the model has no explanatory power over the dependent variable (Gujarati, 2003). Thus, the following null and alternative hypotheses were assumed:

$$Ho : \beta_1=\beta_2=\beta_3=\beta_4=\beta_5=\beta_6=\beta_7=\beta_8=0$$
$$H1 : \beta_1\neq\beta_2\neq\beta_3\neq\beta_4\neq\beta_5\neq\beta_6\neq\beta_7\neq\beta_8\neq 0$$

The null hypothesis states that each parameter other than the intercept has no explanatory value. While an accepted alternative hypothesis gives no indication of what variables have relevancy in the model, it does validate the overall significance of the model. The test for null hypothesis is explained as:

$$F_{q,n-k} = \frac{\left(ESS_R - ESS_{UR}\right)}{q} \Big/ \frac{\left(ESS_{UR}\right)}{\left(n-k\right)}$$
$$= \frac{R^2_{UR}-R^2_{UR}}{q} \Big/ \frac{\left(1-R^2_{UR}\right)}{\left(n-k\right)}$$

Degrees of freedom are given by deflators in numerator and denominator, while ESS and RSS are the estimated and residual sum squares respectively. q is the number of restricted variables, n is the number of observation, and k is the number of explanatory variables (including intercepts).

Test for Parameters Significance

The statistical significance of estimation parameters was tested using a standard t-test applied in GLS regressions. Estimation coefficients can be interpreted as elasticities following the standard treatment of log-linear regression.

Detection and Correction for Serial Correlation

Both detection and correction for the present of autocorrelation was done by the Durbin-Watson procedure.

5.3.3. Sources of Data

The data needed was obtained from the following resources:

- COMTRADE statistics database for bilateral trade activities (www.comtrade.org), data has been aggregated to 3 digits level of SITC.3, except for pepper 4 digits level.
- FAOSTAT statistics division (www.faostat.org) for the export-import prices of primary commodity.
- DISTANCE (www.distance.com) for distance between countries. The distances measured are distances between the largest shipping ports in each country, used particularly in export-import of certain commodity groups.
- The annual statistics data on standards was obtained from: BSN (www.bsn.org) for Indonesian National Standards, BSI (www.bsi.uk) for British Standards, DIN (www.din.de) for German Standards, AFNOR (www.afnor.fr) for French Standards, and NEN (www.nen.nl) for Dutch Standards.
- World Trade Organization database (www.wto.org) for information on tariffs and non-tariff barriers.

CHAPTER VI
RESULTS AND ANALYSIS

This chapter in general is divided into three parts. The first part presents the result of models estimation and selection. The second part assesses the model capability in addressing factors that affect Indonesia's export to the countries. The third part goes to a more specific analysis on the impacts of standards measures

6.1. Statistical Hypothesis Tests

The results of regression (presented in Table 6.1) are not far from what expected. Under the t-test, all of the explanatory variables are statistically significant in 5 per cent level and the signs are correct, which show the model estimation is relatively close to one as predicted by theory and gravity equation literature.

The regression is also able to provide various constants for different specific trades among countries with the same elasticities of coefficients. Several constant for trade specific do not fit to the single regression (export of coffee to Netherlands, cocoa to France and UK, and pepper to Germany), but the over all regression seems to fit the assumptions, indicated by the high value of coefficient determination (R^2) and adjusted R^2 of 0.815 and 0.795, respectively. Thus, variance of the exports to the countries of EU is explained by the model as much as 81 per cent, while value of R^2 is not increased by the addition of each explanatory variable.

Table 6.1. The Results of the Preliminary Estimates

Export to the Country of EU (ln)			
Variable (ln)	**Coefficient**	**Std. Error**	**Sign**
Total Exports of Indonesia	0.747	0.027	***
Total Imports of EU country	0.379	0.027	***
World Trade	-0.062	0.018	***
Distance Proximity	-0.213	0.013	***
Bilateral Competitiveness	-0.388	0.030	***
Global Competitiveness	0.527	0.024	***
Tariffs	-0.030	0.013	***
EU Country Standards	-0.181	0.029	***
National Standards	0.133	0.008	***
R^2	0.815		
Adj. R^2	0.795		
RSS	119.881		
DW. stat	0.881		

*** denote significance levels in 1%

Poolability Test Results

Compared with Pooled Least Squares estimation (Table 6.2.), which assumes that all coefficients constant across time and individuals, SUR estimation gives the better efficiency. This can be indicated by the restricted F-test for individual effect significance, by setting restricted model (PLS), unrestricted model (SUR), and the number of restriction is 16-1 = 15. Clearly the F value of 20.30 (for 15 numerator df and 223 denominator df) is highly significant and, therefore, the PLS seems to be invalid and the selected the SUR model are chosen for further analysis.

Table 6.2. The Results of Pooled Least Squares Estimation

Export to the Country of EU (ln)			
Variable (ln)	**Coefficient**	**Std. Error**	**Sign**
Total Exports of Indonesia	-0.183	0.200	ns
Total Imports of EU country	1.172	0.110	***
World Trade	-0.444	0.165	**
Distance Proximity	0.542	0.181	**
Bilateral Competitiveness	0.399	0.179	**
Global Competitiveness	1.118	0.156	***
Tariffs	0.193	0.233	ns
EU Country Standards	0.098	0.069	ns
National Standards	-0.108	0.148	ns
Constant	0.588	3.067	ns
R^2	0.508		
Adj. R^2	0.490		
RSS	318.728		
DW. stat	0.437		

*** and ** denote significance levels of 1% and 5%, respectively, while ns means non significant.

Model Significance

Next, the results of Wald test for coefficient restrictions presented in Table 6.3., show that the model has explanatory power over the explanatory variables (exports flow). The F value of 656.015 (for 9 numerator df and 239 denumerator df) is highly significant, the restricted regression (all explanatory variables are equal to zero) seems to be invalid. Therefore, the model is sufficient for further analysis on bilateral trade flows.

Table 6.3. Wald Test for Coefficient Restriction Results

Test Statistic	Value	df	Probability
F-stat.	656.0153	(9, 223)	0.0000

The final results of estimates after the application of Durbin-Watson procedure for autocorrelation correction, is shown in Table 6.4.

Table 6.4. Model for Exports Analysis

Export to the Country of EU (ln)			
Variable (ln)	**Coefficient**	**Std. Error**	**Sign**
Total Exports of Indonesia	0.756	0.024	***
Total Imports of EU country	0.242	0.026	***
World Trade	-0.046	0.009	***
Distance Proximity	-0.157	0.019	***
Bilateral Competitiveness	-0.206	0.038	***
Global Competitiveness	0.535	0.017	***
Tariffs	-0.050	0.024	***
EU Country Standards	-0.079	0.048	*
National Standards	0.032	0.015	***
Constant for Specific Trade			
COFFEE		**COCOA**	
France	0.157	France	0.446
Germany	1.569	Germany	0.945
Netherlands	0.504	Netherlands	1.114
United Kingdom	1.154	United Kingdom	0.586
TEA		**PEPPER**	
France	-0.366	France	-0.010
Germany	0.979	Germany	0.622
Netherlands	1.159	Netherlands	0.929
United Kingdom	1.464	United Kingdom	0.058
R^2	0.603		
Adj. R^2	0.557		
RSS	75.228		
DW. stat	2.051		

*** and ** denote significance levels of 1% and 50%, respectively.

6.2. Analysis on Export Model

6.2.1. Gravity Model Variables

The results of model estimations for classical variables fit expectations of a gravity model that the volume of exports from Indonesia increases by the masses (in this case total volume of exports and imports), and distance (proximity) discourages trades. The volume of exports to a country increases by 0.75 per cent whenever there is an increase of 1 per cent in the total volume of Indonesia's exports. The volume of exports to a country increases by 0.24 per cent with the increase of one per cent in the total volume of its imports. The coefficient values resemble to the unitary mass elasticity of gravity model, as showed in Table 6.5.

Table 6.5. Wald Coefficient Test for Unitary Elasticity

Test Statistic	Value	df	Probability
F-stat.	0.006256	(1, 223)	0.9370

A higher value of Indonesia's total exports elasticity comparing to partners' total import elasticity, showing that the countries of EU do not depend on Indonesia's products in fulfilling their consumptions and have preferences to substitute imports from Indonesia with products from other countries.

