The determinants of textile and apparel export performance in Asian countries

by

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DEDICATION

To my father, Bo Wang; my mother, Suping Guo; and my husband, Yan Zhang.

I appreciate the love, encouragement, and support of my parents, husband and extended family.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Since the end of the 20th century, textile and apparel retailers from developed countries have started to source globally instead of manufacturing products domestically to reduce costs and become more competitive in textile and apparel markets. However, since global sourcing has extended organizations' supply chains on a worldwide scale, other factors, such as suppliers' capability lead time, logistics service, and trade barriers, should also be seriously considered. Therefore, it is important for buyers to determine the comparative advantages of supplier countries, and suppliers to understand the determinants of their export performance to become more competitive in the era of trade liberalization. The purpose of this study was to understand the emerging trends and determinants of Asian developing countries' textile and apparel export performances over the twelve years (2000-2011).

The research framework in this study was built on the theory of comparative advantages and global value chain framework. The main analysis was conducted in three stages: (1) analyzing the textile and apparel export performance among 11 Asian developing countries, (2) testing the hypothesized relationships between determinants and textile and apparel export performance using a vector autoregressive (VAR) errors model approach, and (3) comparing the impact of determinants on textile and apparel export performance. SPSS 17.0 and SAS 9.3 were used to analyze secondary data sets collected from each country's available industry and government databases.

This study implied that textile and apparel manufacturing industry is a sunset industry in Asian developing countries. In addition, textile and apparel export performance can be influenced by economic levels, immediate and short term impacts. This study also verified elimination of the quota system influence on Asian developing countries comparative advantages and leads to global textile and apparel industry under reconstruction.

This study demonstrated that low labor costs may be comparative advantages for Asian developing countries to attract buyer sourcing in Asian, but for a specific Asian developing country, low labor costs will not be the most crucial comparative advantage. Manufacturing competence is not a crucial determinant for textile and apparel export performance in Asian developing countries. Logistics performance has a closer relationship with textile and apparel export performance than lead time. Currency exchange rate has a different impact on textile and apparel export performances among Asian developing countries. Tariffs had a negative impact on textile and apparel export performance in Asian developing countries, especially after the elimination of the quota system.

This study makes an important step towards understanding the determinants of textile and apparel export performance, and aids in building a research model of determinants for textile and apparel export performance in Asian developing countries. The research provides a number of practical implications for both supplier countries and global sourcing managers in international trade.

CHAPTER 1: INTRODUCTION

Background

Asian textile and apparel manufacturing performs differently in specific regions and countries, due to variations in economic levels, international trade regulations, political issues, and cultural differences. In 1990s and the beginning of 20th century, low labor costs were believed to be a key competitive factor influencing export performance for Asian developing countries. During this time period, countries in Asia, such as China, Indonesia, and Thailand, established positions in the world textile and apparel manufacturing market largely by paying their workforces much less than competing countries (Gibbon & Thomsen, 2005).

Asian developing countries usually export textile and apparel products to buyers who are retailers from developed countries and prefer global sourcing, compared with making the product in-house. The buyers prefer the ability of external specialized companies to produce a service or product in a less costly manner (Burt, Dobler, & Starling, 2003). Considering the increasing domestic labor and material costs, most apparel companies in developed countries tend to cooperate with the textile and apparel manufacturers from developing countries for the purpose of reducing production costs. Global sourcing has become a growing trend in the textile and apparel industry, and products are often produced in developing countries, sometimes thousands of miles away from the point of consumption (Allen, 2008).

Global sourcing, as a procurement strategy, has extended organizations' supply chains on a worldwide scale (Zeng & Rossetti, 2003). This complex process indicates that direct costs (labor and material cost) are not the only costs of ownership and that buyers should not use direct costs as the only indicator to select suppliers. The following factors should also be comprehensively considered when making sourcing decisions—suppliers' capability (Eusebio, Andreu, & Belbeze, 2007), productivity (Gibbon & Thomsen, 2005), innovation ability (Gibbon & Thomsen, 2005; Jin, 2004; Kang & Jin, 2007), lead time (Chen, Hudson, & White, 2009; Gibbon & Thomsen, 2005), product's quality (Handfield, 1994), relationship between suppliers and buyers (Kang & Jin, 2007), and total ownership cost (Allen, 2008; Birnbaum, 2005; Dutta, 2008; Gibbon & Thomsen, 2005).

It is challenging for apparel firms to make reasonable global sourcing decisions in light of these issues. In this process, apparel firms should determine optimal sourcing countries, based on their comparative advantages, such as labor costs, lead time, innovation ability, and product quality. Therefore, it is important for buyers to determine the comparative advantages of supplier countries; in other words, location-specific competing advantages a country processes in a particular industry relative to other countries (Kogut, 1985). Additionally, supplier countries should understand the determinants of their export performance to enhance their comparative advantages and become more competitive in international trade.

The Department of Economic and Social Affairs of the United Nations Secretariat classifies countries into developed and developing based on gross national

income (GNI) per capita, Human Assets Index (HAI), Economic Vulnerability Index (EVI), and population size. Based on these criteria, the developed countries or areas include Japan, Hong Kong SAR, Israel, South Korea, New Zealand, Singapore, and Taiwan Province of China in Asian. Except for these countries or areas, all the other countries or areas in Asian are developing countries or areas. The comparative advantages (e.g., abundant labor force, raw materials, and low labor costs) of Asian developing countries have boosted the development of the textile and apparel manufacturing industry in these countries, along with textile and apparel product exports to buyer countries since the onset of global sourcing.

However, the comparative advantages have not been permanent. Textile and apparel product exports have performed variably during the past decade, due to variations in economic levels, international trade regulations, political issues, and cultural differences. For example, elimination of the quota system in 2005 brought significant opportunities for trade liberty for China, as well as other Asian countries (Dutta, 2008). The global apparel industry has been under major reconstruction, since the drifting of comparative advantages among countries after elimination of the quota system (Tewari, 2008). In the past few years, China, who has enjoyed the leader position of textile and apparel product exports, lost advantages in production, due to increasing labor costs. “Made in China” is no longer the only choice for buyers (Ishtiaque, 2005). Other developing countries in Asia, such as India, Indonesia, and Malaysia, may displace China’s position in the future because of their comparative advantages.

Significance of the Study

Export performance refers to the composite outcome of a firm or a country's international sales, which includes three sub-dimensions: 1) export intensity – the ratio of export sales to a country's total sales (Katsikeas, Leonidou, & Morgan, 2000), 2) export sales – the size of export earnings in dollar value for a country (Shoham, 1996), and 3) export growth – increase of exports over a certain time period (Aaby & Slater, 1989). The drifting of comparative advantages among Asian developing countries changes buyers' sourcing decisions and may potentially differentiate the textile and apparel export performance of these countries. If export countries fail to determine the causes for these changes and differences, they may develop in the wrong direction by misunderstanding the complex global sourcing trends and determinants for export performance. This will lead them to lose comparative advantages in the global export competition and experience reduced export performance. Therefore, it is important to explore the emerging trends in Asian developing countries, regarding textile and apparel industries export performance, and determinants of Asian developing countries' textile and apparel industries export performance as a whole in the era of trade liberalization.

The majority of previous studies have explored the complex process of export performance at the firm level (e.g., Aaby & Slater, 1989; Chetty & Hamilton, 1993; Eusebio, Andreu, & Belbeze, 2007; Kang & Jin, 2007; Lau, To, Zhang, & Chen, 2009; Robertson & Chetty, 2000; Walters & Samiee, 1990), while a few studies have focused on the industry level (e.g., Athukorala, 2009; Jin, 2004; Kaplinsky & Morris,

2008; Verma, 2002). In the present study, the determinants of export performance for Asian developing countries will be discussed at the industry level.

The majority of existing industrial level studies have examined export performance in one or more developing countries, including Bangladesh (Sultana, Alam, Saha, Ashek, & Sarker, 2011), China (Zhang & Hathcote, 2008), China versus South Africa (Kaplinsky & Morris, 2008), East Asian developing countries (Athukorala, 2009; Funke & Ruhwedel, 2001), India (Abraham & Sasikumar, 2011; Verma, 2002), Thailand versus China (Athukorala & Suphachalasai, 2004). The others have focused on export performance in one or more developed countries, including Hong Kong versus South Korea versus Taiwan (Jin, 2004). In addition, only a few studies have focused on a comparison of export performance between developing and developed countries, also known as exporting and importing countries, respectively (e.g., Nordas, 2004).

Relatively few studies have examined textile and apparel export performance across Asian countries at the industry level in the past ten years (Athukorala, 2009; Funke & Ruhwedel, 2001). In fact, given their geographic proximity in textile and apparel manufacturing, countries located in East and South Asia are often aligned together, including Bangladesh, China, Cambodia, India, Indonesia, Malaysia, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam (e.g., Gereffi & Frederick, 2010; Seyoum, 2010). These selected countries are the major suppliers for buyers from developing countries, and their textile and apparel export performances are remarkable among all of the Asian developing countries.

The present study will explore: (1) emerging trends in Asian developing countries, regarding textiles and apparel export performances and (2) determinants of Asian developing countries' textile and apparel export performances in the era of trade liberalization. Prior to examining these two aspects concerning export performance, each country's position in current intense global market will be assessed via descriptive analysis. The present study will offer detailed analysis of Asian developing countries' textile and apparel export performances developing trends for the first time. This study will also fill a void in the area of analyzing the current determinants of Asian developing countries' export performance. Almost all Asian developing countries face formidable challenges (e.g. global economic crisis and the changing of trade policies), which may change the determinants of export performance and then influence the export performance, in textiles and apparel international trade. If Asian developing countries can find out what these determinants are, they may develop more specific and workable strategies to enhance their comparative advantages and improve their export performance. However, the previous studies only focused on a few Asian developing countries and the data sets were collected from at least five years ago. Therefore, it is important to explore the determinants of Asian developing countries' textile and apparel export performances in the era of trade liberalization.

The findings from this study will help Asian developing countries enhance their competitive power in international trade by understanding the latest determinants for export performance. Firms, who are engaged in the textile and apparel

international trade, and consider sourcing in Asian developing countries, will be benefited from the results of the present study to make more rational sourcing strategy decisions. Furthermore, the present study will also develop and test a research model to aid in identifying the determinants of export performance for future study.

Objectives of the Study

The overall objective of the present study is to understand the trends and determinants of Asian developing countries' textile and apparel export performances over a twelve year period (2000-2011). Export performance will be defined for the purposes of this study as the composite outcome of a country's international sales, and presented by textile and apparel export intensity, export values, and export growth for each country (Shoham, 1996). Export intensity, export sales, and export growth will be used as three indicators to measure export performance since they are the three most used measures of export performance in the extant literature at the industry level (Robertson & Chetty, 2000). The specific objectives of the present study are to:

1. Compare textile and apparel export performances among 11 major Asian developing countries over a 12 year period (2000-2011). Trends in textile and apparel export activities for this set of countries will also be examined.
2. Identify the effects of industrial, economic, and trade factors, including the number of production facilities, the number of employees, labor costs, lead time, logistic performance, exchange rates, quotas, and tariffs, on Asian developing countries' textile and apparel export performances.

Theoretical Framework and Methods

The theoretical framework for this research was based on the theory of comparative advantages (Kogut, 1985) and the global value chain framework developed by Gereffi and Memedovic (2003). This framework also contains trade-related factors, including tariffs, quotas, and exchange rates, which influenced export performance.

Secondary data sets collected from the respective national bureau of statistics of each country, the World Bank website (http://www.worldbank.org), and the World Trade Organization (WTO) website (http://www.wto.org) were employed for the present study. Measures utilized include: export values, employee salaries, number of employees and production facilities, lead time to export countries, logistic performance indicators (ability to track and trace consignments, competence and quality of logistics services, pricing, efficiency of customs clearance process, timeliness of services, and quality of trade and transport-related infrastructure), tariff rates, quotas, and official exchange rate. These measures were used to represent export performance, labor costs, manufacturing competence, transportation services and logistics, tariff rates, quotas, and exchange rates. Export performance comparisons were made between Bangladesh, China, Cambodia, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam. Determinants for export performance analysis empirically examined trade related factors (tariff rate and exchange rates) based on data from China, Cambodia, Malaysia, Sri Lanka, and

Vietnam, and descriptively analyzed other factors for all the countries, varying with data availability.

Data were analyzed using SPSS 17.0 and SAS 9.3. Descriptive statistics were utilized for analyzing textile and apparel export performance among Asian developing countries. Vector Auto-regression (VAR) error model was used to explore the impact of labor costs, number of employees, and exchange rate on export performance among Asian developing countries. The impact of all the determinant factors on export performance was also descriptively analyzed among Asian developing countries.

Definitions of Terms

The following terms were defined and operationalized for this study:

Comparative advantage – Comparative advantages are location-specific competing advantages (e.g., labor costs, productivity, employment, and lead time) a country processes in a particular industry relative to other countries (Kogut, 1985). Comparative advantages could be measured in this study using Global Value Chain framework (Bair & Peters, 2006).

Competitive advantage – Comparative advantages are firm-specific advantages (e.g., firm size, management commitment, and government incentives) influencing decisions on what activities and technologies a firm should concentrate (Kogut, 1985). A firm that enjoys a competitive advantage is implementing a strategy not simultaneously being implemented by any of its current or potential competitors (Barney, McWilliams, & Turk, 1989).

Export performance – The composite outcome of a firm's international sales, which includes three sub-dimensions: export intensity, export sales, and export growth (Katsikeas et al., 2000; Shoham, 1996).

Global sourcing – The integration and coordination of procurement requirements across worldwide business units, looking at common items, process, technologies, and suppliers (Monczka & Trent, 1991).

Global value chain framework –The global apparel value chain consists of the following components: textile materials supply; manufacturing of finished products; transportation services and logistics; and marketing (Gereffi & Memedovic, 2003). This framework explains the process of global sourcing in textile and apparel industry.

Lead time – The time from when an order is transmitted by a customer until the order is received by that customer (Chen, Hudson, & White, 2009).

Quota – Quota is a quantitative limitation. In the context of the garment industry, quota is the maximum number of garments that can be exported legally by a particular country to another country on an annual basis (Birnbaum, 2005).

Tariffs – Tariff is a tax levied by governments on the value including freight and insurance of imported products (What is a tariff, 2012).

Total ownership cost – Total cost of ownership for noncapital goods acquisition includes all relevant costs, such as administration, follow-up, expediting, inbound transportation, inspection and testing, rework, storage, scrap, warranty, service, downtime, customer returns, and lost sales. The acquisition price plus all other

associated costs becomes the total cost of ownership (Johnson, Leenders, & Flynn, 2011).

Thesis Structure

This thesis is organized into five chapters. Chapter one provides a brief review of research background, discusses the significance and objectives of the study, and gives the definitions of terms relevant to the study. Chapter two reviews findings from previous research regarding determinants of export performance, including number of employees, number of production facilities, labor costs, tariff rates, quotas, exchange rates, transportation service and logistics. Consequently, a theoretical framework is presented describing the determinants of textile and apparel export performance. Research questions and testable hypotheses are formulated based on the theoretical framework and extant research findings. Chapter three reports the method used in the main study, including research design, research model and hypothesis testing, measurements of variables, data collection, and data analysis. In chapter four, data analyses and results are discussed. Chapter five concludes with the thesis findings and implications. It also addresses limitations of the current study and suggestions for future research.

CHAPTER 2: LITERATURE REVIEW

The following chapter summarizes findings from previous studies that focus on textile and apparel export performance and analyzes determinants of export performance from different aspects of the textile and apparel industry. The global value chain framework was used to guide this research (Gereffi & Memedovic, 2003), while also incorporating the theory of comparative advantage (Kogut, 1985). Three trade-related factors were also added to the research framework, including exchange rates, quotas, and tariffs. Based on the literature review and theoretical framework, research variables for inclusion in this study were determined. Research questions are presented in this chapter regarding the determinants of export performance in Asian developing countries.

Export Performance

How to achieve success in the competitive global textile and apparel trade environment has become a popular topic for discussion among academicians (Berdine, Parrish, Cassill, & Oxenham, 2008). As an important measurement of business success, influential factors related to export performance have been explored as well as the relationships between these factors from both firm (e.g., Aaby & Slater, 1989; Chetty & Hamilton, 1993; Zou & Stan, 1998) and industry perspectives (e.g., Abraham & Sasikumar, 2011; Edwards & Alves, 2006; Jin, 2004; Kaplinsky & Morris, 2008; Verma, 2002).

Export performance at firm level

Firm behavior and performance in export markets have received much research attention over the past three decades (e.g., Aaby & Slater, 1989; Porter, 1990; Katsikeas, Piercy & Ioannidis, 1996). During the 1990s and before, most studies focused on export performance at the firm level (e.g., Chetty & Hamilton, 1993; Zou & Stan, 1998). These studies generally concluded export performance of a company would be conditional upon institutional performance and domestic conditions (Porter, 1990). Aaby and Slater (1989) provided the most widely adopted conceptual framework used to measure influential factors on firms' export performance (i.e., propensity to export, export sales, export problems, exporter versus non-exporters, level of export, perceptions towards export, export growth intensity, barriers to export) at the firm level. Measures included in this framework are external impact (i.e., environment) and internal impacts (i.e., firm characteristics and strategy) on export performance. Strategies contain market selection, use of intermediaries, product mix, product development, promotion, pricing, and staffing. Firm characteristics that impact both strategy and export performance include technology, export/market knowledge, planning, export policy, management control, quality, and communication. In addition, there are also firm characteristics that only impact strategy (i.e., firm size, management commitment, management perceptions towards financial incentives, competition, market potential, distribution, delivery and service, government incentives, risk, and profit) (Chetty & Hamilton, 1993).

Under the guidance of this framework, one research focus has been to synthesize and empirically test a model of export performance at the firm level (e.g., Robertson & Chetty, 2000; Shamsuddoha, Ali, & Ndubisi, 2009). Research revealed firm size (Culpan, 1989; Katsikeas, Piercy, & Ioannidis, 1996; Reid, 1983), export experience (Katsikeas et al., 1996; Madsen, 1989), export commitment (Katsikeas et al., 1996) and production technology (Aaby & Slater, 1989) positively influenced export performance, while price (Madsen, 1989), domestic market orientation (Karafakioglu, 1986; Madsen, 1989), and contextual environmental factors (Kaynak & Erol, 1989) negatively affected export performance. Recent studies have further assessed these relationships and tested more variables that affect export performance. For example, research indicated a negative impact on a firm's performance, if its strategic orientation and channel structure matched its external environment (Robertson & Chetty, 2000). Shamsuddoha, Ali, and Ndubisi (2009) also found government export promotion programs influenced a firm's export strategy and export performance by developing firm and managerial capabilities, such as knowledge and skills. The domain of synthesizing and empirically testing a model for export performance has been sufficiently addressed in the literature.

Recent research concerning export performance at the firm level has focused on exploring the determinants of export performance in a particular economy. Numerous studies have arrived at a consensus that labor costs were no longer the primary determinant for export performance at the firm level and the importance of determinants may vary in different economies (e.g., Eusebio, Andreu, & Belbeze,

2007; Kang & Jin, 2007; Lau et al., 2009; Maurel, 2009; O'Cass & Julian, 2003; Walters & Samiee, 1990). Firm characteristics (i.e., firm size, business partnership or domestic social network, and innovation) (Duenas-Caparas, 2007; Kang & Jin, 2007; Maurel, 2009; O'Cass & Julian, 2003; Ogunmokun & Ng, 2004), environmental characteristics (Lau et al., 2009; O'Cass & Julian, 2003), and export commitment (Ali, 2004; Maurel, 2009; Ural, 2009) are considered primary determinants for export performance in most of the countries (e.g., Australia, French, Philippines, South Korea, China, and Turkey), followed by market strategy (Ogunmokun & Ng, 2004; Tooksoon & Mohamad, 2010). Export experience (Eusebio et al., 2007), investment in R&D (Eusebio et al., 2007), exporting problems encountered (Ali, 2004; Ogunmokun & Ng, 2004), and domestic demand (Lau et al., 2009) have shown to provide an impact on export performance only in certain countries (e.g., Australia, Spain, Italy, and China). This body of research illustrates the domain of determinants of export performance in regard to various national economies has been sufficiently completed for most of the exporting countries addressed in this study.

Export performance at industry level

In most of the developing countries in Asia, small- and medium-sized enterprises (SMEs) are dominant in the textile and apparel industry (Omar, Arokiasamy, & Ismail, 2009). Most of the recent export performance studies (e.g., Abraham & Sasikumar, 2011; Jin, 2004) have started to consider the SMEs in a specific economy as a whole to analyze the comparative advantages or explore determinants of export success at the industry level in the global economy, since firm

level export performance studies have been sufficiently completed. The first trend for these studies is to analyze the export comparative or competitive advantages of a particular economy (Abraham & Sasikumar, 2011; Sultana et al., 2011; Verma, 2002) or make a comparative analysis across more than one economy (Jin, 2004; Kaplinsky & Morris, 2008). Another trend is to explore the determinants of export performance in one or more economies (e.g., Athukorala, 2009; Athukorala & Suphachalasai, 2004; Bilquees, Mukhtar, & Malik, 2010; Edwards & Alves, 2006; Funke & Ruhwedel, 2001; Kasman & Kasman, 2005; Kaplinsky & Morris, 2008; Santos-Paulino, 2002; Zhang & Hathcote, 2008).

Most of research for both of these two trends focuses on similar factors, such as labor costs, productivity, lead time, quotas, tariff, and exchange rate (e.g., Athukorala, 2009; Abraham & Sasikumar, 2011; Kaplinsky & Morris, 2008; Zhang & Hathcote, 2008). This similarity indicates these factors are widely accepted in comparative advantage or export performance analysis in different economies. Other factors, like number of facilities and employment (Kaplinsky & Morris, 2008), product variety (Funke & Ruhwedel, 2001), government policy (Abraham & Sasikumar, 2011), and global brand (Jin, 2004) are only considered and examined in a few studies. Nevertheless, it is necessary to consider these factors in certain economies because of the variety and complexity of comparative advantages and export performance analyses. Country selections for most of these research trends include both developing and developed countries from Asia (e.g., Athukorala, 2009; Jin, 2004; Kaplinsky & Morris, 2008; Zhang & Hathcote, 2008), Africa (Edwards &

Alves, 2006; Kaplinsky & Morris, 2008; Santos-Paulino, 2002), Europe (Kasman & Kasman, 2005), and Latin America (Santos-Paulino, 2002). These countries were selected because they are thought to provide a cumulative comparison of diverse performance factors of interest to these studies.

Similar to export performance studies at the firm level, most industry level literature indicates low cost labor is no longer the significant comparative advantage in textile and apparel industry in Asian developed and certain developing countries or areas, such as China (Zhang & Hathcote, 2008), Hong Kong (Jin, 2004), India (Verma, 2002), Japan (Athukorala, 2009), South Korea (Jin, 2004), and Taiwan (Jin, 2004). These countries or areas have experienced losing export competitiveness, due to increasing labor costs and negatively influenced their textiles and apparel export performance (Jin, 2004). However, not all of studies reach similar conclusions (Abraham & Sasikumar, 2011; Kaplinsky & Morris, 2008; Sultana et al., 2011).

Besides labor costs, quotas is another critical determinant of export performance at the industry level (Zhang & Hathcote, 2008). Before the Multi-Fibre Arrangement (MFA) quota removal in 2005, the influence of trade liberty has been intensely discussed. The most widely adopted opinion is MFA-quota removal represents both an opportunity as well as a threat. An opportunity is the quotas will not restrict export activities anymore. However, the non-restriction trade activities perhaps will open the domestic market to competition (Kathuria & Bharadwaj, 1998). South Asian countries try to prevent large-scale job losses, due to liberalization and globalization (Sultana et al., 2011). This prediction has proven in the current trade

liberty era, quota removal has improved the nations' competitiveness in global trade for most export countries (Abraham & Sasikumar, 2011; Zhang & Hathcote, 2008). But the competitiveness of these countries has become a threat to other countries, which lack similar comparative advantages (Kaplinsky & Morris, 2008; Zhang & Hathcote, 2008).

Furthermore, labor costs and quotas are not the only comparative advantages for export countries. Quality, products, and process technology are also important factors that buyer firms care about (Handfield, 1994). Meanwhile, other studies are concerned with the impact of productivity (Abraham & Sasikumar, 2011), number of facilities and employment (Kaplinsky & Morris, 2008), government policy (Abraham & Sasikumar, 2011), domestic demand (Edwards & Alves, 2006), export variety (Funke & Ruhwedel, 2001), lead time (Athukorala, 2009), exchange rate (Kaplinsky & Morris, 2008), and tariff (Zhang & Hathcote, 2008) on nation competitiveness, and their export performance (Dickerson, 1999; Naughton, 1996; Schoenberger, 1988). However, it is difficult to achieve consensus, due to a lack of consistency of countries or data selection period among these studies. Therefore, for a better understanding of the export performance in Asian developing countries, it is important to conduct the present research to examine the determinants of textiles and apparel exports in Asian developing countries to suggest future direction and challenges.

Theoretical Frameworks

The present study builds an integrated conceptual framework based on comparative advantage theory (Kogut, 1985) and global value chain framework

(Gereffi & Memedovic, 2003). The theory of comparative advantage provides influential factors that determine the price of products and eventually export performance determines export performance, which is helpful to examine the textile and apparel industry from a global perspective (Krugman & Obstfeld, 1999). The global value chain framework (GVC) explains how global sourcing works in the textile and apparel industry, and indicates the factors related to supply a country's export performance. The theory of comparative advantage directs where global value chain activity should be located (Kogut, 1985).

Theory of comparative advantage

Comparative advantages are location-specific competing advantages a country processes in a particular industry relative to other countries (Kogut, 1985). International trade is beneficial for all, if each country specializes in those products for which its "factors" of production (heterogeneous and immobile across countries) make it more efficient, compared with other countries. It need not have an absolute efficiency advantage to produce any product over all countries; it need only be relatively more efficient in producing some products than other countries (Hunt & Morgan, 1995). Comparative advantage theory assumes labor costs, productivity, employment, and lead time determine the price of products and eventually export performance (Krugman & Obstfeld, 1999). In the textile and apparel industry, comparative advantage needs examination in such a turbulent global competition. Comparative advantage is central to global competition, as it indicates where a global value chain activity should be located when many countries can conduct the whole or

part of the activity, for example, in those countries most competitive in completing it (Kogut, 1985).

Global value chain framework (GVC)

Globalization implies functional integration between internationally dispersed activities (Dicken, 1998). Buyer-driven value chains are common in a labor-intensive industry, such as textiles and apparel, footwear, toys, and handicrafts. Different from producer-driven value chains, which lie in technology, the critical asset of buyer-driven value chains is brand name (design, marketing) and an ability to organize the decentralized and horizontal production system (Gereffi, 1994). In this pattern of trade-led industrialization, third-world contractors, who make finished goods for foreign buyers, complete production, while large retailers or marketers, who order the goods, supply the specifications. The global apparel value chain consists of the following components: textile materials supply; manufacturing of finished products; transportation services and logistics; and marketing (Gereffi & Memedovic, 2003). This framework explains the process of global sourcing in the textile and apparel industry.

In the global value chain framework, marketing activities, a buyer-related component, are characterized by higher value-added and greater market-control (Kogurt, 1985). Furthermore, in the apparel GVC, brand companies in developed countries control the above activities, such as design, branding, retailing, and set-up dispersed production networks in a variety of locations, usually in developing countries (Gereffi & Frederick, 2010). They make sourcing decisions, based upon the

supplier-related components of textile materials supply, manufacturing of finished products, and transportation services and logistics. The current trend is apparel production relocates from the U.S. and Western Europe to developing countries in South East and Southern Asia (Kilduff & Chi, 2007). Therefore, the countries, which have comparative advantages for these supplier-related components, could become more competitive in the global economy.

In the present study, two components, manufacturing of finished products, and transportation services and logistics, are used to build the conceptual framework and assess the determinants of textile and apparel export performance in Asian developing countries. Labor costs and manufacturing competence (numbers of production facilities and employees) are the factors that influence the manufacturing of finished products and are critical factors that affect buyers' decisions, as well as suppliers' competitiveness (Gereffi & Memedovic, 2003). In addition, six logistic performance indicators (ability to track and trace consignments, competence and quality of logistics services, pricing, efficiency of customs clearance process, timeliness of services, and quality of trade and transport-related infrastructure) and lead time are the factors represented transportation service and logistics that have an impact on the country's comparative advantage followed by export performance in a global economy (World Bank, 2009a).

Research Questions

In this study, determinants of the textiles and apparel industry export performance are examined in Asian developing countries. However, comparative

advantage theory and global value chain framework do not include trade-related factors that impact export performance. Therefore, the present study extended the framework to include manufacturing factors, transportation services, logistics factors, and trade-related factors. The next section presents research questions that reflect the relationships between these factors and export performance, and indicate what the final model includes.

Manufacturing of finished products

In the global value frame work, the supplier-related component of manufacturing of finished products affects buyers' decisions, as well as suppliers' competitiveness (Gereffi & Memedovic, 2003). Comparative advantage theory assumes labor costs and employment determine the price of products and eventually export performance (Krugman & Obstfeld, 1999). Therefore, in the present study, labor costs and manufacturing competence (numbers of production facilities and employees) are influential factors of manufacturing of finished products and then impact export performance.

Labor costs. According to comparative advantage theory and GVC framework, labor costs determine the price of products, especially for the labor-intensive industry and eventually export performance (Abraham & Sasikumar, 2011; Krugman & Obstfeld, 1999). Since textile and apparel industry is known as labor-intensive industry, most of the textile and apparel buyers and retailers in both developing and developed countries are sensitive to the price of products to obtain more competitive advantages. This sensitivity forces textile and apparel

manufacturing to shift from a country with increasing labor costs to a lower costs labor country which drives the emerging of global souring (Salinger, 2003). Although the textile and apparel industry has the requirement for a shorter lead time and tighter logistics (Gereffi & Memedovic, 2003), low labor costs can make up this shortage and enhance retailers' competitive advantages (Kaplinsky & Morris, 2008). In this case, labor costs significantly affect buyers' decisions, and as a result, directly influence a national apparel industry's competitiveness and export performance (Abernathy, Abernathy, & Weil, 2006).

Most of studies insist labor costs are the most important factor to determine textile and apparel export performance in a specific country (e.g., Abraham & Sasikumar, 2011; Kaplinsky & Morris, 2008; Zhang & Hathcote, 2008). For example, Zhang and Hathcote (2008) report that labor costs have significant impact on textile and apparel export value and volume from China to USA. Among all the textile and apparel export categories examined in their study, labor costs have the most significant negative impact on the silk content categories (Zhang & Hathcote, 2008). According to Abraham and Sasikumar (2011), labor costs and flexibility are also important factors for Indian textile and apparel manufacturers to acquire competitive advantages and have a better export performance in the trade liberty era. Meanwhile, research shows abundant low-cost workforces, as well as a strong domestic raw material supply and the traditional focus on the textiles and clothing sector, could enhance both China and India's comparative advantages and export performances (Kaplinsky & Morris, 2008).

Many developing countries have relatively poor apparel productivity levels compared to developed countries, due to less capital per worker, resulting in lower hourly wages (Dickerson, 1999). At the same time, Asian developing countries, such as India, also try to reduce labor costs by implying effective strategies, such as contractualization of employment, feminization of work, subcontracting of work, relaxation of the implementation of labor laws, and weakening of the collective bargaining process (Abraham & Sasikumar, 2011). Therefore, compared to developed countries in Europe and North America, such as Italy, France, and the U.S., developing countries with low cost labor have a significant, comparative advantage in labor-intensive commodities and, in this case, textiles and apparel products (Zhang & Hathcote, 2008), leading to the following research question:

> **Research Question 1:** Do labor costs influence textile and apparel export performance (e.g., intensity, value, and growth) in the same way among Asian developing countries?

Prior to descriptively compare the impact of labor costs on textiles and apparel export performance among Asian developing countries, this study will first statistically examine the impact of labor costs on export performance using data sets collected from Asian developing country during recent years. As discussed above, labor costs have been one of the most important reasons why buyers from developing countries prefer global sourcing (Salinger, 2003), which can be considered as comparative advantages for Asian developing countries (Zhang & Hathcote, 2008). However, only a few previous studies prove the

direct impact of labor costs on textiles and apparel export performance in Asian developing countries, especially in recent years (e.g., Kaplinsky & Morris, 2008). In addition, some studies pointed out the labor costs have become less important in textiles and apparel global trade (Zhang & Hathcote, 2008). Therefore, before we comparatively analyze the impact of labor costs, we need to support there exist direct impacts of labor costs on textiles and apparel export performance in Asian developing countries recently. The following hypotheses will be tested:

Hypothesis 1a: Labor costs have no direct impact on (1) textile, and (2) apparel export intensity in Asian developing countries.

Hypothesis 1b: Labor costs have no direct impact on (1) textile, and (2) apparel export values in Asian developing countries.

Hypothesis 1c: Labor costs have no direct impact on (1) textile, and (2) apparel export growth in Asian developing countries.

Manufacturing competence. As an influential factor of manufacturing finished products in the global value chain, manufacturing competence of a country finally impacts this country's export performance (Gereffi & Memedovic, 2003). According to Gereffi and Memedovic (2003), textile and apparel industry can be classified to labor-intensive and consumer-goods industries, which establish buyer-driven value chains that large retailers, marketers and branded manufacturers play the pivotal roles in setting up

decentralized production networks in a variety of exporting countries, typically located in developing countries.

Recently, the emerging of “lean retailing” (the model of frequent shipments by suppliers to fill ongoing replenishment orders by retailers, based on real-time sale information collected at the retailer’s stores on a daily basis) increases retailers’ requirement for strong production capability and low prices (Gereffi & Memedovic, 2003; Kaplinsky & Morris, 2008). They prefer suppliers from the country with abundance of labor and facilities since the number of textile and apparel facilities, and employment of export country represent the labor conditions and production abilities in the textile and apparel manufacturing industry. This preference determines the concentration of global buying power in the textile and apparel manufacturing countries and then, determines the direction of the global shifts in textiles and apparel (Kaplinsky, 2005).

In addition, differences between countries in the relative abundance of labor and capital, and the apparel industry’s labor intensity lead to the result that wage differences between countries that differ the textile and apparel export performance from country to country (Dickerson, 1999). The interaction between employment and textile and apparel exports indicates that the exports value declines with the scale of production, minimizing or even bankrupting the manufacturer, resulting in employment loss, and similarly, employment decreases when export demand reduces (Morris, 2008). Research indicates a

relatively facilities- and labor-abundant country has a comparative advantage in producing the commodity and enhances its export performance (Czinkota, Ronkainen, & Moffett, 1999). Therefore, it is not easy for countries with a small number of production facilities and employees to meet the requirements of large global buyers, and the countries with large volume plants and employees have a comparative advantage in global competition (Kaplinsky & Morris, 2008). The following research questions were developed:

Research Question 2a: Does the number of production facilities influence textile and apparel export performance (e.g., intensity, value, and growth) in the same way among Asian developing countries?

Research Question 2b: Does the number of employees influence textile and apparel export performance (e.g., intensity, value, and growth) in the same way among Asian developing countries?

Based on previous discussion, we know a country's manufacturing competence can be its comparative advantages and finally impacts this country's export performance (Gereffi & Memedovic, 2003; Kaplinsky & Morris, 2008). However, there is few previous studies reported the direct causal relationship between manufacturing competence and textiles and apparel export performance in Asian developing countries. In order to make the results of the present study more credible, we first empirically examine the relationship between manufacturing competence and textile and apparel export performance in Asian developing countries before descriptively compare the impact of

manufacturing competence on textile and apparel export performance among Asian developing countries. Since the number of employees is more stable and credible to reflect the manufacturing competence in Asian developing countries, we use the number of employees to measure the manufacturing competence in hypothesis testing. The following hypotheses will be tested:

Hypothesis 2a: The number of employees has no direct impact on (1) textile, and (2) apparel export intensity in Asian developing countries.

Hypothesis 2b: The number of employees has no direct impact on (1) textile, and (2) apparel export value in Asian developing countries.

Hypothesis 2c: The number of employees has no direct impact on (1) textile, and (2) apparel export growth in Asian developing countries.

Transportation service and logistics

Logistics and transportation services processes form the critical loops of supply chains and oversee the flows of materials, information and cash, which are the essential elements of fulfilling buyers' orders (Zeng & Rossetti, 2003). Yeung (2006) defined logistics as "a time-based activity concerned with the profitable movement of information and materials into/through the organization and out to the customer". There is a growing recognition of the role that transportation and logistics excellence plays in achieving a world-class supply chain and that freight costs represent a substantial components of total cost of ownership (Gilmore, 2002). Higher costs and time spent on logistics and transportation services decrease suppliers' competitiveness in the international market. As a result, being one critical component of global value

chain, a country's logistics and transportation services have significant impact on the country's comparative advantage and export performance in a global economy (World Bank, 2009a).

World Bank gives two factors, logistics performance and lead time, to measure a country's logistics and transportation services quality (http://www.worldbank.org/lpi). Six indicators are used to measure logistics performance, including ability to track and trace consignments, competence and quality of logistics services, pricing (ease of arranging competitively priced shipments), efficiency of customs clearance process, timeliness of services (frequency with which shipments reach consignee within scheduled or expected time), and quality of trade and transport-related infrastructure. In fact, a supplier's ability to assume carrying costs, speed up container movements, track inventory and sales, as well as share data with buyer has been proved to be positively correlated to its export performance (Li & Ogunmokun, 2001). Research also indicates reliable delivery from manufacturing to commercial market correlate significantly and positively with a firm's export ratio (Guan & Ma, 2003). This means reducing timeliness of the service, decreasing price, and improving the quality of logistics service may enhance logistic performance and export performance (Yeung, 2006).

In response to market instability, textiles and apparel firms usually target small and rapidly changing market niches and have the requirement for quick delivery (Zhang & Hathcote, 2008). These firms prefer lean retailing and have the requirement for short order response time and frequent delivery, in smaller quantities, of more

diverse products (Gereffi & Memedovic, 2003). As an important component of the total cost of ownership, a long lead time could offset the cost advantages obtained by global sourcing in low labor costs countries (Schoenberger, 1988). Contrarily speaking, short lead time could make up the comparative disadvantage of high labor costs countries, particularly in the fashion industry, where a quick-response is important for competitiveness (Goedhuys, Janz & Mohnen, 2008). Therefore, the requirement for a quick response forces buyer firms to choose suppliers geographically near the final market to become competitive in fast changing markets (Christerson, 1994). For example, the U.S. must shift much of its sourcing from China to Mexico and the Caribbean nations (Zhang & Hathcote, 2008).

Summarily speaking, both logistics performance and lead time can influence a country's textile and apparel export performance. The differences of logistics performance and lead time may cause different export performance among Asian developing countries. For instance, in certain developing countries, such as India, delays and inefficiencies in Indian ports compared to other Asian countries significantly weaken the comparative advantages for export performance (Verma, 2002). This study investigated the following research questions:

> **Research Question 3a:** Does logistics performance influence textile and apparel export performance (e.g., intensity, value, and growth) in the same way among Asian developing countries?

Research Question 3b: Does lead time influence textile and apparel export performance (e.g., intensity, value, and growth) in the same way among Asian developing countries?

Trade-related factors

Trade-related factors include exchange rates, quotas, and tariffs. The purpose of trade barriers is to protect domestic textiles and apparel industries, and reduce supplier countries' competitiveness. These trade-related factors bring external pressures on the textile and apparel export performance.

Exchange rates. Exchange rates is one of the main instruments used to promote export growth and diversification, as well as to enhance the nation's comparative advantage as part of trade liberalization (Edwards & Alves, 2006; Santos-Paulino, 2002). Research concludes that the devaluation of the currency exchange rates is one of the key factors that should be responsible for the growth of exports values (Athukorala & Suphachalasai, 2004; Naughton, 1996). Edwards and Alves (2006) found that domestic exporters are price-takers in the international market and the export prices would rise with the depreciation of the exchange rates. This means a decrease of exchange rates reduces the price for import products from other countries, where they charge the same price, but importing countries must pay more in their currency (Amponsah & Boadu, 2002). Similarly, exporting countries are able to make more profits with the depreciation of the exchange rates and vice versa. A possible explanation for the positive relationship between exchange rates depreciation and export performance is exchange rates depreciation raise the

profitability of export supply (Edwards & Alves, 2006). Since labor-intensive industry, such as textile and apparel industry, appear to be particularly sensitive to the exchange rates changes, textile and apparel producers in developing countries experience lost profits and even a breakdown, due to a rising exchange rates in global trade (Kaplinsky & Morris, 2008). However, results from studies on the impact of exchange rates on export performance do not reach a consensus. Contrary opinions indicate the increase of exchange rates shrinks income and then income's effect will lead exporters to export even more to avoid the utility depression effect of a large reduction in their export earnings (Kasman & Kasman, 2005). Furthermore, for researchers who agree there exists effects of exchange rates on textile and apparel exports performance, they still do not believe it is the critical factor, since the influences of labor costs and number of employees are more significant (Gerard, Byron, & Yochanan, 2006).

Except for the direct impact on export performance, researches also provide evidences to show the importance of a stable and competitive real effective exchange rates in driving export performance (e.g., Bilquees et al., 2010; Kasman & Kasman, 2005). The increased uncertainly from high volatility in the exchange rate is believed to impact international trade, and reduces the comparative advantages and worldwide specialization (Kasman & Kasman, 2005). For example, the volatility of exchange rates fluctuations has potentially deterred new entrants and given rise to a more muted response than otherwise would have been the case in South Africa, which may have contributed to the poor export response relative to other developing countries

(Edwards & Alves, 2006). In addition, the effects of real exchange rates volatility on export performance are different, based upon the countries selection (Bilquees et al., 2010). Compared to developed country, exchange rate risk is more important in developing country trade flows since financial markets for hedging currency risk have not been well developed (Kasman & Kasman, 2005). Therefore, keeping the real effective exchange rates stable at a competitive level is critical to enhance a country's comparative advantages and improve export performance (Edwards & Alves, 2006). The following research questions have been developed:

> **Research Question 4:** Does exchange rate influence textile and apparel export performance (e.g., intensity, value, and growth) in the same way among Asian developing countries before and after quota phase-out?

In previous studies that focused on the impact of exchange rates on export performance, the most widely used measurement to present export performance was export volume (e.g, Athukorala & Suphachalasai, 2004; Edwards & Alves, 2006; Kasman & Kasman, 2005). In addition, the data sets used in these studies were collected before 2005, the year in which quota system was terminated. After the removal of quota system, other trade-related factors played more critical roles in textile and apparel international trade. In this case, we need to explore whether exchange rate directly influences the export performance measurements used in the present study, especially after the year of 2005. Therefore, prior to descriptively compare the impact of exchange rate on textile and apparel export performance among Asian developing countries, we

first empirically test the hypotheses to assess the relationship between exchange rate and the export performance measurements used in the present study. Here came the hypotheses:

Hypothesis 4.1a: Exchange rate has no direct impact on textiles export intensity in (1) Sri Lanka, and (2) Malaysia after quota phase-out.

Hypothesis 4.1b: Exchange rate has no direct impact on textiles export value in (1) Sri Lanka, and (2) Malaysia after quota phase-out.

Hypothesis 4.1c: Exchange rate has no direct impact on textiles export growth in (1) Sri Lanka, and (2) Malaysia after quota phase-out.

Hypothesis 4.2a: Exchange rate has no direct impact on textiles export intensity in Asian developing countries both (1) before, and (2) after quota phase-out.

Hypothesis 4.2b: Exchange rate has no direct impact on textiles export value in Asian developing countries both (1) before, and (2) after quota phase-out.

Hypothesis 4.2c: Exchange rate has no direct impact on textiles export growth in Asian developing countries both (1) before, and (2) after quota phase-out.

Hypothesis 4.3a: Exchange rate has no direct impact on apparel export intensity in Asian developing countries both (1) before, and (2) after quota phase-out.

Hypothesis 4.3b: Exchange rate has no direct impact on apparel export value in Asian developing countries both (1) before, and (2) after quota phase-out.

Hypothesis 4.3c: Exchange rate has no direct impact on apparel export growth in Asian developing countries both (1) before, and (2) after quota phase-out.