Meanwhile, cost of trade distance (proximity) has statistically significant effects on export flows. It restricts trade between two countries, reflected by the decrease of volume of exports by 0.15 per cent with the increase of one per cent in cost of trade distance. Although the geographical distances from Indonesia to each observed countries in EU do not varies much, in certain levels, they still raise heterogeneity to transport costs. Here, cost distance is weighted by the remoteness factors (exchange rates), since the shipping costs are

usually in term of US dollars. When the value of Rupiah falls to US dollar, each nautical miles of distance lead to the extra cost to the exporters, thus, exporters would feel that the shipping costs are too expensive for exporting and hold their delivery. As the result, the quantity of exports decreases.

6.2.2. Specific Trade Effects

The model estimates provide different intercepts that able to catch the specific trade effects on country-commodity pairs. These intercepts represent other factors that are not captured by the model (independent variables) but specific to trade activities of certain commodity to certain country. The overall results are in line to real condition of Indonesia's export activities;

- Indonesia's exports to France have the lowest volume of exports in all commodities traded, compared to the other three countries in the EU (indicated by the negative value of constants).
- Indonesia tends to export coffee to Germany (constant value of 1.56). The result is in line with the fact that Germany has always been one of the main markets of Indonesia's coffee exports. Up to the 2003, the Germany positioned as the first on market lists of Indonesia's coffee exports, followed by Japan and the United States (Ministry of Trade, 2006). Although since 2004 up to present, the United States has positioned as the first on market lists of Indonesia's coffee exports (20 per cent of export share), Germany still on the second with 18 per cent share of Indonesia's coffee exports and still above other markets in the EU.
- Cocoa exports to the Netherlands are the largest among the countries analyzed (constant value of 1.11). Netherlands is the largest cocoa bean importer in the world, followed by the United

States, Germany, France, Malaysia and the UK. Although the main destinations of Indonesia's exports are to United States and Malaysia, in EU region, the Netherlands has always been the main exports destination (The Ministry of Trade, 2006).

- Tea exports to the UK are the largest among the countries analyzed (constant value of 1.46). In UK as the largest tea importer in the world, Indonesian (black) tea has the strongest competitiveness compared to the other exporter countries. According to Suprihartini (2005), the strong competitiveness of Indonesian (black) tea in British market correlates to the strong market network provided by Lipton as the largest tea importer from Indonesia.
- Pepper exports to the Netherlands are the largest among the countries analyzed (constant value of 0.92). The Netherlands is considered to be a stable market of Indonesia's spices, especially as it is supported by the historical trade relations between Indonesia and this country, thus, secures Indonesia's position as spices supplier to Netherlands.

6.2.3. Competitiveness Factors

The model introduces prices and develops the term of multilateral resistance by introducing two ratios of competitiveness (bilateral and global), with estimation result in conformation with theory.

The volume of exports to a country decreases to 0.20 per cent with the increase of 1 per cent in price ratio, which means that the bilateral price competitiveness (relative price movements) has significant negative impact on trade, implying that Indonesia's exports have been influenced by price. The higher the relative price of respective product on a given market, the lower the level of trade; the higher the export

price of the exporting country compared to the import price on market of importing country, the lower the volume of exports.

Meanwhile, from global perspective; less competitive the country on a global market, more it will trade with a given bilateral partner. If the average competitiveness of Indonesia in all of its market is high, Indonesia may set its exports priority to certain markets other than the EU. For example, Indonesia probably chooses to allocate more of its cocoa export to Singapore, or coffee to the United States only (as the volume of exports to these two countries are high), and not to the countries of EU.

6.2.4. Tariffs

As expected, tariffs reduction enhances exports. The volume of exports to a country increases by 0.05 per cent with the decreases of one per cent in tariffs level, showing that tariff elasticity is very inelastic. The result is not in line with most literature, which usually shows that one per cent tariff reduction would contribute to at least one per cent enhancement in exports. This inelastic condition shows that tariff reduction is not a major factor that able to boost Indonesia exports to the countries of EU.

Indonesia's exports are mainly in the form of raw materials or unprocessed products, in which the countries of EU have already set the low tariffs since years ago. Thus, tariffs reduction does not give much effect in reducing the cost of exports. Moreover, unlike most competitor countries from African region, Indonesia has not been privileged by the General Scheme Preference (GSP) of the EU. Therefore, the reduction in tariff actually gives most benefit to competitors and reduces Indonesia's competitiveness.

6.3. Analysis on the Impacts of Standards Measures

There are two important things to be underlined in this study regarding standards measures that would implicate to further interpretations:

(1) The type of standards accounted here is mostly voluntary. It should be noted that the standards accounted in this study are the minimum quality standards required by consumers published by certain National Standardization Bodies, which are not reflect the whole measures of standards by a country. Most of standards published by this by these Standardization Bodies are voluntary, not mandatory

(2) The use of stocks as standards parameters may indicate that demand in quality of consumers and also reflect the ability of consumer/producer in compliance to standards implementation in general.

6.3.1. Foreign Specific Standards

Foreign standards reduce Indonesia's exports. It can be noted that in general, the theories of competition advantage can explain the findings of this study that predicts negative coefficients on country-specific standards of importing country. However, due to the restrictions of type of standards being observed (voluntary), we cannot naively do a direct interpretation from the econometrics results that the volume of exports to a country decreases by 0.07 per cent with the increase of one per cent in the stocks of foreign standards.

To explain such finding we should denote that the doubt on quality created in consumers' minds reduces their average willingness to pay

for the food item, the domestic demand function then shifts leftwards and, as a consequence, imports fall.

As the stocks of standards refer to number of quality parameters desired by consumers on a product, the higher number of standards stock of countries of EU reflect that they demand products with higher quality level than consumers in Indonesia. Hence, regarding to the exports activities of Indonesia, the sufficient interpretation for the econometrics results would be when the consumers in EU demand standards of quality 1 per cent higher may lead to the decrease of Indonesia's exports by 0.07 per cent as now products from Indonesia can no longer satisfy EU consumers. Later, these consumers would alter their consumption preferences to the products from other countries that comply with their standards. As simple example, as nowadays consumers in EU prefer to consume organic coffee rather than the inorganic one, they would prefer coffee products that fulfill standards of organic coffee. If in return, Indonesia cannot acknowledge such demand, eventually it will lead to the decrease of demand and reduce products to be exported by Indonesia.

The interesting finding here is that the very inelastic value of foreign standards elasticity shows that unlike mostly predicted, the changes (increase) of consumer perception on minimum quality actually do not give much impact to Indonesia's exports. Thus, unlike most standards that adopted to be technical regulations (mandatory), in country level, voluntary standards do not have a direct shock/ power to determine a reduction of consumption to a certain product whenever the products cannot fulfill the need. Nevertheless, the positive relationship between exports and foreign standards show that these standards still reflect consumers' needs in term of quality and may cause demand alteration to the products.

6.3.2. National Standards of Indonesia (SNI)

National standards increase Indonesia's exports. The volume of exports to a country increases by 0.03 per cent with the increase of one per cent in the stocks of national standards. It seems that here, the competitive advantage theory correctly predicts a positive coefficient on the number of country-specific standards of exporters. Thus, the National Standards of Indonesia (SNI) may reflect approaches to overcome imperfect information of quality requires by consumers in EU and act as the reference measure of the minimum quality level to be expected.

At certain levels, the implementation of national standards may be optimal for Indonesia's exports and may increase the volume of exports as they prevent the reduction in consumers' willingness to pay in the face of imperfect information. Thus, such standards provide information to importers which the market alone cannot provide and they help to solve the market failure caused by asymmetric information and credence characteristic of quality. In shorts, SNI may prevent the 'lemon' quality to be exported.

However, by looking to the econometrics results that the increase of 1 per cent of standards development in Indonesia would only resulted to 0.03 per cent in the volume of exported (very inelastic), it shows that in general, the implementation of SNI has not been able to boost products from Indonesia to have (at least) the minimum quality level as demanded by EU consumer'.

The problems may first be sourced from the quality gap that naturally exists between EU and Indonesia. Thus, the SNI are fundamentally still unable to meet standards of consumers in EU. Although most of the countries in EU recognized SNI as the national standards, SNI has not been accepted and directly used as standards for exports to these

countries, as there have not been any mutual recognition arrangements that involve in the acceptance of SNI in EU markets.

On the other hand, which also consider as a major problem, Indonesia still lacks of infrastructure to provide environment for standards, even for of the SNI implementation. The implementation of standards is basically connected to science and technology improvements. For example, an assessment of minimum level of heavy metals content in tea or coffee products requires chemical instruments that able to detect heavy metals to a certain limit of detection. More advance of testing methods and instruments would give more valid testing results and better justification of to the quality of a product. Therefore, a reduction of Indonesia's exports to the countries of EU may source also from the increase or improvement in science and technology in those countries that are unable to be addressed by Indonesia.