Quotas and tariffs. Quotas and tariffs are two critical trade-related factors that influence textile and apparel export performance. Multi-Fibre Arrangement (MFA) sets quantitative limits (quota) on the volume of textile and apparel products allowed into the U.S. and European markets (Jin, 2004). Quotas has been often the largest single expense in the total cost of ownership of imported textile and apparel products, usually accounting for 15 to 20% of the factory price of the product (Christerson, 1994). This large expense is believed to increase production costs, damage suppliers' competitiveness, raise the price of products exported to buyer countries, and then negatively influence export performance (Sito, 2003). Under the MFA, bilateral agreements established textile and apparel quotas without compensation, and as a result, a series of discriminatory bilateral quotas restricted exports from most developing countries (Trela & Whalley, 1990). First, quotas results in increasing numbers of low-wage locations exporting apparel to the U.S. market, and forcing firms in quota-restricted nations to upgrade to high-value market niches (Bonacich & Appelbaum, 2000). In addition, quotas forces garment firms from Hong Kong,

Korea, Taiwan, India, and Sri Lanka to establish plants in countries with less quota restrictions, such as South Africa (Kaplinsky & Morris, 2008). Therefore, quotas is the most effective trade barrier to protect the domestic textiles and apparel industry (Zhang & Hathcote, 2008).

The Multi-Fibre Arrangement (MFA) quota removal in 2005 triggered intense discussions about the influence of trade liberty. Research indicates in the current trade liberty era, the withdrawal of the MFA quotas has improved nations' competitiveness in the global trade for most large, labor surplus export countries, such as China and India (Abraham & Sasikumar, 2011; Zhang & Hathcote, 2008). Despite the removal of quota system represents an opportunity, it also brings a threat - the non-restriction trade activities perhaps will open the domestic market to competition which is no longer guaranteed by quotas (Kathuria & Bharadwaj, 1998). The competitiveness of these quota removal countries may also become a threat to other countries which lack similar comparative advantages (Kaplinsky & Morris, 2008; Zhang & Hathcote, 2008).

However, the elimination of MFA and non-MFA restrictions does not mean a "level playing field," since the global trade in textiles and apparel industry is still regulated by tariffs, another important trade barrier for the purpose of protecting domestic production (Kaplinsky & Morris, 2008; Trela & Whalley, 1990). As a tax on imported goods, tariffs will directly impact the final price of export products paid by buyers from imported countries (Dickerson, 1999; Ishido, 2004). Preferential reduction in foreign tariffs and market access will improve export performance since

they raise the price received by exporters (Edwards & Alves, 2006). Research indicates an increase of tariff rates results in a decrease of apparel import value in China, especially for the silk content apparel groups (shirts, jackets, and pants) (Zhang & Hathcote, 2008).

The membership and commitments to the World Trade Organization (WTO) determine trade reforms and export performance in developing countries (Santos-Paulino, 2002). According to Santos-Paulino (2002), trade liberalization reduces anti-export bias, and then improves export competitiveness and export performance (e.g., export growth). Research indicates restraining trade will decrease the efficiency of production to a more highly competitive, free trade environment, where only efficient production would be maintained (Rees, 1993). Tariff liberalization raises export performance by lowering the cost of imported intermediate and capital goods used in export production as well as reducing the incentive to produce for the domestic market (Edwards & Alves, 2006). Therefore, although the tariffs are a form of cost-subsidy to exporting firms (Kaplinsky & Morris, 2008), this extra payment limits buyers' choices, and the variety of textiles and apparel products available within the market, diminish the volume of apparel that would be exported, and negatively influence the export performance (Zhang & Hathcote, 2008). The following research question was developed:

Research Question 5: Does tariffs influence textile and apparel export performance (e.g., intensity, value, and growth) in the same way among Asian developing countries before and after the quota phase-out?

Summary

The purpose of the present study is to compare the textile and apparel export performance among 11 major developing Asian countries over the past twelve years (2000-2011). Export performance is measured by textiles and apparel export intensity, export values, and export growth for each country. The present study also identify the effects of industry, economic, and trade factors on export performance.

Global value chain framework (GVC) and comparative advantage theory provide the theoretical basis for the present study. Three trade-related factors are also examined, including exchange rates, quotas, and tariffs. Numerous studies have focused on the comparative analysis of influential factors on textiles and apparel export performance or the determinants of export performance. However, the literature is lacking consensus, due to country or data collection period selection. Therefore, the present study develops seven research questions to identify the determinants of the textile and apparel export performance in Asian developing countries. In the stage of empirical analysis, the dependent variables in the present study are export performance represented by export intensity, export values as well as export growth, while the independent variables are labor costs, number of employees, and exchange rates. For all the determinants, labor costs, number of production facilities, and number of employees are influential factors for manufacturing finished products. Transportation services and logistics are represented by lead time and logistic performance. Manufacturing of finished products, and transportation services and logistics are two components of the global value chain framework used in the

present study. Moreover, trade-related factors include exchange rates, quotas, and tariffs. The research framework proposed for the present study is presented in Figure 2.1.

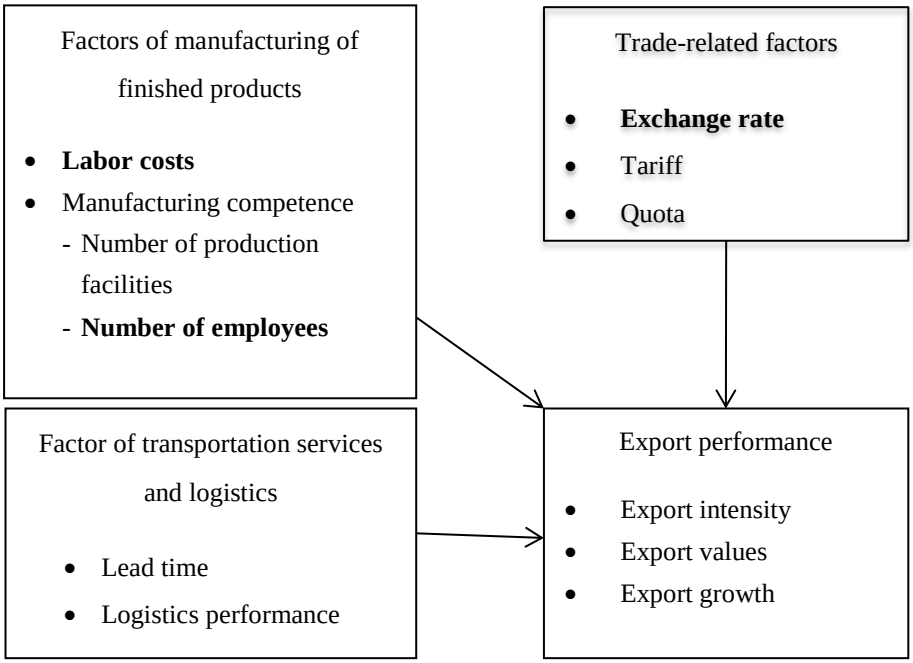

Figure 2.1 Determinants of Export Performance Framework for Asian Developing Country

CHAPTER 3: RESEARCH METHODS

This chapter outlines the research methods for the study. Research design, model testing, measures, data collection, and data analysis are discussed in the following sections.

Research Design

This study employed a two-phase quantitative method. The goal of the first phase is to compare the textiles and apparel export performance among 11 major developing Asian countries over a twelve-year period (2000-2011). A twelve-year interval allowed sufficient time lapse for new trade developments and the growth of new competitors in textiles and apparel export activities. The countries included in the analysis are: Bangladesh, China, Cambodia, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam. The country selection criteria included: Asian developing countries, and engaged in textile and apparel products export trade with other foreign countries (either developing or developed countries). The Department of Economic and Social Affairs of the United Nations Secretariat provided the criteria used to classify countries as least developed, including gross national income (GNI) per capita, Human Assets Index (HAI), Economic Vulnerability Index (EVI), and population size (Committee for Development Policy and United Nations Department of Economic and Social Affairs, 2008). Based on these criteria, the International Monetary Fund listed developed countries or economies in Asia, which were Japan, Hong Kong SAR, Israel, South Korea, New

Zealand, Singapore, and Taiwan Province of China (The International Monetary Fund, 2013). Therefore, the above developed countries (or areas) were excluded in this study based on selection criteria.

The World Trade Organization (WTO) provided continuous textile and apparel products export trade yearly data for selected countries from 2000 to 2011. The data sets for Cambodia and Vietnam were only in textile industry, since textile industry in these countries was underdeveloped with few textile exports. Export performance was measured by level of textiles and apparel export intensity, export values as well as export growth for each country. In this phase, this study descriptively analyzes textile and apparel export performance among selected Asian developing countries. This phase of the study was critical to understand the trends of textile and apparel export performance and the development of the textile and apparel industry in Asian developing countries.

The second phase of the study was to identify the effects of industry, economic, and trade factors on export performance and compare the differences of these effects among 11 Asian developing countries. The determinant factors included labor costs, number of employees, number of production facilities, lead time, logistic performance, exchange rates, tariff rates, and quotas covering the period from 2000 to 2011. First, this phase of the study empirically estimated the impact of labor costs, number of employees, and exchange rates on textile and apparel export performance depending upon data availability. The estimations for labor costs and number of employees used monthly data collected from Malaysia over the period from 2008 to

2011. Total exports were disaggregated into five major categories -- fiber spinning (weaving of textiles), manmade fiber spinning (weaving of textiles), dyeing, bleaching, printing and finishing of yarns and fabrics, knitted and crocheted fabrics and articles, and apparel. Data sets for labor costs and number of employees were consistent with export data sets. The impact of labor costs and number of employees were examined separately on exports intensity, export value, and export growth.

The estimations for exchange rates employed monthly data collected from China for the 2000-2011 period and from Malaysia and Sri Lanka for the 2006-2011 period. The data sets collected from China were used to examine the impact of exchange rates on export performance both before and after trade liberalization, while the data sets from Malaysia and Sri Lanka were only used to examine the impact after trade liberalization. Exports data sets included two categories – textiles and apparel. The impact of exchange rates was examined separately on exports intensity, export value, and export growth.

After empirically estimated the impact of labor costs, number of employees, and exchange rates on textiles and apparel export performance, the second stage was to descriptively compare the impact of labor costs, number of employees, number of production facilities, lead time, logistic performance, exchange rates, tariff rates, and quotas on textiles and apparel export intensity, export value, and export growth among 11 Asian developing countries. The second phase of this study was used to answer research questions and explore the determinants of textile and apparel export performance in Asian developing countries.

Research Model and Hypothesis Testing

The research framework described in Chapter two guided research model, measures, data collection, and data analysis section. In the first stage, this study descriptively analyzed the export performance for all the 11 Asian developing countries and the procedure is discussed in detail in the data analysis section. In the second stage, this study first empirically analyzed the impact of labor costs, number of employees, and exchange rate on textiles and apparel export performance, and then descriptively analyzed the impact of all the determinants on export performance. This section discussed the model using to test the impact of labor costs, number of employees, and exchange rate on textiles and apparel export performance.

Labor costs and number of employees

Labor costs and number of employees were two variables included in the research model to examine their impact on export performance. Time-series data were collected for each variable for every month from 2008 through 2011. Usually, ordinary regression analysis required several statistical assumptions and one crucial assumption is the errors should be independent of each other. However, with time series data, the ordinary regression residuals usually were correlated over time. If ordinary least-squares parameter estimation were used to analyze time-series data sets, it would cause “spurious regression phenomenon” because the usual t- and F- ratio test statistics do not converge to their limiting distribution as the sample size increases (Arize, 1995). The spurious regression phenomenon would lead to three possible mistakes: 1) statistical tests of the significance of the parameters and the confidence

limits for the predicted values were not correct; 2) the estimates of the regression coefficients are not as efficient as they would be if the autocorrelation were taken into account; and 3) since the ordinary regression residuals were not independent, they contained information that could not be used to improve the prediction of future values. Therefore, the following Vector Autoregressive (VAR) error model was used in this study to test H1a, H1b, H1c, H2a, H2b, and H2c. Variables used in the model are in natural logarithm as follows:

H1a-(1) and H2a-(1):

$$\ln TEI_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln LC_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln NE_{t-i} + \sum_{i=1}^{p} \beta_t^3 \ln TEI_{t-i} + \varepsilon_t$$

$$\varepsilon_t \sim IN(0, \sigma^2) \qquad (1\text{-}1)$$

H1a-(2) and H2a-(2):

$$\ln AEI_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln LC_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln NE_{t-i} + \sum_{i=1}^{p} \beta_t^3 \ln AEI_{t-i} + \varepsilon_t$$

$$\varepsilon_t \sim IN(0, \sigma^2) \qquad (1\text{-}2)$$

H1b-(1) and H2b-(1):

$$\ln TEV_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln LC_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln NE_{t-i} + \sum_{i=1}^{p} \beta_t^3 \ln TEV_{t-i} + \varepsilon_t$$

$$\varepsilon_t \sim IN(0, \sigma^2) \qquad (2\text{-}1)$$

H1b-(2) and H2b-(2):

$$\ln AEV_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln LC_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln NE_{t-i} + \sum_{i=1}^{p} \beta_t^3 \ln AEV_{t-i} + \varepsilon_t$$

$$\varepsilon_t \sim IN(0, \sigma^2) \qquad (2\text{-}2)$$

H1c-(1) and H2c-(1):

$$\ln TEG_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln LC_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln NE_{t-i} + \sum_{i=1}^{p} \beta_t^3 \ln TEG_{t-i} + \varepsilon_t$$

$$\varepsilon_t \sim IN(0, \sigma^2) \qquad (3\text{-}1)$$

H1c-(2) and H2c-(2):

$$\ln AEG_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln LC_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln NE_{t-i} + \sum_{i=1}^{p} \beta_t^3 \ln AEG_{t-i} + \varepsilon_t$$

$$\varepsilon_t \sim IN(0, \sigma^2) \qquad (3\text{-}2)$$

where subscripts *t* referred to the order of data sets. The variables were listed below:

TEI = Textile export intensity,

AEI = Apparel export intensity,

TEV = Textile export values,

AEV = Apparel export values,

TEG = Textile export growth,

AEG = Apparel export growth,

LC = Labor costs,

NE = Number of employees,

$\beta_0 =$ A constant term

$\varepsilon_i =$ A random error term.

Exchange rate

Exchange rate was an independent variable included in the following model to examine its impact on export performance. First, time-series data were collected from Malaysia and Sri Lanka for every month from 2006 through 2011 to compare the impact of exchange rate between countries. Similarly, the Vector Autoregressive (VAR) error model was used to test hypotheses 4a, 4b, and 4c. Next, time-series data were collected from China for the 2000-2011 period to compare the impact of exchange rate before and after the quota removal. Similarly, the Vector

Autoregressive (VAR) error model was used to explore the impact of exchange rate on export performance. Variables used in the model were in natural logarithm:

H4.1a and H4.2a:

$$\ln TEI_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln \mathrm{REER}_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln \mathrm{TEI}_{t-i} + \varepsilon_t \quad \varepsilon_t \sim IN(0, \sigma^2) \qquad (4\text{-}1)$$

H4.3a:

$$\ln AEI_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln \mathrm{REER}_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln \mathrm{AEI}_{t-i} + \varepsilon_t \quad \varepsilon_t \sim IN(0, \sigma^2) \qquad (4\text{-}2)$$

H4.1b and H4.2b:

$$\ln TEV_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln \mathrm{REER}_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln \mathrm{TEV}_{t-i} + \varepsilon_t \quad \varepsilon_t \sim IN(0, \sigma^2) \qquad (5\text{-}1)$$

H4.3b:

$$\ln AEV_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln \mathrm{REER}_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln \mathrm{AEV}_{t-i} + \varepsilon_t \quad \varepsilon_t \sim IN(0, \sigma^2) \qquad (5\text{-}2)$$

H4.1c and H4.2c:

$$\ln TEG_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln \mathrm{REER}_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln \mathrm{EG}_{t-i} + \varepsilon_t \quad \varepsilon_t \sim IN(0, \sigma^2) \qquad (6\text{-}1)$$

H4.3c:

$$\ln AEG_t = \beta_0 + \sum_{i=1}^{p} \beta_t^1 \ln \mathrm{REER}_{t-i} + \sum_{i=1}^{p} \beta_t^2 \ln \mathrm{EG}_{t-i} + \varepsilon_t \quad \varepsilon_t \sim IN(0, \sigma^2) \qquad (6\text{-}2)$$

where subscripts *t* referred to the order of data sets. The variables were listed below:

TEI = Textile export intensity,

AEI = Apparel export intensity,

TEV = Textile export values,

AEV = Apparel export values,

TEG = Textile export growth,

AEG = Apparel export growth,

REER = Real effective exchange rate,

$\beta_0 =$ A constant term

$\varepsilon_i =$ A random error term.

Measures

Measures for export performance and determinant factors are discussed as follows, in the order they appear in the research questions. They were selected from previously studies that explored the determinants of export performance.

Export performance

Export performance refers to the composite outcome of a firm or a country's international sales, which includes three sub-dimensions: 1) export intensity – the ratio of export sales to a country's total sales (Katsikeas et al., 2000), 2) export sales – the size of export earnings in dollar value for a country (Shoham, 1996), and 3) export growth – increase of exports over a certain time period (Aaby & Slater, 1989). In this case, Asian developing countries' textile and apparel export performance were represented by three indices: 1) textile and apparel export intensity ratios, 2) textile and apparel export values, and 3) textile and apparel growth rates. The second indice was directly represented by the customs textile and apparel export values in U.S. dollar for each country by industry coving the period from 2000 to 2011. Next, the annual export growth rates were calculated based on the textile and apparel export values for each country by industry from 2000 to 2011 (Eqs. (10)). In addition, The annual export intensity were calculated based on the textile and apparel export values and the total commodity export values for each country by industry from 2000 to 2011 (Eqs. (11)). The calculation equations were presented as follows:

$$G_{ik} = \frac{V_{ik} - V_{i(k-1)}}{V_{ik}} \quad \text{and} \tag{10}$$

$$I_{ik} = \frac{V_{ik}}{TV_{ik}} \quad , \tag{11}$$

where

$G_{ik} =$ Annual textile and apparel export growth,

$I_{ik} =$ Annual textile and apparel export intensity,

$V_{ik} =$ Annual textile and apparel export values, and

$TV_{ik} =$ Annual total commodity export values for each Asian developing country.

Yearly data sets for textile and apparel export performance were collected for all 11 Asian developing countries coving the period from 2000 to 2011 to analyze the export performance trends and descriptively compare the impact of determinants on export performance among Asian developing countries. In order to empirically analyze the impact of labor costs and manufacturing competence on export performance, five major categories included fiber spinning (weaving of textiles), manmade fiber spinning (weaving of textiles), dyeing, bleaching, printing and finishing of yarns and fabrics, knitted and crocheted fabrics and articles, and apparel were identified, and data sets were collected from Malaysia for the 2008-2011 period. In addition, monthly data sets for textile and apparel export performance obtained from Malaysia and Sri Lanka for the 2006-2011 period were used to empirically compare the impact of exchange rate on export performance among countries, while data sets from China the 2000-2011 period were used to compare the impact of exchange rates on export performance before and after the trade liberalization.

Labor costs

Asian developing countries acquire their comparative advantages in textile and apparel exports to a large extent rely on low cost labor. Labor-cost is defined as "labor costs per unit of sales and is measured as Salaries, wages, and other charges divided by total sales" (Abraham & Sasikumar, 2011). In this study, labor costs were first valued by annual minimum monthly wages and annual average monthly wages for each Asian developing country. Next, labor costs were valued by average monthly wages in textile and apparel manufacturing industry for selected Asian developing countries, including China, India, Malaysia, and Philippines, due to data availability. In addition, in order to empirically analyze the impact of labor costs on export performance, five major categories included fiber spinning (weaving of textiles), manmade fiber spinning (weaving of textiles), dyeing, bleaching, printing and finishing of yarns and fabrics, knitted and crocheted fabrics and articles, and apparel were identified and monthly data sets for the average monthly wages in related categories manufacturing industry were collected from Malaysia covering the period from 2008 to 2011.

Manufacturing competence

Manufacturing competence was represented by the number of facilities and the number of employees, which could reflect the labor conditions and production abilities in the textile and apparel manufacturing industry (Gereffi & Memedovic, 2003; Kaplinsky & Morris, 2008). First, the number of employees was valued by the annual average number of employees for each country in the textile and apparel

manufacturing industry. The number of facilities was valued by the annual average number of manufacturing factories for each country in textile and apparel manufacturing industry. In addition, in order to empirically analyze the impact of manufacturing competence on export performance, five major categories included fiber spinning (weaving of textiles), manmade fiber spinning (weaving of textiles), dyeing, bleaching, printing and finishing of yarns and fabrics, knitted and crocheted fabrics and articles, and apparel were identified and monthly data sets for average number of factories in related categories manufacturing industry were collected from Malaysia over the period 2008-2011.

Transportation services and logistics

Logistics is as "a time-based activity concerned with the profitable movement of information and materials into/through the organization and out to the customer" (Yeung, 2006)). World Bank gave two factors, lead time and logistics performance, to measure a country's logistics and transportation services quality (http://www.worldbank.org/lpi). Lead time was represented "the media time (the value for 50 percent of shipment) from shipment point to port of loading" in days (http://www.worldbank.org/lpi). Six indicators were used to measure logistics performance, including ability to track and trace consignments, competence and quality of logistics services, pricing, efficiency of customs clearance process, timeliness of services, and quality of trade and transport-related infrastructure. Transport operators and customer brokers were used to measure competence and quality of logistics services. Pricing was measured by ease of arranging competitively

priced shipments. Speed, simplicity, and predictability of formalities were used to measure the efficiency of customs clearance process. Timeliness of services was measured using frequency with which shipments reach consignee within scheduled or expected time. Ports, railroads, roads, and information technology were used to measure quality of trade and transport-related infrastructure. Respondents evaluated each indicator for logistic performance on a 5-point Likert scale from 1 (worst) to 5 (best). Specifically speaking, the scale for pricing was from 1 (very difficulty) to 5 (very easy) and for timeliness of services was from 1 (hardly ever) to 5 (very high). The scale for the rest of indicators was from 1 (very low) to 5 (very high). Scores are averaged across all respondents. Data sets for lead time and logistics performance were obtained from 2007 and 2010.