Another problem is that producers in Indonesia, which most of them are smallholder farmers, are usually have no incentive to produce a higher quality product than the minimum level of SNI, as they are also lack of information about standards of quality other than the national standards. Meanwhile, the well-informed producers which have opportunity to provide a high quality product are undermined by other producers which produce low-quality products. Hence, the mix of quality products will not match the consumers' preferred high-quality products, and these well-informed producers will stop their effort in improving quality for exports. Altogether, such circumstances may lead a sub-optimal situation and the small impact of SNI implementation on Indonesia's exports.

CHAPTER VII
CONCLUSIONS AND RECOMMENDATION

7.1. Conclusions

The use of a single-country gravity model is considered sufficient for analyzing the export behavior of particular agricultural commodity groups (coffee, cocoa, tea, and pepper) from Indonesia to the selected countries of EU, since the model is able to address tactfully the determinant of exports, including price, competitiveness, and trade restrictions.

By treating standards as one of the trade restrictiveness on Indonesia's exports, it can be concluded that:

- Foreign specific standards, imposed by each countries of EU contributes to the declined of Indonesia's exports. Thus, these standards act as the barrier to trade. However, the impacts of these standards measure in restricting exports are relatively low, as standards observed are voluntary.
- Although relatively small, the National Standards of Indonesia (SNI) gives the positive impact to increase of quantity exported to the countries of EU.

In additions, it can be stated also that rather than the problems of quality compliance, Indonesia's export activities to the countries of EU are still fully determined by competitiveness factors that:

- The total volume exported of Indonesia, which resembles supply capacity. The higher the total of quantity exported by Indonesia, the more possibility of Indonesia's product to enter the EU market.

- The total volume imported by trading partners, which resembles demand capacity. The higher the total of quantity imported by EU, the more possibility of product from Indonesia demanded by EU consumers.
- Bilateral (price) competitiveness; the higher the relative price (the export price of Indonesia compared to the import price of EU), the lower the volume of exports.
- Global competitiveness; the more competitive Indonesia in its overall market, the more it prefer to trade with other countries, and less it will trade with the countries of EU.
- Distance is still an obstacle for export activities, especially if it is combined with remoteness factors.
- Tariffs; despite the relatively low impacts of tariffs reduction for Indonesia to gain more share in EU markets, tariffs still act as the barrier to trade for Indonesia' exports.

7.2. Recommendations

Up to now, the success of gravity models in determining the impacts of technical barriers also varies from one study to another. In principle, the model used in study manages to capture the ability of a single-country gravity model for analyzing trade at the bilateral level. However, unlike the traditional gravity model that uses expenditure (GDP) approaches as sources of country masses, the application of such methodology may be subject to a particular scale and scope of analysis due to the theoretical assumptions hold. It is better to do the analysis on reverse trade activities (in this case import Indonesia from EU) to see whether the parameters observed are truly comply with a single-country gravity model. Most of the researchers suggest this approach as the reverse trade analysis may give different result.

Specifically to the standards parameters, one should determine first the type of standards observed, whether they are mandatory or voluntary, since the out come from the two measures may be different. The impacts of mandatory standards to export are usually come directly and in short of time, while voluntary standards do not directly give direct impacts on trade activities. Basically this study only observed the minimum quality standards that are mostly voluntary and did not directly subject to the mandatory standards. Thus, the study might find different results and conclusions whenever specific mandatory standards are analyzed.

Meanwhile, the policy implications suggested are fully subjected to the standards implementation and compliance. Despite the relatively low impacts of standards measures (national and foreign standards) to the quantity exported, standards are in fact, the most possible factors to be controlled for export enhancement (other factors, such as total export, total imports, and competitiveness are often beyond our control) among trade parameters observed by the model. Thus, in order Indonesia's products to be accepted in foreign markets, it is necessary that we put more attention on national standards development and implementation, and their compliance to foreign standards, by establishing mutual recognition arrangements between National Standards of Indonesia and European Standards.

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ANNEX

Table Ia. Estimation Results [1]

Dependent Variable: LOG(EXINATOPARTNER?)
Method: Seemingly Unrelated Regression
Sample: 1990 2005
Included observations: 16
Number of cross-sections used: 16
Total panel (unbalanced) observations: 248
One-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(TOTEXPORTINA?)	0.747244	0.026567	28.12697	0.0000
LOG(TOTIMPORTPARTNER?)	0.379115	0.027293	13.89038	0.0000
LOG(WORLDTRADE?)	-0.062466	0.017902	-3.489370	0.0006
LOG(PROXIMITY?)	-0.212681	0.012591	-16.89172	0.0000
LOG(BILACOM?)	-0.388055	0.030471	-12.73542	0.0000
LOG(GBCINDEX?)	0.526712	0.023828	22.10434	0.0000
LOG(TARIFF?)	-0.029668	0.013328	-2.225925	0.0270
LOG(STPARTNER?)	-0.180585	0.028606	-6.312891	0.0000
LOG(STINDO?)	0.132683	0.007972	16.64321	0.0000
Fixed Effects				
_1--C	-0.764769			0.2321
_2--C	2.324527			0.0001
_3--C	0.406885			0.4840
_4--C	1.527717			0.0080
_5--C	-0.569659			0.3982
_6--C	1.250445			0.0561
_7--C	1.459066			0.0155
_8--C	-0.299760			0.6584
_9--C	-1.401137			0.0241
_10--C	1.310149			0.0147
_11--C	1.827996			0.0006
_12--C	2.294067			0.0000
_13--C	-1.119289			0.0505
_14--C	0.123461			0.7698
_15--C	1.007317			0.0429
_16--C	-0.948837			0.0647
Weighted Statistics				
Unweighted Statistics				
R-squared	0.815183	Mean dependent var		15.01346
Adjusted R-squared	0.795292	S.D. dependent var		1.620527
S.E. of regression	0.733202	Sum squared resid		119.8815
Durbin-Watson stat	0.881076			

[1] autocorrelation is not corrected

Table Ib. Pooled Least Squares Estimation Results

Dependent Variable: LOG(EXINATOPARTNER?)
Method: Pooled Least Squares
Sample: 1990 2005
Included observations: 16
Number of cross-sections used: 16
Total panel (unbalanced) observations: 248

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.588499	3.377407	0.174246	0.8618
LOG(TOTEXPORTINA?)	-0.183366	0.214770	-0.853780	0.3941
LOG(TOTIMPORTPARTNER?)	1.172492	0.128583	9.118582	0.0000
LOG(WORLDTRADE?)	-0.444927	0.154754	-2.875054	0.0044
LOG(PROXIMITY?)	0.542944	0.176919	3.068891	0.0024
LOG(BILACOM?)	0.399183	0.164452	2.427350	0.0160
LOG(GBCINDEX?)	1.118970	0.175329	6.382102	0.0000
LOG(TARIFF?)	0.193911	0.236424	0.820182	0.4129
LOG(STPARTNER?)	0.098743	0.087635	1.126744	0.2610
LOG(STINDO?)	-0.108775	0.137794	-0.789399	0.4307
R-squared	0.508627	Mean dependent var		15.01346
Adjusted R-squared	0.490046	S.D. dependent var		1.620527
S.E. of regression	1.157236	Sum squared resid		318.7284
F-statistic	27.37303	Durbin-Watson stat		0.437312
Prob(F-statistic)	0.000000			

Chow F-Test Result

$$F_{15,231} = \frac{(318.7284 - 119.8815)}{15} / \frac{(119.8815)}{(231)}$$

$$= 20.3098$$

Table Ic. Coefficient Covariance Matrix of the Estimates

	LOG (TOTEXPORTINA?)	LOG (TOTIMPORTPARTNER?)	LOG (WORLDTRADE?)	LOG (PROX1MITY?)	LOG (BILACOM?)	LOG (GBCINDEX?)	LOG (TARIFF?)	LOG (STPARTNER?)	LOG (STINDO?)
LOG (TOTEXPORTINA?)	0.000706	-0.000290	-0.000102	-6.02E-05	0.000234	-0.000480	7.18E-05	5.30E-05	-2.84E-05
LOG (TOTIMPORTPARTNER?)	-0.000290	0.000745	-2.76E-05	3.21E-05	4.25E-05	0.000226	-7.07E-05	-0.000198	0.000123
LOG (WORLDTRADE?)	-0.000102	-2.76E-05	0.000320	-0.000112	-2.00E-05	3.34E-05	-8.00E-05	-0.000133	-1.95E-05
LOG (PROXIMITY?)	-6.02E-05	3.21E-05	-0.000112	0.000159	-2.57E-05	5.88E-05	0.000112	8.22E-05	-2.36E-05
LOG (BILACOM?)	0.000234	4.25E-05	-2.00E-05	-2.57E-05	0.000928	-0.000202	-4.84E-05	-0.000190	-4.53E-05
LOG (GBCINDEX?)	-0.000480	0.000226	3.34E-05	5.88E-05	-0.000202	0.000568	-8.41E-05	-0.000130	4.75E-05
LOG (TARIFF?)	7.18E-05	-7.07E-05	-8.00E-05	0.000112	-4.84E-05	-8.41E-05	0.000178	0.000226	-9.05E-06
LOG (STPARTNER?)	5.30E-05	-0.000198	-0.000133	8.22E-05	-0.000190	-0.000130	0.000226	0.000818	-1.60E-05
LOG (STINDO?)	-2.84E-05	0.000123	-1.95E-05	-2.36E-05	-4.53E-05	4.75E-05	-9.05E-06	-1.60E-05	6.36E-05

Table Id. Final Estimation Results [II]

Dependent Variable: NEWEXINATOPARTNER?
Method: Seemingly Unrelated Regression
Sample: 1991 2005
Included observations: 15
Number of cross-sections used: 16
Total panel (unbalanced) observations: 232
One-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NEWTOTEXPORTINA?	0.755511	0.023986	31.49764	0.0000
NEWTOTIMPORTPARTNER?	0.242137	0.026141	9.262862	0.0000
NEWWORLDTRADE?	-0.045613	0.008782	-5.193798	0.0000
NEWPROXIMITY?	-0.157212	0.019419	-8.095701	0.0000
NEWBILACOM?	-0.205838	0.038387	-5.362155	0.0000
NEWGBCINDEX?	0.534883	0.017404	30.73371	0.0000
NEWTARIFF?	-0.050375	0.023776	-2.118709	0.0353
NEWSTPARTNER?	-0.079153	0.048462	-1.633318	0.1039
NEWSTINDO?	0.032328	0.014541	2.223309	0.0273
Fixed Effects				
_1--C	0.156829			0.7434
_2--C	1.569164			0.0000
_3--C	0.503817			0.1007
_4--C	1.153561			0.0001
_5--C	0.446119			0.1679
_6--C	0.945439			0.0053
_7--C	1.114399			0.0003
_8--C	0.585546			0.0781
_9--C	-0.365782			0.2818
_10--C	0.979470			0.0003
_11--C	1.158541			0.0000
_12--C	1.463924			0.0000
_13--C	-0.009814			0.7013
_14--C	0.622201			0.0335
_15--C	0.928742			0.0004
_16--C	0.058443			0.9144
Weighted Statistics				
Unweighted Statistics				
R-squared	0.603453	Mean dependent var		6.596296
Adjusted R-squared	0.557476	S.D. dependent var		0.906227
S.E. of regression	0.602844	Sum squared resid		75.22822
Durbin-Watson stat	2.051738			

[II] Autocorrelation corrected with Durbin-Watson procedure, $\rho = 0.559462$

Table Id. Wald Coefficient Test for Model Significance

Wald Test: Equation:Coefficient_Restriction			
Test Statistic	Value	df	Probability
F-statistic	656.0153	(9, 223)	0.0000
Chi-square	5904.137	9	0.0000
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(1)		0.755511	0.023986
C(2)		0.242137	0.026141
C(3)		-0.045613	0.008782
C(4)		-0.157212	0.019419
C(5)		-0.205838	0.038387
C(6)		0.534883	0.017404
C(7)		-0.050375	0.023776
C(8)		-0.079153	0.048462
C(9)		0.032328	0.014541
Restrictions are linear in coefficients.			

Table Ie. Wald Coefficient Test for Unitary Elasiticity of Gravity Model

Wald Test: Equation: ANALYSIS7			
Test Statistic	Value	df	Probability
F-statistic	0.006256	(1, 223)	0.9370
Chi-square	0.006256	1	0.9370
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
-1 + C(1) + C(2)		-0.002351	0.029729
Restrictions are linear in coefficients.			

Table IIa. Indonesia Exports to Countries of EU (1990-2005), Volume, in Kilograms

YEAR	COFFEE-FR	COFFEE-DE	COFFEE-NL	COFFEE-UK	COCOA-FR	COCOA-DE	COCOA-NL	COCOA-UK
1990	4,938,539		42,958,408	14,329,980	257,375	14,856,031	14,856,031	2,558,437
1991	808,687	93,218,496	11,185,866	13,331,250	220,000	9,256,488	9,256,488	747,500
1992	466,812	52,331,236	5,533,608	11,009,206	115,000	9,482,554	9,482,554	763,500
1993	2,359,687	62,705,108	4,957,901	23,658,500	910,000	36,776,464	36,776,464	3,672,000
1994	564,000	38,004,160	3,765,312	21,444,452	2,254,175	23,205,652	23,205,652	2,427,000
1995	940,300	32,948,268	5,190,287	16,471,160	700,000	14,371,108	14,371,108	4,410,000
1996	6,651,878	58,167,608	5,341,019	20,938,100	1,756,000	17,838,100	17,838,100	15,740,000
1997	2,318,687	50,191,040	3,732,312	9,902,566	1,354,906	9,308,999	9,308,999	7,647,500
1998	2,705,312	56,667,208	5,676,170	8,230,619	1,270,375	11,915,237	11,915,237	1,691,937
1999	2,263,687	50,309,175	3,916,000	11,994,687	2,481,999	13,199,741	13,199,741	1,237,097
2000	2,837,500	47,664,452	3,344,562	11,199,198	2,676,175	6,412,589	6,412,589	1,857,625
2001	198,093	29,431,580	3,612,953	5,915,281	3,620,000	7,271,652	7,271,652	1,035,519
2002	3,868,960	53,580,656	3,592,140	10,480,562	5,676,398	35,431,436	35,431,436	6,863,061
2003	2,153,000	57,608,812	2,855,209	12,212,324	6,829,261	7,392,862	7,392,862	2,695,812
2004	2,537,250	53,937,116	1,899,109	10,474,597	7,660,351	4,512,999	4,512,999	2,472,687
2005	4,236,028	78,755,488	1,797,477	16,441,870	9,232,673	7,657,000	7,657,000	9,866,200
YEAR	**TEA-FR**	**TEA-DE**	**TEA-NL**	**TEA-UK**	**PEPPER-FR**	**PEPPER-DE**	**PEPPER-NL**	**PEPPER-UK**
1990	325,222		6,277,886	6,683,299	1,107,875		7,348,351	803,250
1991	374,878	3,437,507	6,026,827	6,855,456	529,000	6,105,320	5,262,503	369,500
1992	193,518	3,452,557	5,500,042	10,779,144	95,000	4,643,000	3,643,000	396,562
1993	842,624	2,855,369	7,183,897	11,990,881	135,000	2,252,375	2,024,187	365,312
1994	474,097	3,339,788	5,456,764	9,236,999	80,000	1,242,312	3,258,250	257,312
1995	779,062	3,622,437	6,693,615	7,117,448	1,593,000	4,250,000	3,791,988	574,125
1996	1,143,500	4,124,573	7,536,116	10,553,350	573,000	1,273,500	1,812,000	636,875
1997	403,726	1,913,023	3,526,648	8,079,722	570,312	2,001,625	1,626,125	150,000
1998	125,421	1,662,608	4,570,327	4,571,595	554,000	1,735,312	2,633,249	284,000
1999	9,812	4,555,261	5,575,580	11,969,362	575,812	785,562	3,232,875	157,000
2000	24,500	6,228,674	6,163,467	16,157,385	1,279,187	1,520,250	6,094,894	109,980
2001	70,847	6,426,062	5,867,452	13,326,650	846,073	1,338,312	4,791,156	138,359
2002		5,837,682	5,079,810	14,238,682	353,019	1,290,625	2,378,562	500,687
2003		6,206,620	4,647,334	12,656,647	448,886	1,942,875	3,107,199	452,687
2004		6,919,397	5,816,139	12,140,963	115,601	1,898,625	1,504,250	359,000
2005		7,371,775	6,416,047	13,835,735	102,323	1,577,494	1,945,290	216,000