Exchange rates

Real effective exchange rate is the most widely used index to measure the impact of exchange rate on export performance, which captures international competitiveness of traded-goods production (e.g., Athukorala & Suphachalasai, 2004; Edwards & Alves, 2006; Kasman & Kasman, 2005). The real effective exchange rate was calculated by the weighted average of the exchange rate-adjusted relative prices (unit export values), where the trade weights are the ones used in creating foreign income and relative prices. First, monthly data sets for real effective exchange rates obtained from Malaysia and Sri Lanka for the 2006-2011 period were used to empirically compare the impact of exchange rate on export performance among countries, while data sets from China over the period 2000 to 2011 were used to

compare the impact of exchange rate on export performance before and after the trade liberalization. Next, annual real effective exchange rates, obtained from China, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, and Thailand, were used to descriptively analyze the impact of exchange rate on export performance. Considering three countries lacked data of real effective exchange rates, official exchange rates, which could reflect the developing trend in exchange rate, were also used to compare the impact of exchange rate on export performance among Asian developing countries.

Tariffs

Tariffs, an important trade barrier to protect domestic production, regulate the global trade in textile and apparel industry (Kaplinsky & Morris, 2008). In this study, tariffs were firstly represented by simple mean MFN applied tariff rates from 2000-2011, which is the unweighted average of effectively applied rates for all products subject to tariffs calculated for all traded goods. Next, simple mean MFN applied tariff rates of the textile and apparel export commodities were obtained from 2008-2011 to further analyze the impact of tariffs on textile and apparel export performance. Data were classified using the Harmonized System (HS) of trade at the six-digit level. Tariff line data were matched to Standard International Trade Classification (SITC) revision 3 codes to define commodity groups. Effectively applied tariff rates at the six-digit product level are averaged for products in each commodity group and then averaged by textile and apparel commodity group.

Quotas

Quotas are another important trade barrier to protect domestic industry. Multi-Fibre Arrangement (MFA) sets quantitative limits (quota) on the volume of textile and apparel products allowed into the U.S. and European markets (Jin, 2004). However, the Multi-Fibre Arrangement (MFA) quota was removed in 2005, the year that was considered as the beginning of trade liberty. In the present study, a binary dummy variables was introduced to capture the possible trade effects of the quota system. The binary dummy variables took a value of 1 for the period of trade liberty (2006-2011) and 0 otherwise (2000-2005).

Data Collection

Secondary data sources were analyzed to develop a comprehensive understanding of textile and apparel export performance among major developing Asian countries and then explore the determinants of their export performance. The data sets for determinants analysis included labor costs, number of employees, number of production facilities, lead time, logistic performance, exchange rates, tariff rates, and quotas.

Export performance

In the first stage, cross-country panel data of annual textile and apparel export values and annual total export values for 11 major Asian developing countries were obtained from the World Trade Organization (WTO) website, where provided the most complete data sets for the 2000-2011 period categorized by country and industry. The selection criteria included: 1) these countries should be Asian developing

countries; and 2) these countries should export textile or apparel commodities continuously during the period 2000-2011. Among 11 Asian developing countries, Cambodia and Vietnam only exported apparel commodities during the research period. In the second stage, monthly export performance data sets for Malaysia were collected from Department of Statistics, Malaysia over the period 2006 to 2011, for Sri Lanka were from Central Bank of Sri Lanka for the 2006-2011 period, and for China were form Ministry of Commerce of the People's Republic of China covering the period from 2000 to 2011.

Labor costs

Yearly data sets for labor costs included minimum monthly wages, average monthly wages, and monthly wages in textile and apparel manufacturing industry in U.S. dollar. Annual minimum monthly wages data sets for all countries were collected from World Bank, Doing Business (DB) database over the period 2007 to 2011, depending on data availability. Malaysia lacked annual minimum monthly wages data since it introduced minimum wage policy for the first time in 2012. Annual average monthly wages data sets for all countries were obtained from International Labour Organization (ILO) database for the 2000-2011 period. The missing data sets were summarized as follows: Bangladesh, China, India, and Indonesia for 2011; Cambodia for 2000-2003, 2005-2006, 2008, and 2010-2011; Pakistan for 2001, 2003, and 2005; Philippines and Thailand for 2000; Sri Lanka for 2009-2011; and Vietnam for 2000-2001, 2003, 2005, 2007, and 2011. Annual average monthly wages in textile and apparel manufacturing industry were obtained from China, India, Malaysia, and

the Philippines, due to data availability. The data sources and period for each selected countries were summarized as follows: China - National Bureau of Statistics of China database - 2001 to 2011; India - Ministry of Statistics and Programme Implementation - 2002 to 2010; Malaysia - Department of Statistics, Malaysia – 2005 to 2011; the Philippines - Republic of The Philippines National Statistics Office – 2001, 2003, 2008, and 2010. Next, monthly data sets for Malaysia average monthly wages in textile and apparel manufacturing industry were collected from Department of Statistics, Malaysia over the period 2008 to 2011. The selection criteria were the data sets for empirical analysis should be monthly continuous for at least four years and from Asian developing countries.

Manufacturing competence

First, yearly data sets for number of production facilities and number of employees in textile and apparel manufacturing industry were obtained from Cambodia, China, India, Indonesia, Malaysia, and the Philippines. Data were missing for Bangladesh, Pakistan, Sri Lanka, Thailand, and Vietnam. Data source and period were summarized as follows: Cambodia –International Labor Organization (ILO) database – 2000, and 2002 to 2008; China – National Bureau of Statistics of China database – 2000 to 2011; India - Ministry of Statistics and Programme Implementation – 2005 to 2009; Indonesia - Yearbook of Indonesia – 2001 to 2009; Malaysia – 2000, 2003, and 2005 to 2010; the Philippines - Republic of The Philippines National Statistics Office – 2001, 2003, 2008, and 2010. Next, monthly data sets for Malaysia number of employees in textile and apparel manufacturing

industry were collected from Department of Statistics, Malaysia over the period 2008 to 2011. The selection criteria were the data sets for empirical analysis should be monthly continuous for at least four years and from Asian developing countries.

Transportation services and logistics

Data sets for lead time and logistics performance were obtained from World Bank, World Development Indicators (WDI) database. World Bank conducted Logistics Performance Index surveys in 2007 and 2010. Participants included academic and international institutions, private companies, and individuals engaged in international logistics. Respondents evaluated eight markets which were chosen based on the most important export and import markets of the respondent's country, random selection, and, for landlocked countries, neighboring countries that connect them with international markets. Data sets were collected for all the 11 Asian developing countries from the results of the Logistics Performance Index surveys for the year of 2007 and 2010.

Exchange rate

First, monthly real effective exchange rate data sets for China, India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand were obtained from World Bank, Global Economic Monitor (GEM) database over the period 2000 to 2011. Data sets for Sri Lanka were collected from Central Bank of Sri Lanka for the 2005-2011 period. Next, official exchange rates were obtained for all the countries from World Bank, Global Economic Monitor (GEM) database over the period 2000 to 2011.

Tariffs and quotas

The average MFN applied tariff rates for all the countries were obtained from World Bank, Temporary Trade Barriers Database (TTBD) covering the period from 2000 to 2011. Data sets were missing for certain years, which were summarized as follows: Bangladesh – 2009 to 2011; Cambodia – 2006, and 2009 to 2011; India – 2003, 2010 to 2011; Indonesia – 2008; Malaysia – 2004, 2010-2011; Pakistan – 2010 to 2011; the Philippines – 2011; Sri Lanka – 2008; Thailand – 2002, 2004, 2010 to 2011; and Vietnam – 2009 and 2011. In addition, the average MFN applied tariff rates of the textile and apparel export commodities were obtained from the World Trade Organization, Integrated Database (IDB) for Bangladesh, Thailand, and Vietnam from 2009 to 2011, for China from 2008 to 2010, and for the rest countries from 2010 to 2011. Quotas were represented by a binary dummy variable which have already been discussed in the section of measures.

Data Analysis

The present study used a two-phase quantitative method. Data were analyzed using SPSS 17.0 and SAS 9.3. First, descriptive statistics were utilized in both phases to descriptively analyze the export performance and the determinants of export performance among Asian developing countries. Next, auto-regression was employed to explore the impact of labor costs, number of employees, and exchange rate on textile and apparel export performance.

During the first phase, textile and apparel export performance, represented by export intensity, export values, and export growth, was descriptively compared using

SPSS 17.0. Descriptive statistics items like mean, standard deviation, maximum, and minimum were reported in chapter four. Line Charts were also used to analyze the trends in export performance among all 11 countries. The analyses helped provide more clear and precise results for the similarities and differences in textile and apparel export performance among Asian developing countries. Results for these analyses are presented and discussed in chapter four.

The second phase of analysis included two steps. First, the Vector Auto-regression error model was estimated using the Statistic Analysis System VARMAX procedure to determine the impact of labor costs, number of employees, and exchange rate on export performance. The unit root test was used to diagnose stationary. Granger Causality test was used to diagnose the Granger-causality between the predictor and response variables. Exact maximum likelihood estimation method was used to estimate the autoregressive error model and obtain the parameter estimates for the independent variables. In addition, descriptive analysis was conducted to analyze the impact of all influential factors on export performance.

Descriptive statistics are reported in chapter four, including mean, standard deviation, maximum, and minimum. Line Charts were also used to descriptively compare the impact of each determinant on export performance among Asian developing countries. The analysis helped provide more clear and precise results for the similarities and differences in the impact of determinant factors on textile and apparel export performance among Asian developing countries. Results for these analyses are presented and discussed in chapter four.

CHAPTER 4: RESULTS AND DISCUSSION

In this chapter, descriptive analyses for export performance, including export intensity, export values and export growth, are presented. Also, this chapter reports the results of hypothesis testing. This chapter further descriptively compares the impact of determinants on textile and apparel export performance.

Export Performance

In this section, export performance, including export intensity, export value, and export growth are descriptively analyzed by textile and apparel industry among Asian developing countries.

Export intensity

Export intensity, defined as the ratio of export sales to a country's total sales (Katsikeas et al., 2000), shows the contributions of commodity exports to a country's total exports. The following sections descriptively analyze the export intensity among Asian developing countries by textile and apparel industries from 2000 to 2011. The results report means and standard deviations of export intensity for 9 countries yearly and those for 1 country over a 12 year period. In addition, the maximum and minimum export intensity values for a country during the period 2000-2011 are also reported.

Textiles export intensity. Table 4.1 reports the textile export intensities for these countries from 2000 to 2011, yearly means and standard deviations of textile export intensity for these countries from 2000 to 2011, and means, standard deviations,

minimum as well as maximum of textile export intensity for each country during the period 2000-2011. *Figure 4.1.1* presents the trends in textile export intensity for 9 Asian developing countries. Since Pakistan had phenomenally larger values than all the other countries, *figure 4.1.2* presents the trends in textile export intensity for the other 8 Asian developing countries, excluding Pakistan, for a clearer vision.

Among 9 Asian developing countries which export textile commodities, the textile export intensities for Pakistan, India, and Bangladesh were higher than the means of the other countries during the period 2000-2011. The textile exports for Pakistan occupied one third to a half of its total exports, which indicated textile export industry was a pillar industry in Pakistan. In addition, its textile intensities were much higher than the other countries, which indicated the roles of textile exports played in the other countries were not as important as those in Pakistan. Among countries with textile intensities lower than the means, Malaysia and the Philippines had quite small textile intensities (less than 1% for most of years), which showed textile exports contributed little to Malaysia and the Philippines' total exports.

The annual mean of 9 countries' textile export intensity values revealed a decreasing trend from 2000 to 2011 with decreasing standard deviation values. This indicated the textile exports have become less important to total exports during the period 2000-2011 for Asian developing countries. Similar results could be found from the minimum and maximum textile export intensity for each country. The 9 Asian developing countries had minimum textile export values at the beginning of the research period (2000-2002), and had maximum textile export values by the end of

the research period (2008-2011). However, although all the Asian developing countries presented decreasing trend in textile exports intensity, the decreasing slopes for their textile exports intensity were obviously different from each other. Pakistan and India had quite sharp decreasing slopes during the period 2000-2011, while other countries have quite flat decreasing slopes. We concluded the more textile exports contributed to a country's total exports, the larger probability that a country had a decreasing trend in textile export intensity.

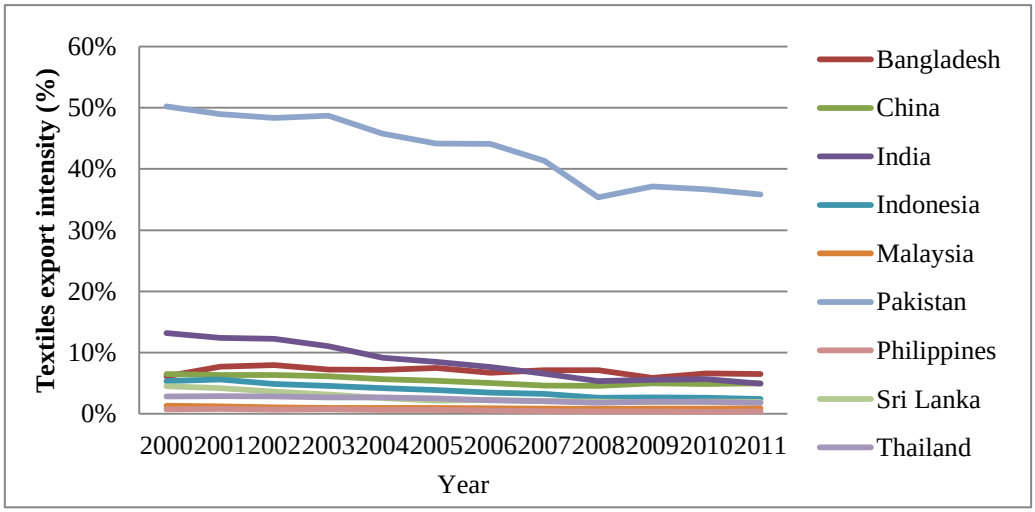

Figure 4.1.1. Textile export intensity for 9 Asian developing countries (%), 2000-2011

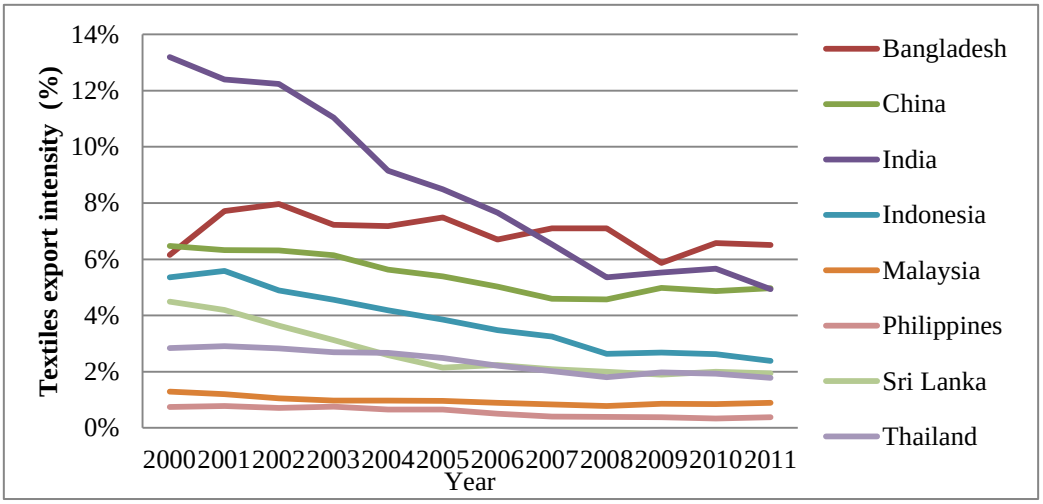

Figure 4.1.2. Textile export intensity for Asian developing countries (Without Pakistan, %), 2000-2011

Table 4.1

Textile export intensity for 9 Asian developing countries (%), 2000-2011

Year	Bangladesh	China	India	Indonesia	Malaysia	Pakistan	Philippines	Sri Lanka	Thailand	Mean	SD
2000	6.15	6.47 [a]	13.20 [* a]	5.36	1.29 [a]	50.20 [* a]	0.75	4.49 [a]	2.84	7.54	13.30
2001	7.71 [*]	6.32	12.40 [*]	5.58 [a]	1.20	48.98 [*]	0.78 [a]	4.19	2.91 [a]	7.48	12.95
2002	7.97 [* a]	6.32	12.24 [*]	4.89	1.06	48.32 [*]	0.71	3.64	2.83	7.27	12.81
2003	7.22 [*]	6.14	11.04 [*]	4.56	0.97	48.71 [*]	0.75	3.12	2.69	7.00	12.92
2004	7.18 [*]	5.63	9.14 [*]	4.18	0.97	45.78 [*]	0.65	2.59	2.66	6.47	12.13
2005	7.49 [*]	5.39	8.49 [*]	3.85	0.96	44.16 [*]	0.65	2.14	2.49	6.17	11.72
2006	6.70 [*]	5.02	7.66 [*]	3.48	0.89	44.11 [*]	0.50	2.24	2.22	5.94	11.72
2007	7.10 [*]	4.59	6.53 [*]	3.24	0.83	41.33 [*]	0.41	2.09	2.02	5.56	10.99
2008	7.09 [*]	4.57 [i]	5.36 [*]	2.63	0.78 [i]	35.36 [* i]	0.40	1.99	1.81	4.91	9.40
2009	5.87 [* i]	4.98	5.52 [*]	2.68	0.86	37.15 [*]	0.38	1.89 [i]	1.97	5.01	9.86
2010	6.58 [*]	4.87	5.67 [*]	2.62	0.84	36.66 [*]	0.33 [i]	1.99	1.93	5.03	9.73
2011	6.51 [*]	4.97 [*]	4.93 [* i]	2.39 [i]	0.90	35.84 [*]	0.38	1.93	1.78 [i]	4.87	9.52
Mean	6.96	5.44	8.52	3.79	0.96	43.05	0.56	2.69	2.35		
SD	0.62	0.71	3.05	1.13	0.15	5.61	0.17	0.94	0.43		
Min	5.87 (2009)	4.57 (2008)	4.93 (2011)	2.39 (2011)	0.78 (2008)	35.36 (2008)	0.33 (2010)	1.89 (2009)	1.78 (2011)		
Max	7.97 (2002)	6.47 (2000)	13.20 (2000)	5.58 (2001)	1.29 (2000)	50.20 (2000)	0.78 (2001)	4.49 (2000)	2.91 (2001)		

Note: * Textile export intensity is higher than the average value of 9 Asian developing countries for relevant year. [i] Minimum textile export intensity for a country from 2000 to 2011. [a]Maximum textile export intensity for a country from 2000 to 2011.

Apparel export intensity. Table 4.2 reports the apparel export intensities for all 11 countries from 2000 to 2011, yearly means and standard deviations of apparel export intensity for all 11 countries from 2000 to 2011, and means, standard deviations, minimum values as well as maximum values of apparel export intensity for each country during the period 2000-2011. *Figure 4.2.1* presents the trends in apparel export intensity for all 11 Asian developing countries. Since Bangladesh, Cambodia, and Sri Lanka had phenomenal larger values than other countries, *figure 4.2.2* is included to provide a clearer vision.

Among 11 Asian developing countries which exported apparel commodities, the apparel export intensities for Bangladesh, Cambodia, Pakistan, Sri Lanka, and Vietnam were higher than the means of 11 countries during the period 2000-2011(Vietnam's were from 2002-2011). The apparel exports for Bangladesh, Cambodia, and Sri Lanka occupied quite large proportions of their total exports, which were three fifths to four fifths, three fifths to a quarter, and two fifths to a half, respectively. Therefore, apparel export industry can be considered as a pillar industry in these countries. In addition, the apparel intensities for these countries were much higher than the other countries, which indicated the roles of apparel exports played in these countries were more important than those in the other countries. Among countries with apparel intensities lower than the means, the apparel intensity values for Malaysia were much smaller than the other countries, which showed textile exports contributed little to Malaysia's total exports.

Similar to textile export intensity, the annual mean of 11 countries' apparel export intensity values revealed a decreasing trend from 2000 to 2011. However, the standard deviation values were stable for the same period. These results indicated the Asian developing countries might have different trends in apparel exports intensity during the period 2000-2011. Specifically, China, India, Indonesia, Pakistan, the Philippines, Sri Lanka, and Thailand displayed decreasing trends in apparel export intensity for the 2000-2011 period, which meant apparel exports have become less important to total exports for these countries. Bangladesh had an increasing trend in apparel export intensity during the same period and by the end of this period, its apparel exports occupied more than 80% of its total exports. Combined its textile export intensity, Bangladesh's textile and apparel exports almost occupied 90% of its total exports, especially after the economic crisis happened in 2009. In other words, Bangladesh's textile and apparel export performance immensely determined its total export performance. Malaysia had quite a stable apparel export intensity trend during the research period. Cambodia also had a stable trend before 2008, however, its apparel export intensity showed a decreasing trend, which might be influenced by economic crisis. Vietnam's apparel export intensity value reached a peak in 2003, and then declined to a stable level of 14 percent. Similar results could be found from the minimum and maximum apparel export intensity for each country. In addition, among the countries with decreasing trends in apparel export intensity, China, India, Pakistan, and Sri Lanka had sharper decreasing slopes than Indonesia, the Philippines, and Thailand, during the period 2000-2011. Similar to textile export intensity, we inferred

the more apparel exports contributed to a country's total exports, the larger probability a country had a decreasing trend in apparel export intensity.