Source : COMTRADE statistics database for commodity trade (http://www.comtrade.org), Data has been aggregated to 3 digits level of SITC.3

Table IIb. Total Indonesia's Exports to the World (1990-2005), Volume, in Kilograms

YEAR	Coffee	Cocoa	Tea	Pepper
1990	422,592,160	113,774,992	110,964,072	48,535,656
1991	381,460,256	139,931,552	110,861,792	50,395,112
1992	270,555,264	171,591,680	121,581,248	62,478,160
1993	352,271,488	226,022,784	124,619,352	27,904,524
1994	291,151,840	228,798,432	85,120,960	36,363,928
1995	231,478,416	230,066,416	79,387,424	58,372,592
1996	368,626,144	318,922,272	101,738,112	37,520,020
1997	316,230,784	261,456,512	67,368,464	33,775,788
1998	363,015,104	327,951,936	67,262,936	39,350,304
1999	358,018,078	389,956,922	98,189,357	36,897,024
2000	345,624,959	396,510,652	105,615,541	65,624,162
2001	254,752,656	371,605,472	102,055,208	54,640,348
2002	330,056,736	445,851,520	107,547,216	63,685,444
2003	328,439,669	342,123,147	93,404,650	52,012,504
2004	348,540,457	356,763,800	105,093,957	33,280,258
2005	455,038,680	457,250,501	105,096,166	35,167,228

Source : COMTRADE statistics database for commodity trade (http://www.comtrade.org), Data has been aggregated to 3 digits level of SITC.3

Table IId. Total EU Countries' Imports from the World (1990-2005), Volume, in Kilograms

YEAR	Coffee - FR	Coffee – DE	Coffee - NL	Coffee - UK	Cocoa - FR	Cocoa – DE	Cocoa - NL	Cocoa - UK
1990	359,483,744		182,979,792	149,636,992	176,991,264	344,819,744	344,819,744	211,590,000
1991	375,240,480	784,943,808	180,912,576	139,242,000	195,843,232	355,470,144	355,470,144	240,858,000
1992	377,032,320	817,046,912	189,408,048	151,628,000	189,909,200	366,206,720	366,206,720	230,232,000
1993	381,978,432	833,072,320	184,470,192	262,170,624	203,433,296	382,637,056	382,637,056	221,851,648
1994	376,836,544	800,042,432	168,762,224	167,681,184	226,732,304	450,567,200	450,567,200	215,133,504
1995	357,579,264	756,920,768	166,657,200	143,949,232	244,478,080	486,746,528	486,746,528	218,300,464
1996	380,164,928	792,040,320	183,202,320	157,918,656	277,996,768	637,348,352	637,348,352	307,292,000
1997	380,975,488	816,512,256	163,978,064	155,036,096	264,612,192	361,688,608	361,688,608	222,348,464
1998	369,935,488	804,293,760	116,732,008	164,935,968	271,013,248	395,238,976	395,238,976	244,292,864
1999	376,787,584	847,635,968	142,858,859	150,386,355	324,257,888	589,608,962	589,608,962	296,952,314
2000	367,137,475	845,474,656	166,547,319	152,739,808	325,630,354	581,491,386	581,491,386	206,315,675
2001	379,059,456	890,359,155	150,324,795	154,200,254	329,751,808	662,482,113	662,482,113	212,120,001
2002	385,126,912	921,300,923	153,596,655	161,056,096	327,849,024	307,380,911	307,380,911	197,832,672
2003	370,420,768	929,124,837	174,655,588	154,673,820	342,268,160	604,880,785	604,880,785	204,719,113
2004	326,616,961	1,028,295,427	176,659,488	171,406,911	354,894,997	584,728,230	584,728,230	202,959,714
2005	315,241,459	993,506,478	168,442,665	167,307,988	346,414,282	688,815,517	688,815,517	197,875,956
YEAR	**Tea - FR**	**Tea – DE**	**Tea - NL**	**Tea - UK**	**Pepper - FR**	**Pepper – DE**	**Pepper - NL**	**Pepper - UK**
1990	12,545,711		26,491,096	26,491,096	9,253,847		7,543,682	4,220,000
1991	13,144,736	27,512,976	28,910,344	28,910,344	8,345,110	17,264,276	5,485,875	3,552,000
1992	13,142,007	28,002,172	29,195,360	29,195,360	7,909,572	16,042,825	8,182,813	4,004,000
1993	15,820,227	32,740,432	31,819,320	31,819,320	9,658,513	16,852,368	7,856,575	5,385,916
1994	15,907,946	32,300,644	24,693,816	24,693,816	7,061,563	16,778,912	11,714,445	5,212,699
1995	14,817,120	38,186,952	26,986,712	26,986,712	7,942,717	17,624,440	11,183,010	6,313,160
1996	19,230,142	41,649,172	23,124,196	23,124,196	7,491,243	15,924,379	11,710,580	5,170,739
1997	23,305,156	38,749,420	28,247,108	28,247,108	6,975,442	19,024,128	16,805,472	6,371,912
1998	19,074,758	42,144,528	26,285,504	26,285,504	7,059,648	14,600,275	12,637,310	4,560,622
1999	17,457,688	42,239,196	25,668,678	25,668,678	7,508,464	19,373,706	15,585,734	4,171,738
2000	20,378,294	37,074,505	25,122,338	25,122,338	7,106,941	17,452,500	14,868,977	4,244,767
2001	20,269,216	47,099,343	29,595,890	29,595,890	7,289,851	19,784,118	18,436,640	3,853,713
2002	20,107,936	64,727,366	30,365,442	30,365,442	7,861,132	20,714,900	18,577,876	3,744,795
2003	45,272,696	91,305,299	27,374,482	27,374,482	8,777,813	22,323,800	16,496,368	3,671,083
2004	22,720,388	100,910,021	29,971,965	29,971,965	6,916,225	26,116,800	11,554,060	3,394,478
2005	21,791,534	97,394,314	37,413,113	37,413,113	7,263,400	20,040,300	11,186,807	3,275,042

Source : COMTRADE statistics database for commodity trade (http://www.comtrade.org), data has been aggregated to 3 digits level of SITC.3

Table IIe. Total World Trade (1990-2005), Volume, in Kilograms

YEAR	Coffee	Cocoa	Tea	Pepper
1990	4,661,006,824	2,377,206,301	593,246,922	274,272,585
1991	4,686,833,833	2,904,549,680	663,763,997	332,475,030
1992	5,023,359,626	8,516,175,247	797,528,586	392,163,368
1993	5,070,373,757	2,760,412,137	896,244,864	355,030,821
1994	4,854,536,036	2,843,460,749	808,598,173	370,776,418
1995	4,589,944,903	2,928,170,668	987,878,014	346,088,729
1996	5,170,668,410	3,611,872,193	1,148,132,026	421,700,480
1997	5,418,933,981	3,276,378,043	1,249,400,053	437,469,393
1998	5,462,699,351	3,552,725,940	30,995,129,302	413,285,807
1999	5,725,959,233	3,757,442,112	1,452,680,446	468,694,265
2000	5,926,025,823	3,916,849,169	1,258,378,076	470,470,863
2001	6,068,053,070	3,951,794,050	1,406,319,273	541,960,554
2002	6,120,234,104	3,490,530,738	1,478,125,673	659,881,239
2003	6,245,653,629	4,090,846,174	1,585,542,530	620,263,290
2004	8,854,960,573	5,989,152,022	1,882,171,637	682,949,710
2005	9,603,821,113	6,418,334,918	1,833,437,787	671,101,026

Source : COMTRADE statistics database for commodity trade (http://www.comtrade.org), data has been aggregated to 3 digits level of SITC.3

Table IIIa. Distance by Ports, in Nautical Miles

Commodity	Shipping Port	Distance
Coffee	Panjang - Marselilles	6769
	Panjang - Hamburg	8784
	Panjang - Rotterdam	8531
	Panjang - Liverpool	8436
Cocoa	Ujung Pandang - Marselilles	7538
	Ujung Pandang - Hamburg	9553
	Ujung Pandang - Rotterdam	9300
	Ujung Pandang - Liverpool	9205
Tea	Tanjung Priok - Marselilles	6786
	Tanjung Priok - Hamburg	8801
	Tanjung Priok - Rotterdam	8548
	Tanjung Priok - Liverpool	8453
Pepper	Belawan - Marselilles	6193
	Belawan - Hamburg	8208
	Bealawan - Rotterdam	7955
	Belawan - Liverpool	7860

Source : http://.www.distance.com.