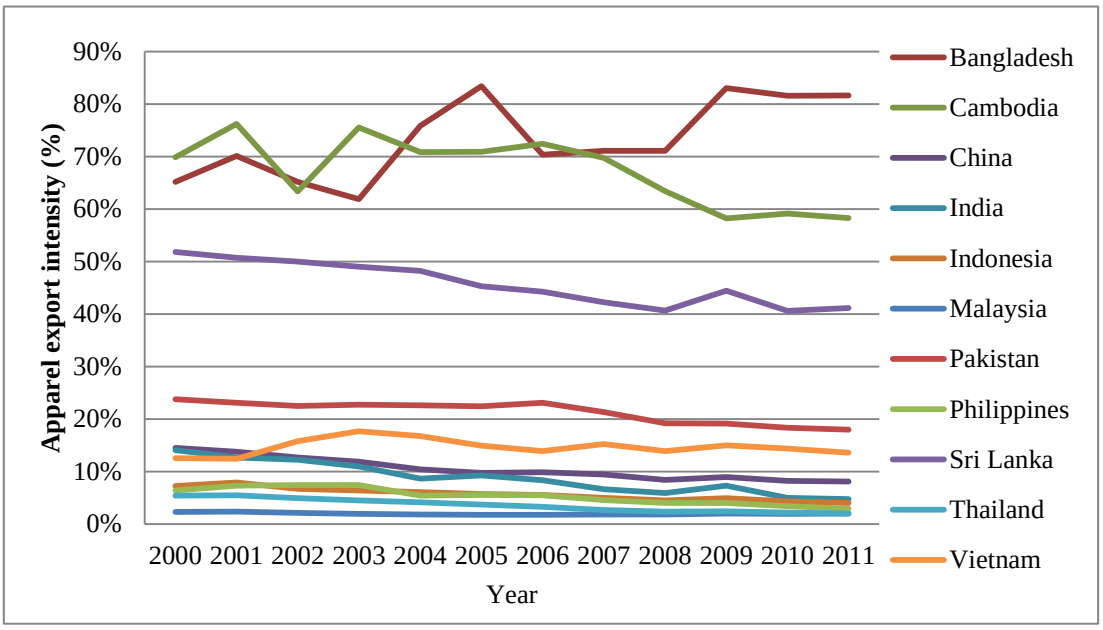

Figure 4.2.1. Apparel export intensity for 11 Asian developing countries (%), 2000-2011.

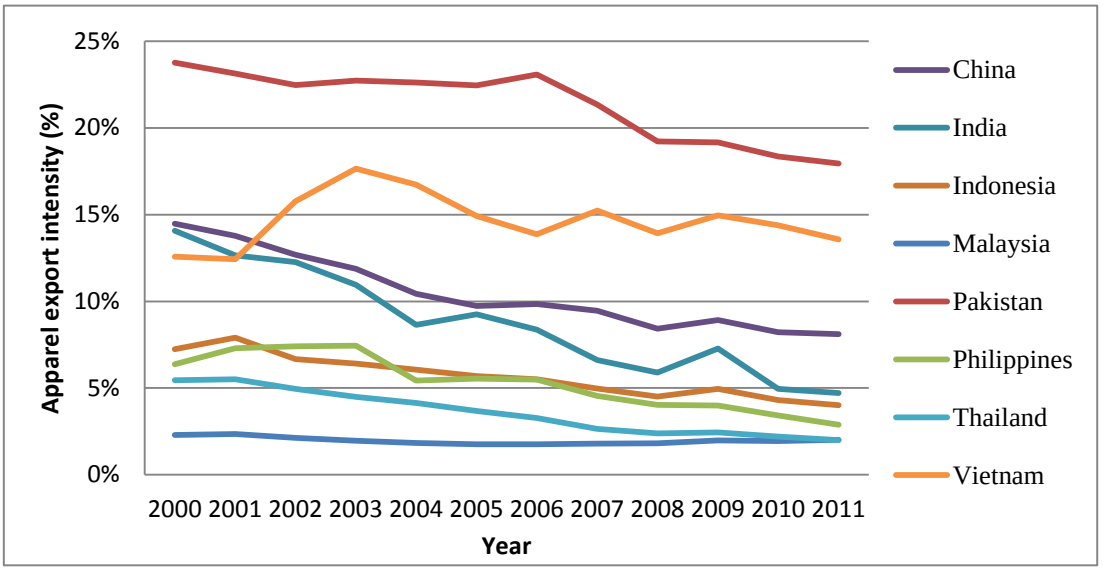

Figure 4.2.2. Apparel export intensity for 8 Asian developing countries (without Bangladesh, Cambodia, & Sri Lanka, %), 2000-2011.

Table 4.2

Apparel export intensity for 11 Asian developing countries (%), 2000-2011

Year	Bangladesh	Cambodia	China	India	Indonesia	Malaysia	Pakistan	Philippines	Sri Lanka	Thailand	Vietnam	Mean	SD
2000	65.14[*]	69.83[*]	14.47[a]	14.07[a]	7.24	2.30	23.75[*a]	6.38	51.79[*a]	5.44	12.57	14.55	21.78
2001	70.08[*]	76.22[*a]	13.77	12.65	7.90[a]	2.35[a]	23.12[*]	7.30	50.69[*]	5.50[a]	12.42[i]	15.00	23.13
2002	65.14[*]	63.34[*]	12.69	12.26	6.67	2.13	22.48[*]	7.42	50.01[*]	4.95	15.76[*]	14.18	20.78
2003	61.89[*i]	75.54[*]	11.88	10.95	6.40	1.97	22.72[*]	7.44[a]	48.99[*]	4.50	17.64[*a]	14.60	22.02
2004	75.81[*]	70.82[*]	10.43	8.65	6.06	1.84	22.62[*]	5.44	48.22[*]	4.14	16.73[*]	14.58	23.16
2005	83.37[*a]	70.92[*]	9.73	9.25	5.70	1.76[i]	22.45[*]	5.54	45.28[*]	3.68	14.91[*]	14.56	24.08
2006	70.35[*]	72.44[*]	9.84	8.37	5.51	1.77	23.08[*]	5.49	44.23[*]	3.28	13.87[*]	13.77	22.40
2007	71.10[*]	69.74[*]	9.46	6.61	4.97	1.79	21.34[*]	4.55	42.27[*]	2.65	15.24[*]	13.38	22.05
2008	71.05[*]	63.40[*]	8.42	5.90	4.50	1.82	19.22[*]	4.03	40.67[*]	2.39	13.92[*]	12.58	21.11
2009	83.04[*]	58.18[*i]	8.93	7.28	4.94	1.99	19.16[*]	3.99	44.46[*]	2.44	14.96[*]	13.34	22.60
2010	81.59[*]	59.13[*]	8.23	4.96	4.31	1.95	18.36[*]	3.42	40.59[*i]	2.20	14.38[*]	12.79	22.26
2011	81.60[*]	58.29[*]	8.10[i]	4.72[i]	4.01[i]	2.01	17.95[*i]	2.89[i]	41.14[*]	1.99[i]	13.57[*]	12.59	22.23
Mean	73.35	67.32	10.50	8.81	5.68	1.97	21.35	5.32	45.69	3.60	14.67		
SD	7.58	6.56	2.20	3.11	1.21	0.20	2.08	1.58	4.11	1.29	1.56		
Min	61.89 (2003)	58.18 (2009)	8.10 (2011)	4.72 (2011)	4.01 (2011)	1.76 (2005)	17.95 (2011)	2.89 (2011)	40.59 (2010)	1.99 (2011)	12.42 (2001)		
Max	83.37 (2005)	76.22 (2001)	14.47 (2000)	14.07 (2000)	7.90 (2001)	2.35 (2001)	23.75 (2000)	7.44 (2003)	51.79 (2000)	5.50 (2001)	17.64 (2003)		

Note: * Apparel export intensity is higher than the average value of eleven Asian developing countries for relevant year. [i] Minimum apparel export intensity for a country from 2000 to 2011. [a] Maximum apparel export intensity for a country from 2000 to 2011.

Export values

Export value, defined as the size of export earnings in dollar value for a country (Shoham, 1996), is an indicator to directly measure a country's export performance. The following sections descriptively analyze the export values among Asian developing countries by textile and apparel industries from 2000 to 2011. Annual means and standard deviation of export values for all 9 countries and those for one country across the research period are reported. In addition, the maximum and minimum export values for a country during the period 2000-2011 are also reported.

Textile export values. Table 4.3 reports the textile export values for all 9 countries from 2000 to 2011, annual means and standard deviations of textile export values for all 9 countries from 2000 to 2011, and means, standard deviations, minimum values as well as maximum values of textile export values for each country during the period 2000-2011. *Figure 4.3.1* presents the trends in textile exports for all 9 Asian developing countries. Since China had phenomenal larger values than the other countries, *figure 4.3.2* is included to present the trends for the other countries more clearly.

Among these 9 Asian developing countries which exported textile commodities, the textile export values for China, India (except for the year of 2009), and Pakistan (from 2000 to 2004) were higher than the means of all 9 countries during the period 2000-2011. China's textile exports were much higher than the other countries, which occupied from 47.5% (2000) to 71.8% (2011) of 9 countries' total

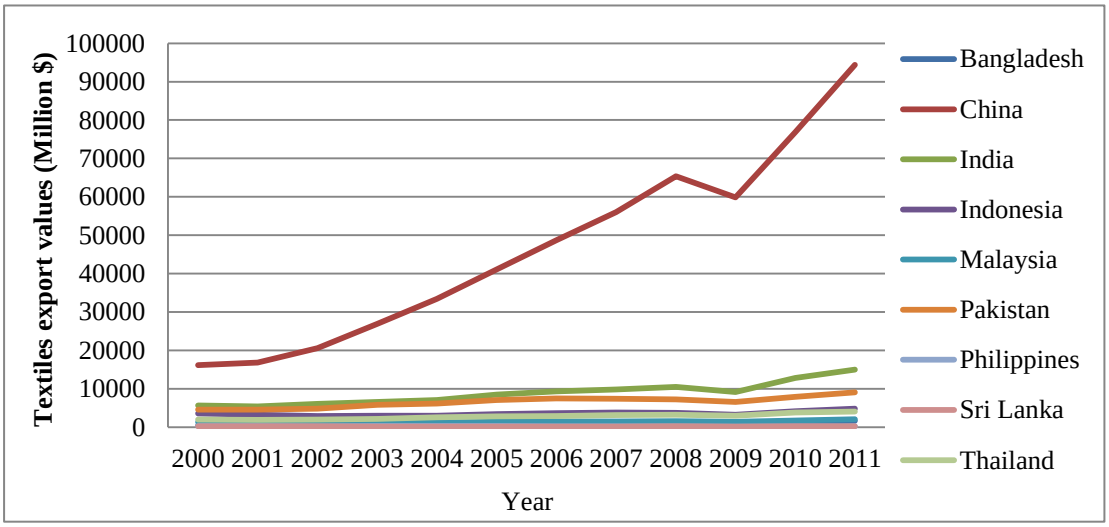

Figure 4.3.1. Textile export values for 9 Asian developing countries (Million dollars), 2000-2011.

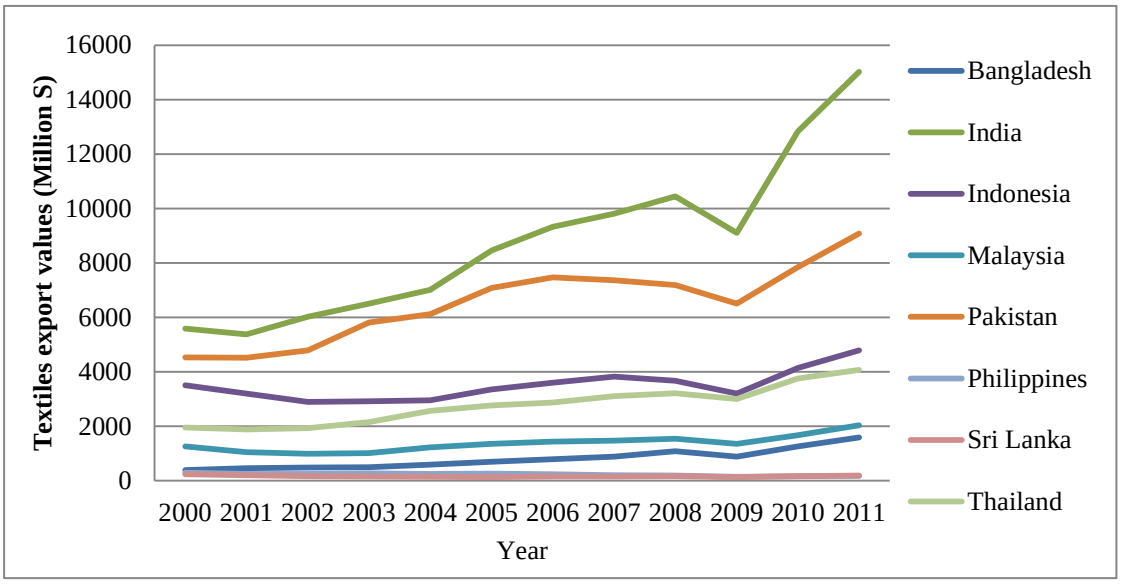

Figure 4.3.2. Textile export values for 9 Asian developing countries (without China, Million dollars), 2000-2011.

textile exports value. The differences in textile export values among China and the other Asian developing countries have become larger during the period 2000-2011. The textile export value for India in 2009 was lower not only than the mean of all 9 countries' textile export values, but also than those in previous (2008) and later years (2010). Except for India, the textile exports for the other countries in 2009 were also lower than previous (2008) and later (2010) year. We inferred that the plunge in

textile exports throughout Asian developing countries was influenced by economic crisis happened in 2009. In other words, the economic crisis can threaten or even bring a negative impact on textile exports in Asian developing countries.

The annual mean of all countries' textile export values revealed a growth trend from 2000 to 2011, with an increase in standard deviation values. The mean in 2011 was close to 5 times as much as that in 2000, while the standard deviation values in 2011 was close to 6 times as much as that in 2000. These results indicated the textile exports throughout all Asian developing countries displayed different trends during the period 2000-2011. Generally speaking, Bangladesh, China, India, Indonesia, Malaysia, Pakistan, and Thailand displayed growth trends during the research period, but the shapes of curves showed in the figure 4.3.1 and figure 4.3.2 were different. In figure 4.3.1, the textile export values for China were significantly higher than the other countries with a smooth growth trend except 2009. According to the previous research (Abraham & Sasikumar, 2011; Zhang & Hathcote, 2008), the removal of the quota system could improve China's comparative advantages, however, the textile export value for China did not shoot up in 2005 or later. We inferred the removal of the quota system did not directly influence on China's textile exports. India was the second largest textile export country in Asia. The textile export values for India shot up a little in 2005 and plunged in 2009, which might be influenced by the removal of the quota system (2005) and the economic crisis happened in 2009. The textile exports trends for Pakistan, Thailand, and Bangladesh were stable at the beginning of

the research period (2000-2002) and have increase since 2003. Like India, Pakistan also had a spike in textile export values in 2005, which indicated the removal of the quota system improved Pakistan's comparative advantages. Indonesia and Malaysia displayed similar trends in textile exports during the period 2000-2011. Their textile export values decreased at the beginning of the research period (2000-2002) and then increased until the economic crisis happened in 2009. After the economic crisis, their textile export values started to grow again. The trends for the Philippines and Sri Lanka were complicated and fluctuated. Philippines's textile export values decreased at the beginning of the research period (2000-2002), and then fluctuated in a small range from 2003 to 2005. After removal of the quota system in 2005, the textile export values decreased quickly, which indicated the quota system could protect the textile exports in the Philippine and removal of the quota system damaged its comparative advantages. Sri Lanka displayed a decreasing trend in textile exports before 2005, however, after removal of the quota system in 2005, the textile exports started to increase regardless the plunge in 2009. We inferred the removal of the quota system in 2005 improved the textile exports in Sri Lanka.

Table 4.3

Textile export values for 9 Asian developing countries (Million dollars), 2000-2011

Year	Bangladesh	China	India	Indonesia	Malaysia	Pakistan	Philippines	Sri Lanka	Thailand	Mean	SD
2000	392.98[i]	16134.63[*i]	5593.17[*]	3505.04	1269.58	4532.08[*]	296.79[a]	244.00[a]	1957.78	3769.56	5028.611
2001	469.00	16826.00[*]	5375.00[*i]	3202.00	1056.00	4525.00[*i]	255.00	202.00	1888.00[i]	3755.33	5253.761
2002	490.00	20563.00[*]	6028.00[*]	2896.00[i]	994.00[i]	4790.00[*]	249.00	171.00	1929.00	4234.44	6463.072
2003	505.00	26901.00[*]	6510.00[*]	2923.00	1018.00	5811.00[*]	273.00	160.11	2162.00	5140.35	8489.795
2004	596.53	33427.91[*]	7009.37[*]	2960.76	1227.43	6124.59[*]	257.38	149.22	2563.29	6035.16	10568.5
2005	696.31	41050.17[*]	8462.14[*]	3352.91	1355.60	7087.47	268.69	135.91[i]	2764.31	7241.50	13020.65
2006	790.23	48683.03[*]	9329.73[*]	3605.14	1437.47	7468.58	238.37	154.00	2877.13	8287.07	15487.2
2007	884.15	56025.00[*]	9811.62[*]	3829.09	1469.72	7371.35	204.81	161.54	3113.93	9207.91	17866.53
2008	1090.34	65360.76[*]	10446.52[*]	3674.53	1548.61	7186.25	194.41	168.60	3211.36	10320.15	20921.64
2009	885.70	59823.50[*]	9110.50	3208.24	1358.58	6509.65	147.39[i]	139.11	3002.49	9353.91	19166.2
2010	1262.91	76871.50[*]	12833.36[*]	4144.27	1671.49	7847.68	169.52	171.60	3761.47	12081.53	24641.45
2011	1589.83[a]	94410.73[*a]	15016.01[*a]	4791.14[a]	2036.30[a]	9082.12[a]	183.71	197.99	4071.65[a]	14597.72	30310.46
Mean	804.41	46339.77	8793.79	3507.68	1370.23	6527.98	228.17	171.26	2775.20		
SD	362.71856	25056.88786	2973.836059	557.2126	297.8524	1423.849	46.80466	30.51639	714.3288		
Min	392.98 (2000)	16134.63 (2000)	5375.00 (2001)	2896.00 (2002)	994.00 (2002)	4525.00 (2001)	147.39 (2009)	135.91 (2005)	1888.00 (2001)		
Max	1589.83 (2011)	94410.73 (2011)	15016.01 (2011)	4791.14 (2011)	2036.30 (2011)	9082.12 (2011)	296.79 (2000)	244.00 (2000)	4071.65 (2011)		

Note: *Textile export value is higher than the average value of 9 Asian developing countries for relevant year. [i] Minimum textiles export value for a country from 2000 to 2011. [a] Maximum textile export value for a country from 2000 to 2011.

Apparel export values. Table 4.4 reports the apparel export values for all the countries from 2000 to 2011, annual means and standard deviations of apparel exports for all 11 countries from 2000 to 2011, and means, standard deviations, minimum values as well as maximum values of apparel exports for each country during the period 2000-2011. *Figure 4.4.1* presents the trends in apparel exports for all 11 Asian developing countries. Since China had phenomenal larger values than the other countries, *figure 4.4.2* is included to present the trends more clearly.

Among 11 Asian developing countries which exported apparel commodities, the apparel export values for China were higher than the means of all 11 countries during the period 2000-2011. China's apparel exports occupied from 53.7% (2000) to 69.2% (2007) of 11 countries' total apparel exports. The differences in apparel export values among China and the other Asian developing countries displayed a similar trend in textiles exports during the research period. For the countries with apparel export values lower than the means of all 11 countries, the differences in apparel export values also have become larger for the 2000-2011 period. In 2009, Bangladesh and India were the only countries with higher apparel export value than those in the previous year, but the apparel exports for India decreased in 2010. We inferred economic crisis had little negative impact on apparel exports in Bangladesh and had lagging negative impact on apparel exports in India. In this case, the impact of economic crisis on apparel exports was complicated and varied: it could be a disaster for some countries, and at the same time, an opportunity for others.

Similar to the means of textile export values, the annual means of all 11 countries' apparel export values also revealed a growth trend from 2000 to 2011 with increasing standard deviation values. The mean in 2011 was 3 times more than that in 2000, while the standard deviation values in 2011 was 4 times more than that in 2000. These results indicated the apparel exports throughout all 11 Asian developing countries displayed different trends during the period 2000-2011. In general, most of Asian developing countries displayed growth trends in apparel exports during the research period except Thailand and the Philippines, but the shapes of curves showed in the figure 4.4.1 and figure 4.4.2 were different. In figure 4.4.1, the smooth growth trend in apparel exports for China was similar to that in textiles exports. After 2005, the slope for China's apparel exports was sharper than that in the previous years, which indicated the removal of the quota system contributed to China's apparel exports. This result was consistent with previous studies (e.g., Abraham & Sasikumar, 2011; Zhang & Hathcote, 2008).

The removal of the quota system also positively influenced the apparel exports in India since the export value shot up in 2005. Bangladesh displayed a phenomenal growth trend in apparel exports from 2000 to 2011, even the economic crisis did not bring a negative impact on its apparel exports. After 2009, Bangladesh became the second largest apparel export countries instead of India. The slope of apparel exports for Vietnam was as sharp as that for Bangladesh regardless of the year of 2009. Indonesia, Sri Lanka, and Malaysia displayed similar trends in apparel exports. Their apparel export values decreased at the beginning of the research period (2000-2002),

and then increased for the rest of the research period (2003-2011) except 2009. Thailand's apparel export values also decreased at the beginning of the research period (2000-2002), and after a short-time increase, they were stable regardless of the plunge in 2009. Cambodia and Pakistan displayed similar trends in apparel exports, which were stable at the beginning of the research period (2000-2002), increased since 2003, and had a plunge in 2009. The trend in apparel exports for the Philippines was fluctuated, and from a long-term perspective, the apparel export values have decreased.

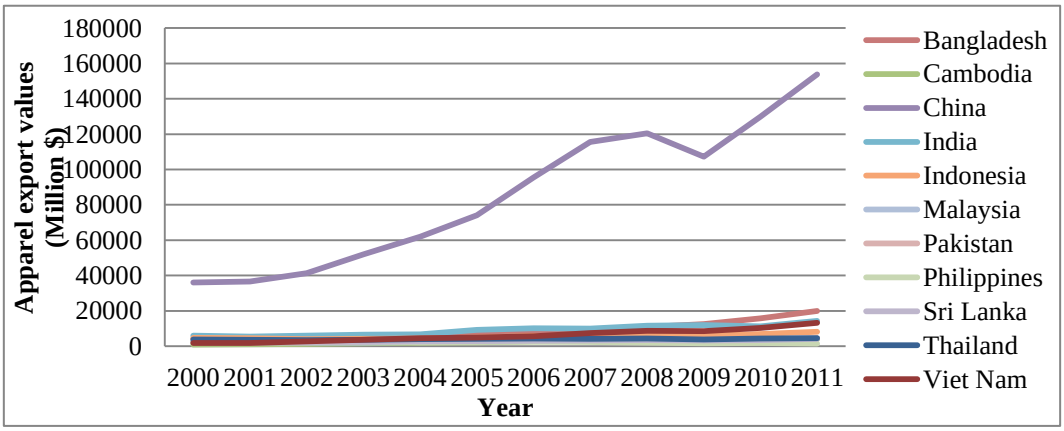

Figure 4.4.1. Apparel export values for 11 Asian developing countries (Million dollars), 2000-2011.