Table IIIb. Cost of Trade Distance between Indonesia and Countries of EU, Weighted by Exchange Rates (Rupiah to US Dollar)

YEAR	Coffee - FR	Coffee – DE	Coffee - NL	Coffee - UK	Cocoa - FR	Cocoa – DE	Cocoa - NL	Cocoa - UK
1990	30.737	39.887	38.738	38.307	34.229	43.379	42.230	41.799
1991	32.946	42.753	41.521	41.059	36.688	46.496	45.264	44.802
1992	34.561	44.849	43.557	43.072	38.487	48.775	47.484	46.999
1993	36.432	47.278	45.916	45.405	40.571	51.417	50.055	49.544
1994	37.910	49.196	47.779	47.247	42.217	53.503	52.086	51.554
1995	39.947	51.838	50.345	49.784	44.485	56.376	54.883	54.323
1996	41.621	54.010	52.455	51.871	46.349	58.739	57.183	56.599
1997	42.033	54.545	52.974	52.385	46.808	59.321	57.750	57.160
1998	35.671	46.290	44.956	44.456	39.723	50.342	49.009	48.508
1999	34.854	45.230	43.927	43.438	38.814	49.189	47.887	47.397
2000	35.126	45.583	44.270	43.777	39.117	49.573	48.260	47.767
2001	35.848	46.520	45.180	44.677	39.921	50.592	49.252	48.749
2002	36.785	47.736	46.361	45.844	40.964	51.915	50.540	50.023
2003	37.509	48.675	47.273	46.746	41.770	52.936	51.534	51.008
2004	37.833	49.096	47.682	47.151	42.132	53.394	51.980	51.449
2005	38.630	50.129	48.685	48.143	43.018	54.518	53.074	52.532
YEAR	**Tea - FR**	**Tea – DE**	**Tea - NL**	**Tea - UK**	**Pepper - FR**	**Pepper – DE**	**Pepper - NL**	**Pepper - UK**
1990	30.814	39.964	38.815	38.384	28.122	37.271	36.123	35.691
1991	33.028	42.836	41.604	41.142	30.142	39.949	38.718	38.256
1992	34.648	44.936	43.644	43.159	31.620	41.908	40.616	40.131
1993	36.524	47.369	46.007	45.496	33.332	44.178	42.816	42.304
1994	38.006	49.291	47.874	47.342	34.685	45.970	44.553	44.021
1995	40.047	51.938	50.445	49.885	36.547	48.439	46.946	46.385
1996	41.725	54.115	52.559	51.975	38.079	50.469	48.913	48.329
1997	42.139	54.651	53.080	52.490	38.456	50.969	49.398	48.808
1998	35.761	46.379	45.046	44.545	32.636	43.254	41.921	41.420
1999	34.942	45.317	44.014	43.525	31.888	42.264	40.961	40.472
2000	35.214	45.671	44.358	43.865	32.137	42.594	41.281	40.788
2001	35.938	46.610	45.270	44.767	32.798	43.469	42.129	41.626
2002	36.878	47.828	46.453	45.937	33.655	44.605	43.230	42.714
2003	37.603	48.769	47.367	46.841	34.317	45.483	44.081	43.555
2004	37.929	49.191	47.777	47.246	34.614	45.876	44.462	43.931
2005	38.727	50.226	48.782	48.240	35.343	46.842	45.398	44.856

Source : compiled from COMTRADE statistics database for commodity trade (http://www.comtrade.org), Exchange Rates from the World Bank (2007)

Table IVa. Export Price, Import Price (US$/Kg), and the Relative Price as Bilateral Competitiveness between Indonesia and Countries of EU in Coffee Commodity

YEAR	Indonesia	France		Germany		Netherlands		United Kingdom	
	Export Price	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.
1990	1.047	1.404	0.746	1.761	0.595	1.563	0.670	1.570	0.667
1991	1.086	1.359	0.799	1.725	0.629	1.577	0.688	1.621	0.670
1992	0.971	1.110	0.875	1.471	0.660	1.291	0.752	1.358	0.715
1993	1.107	1.177	0.940	1.509	0.733	1.478	0.749	1.444	0.766
1994	2.243	2.167	1.035	2.457	0.913	2.475	0.906	2.472	0.907
1995	2.705	2.876	0.940	3.264	0.829	3.197	0.846	3.169	0.854
1996	1.686	2.129	0.792	2.523	0.668	2.535	0.665	2.379	0.709
1997	1.862	2.482	0.750	3.070	0.606	3.055	0.609	2.959	0.629
1998	1.736	2.243	0.774	2.684	0.647	2.691	0.645	2.613	0.664
1999	1.381	1.727	0.799	2.018	0.684	2.044	0.676	2.000	0.690
2000	1.080	1.475	0.732	1.737	0.622	1.759	0.614	1.665	0.649
2001	0.798	1.029	0.776	1.191	0.670	1.257	0.635	1.167	0.684
2002	0.711	0.949	0.749	1.052	0.676	1.154	0.616	1.046	0.679
2003	0.842	1.092	0.771	1.177	0.716	1.341	0.628	1.191	0.707
2004	0.957	1.291	0.741	1.309	0.731	1.484	0.645	1.359	0.705
2005	1.251	1.771	0.707	1.785	0.701	1.936	0.646	1.824	0.686

Source: Export and Import Price are compiled from FAOSTAT, FAO Statistics Division 2007

Table IVb. Export Price, Import Price (US$/Kg), and the Relative Price as Bilateral Competitiveness between Indonesia and Countries of EU in Cocoa Commodity

YEAR	Indonesia	France		Germany		Netherlands		United Kingdom	
	Export Price	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.
1990	0.994	1.349	0.737	1.354	0.734	1.383	0.719	1.368	0.727
1991	0.960	1.247	0.770	1.260	0.762	1.248	0.769	1.184	0.811
1992	0.964	1.314	0.734	1.316	0.732	1.316	0.733	1.236	0.780
1993	0.855	1.112	0.769	1.149	0.744	1.104	0.774	1.106	0.773
1994	1.104	1.384	0.798	1.350	0.818	1.349	0.819	1.406	0.785
1995	1.201	1.560	0.770	1.481	0.811	1.489	0.807	1.492	0.805
1996	1.116	1.477	0.756	1.434	0.778	1.402	0.796	1.416	0.788
1997	1.328	1.525	0.871	1.442	0.921	1.436	0.925	1.480	0.898
1998	1.447	1.712	0.845	1.658	0.873	1.595	0.907	1.724	0.839
1999	1.008	1.374	0.734	1.403	0.719	1.337	0.754	1.348	0.748
2000	0.745	1.036	0.719	0.998	0.746	0.919	0.810	0.976	0.763
2001	0.874	1.123	0.778	1.034	0.845	1.005	0.870	1.200	0.728
2002	1.437	1.724	0.834	1.611	0.892	1.604	0.896	1.804	0.797
2003	1.519	2.160	0.703	2.085	0.729	1.969	0.771	1.971	0.771
2004	1.197	1.877	0.638	1.822	0.657	1.574	0.760	1.686	0.710
2005	1.273	1.719	0.741	1.706	0.746	1.576	0.808	1.558	0.817

Source: Export and Import Price are compiled from FAOSTAT, FAO Statistics Division 2007

Table IVc. Export Price, Import Price (US$/Kg), and the Relative Price as Bilateral Competitiveness between Indonesia and Countries of EU in Tea Commodity

YEAR	Indonesia	France		Germany		Netherlands		United Kingdom	
	Export Price	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.
1990	1.803	1.801	1.002	1.807	0.998	1.883	0.958	1.948	0.926
1991	1.430	1.624	0.881	1.426	1.003	1.452	0.985	1.541	0.928
1992	1.137	1.470	0.773	1.286	0.884	1.286	0.884	1.340	0.849
1993	1.446	1.641	0.881	1.541	0.938	1.570	0.921	1.608	0.899
1994	2.067	2.200	0.939	2.222	0.930	2.204	0.938	2.244	0.921
1995	2.662	2.866	0.929	2.846	0.935	2.784	0.956	2.752	0.967
1996	2.622	2.773	0.946	2.734	0.959	2.616	1.002	2.732	0.960
1997	3.983	4.106	0.970	3.974	1.002	3.807	1.046	4.035	0.987
1998	4.705	5.178	0.909	4.990	0.943	4.591	1.025	4.908	0.959
1999	4.650	4.894	0.950	4.841	0.961	4.486	1.037	4.783	0.972
2000	3.752	4.308	0.871	4.050	0.926	3.780	0.993	4.438	0.845
2001	2.032	2.512	0.809	2.269	0.895	2.168	0.937	2.784	0.730
2002	1.523	2.106	0.723	1.953	0.780	1.781	0.855	2.412	0.631
2003	1.791	2.340	0.765	2.157	0.830	1.987	0.901	2.665	0.672
2004	1.791	2.355	0.761	1.999	0.896	2.012	0.890	2.572	0.696
2005	1.729	2.255	0.766	2.032	0.851	1.965	0.880	2.601	0.665