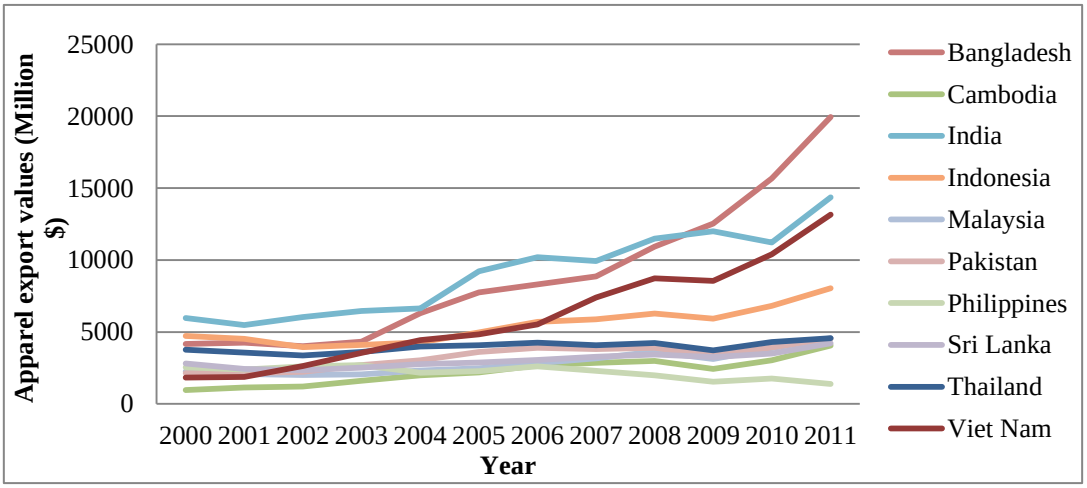

Figure 4.4.2. Apparel export values for 11 Asian developing countries (without China) (Million dollars), 2000-2011.

Table 4.4

Apparel export values for 11 Asian developing countries (Million dollars), 2000-2011

Year	Bangladesh	Cambodia	China	India	Indonesia	Malaysia	Pakistan	Philippines	Sri Lanka	Thailand	Vietnam	Mean	SD
2000	4161.63	969.95[i]	36070.92[*i]	5964.50	4734.04	2256.51	2144.20	2536.49	2812.00	3758.93	1821.20[i]	6111.85	10039.58
2001	4261.00	1143.00	36650.00[*]	5483.00[i]	4531.00	2071.00	2136.00[i]	2384.00	2441.00	3575.00	1867.00	6049.27	10234.78
2002	4005.34[i]	1218.00	41302.00[*]	6037.00	3945.00[i]	2003.00[i]	2228.00	2611.00	2350.00[i]	3369.00[i]	2633.00	6518.30	11608.69
2003	4325.77	1600.00	52061.00[*]	6459.00	4105.00	2058.00	2710.00	2695.00[a]	2510.80	3615.00	3555.00	7790.42	14742.61
2004	6295.71	1981.43	61856.40[*]	6631.89	4285.49	2326.21	3025.74	2157.31	2776.16	3984.58	4430.00	9068.27	17578.35
2005	7751.00	2192.55	74162.52[*]	9212.23	4958.90	2478.69	3603.59	2287.11	2873.57	4085.28	4838.00	10767.59	21146.59
2006	8302.92	2674.91	95387.77[*]	10191.67	5699.46	2842.45	3906.89	2603.67	3045.80	4256.70	5525.27	13130.68	27391.16
2007	8854.85	2851.44	115515.50[*]	9932.49	5869.80	3158.82	3806.36	2294.42	3271.52	4073.04	7400.35	15184.42	33375.19
2008	10919.80	2985.00	120398.61[*]	11494.64	6284.68	3624.35	3906.00	1978.99	3437.44	4240.65	8724.43	16181.33	34718.35
2009	12524.58	2441.46	107261.15[*]	12004.89	5915.04	3126.12	3357.49	1534.14	3265.31	3724.50	8539.54	14881.29	30873.55
2010	15660.04	3041.09	129820.29[*]	11229.33	6819.97	3880.14	3930.18	1759.37	3491.43	4299.58	10389.60	17665.55	37443.07
2011	19938.72[a]	4050.95[a]	153773.61[*a]	14364.62[a]	8045.24[a]	4567.46[a]	4549.63[a]	1395.46[i]	4211.45[a]	4561.18[a]	13153.69[a]	21146.55	44348.03
Mean	8916.78	2262.48	85354.98	9083.77	5432.80	2866.06	3275.34	2186.41	3040.54	3961.95	6073.09		
SD	5063.96	925.08	40344.23	2918.28	1235.40	825.45	814.76	434.19	531.10	354.83	3594.34		
Min	4005.34 (2002)	969.95 (2000)	36070.92 (2000)	5483.00 (2001)	3945.00 (2002)	2003.00 (2002)	2136.00 (2001)	1395.46 (2011)	2350.00 (2002)	3369.00 (2002)	1821.20 (2000)		
Max	19938.72 (2011)	4050.95 (2011)	153773.61 (2011)	14364.62 (2011)	8045.24 (2011)	4567.46 (2011)	4549.63 (2011)	2695.00 (2003)	4211.45 (2011)	4561.18 (2011)	13153.69 (2011)		

Note: * Apparel export value is higher than the average value of 11 Asian developing countries for relevant year. [i] Minimum apparel export value for a country from 2000 to 2011. [a] Maximum apparel export value for a country from 2000 to 2011.

Export growth

Export growth, defined as the increase of exports over a certain time period (Aaby & Slater, 1989), reflects the changing rate and developing trends of export values. The following sections descriptively analyze the export growth rates among Asian developing countries by textile and apparel industries from 2000 to 2011. Means and standard deviation of export growth rates for all countries each year and that for each country across the research period are reported. In addition, the maximum and minimum export growth rates for a country during the period 2000-2011 are also reported.

Textile export growth. Table 4.5 reports the textile export growth rates for all countries from 2001 to 2011, annual means and standard deviations of textile export growth rates for all 9 countries from 2001 to 2011, and means, standard deviations, minimum values as well as maximum values of textile export growth rates for each country during the period 2001-2011. *Figure 4.5* presents the textile export intensity developing trends for these Asian developing countries.

Among 9 Asian developing countries which exported textile commodities, Bangladesh, China, India, Indonesia, Malaysia, Pakistan, and Thailand had positive textile export growth rates in most of years during the period 2000-2011. The growth rates for China were positive (except 2009) and larger than the growth rates means of all countries during the research period. Like China, Bangladesh also had positive textile export growth rates (except 2009), which were larger than growth rates means of all countries (except 2003 and 2009). Similarly, India had positive textile export

growth rates (except 2001 and 2009), which were larger the growth rates means of all countries (except 2003 and 2004). These results indicated Bangladesh, China, and India maintained growth trends in textile exports with larger growth rates than other countries during the period 2000-2011. Although Indonesia, Malaysia, Pakistan, and Thailand had positive textiles growth rates in most of years, their growth rates were only larger than the means in several years during the research period. These 4 countries displayed increasing trends in textile exports in general but their increment speeds were slow in most of years. The Philippines and Sri Lanka had negative growth rates in most of years during the research period. In addition, the Philippines' textile growth rates were only larger than the means of all countries in 2003, while Sri Lanka were only in 2006 and 2007. Therefore, these two countries displayed decreasing trends in textile exports in most of years during the research period.

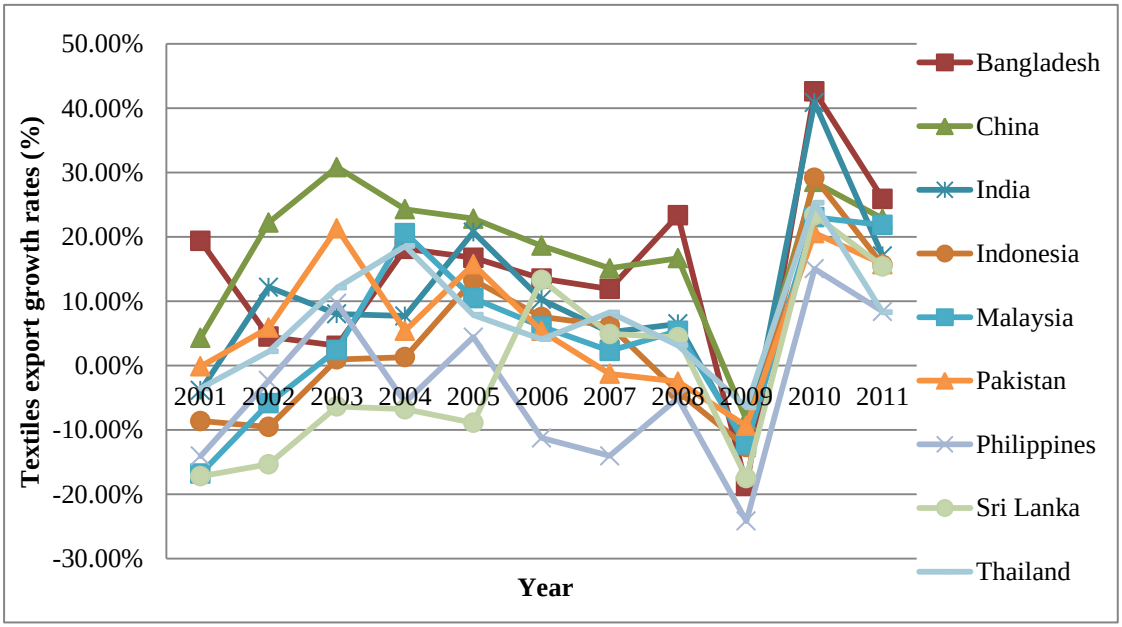

Figure 4.5. Textile export growth rates for 9 Asian developing countries (%), 2001-2011.

Table 4.5

Textile export growth for 9 Asian developing countries (%), 2001-2011

Year	Bangladesh	China	India	Indonesia	Malaysia	Pakistan	Philippines	Sri Lanka	Thailand	Mean	SD
2001	19.35*	4.28*	-3.90*	-8.65	-16.82[i]	-0.16*	-14.08	-17.21	-3.56*	-4.53	11.66
2002	4.48*	22.21*	12.15*	-9.56	-5.87	5.86*	-2.35	-15.35	2.17*	1.53	11.43
2003	3.06	30.82*[a]	8.00	0.93	2.41	21.32*[a]	9.64*	-6.37	12.08*	9.10	11.28
2004	18.12*	24.26*	7.67	1.29	20.57*	5.40	-5.72	-6.80	18.56*	9.26	11.63
2005	16.73*	22.80*	20.73*	13.25*	10.44	15.72*	4.39	-8.92	7.84	11.44	9.64
2006	13.49*	18.59*	10.25*	7.52*	6.04	5.38	-11.29	13.31*	4.08	7.49	8.45
2007	11.89*	15.08*	5.17*	6.21*	2.24	-1.30	-14.08	4.90*	8.23*	4.26	8.42
2008	23.32*	16.66*	6.47*	-4.04	5.37*	-2.51	-5.08	4.37	3.13	5.30	9.46
2009	-18.77[i]	-8.47*[i]	-12.79*[i]	-12.69*[i]	-12.27*	-9.42*[i]	-24.19[i]	-17.49[i]	-6.50*[i]	-13.62	5.60
2010	42.59*[a]	28.50*	40.86*[a]	29.18*[a]	23.03[a]	20.55	15.01[a]	23.35[a]	25.28[a]	27.60	9.06
2011	25.89*	22.82*	17.01*	15.61	21.83*	15.73	8.37	15.38	8.25	16.76	6.05
Mean	14.56	17.96	10.15	3.55	5.18	6.96	-3.58	-0.98	7.23		
SD	15.44	11.30	13.71	12.54	13.37	10.14	12.00	14.13	9.15		
Min	-18.77 (2009)	-8.47 (2009)	-12.79 (2009)	-12.69 (2009)	-16.82 (2001)	-9.42 (2009)	-24.19 (2009)	-17.49 (2009)	-6.50 (2009)		
Max	42.59 (2010)	30.82 (2003)	40.86 (2010)	29.18 (2010)	23.03 (2010)	21.32 (2003)	15.01 (2010)	23.35 (2010)	25.28 (2010)		

Note: *Textile export growth rate is higher than the average value of 9 Asian developing countries for relevant year. [i] Minimum textiles export growth rate for a country from 2000 to 2011. [a] Maximum textile export growth rate for a country from 2000 to 2011.

The mean of all 9 countries' textile export growth rates were positive, except the year of 2001 and 2009, which revealed a growth trend in textile exports from 2000 to 2011 in general. The textile export growth rates sharply rose for Bangladesh, India, Indonesia, Pakistan, and the Philippines and decreased for Thailand in 2005. In addition, the textile growth rate changed from negative to positive after 2005. This indicated the removal of the quota system in 2005 accelerated the growth of textile exports for Bangladesh, India, Indonesia, Pakistan, the Philippines, and Sri Lanka, but decelerated that for Thailand. Therefore, the removal of the quota system can improve comparative advantages for some countries, while damage the advantages for the others. In 2009, all 9 countries had negative textile export growth rates due to economic crisis. Buyers from developing countries cut down textile commodity orders from Asian developing, and as a result, Asian developing countries' textile exports plunged in 2009. Bangladesh, the Philippines, and Sri Lanka had textile export growth rates lower than the means of all 9 countries, which indicated the economic crisis had a greater impact on these countries' textile exports. However, the economic crisis did not bring a long impact on Asian developing countries' textile exports, since the mean of textile export growth rate bounced back to the peak number (27.6%) in 2010.

Apparel export growth. Table 4.6 reports the apparel export growth rates for all 11 countries from 2000 to 2011, annual means and standard deviations of apparel export intensity for all 11 countries from 2000 to 2011, and means, standard deviations, minimum values as well as maximum values of apparel export intensity

for each country during the period 2000-2011. Figure 4.6 presents the apparel export growth rates developing trends for these Asian developing countries.

Among 11 Asian developing countries which exported apparel commodities, Bangladesh, Cambodia, China, India, Indonesia, Malaysia, Pakistan, Sri Lanka, Thailand, and Vietnam had positive apparel export growth rates in most of years during the period 2000-2011. The growth rates for Bangladesh, Cambodia, China, and Vietnam were not only positive, but also larger than the growth rates means of all the countries in most of years during the research period. The apparel export growth rate for Bangladesh was negative in 2002, while those for Cambodia, China, and Vietnam were negative in 2009. These results indicated Bangladesh, Cambodia, China, and Vietnam maintained growth trends in apparel exports with larger growth rates than other countries during the period 2000-2011. Although India, Indonesia, Malaysia, Pakistan, Sri Lanka, and Thailand had positive apparel growth rates in most of years, the growth rates were lower than the means in most of years during the research period. Similar to textile exports, these 6 countries displayed increasing trends in apparel exports in general, but their increment speeds were slow in most of or even all of years. The Philippines had negative growth rates in most of years during the research period. In addition, the Philippines' apparel growth rates were only larger than the means of all 11 countries in 2002 and 2006. The Philippine displayed decreasing trends in apparel exports during the period 2000-2011.

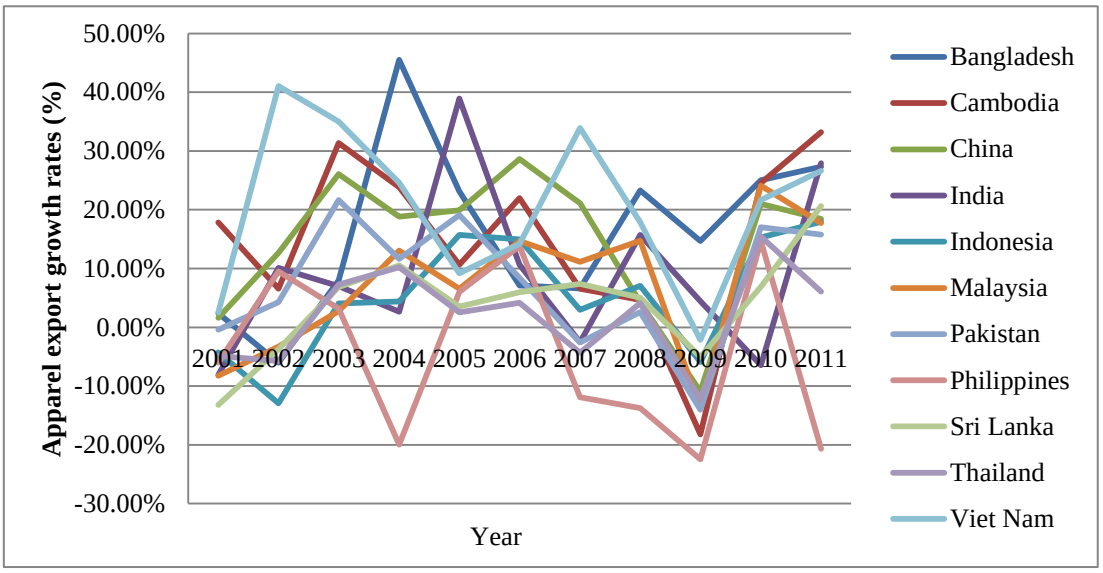

Figure 4.6. Apparel export growth rates for 11 Asian developing countries (%), 2001-2011.

Similar to textile exports', the means of all countries' apparel export growth rates were positive except the year of 2001 and 2009, which revealed a growth trend in apparel exports from 2000 to 2011 in general. Specifically, the apparel export growth rates were fluctuant for each country. Bangladesh and Malaysia's apparel export growth rates sharply rose in 2004 and have kept positive growth rates since then. Cambodia, China, and Indonesia's apparel growth rates sharply rose in 2003 and have kept positive growth rates since then except 2009. India, Pakistan, the Philippines, Thailand, and Vietnam had fluctuant apparel export growth rates, while Sri Lanka had quite stable growth rates during the period 2000-2011. These results indicated each Asian developing country performed differently in apparel exports increment speed. Although these countries faced similar international economic situation, their apparel export growth rates were quite different. For example, when the quota system was terminated in 2005, only India, Indonesia, Pakistan, the Philippines had the apparel export growth rates larger than previous year's. We

concluded the removal of the quota system influenced Asian developing countries' apparel export growth rates in different ways. However, despite there were various trends in the apparel export growth rates among Asian developing countries, these countries' apparel export growth rates were all negatively influenced by economic crisis in 2009, since all 11 countries' growth rates were much lower than the previous year.

Table 4.6

Apparel export growth for 11 Asian developing countries (%), 2001-2011

Year	Bangladesh	Cambodia	China	India	Indonesia	Malaysia	Pakistan	Philippines	Sri Lanka	Thailand	Vietnam	Mean	SD
2001	2.39*	17.84*	1.61*	-8.07i	-4.29	-8.22	-0.38*	-6.01	-13.19i	-4.89	2.51*	-1.88	8.24
2002	-6.00i	6.56*	12.69*	10.10*	-12.93i	-3.28	4.31	9.52*	-3.73	-5.76	41.03*a	4.77	14.52
2003	8.00	31.36*	26.05*	6.99	4.06	2.75	21.63*a	3.22	6.84	7.30	35.02*	13.93	12.12
2004	45.54*a	23.84*	18.82*	2.68	4.40	13.03	11.65	-19.95	10.57	10.22	24.61*	13.22	16.21
2005	23.12*	10.66	19.89*	38.91*a	15.71*	6.55	19.10*	6.02	3.51	2.53	9.21	14.11	10.78
2006	7.12	22.00*	28.62*a	10.63	14.93*	14.68*	8.42	13.84*	5.99	4.20	14.21*	13.15	7.22
2007	6.65*	6.60*	21.10*	-2.54	2.99	11.13*	-2.57	-11.88	7.41*	-4.31	33.94*	6.23	12.72
2008	23.32*	4.68	4.23	15.73*	7.07	14.74*	2.62	-13.75	5.07	4.12	17.89*	7.79	9.94
2009	14.70*	-18.21i	-10.91i	4.44*	-5.88*	-13.75i	-14.04i	-22.48i	-5.01*	-12.17i	-2.12*i	-7.77	10.61
2010	25.03*	24.56*	21.03*	-6.46	15.30	24.12*a	17.06*	14.68a	6.92	15.44a	21.66*	16.30	9.32
2011	27.32*	33.21*a	18.45*	27.92*	17.97*a	17.71*	15.76	-20.68	20.62*a	6.08	26.60*	17.36	14.62
Mean	16.11	14.83	14.69	9.12	5.39	7.22	7.59	-4.32	4.09	2.07	20.42		
SD	14.45	14.82	11.84	14.25	10.11	11.69	10.83	14.27	8.89	8.07	13.70		
Min	-6.00 (2002)	-18.21 (2009)	-10.91 (2009)	-8.07 (2001)	-12.93 (2002)	-13.75 (2009)	-14.04 (2009)	-22.48 (2009)	-13.19 (2001)	-12.17 (2009)	-2.12 (2009)		
Max	45.54 (2004)	33.21 (2011)	28.62 (2006)	38.91 (2005)	17.97 (2011)	24.12 (2010)	21.63 (2003)	14.68 (2010)	20.62 (2011)	15.44 (2010)	41.03 (2002)		

Note: * Apparel export growth rate is higher than the average value of 11 Asian developing countries for relevant year. [i] Minimum apparel export growth rate for a country from 2000 to 2011. [a] Maximum apparel export growth rate for a country from 2000 to 2011.

Hypothesis Testing

This section reports the results from hypotheses testing, including the impact of labor costs and number of employees on textiles and apparel export performance in Malaysia, the impact of exchange rates on textile export performance between Malaysia and Sri Lanka, as well as the impact of exchange rates on textile and apparel export performance before and after the removal of the quota system. Hypotheses were tested by the vector auto-regression (VAR) error model, which was widely used to analyze time series data sets.

Labor costs and number of employees

Textile export intensity. This section reports the results from hypothesis testing for the impact of labor costs and number of employee on textile export intensity. There were 48 observations included in hypothesis testing. The results from descriptive statistics for response and predictor variables are shown in Table 4.7.1.

Table 4.7.1

Descriptive statistics for textile export intensity, labor costs, and number of employees in Malaysia (Jan, 2008 - Dec, 2011)

Variable	Type	N	Mean	Standard Deviation	Min	Max
lgTEI	Response	48	-4.68777	0.13617	-4.94881	-4.33016
lgLC	Predictor	48	6.13844	0.13447	5.87724	6.33423
lgNE	Predictor	48	9.77118	0.11894	9.63371	10.03719

The full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.6118), which indicated that this model was stationary. The model was VAR(1,0) with AIC value of -4.7547 and SBC value of -4.5972. According to the results from Granger-Causality Wald test (Table 4.7.2), only the

number of employee elasticity was Granger-causal with the textile export intensity elasticity ($\chi^2 = 4.43, p = 0.0353$), while the labor cost elasticity was not ($\chi^2 = 2.06, p = 0.1509$). Therefore, the predictor variable of labor cost was reduced from the VAR model. We accepted the null Hypothesis 1a-(1) that labor costs have no direct impact on textile export intensity in Asian developing countries.

Table 4.7.2

Granger-Causality Wald test for textile export intensity, labor costs, and number of employees

Test	DF	Chi-Square	Pr > Chi-Square
Labor costs	1	2.06	0.1509
Number of employees	1	4.43	0.0353

The response variable for reduced VAR error model was textile export intensity, while the predictor variable was the number of employees. The reduced VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.6063), which indicated that this model was stationary. The model was VAR(1,0) with AIC value of -4.786 and SBC value of -4.668. The reduced model parameter estimates are shown in Table 4.7.3. The number of employee elasticity had a significant negative impact on textile export intensity elasticity at 90% confidential level (t = -1.71, p = 0.0934). This indicated every 0.25% decrease in textile export intensity could be caused by a 1% increase in the number of employees. Therefore, we rejected the null Hypothesis 2a-(1) and concluded the number of employees directly influenced on textile export intensity in Asian developing countries. The model could be presented as following:

$$\ln TEI_t = 0.64667 - 0.25427\ln \mathrm{NE_t} + 0.60627\ln \mathrm{EI_{t-1}} \qquad (4\text{-}1)$$

Table 4.7.3

The reduced model parameter estimates for textile export intensity, labor costs, and number of employees

Equation	Variable	Parameter	Estimate	Standard Error	t Value	Pr > |t|
lgTEI	Constant	CONST1	0.64667	1.14857	0.56	0.5763
	lgNE(t)	XL0_1_1	-0.25427	0.14829	-1.71	0.0934
	lgTEI(t-1)	AR1_1_1	0.60627	0.13163	4.61	0.0001

Apparel export intensity. This section reports the results from hypothesis testing for the impact of labor costs and number of employees on apparel export intensity. There were 48 observations included in this hypothesis testing. The results from descriptive statistics for response and predictor variables are shown in Table 4.8.1.

Table 4.8.1

Descriptive statistics for apparel export intensity, labor cost, and number of employees in Malaysia (Jan, 2008 - Dec, 2011)

Variable	Type	N	Mean	Standard Deviation	Min	Max
lgAEI	Response	48	-3.92527	0.11398	-4.20988	-3.61152
lgLC	Predictor	48	5.93776	0.15823	5.71996	6.17165
lgNE	Predictor	48	10.33541	0.11579	10.16685	10.55592

The full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.7027), which indicated that this model was stationary. The model was VAR(1,0) with AIC value of -5.2029 and SBC value of -5.04548. According to the results from Granger-Causality Wald test (Table 4.8.2), both parameters, the labor costs elasticity and the number of employees elasticity, were not Granger-causal with the apparel export intensity elasticity, with $\chi^2 = 0.27$ ($p =$

0.6017) and $\chi^2 = 0.67$ ($p = 0.4116$). Therefore, we accepted the null Hypotheses 1a-(2) and 2a-(2) and concluded the labor cost and number of employees did not directly influence on apparel export intensity in Asian developing countries.

Table 4.8.2

Granger-Causality Wald test for apparel export intensity, labor costs, and number of employees

Test	DF	Chi-Square	Pr > ChiSq
Labor costs	1	0.27	0.6017
Number of employees	1	0.67	0.4116

Textile export value. This section reports the results from hypothesis testing for the impact of labor cost and number of employee on textiles export values. There were 48 observations included in hypothesis testing. The results from descriptive statistics for response and predictor variables are shown in Table 4.9.1.

Table 4.9.1

Descriptive statistics for textile export value, labor costs, and number of employees in Malaysia (Jan, 2008 - Dec, 2011)

Variable	Type	N	Mean	Standard Deviation	Min	Max
lgTEV	Response	48	18.81268	0.23075	18.38969	19.39923
lgLC	Predictor	48	6.13844	0.13447	5.87724	6.33423
lgNE	Predictor	48	9.77118	0.11894	9.63371	10.03719

The full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.4189), which indicated that this model was stationary. The model was VAR (2,0) with AIC value of -4. 4826 and SBC value of -4.2839. According to the results from Granger-Causality Wald test (Table 4.9.2), only the labor costs elasticity was Granger-causal with the textile export value elasticity ($\chi^2 = 8.05, p = 0.0179$), while the number of employees elasticity was not

($\chi^2 = 1.00, p = 0.6075$). We accepted the null Hypothesis 2b-(1) and concluded the number of employees had no direct impact on textile export value in Asian developing countries. Previous study stated the differences in labor intensity might lead to wage differences, and then influenced on export performance (Dickerson, 1999). We inferred the number of employees might have an indirect impact on textile export value by affecting labor costs. Therefore, the predictor variable of number of employees was reduced from the full VAR model.

Table 4.9.2

Granger-Causality Wald test for textile export value, labor costs, and number of employees

Test	DF	Chi-Square	Pr > ChiSq
Labor costs	1	8.05	0.0179
Number of employees	1	1.00	0.6075

The response variable for reduced VAR error model was textile export value while the predictor variable was the labor cost. The reduced VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.4102), which indicated that this model was stationary. The model was VAR (2,0) with AIC value of -4.4856 and SBC value of -4.3266. The reduced model parameter estimates are shown in Table 4.9.3. The labor costs elasticity had a significant negative impact on textiles export value elasticity at 99% confidential level (t = 3.4, p = 0.0015). We rejected the null Hypothesis 1b-(1) and concluded labor costs had a direct impact on textiles export performance. The results indicated every 0.65% increase in textile export value could be caused by a 1% increase in the labor costs. The model could be presented as follows:

$$\ln TEV_t = 3.58301 + 0.65106 \ln LC_t + 0.30471 \ln TEV_{t-1} + 0.29329 \ln TEV_{t-2} \quad (4\text{-}2)$$

Table 4.9.3

The reduced model parameter estimates for textile export value, labor costs, and number of employees

Equation	Variable	Estimate	Standard Error	t Value	Pr > |t|
lgTEV	Constant	3.58301	1.51934	2.36	0.0231
	lgLC(t)	0.65106	0.19177	3.4	0.0015
	lgTEV(t-1)	0.30471	0.14387	2.12	0.0401
	lgTEV(t-2)	0.29329	0.13335	2.2	0.0334

Apparel export value. This section reports the results from hypothesis testing for the impact of labor costs and number of employees on apparel export values. There were 48 observations included in hypothesis testing. The results of descriptive statistics for response and predictor variables are shown in Table 4.10.1.

Table 4.10.1

Descriptive statistics for apparel export value, labor costs, and number of employees in Malaysia (Jan, 2008 - Dec, 2011)

Variable	Type	N	Mean	Standard Deviation	Min	Max
lgAEV	Response	48	5.75967	0.16750	5.46090	6.08432
lgLC	Predictor	48	5.93776	0.15823	5.71996	6.17165
lgNE	Predictor	48	10.33541	0.11579	10.16685	10.55592

The full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.6009), which indicated that this model was stationary. The model was VAR (1,0) with AIC value of -4.7528 and SBC value of 4.5954. According to the results from Granger-Causality Wald test (Table 4.10.2), both of parameters, the labor costs elasticity and the number of employees elasticity were Granger-causal with the apparel export value elasticity, with $\chi^2 = 8.91$ ($p = 0.0028$)

and $\chi^2 = 4.51$ $(p = 0.0336)$. Therefore, both predictor variables could be kept in the full VAR model.

Table 4.10.2

Granger-Causality Wald test for apparel export value, labor costs, and number of employees

Test	DF	Chi-Square	Pr > ChiSq
Labor costs	1	8.91	0.0028
Number of employees	1	4.51	0.0336

The full model parameter estimates were shown in Table 4.10.3. The labor costs elasticity had a significant positive impact on apparel export value elasticity at 95% confidential level (t = 2.05, p = 0.0466). The number of employees elasticity did not have a significant impact on apparel export value elasticity (t=0.91, p=0.3690). We accepted the null Hypothesis 2b-(2) and concluded the number of employees did not have a direct impact on apparel export value in Asian developing countries. Therefore, the number of employees should be reduced from the full VAR error model.

Table 4.10.3

The reduced model parameter estimates for apparel export value, labor costs, and number of employees

Equation	Variable	Estimate	Standard Error	t Value	Pr > |t|
lgAEV	Constant	-4.83287	5.42528	-0.89	0.3780
	lgLC(t)	0.60443	0.29505	2.05	0.0466
	lgNE(t)	0.34324	0.37805	0.91	0.3690
	lgAEV(t-1)	0.60087	0.11116	5.41	0.0001

The response variable for reduced VAR error model was apparel export value, while the predictor variable was the labor costs. The reduced VAR error model had

inverse roots of AR characteristic polynomial modulus less than 1 (0.6206), which indicated that this model was stationary. The model was VAR (1, 0) with AIC value of -4.7764 and SBC value of - 4.6583. The reduced model parameter estimates are shown in Table 4.10.4. The labor costs elasticity had a significant positive impact on the apparel export value elasticity at 99% confidential level (t = 3.16, p = 0.0029). We rejected the null Hypothesis 1b-(2) and concluded the labor costs had a direct impact on the apparel export value in Asian developing countries. The results indicated every 0.36% increase in apparel export value could be caused by a 1% increase in the labor costs. The model could be presented as follows:

$$\ln AEV_t = 0.06939 + 0.35707 \ln LC_t + 0.62059 \ln AEV_{t-1} \qquad (4\text{-}3)$$

Table 4.10.4

The reduced model parameter estimates for apparel export value, labor costs, and number of employees

Equation	Variable	Estimate	Standard Error	t Value	Pr > |t|
lgAEV	Constant	0.06939	0.52789	0.13	0.8960
	lgLC(t)	0.35707	0.11306	3.16	0.0029
	lgAEV(t-1)	0.62059	0.10880	5.70	0.0001

Textile export growth. This section reports the results from hypothesis testing for the impact of labor costs and number of employees on textile export Growth. There were 47 observations included in the hypothesis testing. The results from descriptive statistics for response and predictor variables are shown in Table 4.11.1.

Table 4.11.1

Descriptive statistics for textiles export growth, labor costs, and number of employees in Malaysia (Jan, 2008 - Dec, 2011)

Variable	Type	N	Mean	Standard Deviation	Min	Max
lgTEG	Dependent	47	-0.15835	2.71100	-3.82637	4.98239
lgLC	Independent	47	6.13951	0.13572	5.87724	6.33423
lgNE	Independent	47	9.76650	0.11567	9.63371	10.03719

The full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.7325), which indicated that this model was stationary. The model was VAR(5,0) with AIC value of 2.1851 and SBC value of 2.5161. According to the results from Granger-Causality Wald test (Table 4.11.2), both of the parameters, the labor costs elasticity and the number of employees elasticity were not Granger-causal with the textile export growth elasticity, with $\chi^2 = 0.08$ ($p = 0.7833$) and $\chi^2 = 0.19$ ($p = 0.6655$). Therefore, we accepted the null Hypotheses 1c-(1) and 2c-(1) and concluded the labor costs and number of employees had no direct impact on textile export growth in Asian developing countries.

Table 4.11.2

Granger-Causality Wald test for textile export growth, labor costs, and number of employees

Test	DF	Chi-Square	Pr > ChiSq
Labor costs	1	0.08	0.7833
Number of employees	1	0.19	0.6655

Apparel export growth. This section reports the results from hypothesis testing for the impact of labor costs and number of employees on apparel export growth. There were 47 observations included in the hypothesis testing. The results

from descriptive statistics for response and predictor variables are shown in Table 4.12.1.

Table 4.12.1

Descriptive statistics for apparel export growth, labor costs, and number of employees in Malaysia from Jan, 2008 to Dec, 2011

Variable	Type	N	Mean	Standard Deviation	Min	Max
lgAEG	Dependent	47	0.06127	3.05499	-5.50163	4.69999
lgLC	Independent	47	5.94239	0.15662	5.72578	6.17165
lgNE	Independent	47	10.33072	0.11233	10.16685	10.55211

The full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.2376), which indicated that this model was stationary. The model was VAR (2, 0) with AIC value of 2.4498 and SBC value of 2.6505. According to the results from Granger-Causality Wald test (Table 4.12.2), both of parameters, the labor costs elasticity and the number of employees elasticity were not Granger-causal with the apparel export growth elasticity, with $\chi^2 = 0.14$ ($p = 0.7123$) and $\chi^2 = 0.00$ ($p = 0.9620$). We accepted the null Hypotheses 1c-(2) and 2c-(2) and concluded the labor costs and number of employees had no direct impact on apparel export growth in Asian developing countries.

Table 4.12.2

Granger-Causality Wald test for apparel export growth, labor costs, and number of employees

Test	DF	Chi-Square	Pr > ChiSq
Labor costs	1	0.14	0.7123
Number of employees	1	0.00	0.9620

Exchange rates

In this section, this study first compares the impact of exchange rates on textile export intensity, textile export value, and textile export growth between Sri Lanka and Malaysia. Second, this section reports the results for the impact of exchange rates on export intensity, export value, and export growth before and after the removal of the quota system in China's textile and apparel industries, respectively.

Textile export intensity between Sri Lanka and Malaysia. This section reports the results from hypothesis testing for the impact of exchange rates on textile export intensity in Sri Lanka and Malaysia. There were 72 observations included in hypothesis testing for each country. The results for descriptive statistics for response and predictor variables are shown in Table 4.13.1.

Table 4.13.1

Descriptive statistics for textile export intensity and exchange rate in Sri Lanka and Malaysia (Jan, 2006-Dec, 2011)

Country	Variable	Type	N	Mean	Standard Deviation	Min	Max
Sri Lanka	lgTEI	Response	72	-0.84731	0.08053	-0.99901	-0.60074
	lgER	Predictor	72	4.73648	0.27378	4.63011	7.01005
Malaysia	lgTEI	Response	72	-4.70838	0.13407	-5.00606	-4.33016
	lgER	Predictor	72	4.69537	0.03695	4.61424	4.75887

For Sri Lanka, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.3166), which indicated that this model was stationary. The model was VAR(2,0) with AIC value of -5.3683 and SBC value of -5.2398. For Malaysia, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.7042), which indicated this model

was stationary. The model was VAR (1,0) with AIC value of - 4.6035 and SBC value of -5.5079. According to the results from Granger-Causality Wald test (Table 4.13.2), the real effective exchange rate elasticity was not Granger-causal with the textile export intensity elasticity in both Sri Lanka ($\chi^2 = 0.06, p = 0.9710$) and Malaysia ($\chi^2 = 2.62, p = 0.1055$). Therefore, we accepted the null Hypotheses 3.1a-(1) and 3.1a-(2) and concluded the exchange rate had little impact on textile export intensity in both Sri Lanka and Malaysia.

Table 4.13.2

Granger-Causality Wald test for textile export intensity and exchange rate in Sri Lanka and Malaysia

Country	Test	DF	Chi-Square	Pr > ChiSq
Sri Lanka	Exchange rate	1	0.06	0.9710
Malaysia	Exchange rate	1	2.62	0.1055

Textile export value between Sri Lanka and Malaysia. This section reports the results from hypothesis testing for the impact of exchange rate on textile export values in Sri Lanka and Malaysia. There were 72 observations included in hypothesis testing for each country. The results from descriptive statistics for response and predictor variables are shown in Table 4.14.1.

Table 4.14.1

Descriptive statistics for apparel export value and exchange rate in Sri Lanka and Malaysia (Jan, 2006- Dec, 2011)

Country	Variable	Type	N	Mean	Standard Deviation	Min	Max
Sri Lanka	lgTEV	Response	72	5.65049	0.19051	5.15213	6.14354
	lgER	Predictor	72	4.73648	0.27378	4.63011	7.01005
Malaysia	lgTEV	Response	72	4.92971	0.22214	4.52252	5.58371
	lgER	Predictor	72	4.69537	0.03695	4.61424	4.75887

For Sri Lanka, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 5 (0.9595), which indicated that this model was stationary. The model was VAR (5,0) with AIC value of -3.32523 and SBC value of -3.06199. For Malaysia, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.9642), which indicated this model was stationary. The model was VAR (1, 0) with AIC value of -4.08604 and SBC value of -3.95856. According to the results from Granger-Causality Wald test (Table 4.14.2), the exchange rate elasticity was not Granger-causal with the textile export value elasticity in Sri Lanka ($\chi^2 = 5.26, p = 0.3847$), but that in Malaysia was Granger-causal with the textile export value elasticity ($\chi^2 = 5.27,\ p = 0.0217$). Therefore, we accepted the null Hypothesis 3.1b-(1) and concluded exchange rate had little impact on textile export value in Ski Lanka. We can further estimate the impact of exchange rate on textile export value in Malaysia.

Table 4.14.2

Granger-Causality Wald test for textile export value and exchange rate

Country	Test	DF	Chi-Square	Pr > ChiSq
Sri Lanka	Exchange rate	1	5.26	0.3847
Malaysia	Exchange rate	1	5.27	0.0217

The model parameter estimates for Malaysia are shown in Table 4.14.3. The exchange rate elasticity did not have a significant impact on textile export value elasticity at 90% confidential level (t = 1.62, p = 0.1096). Therefore, we accepted the null Hypothesis 3.1b-(2) and concluded exchange rate had no impact on textile export value in both Sri Lanka and Malaysia.

Table 4.14.3

The reduced model parameter estimates for textile export value and exchange rate

Country	Equation	Variable	Estimate	Standard Error	t Value	Pr > |t|
Malaysia	lgTEV	Constant	-1.56715	0.98028	-1.60	0.1143
		lgER(t)	0.37371	0.23063	1.62	0.1096
		lgTEV(t-1)	0.96421	0.03390	28.44	0.0001

Textile export growth between Sri Lanka and Malaysia. This section reports the results from hypothesis testing for the impact of exchange rate on textile export growth in Sri Lanka and Malaysia. There were 71 observations included in hypothesis testing for each country. The results from descriptive statistics for response and predictor variables are shown in Table 4.15.1.

Table 4.15.1

Descriptive statistics for textile export growth and exchange rate in Sri Lanka and Malaysia (Jan, 2006- Dec, 2011)

Country	Variable	Type	N	Mean	Standard Deviation	Min	Max
Sri Lanka	lgTEV	Response	71	-0.34312	2.29891	-6.08412	4.00058
	lgER	Predictor	71	4.73798	0.27544	4.63084	7.01005
Malaysia	lgTEV	Response	71	0.19446	2.63957	-4.15360	4.98239
	lgER	Predictor	71	4.69651	0.03591	4.62512	4.75887

For Sri Lanka, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.1001), which indicated that this model was stationary. The model was VAR (1, 0) with AIC value of 1.7340 and SBC value of 1.8303. For Malaysia, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.1403), which indicated that this model was stationary. The model was VAR (1, 0) with AIC value of 1.9745 and SBC value of 2.0709. According to the results from Granger-Causality Wald test (Table 4.15.2), the

exchange rate elasticity was not Granger-causal with the textile export growth elasticity in Sri Lanka ($\chi^2 = 0.05, p = 0.8207$) and Malaysia ($\chi^2 = 0.29,\ p = 0.5910$). Therefore, we accepted the null Hypotheses 3.1c-(1) and 3.1c-(2) and concluded exchange rate had no direct impact on textile export growth in Ski Lanka and Malaysia.

Table 4.15.2

Granger-Causality Wald test for textile export growth and exchange rate

Country	Test	DF	Chi-Square	Pr > ChiSq
Sri Lanka	Exchange rate	1	0.05	0.8207
Malaysia	Exchange rate	1	0.29	0.5910

Textile export intensity before and after the removal of the quota system in China. This section reports the results from hypothesis testing for the impact of exchange rate on textile export intensity before and after the removal of the quota system in China. There were 54 observations included in hypothesis testing for the first time period and 84 observations for the second time period. The results from descriptive statistics for response and predictor variables are shown in Table 4.16.1.

Table 4.16.1

Descriptive statistics for textile export intensity and exchange rate before and after the removal of the quota system in China (Jul, 2000-Dec, 2011)

Time Period	Variable	Type	N	Mean	Standard Deviation	Min	Max
Before	lgTEI	Response	54	-5.09892	0.08211	-5.30332	-4.90803
	lgER	Predictor	54	4.67361	0.05062	4.56965	4.75445
After	lgTEI	Response	84	-5.31668	0.08881	-5.53350	-5.12063
	lgER	Predictor	84	4.71312	0.08117	4.57141	4.84812

Before the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.6107), which indicated that this model was stationary. The model was VAR (1, 0) with the AIC value of -5.6478 and SBC value of -5.5363. After the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.4141), which indicated this model was stationary. The model was VAR (1, 0) with AIC value of -5.07 and SBC value of -4.9826. According to the results from Granger-Causality Wald test (Table 4.16.2), the real effective exchange rate elasticity was Granger-causal with the textile export intensity elasticity in China before the removal of the quota system ($\chi^2 = 4.72, p = 0.0298$), but after the removal of the quota system ($\chi^2 = 0.86, p = 0.3531$). Therefore, we accepted the null Hypothesis 3.2a-(2) and concluded exchange rate had no direct impact on textile export intensity in China after the removal of the quota system. We can further estimate the impact of exchange rate on textile export intensity in China before the removal of the quota system.