Source: Export and Import Price are compiled from FAOSTAT, FAO Statistics Division 2007

Table IVd. Export Price, Import Price (US$/Kg), and the Relative Price as Bilateral Competitiveness between Indonesia and Countries of EU in Pepper Commodity

YEAR	Indonesia	France		Germany		Netherlands		United Kingdom	
	Export Price	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.	Import Price	Bilateral Comp.
1990	1.703	5.199	0.328	2.161	0.788	1.805	0.944	2.108	0.808
1991	1.393	4.598	0.303	2.956	0.471	1.730	0.805	1.838	0.758
1992	1.287	4.938	0.261	2.964	0.434	1.790	0.719	1.851	0.695
1993	1.333	4.333	0.308	3.037	0.439	1.609	0.828	1.760	0.757
1994	1.245	4.014	0.310	3.171	0.393	1.873	0.665	1.785	0.698
1995	1.217	4.054	0.300	3.495	0.348	1.738	0.700	1.735	0.701
1996	1.215	4.295	0.283	3.275	0.371	1.870	0.649	1.729	0.703
1997	1.456	4.380	0.333	3.121	0.467	1.860	0.783	1.906	0.764
1998	1.714	4.752	0.361	3.142	0.545	2.111	0.812	2.098	0.817
1999	1.141	4.810	0.237	2.745	0.416	1.825	0.626	1.960	0.582
2000	1.171	4.428	0.264	2.488	0.471	1.874	0.625	1.977	0.592
2001	1.107	4.399	0.252	2.283	0.485	1.837	0.603	1.732	0.639
2002	1.100	4.780	0.230	2.220	0.496	1.887	0.583	1.700	0.647
2003	1.170	5.240	0.223	2.302	0.508	2.061	0.567	1.718	0.681
2004	1.223	5.592	0.219	2.396	0.510	2.255	0.542	1.845	0.663
2005	1.273	5.852	0.218	2.529	0.504	2.110	0.604	1.763	0.722

Source: Export and Import Price are compiled from FAOSTAT, FAO Statistics Division 2007

Table Va. Average Share in All of the Markets, Share in EU Markets, and Global Competitiveness Index of Indonesia's Coffee

YEAR	AVG MARKET SHARE	France		Germany		Netherlands		United Kingdom	
		MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX
1990	0.093	0.068	0.733			0.023	0.251	0.095	1.026
1991	0.106	0.065	0.608	0.080	0.750	0.016	0.153	0.116	1.095
1992	0.050	0.043	0.861	0.054	1.088	0.013	0.253	0.077	1.544
1993	0.072	0.012	0.172	0.067	0.929	0.013	0.177	0.096	1.323
1994	0.063	0.009	0.136	0.057	0.899	0.009	0.143	0.126	1.991
1995	0.087	0.005	0.056	0.035	0.397	0.008	0.095	0.122	1.402
1996	0.223	0.019	0.083	0.063	0.283	0.012	0.055	0.117	0.527
1997	0.076	0.015	0.197	0.064	0.838	0.020	0.264	0.083	1.093
1998	0.106	0.013	0.126	0.067	0.631	0.022	0.210	0.037	0.350
1999	0.134	0.007	0.055	0.053	0.398	0.018	0.138	0.061	0.458
2000	0.141	0.006	0.042	0.054	0.384	0.009	0.060	0.065	0.457
2001	0.092	0.009	0.097	0.062	0.669	0.007	0.080	0.067	0.725
2002	0.108	0.016	0.147	0.062	0.569	0.007	0.063	0.065	0.600
2003	0.076	0.008	0.103	0.065	0.849	0.007	0.090	0.090	1.183
2004	0.072	0.015	0.202	0.061	0.837	0.007	0.099	0.057	0.789
2005	0.092	0.020	0.221	0.085	0.922	0.009	0.092	0.109	1.183

Sources : data processed by the author

Table Vb. Average Share in All Markets, Share in EU Markets, and Global Competitiveness Index of Indonesia's Coffee

YEAR	AVG MARKET SHARE	France		Germany		Netherlands		United Kingdom	
		MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX
1990	0.100	0.004	0.038			0.022	0.222	0.003	0.035
1991	0.109	0.004	0.033	0.055	0.500	0.023	0.209	0.012	0.111
1992	0.134	0.012	0.088	0.041	0.302	0.020	0.147	0.009	0.066
1993	0.152	0.046	0.303	0.036	0.238	0.051	0.334	0.053	0.350
1994	0.164	0.064	0.388	0.069	0.420	0.047	0.287	0.046	0.283
1995	0.173	0.050	0.289	0.083	0.482	0.040	0.231	0.034	0.196
1996	0.410	0.041	0.101	0.074	0.179	0.021	0.051	0.027	0.066
1997	0.300	0.022	0.073	0.062	0.206	0.024	0.082	0.060	0.199
1998	0.360	0.013	0.035	0.014	0.038	0.015	0.041	0.018	0.050
1999	0.310	0.012	0.038	0.032	0.104	0.009	0.028	0.003	0.008
2000	0.289	0.019	0.066	0.050	0.172	0.016	0.055	0.008	0.029
2001	0.219	0.014	0.066	0.031	0.141	0.008	0.037	0.005	0.024
2002	0.260	0.029	0.113	0.015	0.056	0.024	0.094	0.013	0.051
2003	0.111	0.022	0.195	0.004	0.034	0.010	0.086	0.014	0.127
2004	0.113	0.030	0.262	0.004	0.032	0.006	0.049	0.013	0.116
2005	0.115	0.033	0.286	0.008	0.069	0.010	0.085	0.053	0.459

Sources : data processed by the author

Table Vc. Average Share in All Markets, Share in EU Markets, and Global Competitiveness Index of Indonesia's Coffee

YEAR	AVG MARKET SHARE	France		Germany		Netherlands		United Kingdom	
		MARKET SHARE	G8CINDEX	MARKET SHARE	G8CINDEX	MARKET SHARE	G8CINDEX	MARKET SHARE	G8CINDEX
1990	0.176	0.039	0.219			0.179	1.018	0.030	0.172
1991	0.184	0.029	0.159	0.069	0.372	0.182	0.989	0.233	1.262
1992	0.176	0.031	0.178	0.067	0.380	0.199	1.132	0.356	2.029
1993	0.137	0.059	0.427	0.077	0.564	0.198	1.447	0.366	2.674
1994	0.170	0.042	0.244	0.124	0.729	0.208	1.220	0.363	2.127
1995	0.145	0.082	0.565	0.096	0.663	0.236	1.621	0.289	1.985
1996	0.144	0.059	0.411	0.134	0.929	0.302	2.095	0.542	3.754
1997	0.095	0.040	0.425	0.097	1.022	0.216	2.279	0.440	4.650
1998	0.085	0.007	0.083	0.111	1.301	0.234	2.752	0.358	4.204
1999	0.194	0.001	0.003	0.113	0.582	0.196	1.014	0.426	2.202
2000	0.134	0.000	0.000	0.161	1.199	0.230	1.709	0.651	4.844
2001	0.142	0.015	0.103	0.136	0.958	0.177	1.248	0.447	3.143
2002	0.108	0.000	0.005	0.101	0.929	0.163	1.508	0.547	5.049
2003	0.127	0.003	0.025	0.081	0.636	0.152	1.198	0.486	3.827
2004	0.122	0.000	0.002	0.078	0.635	0.172	1.405	0.465	3.810
2005	0.110	0.001	0.006	0.078	0.710	0.180	1.646	0.332	3.036

Sources : data processed by the author

Table Vd. Average Share in All Markets, Share in EU Markets, and Global Competitiveness Index of Indonesia's Coffee

YEAR	AVG MARKET SHARE	France		Germany		Netherlands		United Kingdom	
		MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX	MARKET SHARE	GBCINDEX
1990	0.378	0.291	0.770			0.309	0.817	0.170	0.449
1991	0.307	0.275	0.897	0.541	1.763	0.456	1.485	0.105	0.342
1992	0.277	0.189	0.682	0.510	1.840	0.369	1.333	0.258	0.933
1993	0.155	0.142	0.915	0.452	2.915	0.424	2.735	0.170	1.098
1994	0.224	0.166	0.741	0.322	1.436	0.441	1.965	0.110	0.488
1995	0.244	0.231	0.948	0.304	1.245	0.475	1.946	0.144	0.588
1996	0.148	0.236	1.595	0.315	2.122	0.486	3.275	0.210	1.418
1997	0.137	0.149	1.083	0.291	2.120	0.226	1.646	0.089	0.646
1998	0.177	0.276	1.561	0.367	2.078	0.309	1.748	0.114	0.646
1999	0.204	0.210	1.030	0.267	1.308	0.324	1.588	0.129	0.630
2000	0.265	0.356	1.344	0.351	1.324	0.565	2.133	0.070	0.266
2001	0.231	0.348	1.509	0.338	1.468	0.476	2.064	0.083	0.358
2002	0.307	0.192	0.624	0.290	0.944	0.366	1.194	0.126	0.412
2003	0.182	0.228	1.253	0.203	1.115	0.341	1.877	0.126	0.691
2004	0.130	0.140	1.075	0.160	1.231	0.198	1.520	0.093	0.710
2005	0.166	0.139	0.834	0.178	1.071	0.183	1.099	0.081	0.487

Sources : data processed by the author

Table VIa. Average of AV Duties in Coffee Products (%)

YEAR	Coffee husks and skins; coffee substitutes containing coffee in any proportion	Decaffeinated coffee (excl. roasted)	Roasted coffee (excl. decaffeinated)	Roasted, decaffeinated coffee	AVERAGE OF COMMODITY GROUPS
1996	11.40	10.00	12.00	15.00	12.10
1997	10.70	10.00	11.30	13.50	11.38
1998	9.00	9.90	10.00	12.00	10.23
1999	8.20	9.50	9.40	11.30	9.60
2000	6.60	8.70	8.20	9.80	8.33
2001	5.80	8.30	7.50	9.00	7.65
2002	5.80	8.30	7.50	9.00	7.65
2003	5.80	8.30	7.50	9.00	7.65
2004	5.80	8.30	7.50	9.00	7.65
2005	5.80	8.30	7.50	9.00	7.65

Table VIb. Average of AV Duties in Cocoa Products (%)

YEAR	Cocoa beans, whole or broken, raw or roasted	AVERAGE OF COMMODITY GROUPS
1996	2.00	2.00
1997	1.50	1.50
1998	1.00	1.00
1999	0.80	0.80
2000	0.30	0.30
2001	0.00	0.00
2002	0.00	0.00
2003	0.00	0.00
2004	0.00	0.00
2005	0.00	0.00

Table VIc. Average of AV Duties in Tea Products (%)

YEAR	Black fermented tea and partly fermented tea, whether or not flavoured, in immediate packings of <= 3 kg	Black fermented tea and partly fermented tea, whether or not flavoured, in immediate packings of > 3 kg	Black fermented tea and partly fermented tea, whether or not flavoured, in immediate packings of > 3 kg	Green tea in immediate packings of <= 3 kg	Green tea in immediate packings of > 3 kg	Mate	AVERAGE OF COMMODITY GROUPS
1996	0.00	0.00	3.30	4.40	0.00	0.00	1.28
1997	0.00	0.00	2.50	4.10	0.00	0.00	1.10
1998	0.00	0.00	1.70	3.80	0.00	0.00	0.92
1999	0.00	0.00	1.30	3.70	0.00	0.00	0.83
2000	0.00	0.00	0.40	3.40	0.00	0.00	0.63
2001	0.00	0.00	0.00	3.20	0.00	0.00	0.53
2002	0.00	0.00	0.00	3.20	0.00	0.00	0.53
2003	0.00	0.00	0.00	3.20	0.00	0.00	0.53
2004	0.00	0.00	0.00	3.20	0.00	0.00	0.53
2005	0.00	0.00	0.00	3.20	0.00	0.00	0.53

Table VId. Average of AV Duties in Pepper Products (%)

YEAR	Pepper of the genus Piper, crushed or ground	Pepper of the genus Piper, neither crushed nor ground	AVERAGE OF COMMODITY GROUPS
1996	4.00	0.00	2.00
1997	4.00	0.00	2.00
1998	4.00	0.00	2.00
1999	4.00	0.00	2.00
2000	4.00	0.00	2.00
2001	4.00	0.00	2.00
2002	4.00	0.00	2.00
2003	4.00	0.00	2.00
2004	4.00	0.00	2.00
2005	4.00	0.00	2.00

Table VIIa. Stocks of Standards for Coffee

YEAR	FR	DE	NL	UK	INA
1990	15	14	8	16	0
1991	17	14	10	18	0
1992	18	16	11	20	3
1993	18	16	11	21	3
1994	22	16	13	23	4
1995	23	16	14	26	4
1996	23	16	14	25	6
1997	23	16	15	25	6
1998	23	17	15	25	7
1999	23	19	15	25	8
2000	24	24	17	25	8
2001	24	25	17	27	8
2002	26	25	18	28	9
2003	27	30	20	29	9
2004	27	34	22	30	10
2005	29	37	25	30	9
2006	30	42	27	30	9

SOURCE : compiled from AFNOR, DIN, NEN, and BSN (1990-2006)

Table VIIb. Stocks of Standards for Cocoa

YEAR	FR	DE	NL	UK	INA
1990	3	10	3	0	0
1991	3	10	4	0	0
1992	3	10	5	0	7
1993	3	10	5	0	7
1994	3	10	6	0	7
1995	4	10	6	0	10
1996	4	10	9	0	11
1997	5	11	15	0	11
1998	5	11	17	0	12
1999	5	12	19	0	12
2000	5	14	24	0	13
2001	6	14	28	0	12
2002	7	15	31	0	13
2003	8	18	38	0	12
2004	8	18	39	0	12
2005	9	18	45	0	6
2006	12	18	49	2	6

SOURCE : compiled from AFNOR, DIN, NEN, and BSN (1990-2006)

Table VIIc. Stocks of Standards for Tea

YEAR	FR	DE	NL	UK	INA
1990	11	6	16	16	1
1991	14	7	16	16	1
1992	14	13	16	16	2
1993	14	13	16	16	2
1994	15	13	18	19	2
1995	16	13	18	18	6
1996	16	16	18	18	7
1997	16	19	18	18	7
1998	16	19	19	19	8
1999	16	20	21	21	8
2000	16	23	21	21	9
2001	16	24	21	21	8
2002	16	25	22	22	9
2003	16	26	22	21	8
2004	16	29	24	22	8
2005	16	29	26	23	8
2006	16	32	28	23	8

SOURCE : compiled from AFNOR, DIN, NEN, and BSN (1990-2006)

Table VIId. Stocks of Standards for Pepper

YEAR	FR	DE	NL	UK	INA
1990	7	0	1	2	1
1991	7	0	1	2	1
1992	7	0	2	2	7
1993	7	0	2	2	6
1994	7	0	4	2	6
1995	9	0	4	3	11
1996	9	0	4	2	11
1997	10	0	4	2	11
1998	13	0	4	2	11
1999	13	1	4	2	11
2000	15	2	4	2	11
2001	16	2	4	2	11
2002	17	2	4	2	11
2003	19	2	4	2	11
2004	19	2	4	2	11
2005	20	2	4	2	8
2006	20	2	4	3	8

SOURCE : compiled from AFNOR, DIN, NEN, and BSN (1990-2006)

Table VIIe. National Bodies for Standards Development and Indicators

National Bodies and indicators	FR	DE	UK	INA
Standards				
Standards body	AFNOR	DIN	BSI	BSN
Documentary standards	37 895	67 987	48 855	6 565
Accreditation				
Accreditation body	Cofrac	DAR (National coordination body)	UKAS	KAN
Accredited certification bodies	84	389	121	51
Accredited calibration laboratories	205	398	351	83
Accredited testing laboratories	1 672	1 839	1 350	262
Calibration and Measurement Capabilities declared in CIPM MRA	916	1 431	1 076	7
Participations in recognised measurement comparisons	308	452	350	11