Table 4.16.2

Granger-Causality Wald test for textile export intensity and exchange rate before and after the removal of the quota system in China

Time Period	Test	DF	Chi-Square	Pr > ChiSq
Before	Exchange rate	1	4.72	0.0298
After	Exchange rate	1	0.86	0.3531

The model parameter estimates for the period before the removal of the quota system are shown in Table 4.16.3. The exchange rate elasticity had a significant

positive impact on textile export value elasticity at 95% confidential level (t = 2.4, p = 0.0204). We rejected the null Hypothesis 3.2a-(2) and concluded the removal of the quota system has changed the impact of exchange rate on textile export value in China. The results indicated every 0.42% increase in textile export intensity could be caused by a 1% increase in the exchange rate in China before the removal of the quota system. The model could be presented as follows:

Before: $$\ln TEI_t = -3.95912 + 0.421871 \ln REER_t + 0.61074 \ln TEI_{t-1} \quad (4\text{-}4)$$

Table 4.16.3

The reduced model parameter estimates for textile export intensity and exchange rate before and after the removal of the quota system in China

Time Period	Equation	Variable	Estimate	Standard Error	t Value	Pr > |t|
Before	lgTEI	Constant	-3.95912	1.21135	-3.27	0.0020
		lgER(t)	0.42187	0.17612	2.40	0.0204
		lgTEI(t-1)	0.61074	0.11568	5.28	0.0001

Apparel export intensity before and after the removal of the quota system in China. This section reports the results from hypothesis testing for the impact of exchange rate on apparel export intensity before and after the removal of the quota system in China. There were 54 observations included in hypothesis testing for the first time period and 84 observations for the second time period. The results of descriptive statistics for response and predictor variables are shown in Table 4.17.1.

Table 4.17.1

Descriptive statistics for apparel export intensity and exchange rate before and after the removal of the quota system in China (Jul, 2000-Dec, 2011)

Time Period	Variable	Type	N	Mean	Standard Deviation	Min	Max
Before	lgTEI	Response	54	-4.39956	0.15821	-4.74194	-4.10586
	lgER	Predictor	54	4.67361	0.05062	4.56965	4.75445
After	lgTEI	Response	84	-4.73881	0.17295	-5.23664	-4.43995
	lgER	Predictor	84	4.71312	0.08117	4.57141	4.84812

Before the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.4881), which indicated that this model was stationary. The model was VAR (2, 0) with AIC value of -4.7662 and SBC value of -4.6161. After the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.7395), which indicated that this model was stationary. The model was VAR (1, 0) with AIC value of -3.7418 and SBC value of -3.5644. According to the results from Granger-Causality Wald test (Table 4.17.2), the real effective exchange rate elasticity was Granger-causal with the apparel export intensity elasticity in China both before ($\chi^2 = 6.28, p = 0.0432$) the removal of the quota system, but was not after ($\chi^2 = 2.65, p = 0.1033$) the removal of the quota system. Therefore, we accepted the null Hypothesis 3.3a-(2) and concluded the exchange rate had no direct impact on apparel export intensity in China after the removal of the quota system. We can further examine the impact of exchange rate on apparel export intensity in China before the removal of the quota system.

Table 4.17.2

Granger-Causality Wald test for apparel export intensity and exchange rate before and after the removal of the quota system in China

Time Period	Test	DF	Chi-Square	Pr > ChiSq
Before	Exchange rate	1	6.28	0.0432
After	Exchange rate	1	2.65	0.1033

The model parameter estimates for the time period both before and after the removal of the quota system are shown in Table 4.17.3. Before the removal of the quota system, the exchange rate elasticity had a significant negative impact on apparel export intensity elasticity at 95% confidential level (t = 2.6, p =0.0123). We rejected Hypothesis 3.3a-(1) and concluded the removal of the quota system had changed the impact of exchange rate on apparel export intensity in China. The results indicated every 0.79% increase in apparel export intensity could be caused by a 1% increase in the exchange rate in China before the removal of the quota system. The model could be presented as follows:

Before:

$$\ln AEI_t = -5.49383 + 0.78919 \ln REER_t + 0.81079 \ln AEI_{t-1} - 0.21912 \ln AEI_{t-2} \quad (4\text{-}5)$$

Table 4.18.3

The reduced model parameter estimates for apparel export intensity and exchange rate before and after the removal of the quota system in China

Time Period	Equation	Variable	Estimate	Standard Error	t Value	Pr > |t|
Before	lgTEV	Constant	-5.49383	1.75596	-3.13	0.0030
		lgER(t)	0.78919	0.30339	2.60	0.0123
		lgTEV(t-1)	0.81079	0.13923	5.82	0.0001
		lgTEV(t-2)	-0.21912	0.13839	-1.58	0.1199

Textile export value before and after the removal of the quota system in China. This section reports the results from hypothesis testing for the impact of exchange rate on textile export value before and after the removal of the quota system in China. There were 54 observations included in hypothesis testing for the first time period and 84 observations for the second time period. The results of descriptive statistics for response and predictor variables are shown in Table 4.18.1.

Table 4.18.1

Descriptive statistics for textile export value and exchange rate before and after the removal of the quota system in China (Jul, 2000-Dec, 2011)

Time Period	Variable	Type	N	Mean	Standard Deviation	Min	Max
Before	lgTEI	Response	54	7.53598	0.30739	6.91874	8.06246
	lgER	Predictor	54	4.67361	0.05062	4.56965	4.75445
After	lgTEI	Response	84	8.52517	0.30623	7.73505	9.07635
	lgER	Predictor	84	4.71312	0.08117	4.57141	4.84812

Before the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.9958), which indicated that this model was stationary. The model was VAR (1, 0) with AIC value of -3.9218 and SBC value of -3.7342. After the removal of the quota system, the full VAR error

model had inverse roots of AR characteristic polynomial modulus less than 1 (0.9689), which indicated that this model was stationary. The model was VAR (1, 0) with AIC value of -3.4791 and SBC value of -3.3625. According to the results from Granger-Causality Wald test (Table 4.18.2), the real effective exchange rate elasticity were Granger-causal with the textile export value elasticity in China before ($\chi^2 = 8.08, p = 0.0045$) and after ($\chi^2 = 0.86, p = 0.3531$) the removal of the quota system. Therefore, the predictor variable of exchange rate had an impact on textile export value in China both before and after the removal of the quota system. We can further compare the impact of exchange rate on textile export value in China both before and after the removal of the quota system.

Table 4.18.2

Granger-Causality Wald test for textile export value and exchange rate before and after the removal of quota system in China

Time Period	Test	DF	Chi-Square	Pr > ChiSq
Before	Exchange rate	1	8.08	0.0045
After	Exchange rate	1	10.13	0.0015

The model parameter estimates for the time period both before and after the removal of the quota system are shown in Table 4.18.3. Before the removal of the quota system, the exchange rate elasticity had a significant negative impact on textile export value elasticity at 99% confidential level (t = -8.61, p <0.0001). Therefore, Hypothesis 3.2-(1) was not supported. The results indicated every 0.17% decrease in textile export value could be caused by a 1% increase in the exchange rate in China before the removal of the quota system. After the removal of the quota system, the

exchange rate elasticity did not have a significant impact on textile export value elasticity at 90% confidential level (t = 0.22, p = 0.8248). Therefore, we accepted the null Hypothesis 3.2b-(2) and concluded that the removal of the quota system changed the impact of exchange rate on textile export value in China. The model could be presented as follows:

Before: $\ln TEV_t = 0.8335 - 0.16808 \ln REER_t + 0.99584 \ln TEV_{t-1}$ (4-6)

Table 4.18.3

The reduced model parameter estimates for textile export value and exchange rate before and after the removal of quota system in China

Time Period	Equation	Variable	Estimate	Standard Error	t Value	Pr > |t|
Before	lgTEV	Constant	0.8335	0.10212	8.16	0.0001
		lgER(t)	-0.16808	0.01952	-8.61	0.0001
		lgTEV(t-1)	0.99584	0.00453	219.94	0.0001
After	lgTEV	Constant	0.13687	0.36903	0.37	0.7117
		lgER(t)	0.03015	0.13575	0.22	0.8248
		lgTEV(t-1)	0.96888	0.04349	22.28	0.0001

Apparel export value before and after the removal of the quota system in China. This section reports the results from hypothesis testing for the impact of exchange rate on apparel export value before and after the removal of the quota system in China. There were 54 observations included in hypothesis testing for the first time period and 84 observations for the second time period. The results from descriptive statistics for response and predictor variables are shown in Table 4.19.1.

Table 4.19.1

Descriptive statistics for apparel export value and exchange rate before and after the removal of the quota system in China (Jul, 2000-Dec, 2011)

Time Period	Variable	Type	N	Mean	Standard Deviation	Min	Max
Before	lgTEI	Response	54	8.23533	0.27330	7.75117	8.78476
	lgER	Predictor	54	4.67361	0.05062	4.56965	4.75445
After	lgTEI	Response	84	9.10305	0.32875	8.29617	9.75846
	lgER	Predictor	84	4.71312	0.08117	4.57141	4.84812

Before the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.4254), which indicated that this model was stationary. The model was VAR (4, 0) with AIC value of -3.8638 and SBC value of -3.5961. After the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.0091), which indicated that this model was stationary. The model was VAR (2, 0) with AIC value of -3.0433 and SBC value of -2.9259. According to the results from Granger-Causality Wald test (Table 4.19.2), the real effective exchange rate elasticity was Granger-causal with the apparel export value elasticity in China before ($\chi^2 = 13.7, p = 0.0083$) the removal of the quota system and was not after ($\chi^2 = 3.08, p = 0.2139$) the removal of the quota system. Therefore, we accepted the null Hypothesis 3.3b-(2) and concluded exchange rate had no direct impact on apparel export value in China after the removal of the quota system. We can further estimate the parameters for the impact of exchange rate on apparel export value in China before the removal of the quota system.

Table 4.19.2

Granger-Causality Wald test for apparel export value and exchange rate before and after the removal of the quota system in China

Time Period	Test	DF	Chi-Square	Pr > ChiSq
Before	Exchange rate	1	13.7	0.0083
After	Exchange rate	1	3.08	0.2139

The model parameter estimates for the time period before the removal of the quota system are shown in Table 4.19.3. Before the removal of the quota system, the exchange rate elasticity had a significant negative impact on apparel export value elasticity at 99% confidential level ($t = -4.58$, $p < 0.0001$). We rejected the null Hypothesis 3.3b-(1) and concluded the removal of the quota system has changed the impact of exchange rate on apparel export value in China. The results indicated every 1.57% decrease in apparel export value could be caused by a 1% increase in the exchange rate in China before the removal of the quota system. The model could be presented as follows:

Before: $$\ln AEV_t = 10.76078 - 1.57216 \ln REER_t + 1.05002 \ln AEV_{t-1} - 0.47437 \ln AEV_{t-2} + 0.48264 \ln AEV_{t-3} - 0.47287 \ln AEV_{t-4} \quad (4\text{-}7)$$

Table 4.19.3

The reduced model parameter estimates for apparel export value and exchange rate before and after the removal of the quota system in China

Time Period	Equation	Variable	Estimate	Standard Error	t Value	Pr > |t|
Before	lgAEV	Constant	10.76078	2.21010	4.87	0.0001
		lgER(t)	-1.57216	0.34303	-4.58	0.0001
		lgAEV(t-1)	1.05002	0.14104	7.44	0.0001
		lgAEV(t-2)	-0.47437	0.17225	-2.75	0.0082
		lgAEV(t-3)	0.48264	0.16033	3.01	0.0041
		lgAEV(t-4)	-0.47287	0.10235	-4.62	0.0001

Textile export growth before and after the removal of the quota system in China. This section reports the results from hypothesis testing for the impact of exchange rate on textile export growth before and after the removal of the quota system in China. There were 53 observations included in hypothesis testing for the first time period and 84 observations for the second time period. The results from descriptive statistics for response and predictor variables are shown in Table 4.20.1.

Table 4.20.1

Descriptive statistics for textile export growth and exchange rate before and after the removal of the quota system in China (Jul, 2000-Dec, 2011)

Time Period	Variable	Type	N	Mean	Standard Deviation	Min	Max
Before	lgTEI	Response	53	0.24173	3.03774	-5.09396	5.12983
	lgER	Predictor	53	4.67352	0.05110	4.56965	4.75445
After	lgTEI	Response	84	0.26653	3.01189	-5.09375	6.28165
	lgER	Predictor	84	4.71312	0.08117	4.57141	4.84812

Before the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.3221), which indicated this model was stationary. The model was VAR (1, 0) with AIC value of 2.1938 and SBC value of 2.3064. After the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.0859), which indicated this model was stationary. The model was VAR (1, 0) with AIC value of - 6.4356 and SBC value of - 6.2607. According to the results from Granger-Causality Wald test (Table 4.20.2), the real effective exchange rate elasticity were not Granger-causal with the textile export growth elasticity in China before ($\chi^2 = 0.66, p = 0.4156$) and after ($\chi^2 = 0.37, p = 0.5446$) the removal of the quota

system. Therefore, we accepted the null Hypotheses 3.2c-(1) and 3.2c-(2) and concluded exchange rate had no direct impact on textile export growth in China both before and after the removal of the quota system.

Table 4.20.2

Granger-Causality Wald test for textile export growth and exchange rate before and after the removal of the quota system in China

Time Period	Test	DF	Chi-Square	Pr > ChiSq
Before	Exchange rate	1	0.66	0.4156
After	Exchange rate	1	0.37	0.5446

Apparel export growth before and after the removal of the quota system in China. This section reports the results from hypothesis testing for the impact of exchange rate on apparel export growth before and after the removal of the quota system in China. There were 53 observations included in hypothesis testing for the first time period and 84 observations for the second time period. The results from descriptive statistics for response and predictor variables are shown in Table 4.21.1.

Table 4.21.1

Descriptive statistics for apparel export growth and exchange rate before and after the removal of quota system in China (Jul, 2000-Dec, 2011)

Time Period	Variable	Type	N	Mean	Standard Deviation	Min	Max
Before	lgTEI	Response	53	0.08583	3.00613	-6.15056	5.84031
	lgER	Predictor	53	4.67352	0.05110	4.56965	4.75445
After	lgTEI	Response	84	-0.09912	2.83319	-6.93076	7.72684
	lgER	Predictor	84	4.71312	0.08117	4.57141	4.84812

Before the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.6580), which indicated

this model was stationary. The model was VAR (2, 0) with AIC value of 2.2913 and SBC value of 2.4428. After the removal of the quota system, the full VAR error model had inverse roots of AR characteristic polynomial modulus less than 1 (0.3900), which indicated this model was stationary. The model was VAR (4, 0) with AIC value of 2.2268 and SBC value of 2.4055. According to the results from Granger-Causality Wald test (Table 4.21.2), the real effective exchange rate elasticity was not Granger-causal with the apparel export growth elasticity in China both before ($\chi^2 = 0.63, p = 0.4290$) and after ($\chi^2 = 0.00, p = 0.9768$) the removal of the quota system. Therefore, we accepted the null Hypotheses 3.3c-(1) and 3.3c-(2) and concluded exchange rate had no direct impact on apparel export growth in China both before and after the removal of the quota system.

Table 4.21.2

Granger-Causality Wald test for apparel export growth and exchange rate before and after the removal of the quota system in China

Time Period	Test	DF	Chi-Square	Pr > ChiSq
Before	Exchange rate	1	0.63	0.4290
After	Exchange rate	1	0.00	0.9768

In summary, labor cost only had a positive impact on textile and apparel export value and had no direct impact on export intensity and growth in the textile and apparel industries in Asian developing countries. Number of employees only had a negative impact on textile export intensity in Asian developing countries. Before the removal of the quota system, exchange rate had a positive impact on export intensity and a negative impact on export value, while had no direct impact on export growth in

the textiles and apparel industry sectors. After the removal of the quota system, exchange rate had no direct impact on all the three export performance measures in the textile and apparel industries. The results for hypothesis testing are summarized in Table 4.22:

Table 4.22

Summary of hypotheses testing results

		Textile Export			Apparel Export		
		Intensity	Value	Growth	Intensity	Value	Growth
Labor Costs		n.s	+	n.s	n.s.	+	n.s.
Number of Employees		-	n.s	n.s	n.s.	n.s.	n.s.
Exchange Rate	Sri Lanka	n.s.	n.s.	n.s.	/	/	/
	Malaysia	n.s.	n.s.	n.s.	/	/	/
	Before (Quota)	+	-	n.s.	+	-	n.s.
	After (Quota)	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

Note: + Positive relationship; – Negative relationship; n.s. Non-significant;
/ Not tested.

Determinants of Export Performance

This section comparatively analyzes the determinants of textiles and apparel export performance among Asian developing countries. The determinants include labor costs, manufacturing competence (number of facilities and number of employees), transportation services and logistics, exchange rates, and tariffs.

Labor cost

This section reports the minimum and average monthly wages of eleven Asian developing countries. The monthly wages for textile and apparel manufacturing industry are reported for China, India, Malaysia, and the Philippines, due to data availability. According to the results from hypotheses testing, labor costs only had a

direct impact on the textile and apparel export value. This section comparatively discusses the relationships between labor costs and export value.

Minimum and average wages. This section reports the minimum (Table 4.23) and average monthly wages (Table 4.24) for all the eleven Asian developing countries. Among these 11 Asian developing countries, China, Indonesia, Malaysia, the Philippines, and Thailand had minimum and average monthly wages much higher than the other countries. In other words, all the other countries had quite low minimum monthly wages ranging from $25.17 per month (India) to $41.67 per month (Cambodia) as well as low average monthly wages ranging from $55.87 per month (Cambodia) to $99.56 per month (India). Although China had high minimum and average monthly wages, its textile and apparel export values were much higher than all the other countries. Therefore, low labor costs were not the reason why buyers from developed countries imported textile and apparel products from China. However, for the other countries, the countries with higher labor costs did not performe well in textiles and apparel exports, compared to the countries with lower labor costs.

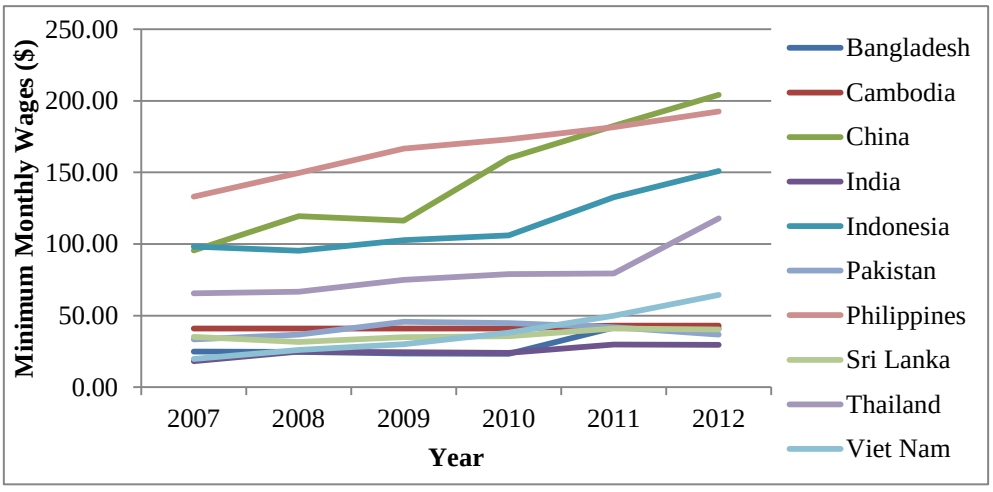

Figure 4.7. Minimum monthly wages for Asian developing countries ($ per month), 2007-2012.

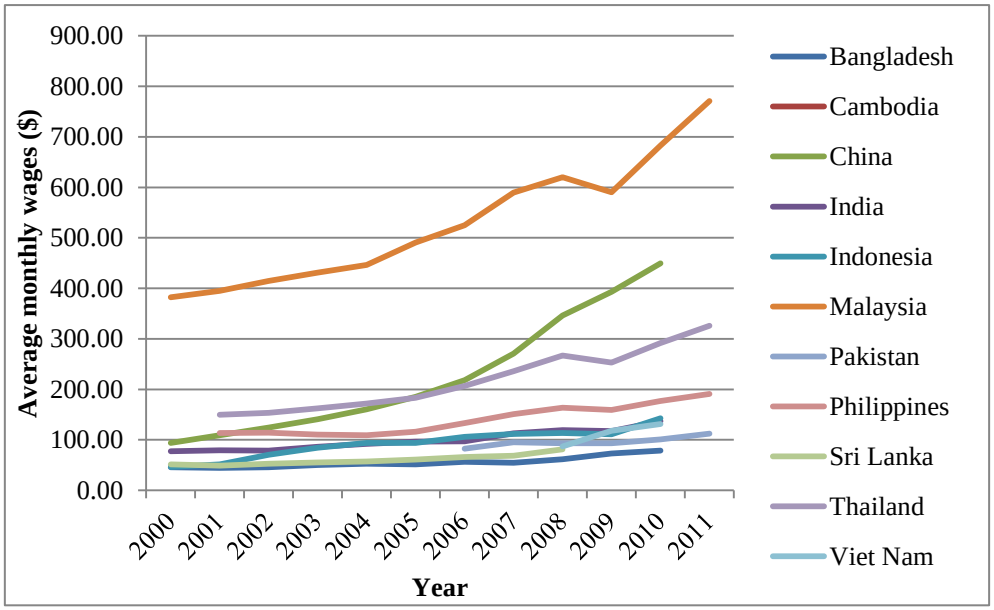

Figure 4.8. Average monthly wages for Asian developing countries ($ per month), 2000-2012.

Table 4.23

Minimum monthly wages for 11 Asian developing countries ($ per month)

	2007	2008	2009	2010	2011	2012	Mean	SD
Bangladesh	24.75	24.55	23.45	23.19	41.70	40.96	29.77	8.98
Cambodia	41.00	41.00	41.00	41.00	43.00	43.00	41.67	1.03
China	95.56	119.37	116.26	159.90	182.50	204.20	146.30	42.55
India	18.12	24.79	24.51	24.08	29.87	29.65	25.17	4.33
Indonesia	98.32	95.27	102.59	105.95	132.66	151.05	114.30	22.42
Malaysia	-	-	-	-	-	263.39	-	-
Pakistan	33.41	36.64	45.63	44.80	41.81	36.70	39.83	4.97
Philippines	133.00	149.68	166.68	173.20	181.64	192.52	166.12	21.70
Sri Lanka	35.08	31.63	34.93	35.57	40.90	40.18	36.38	3.52
Thailand	65.55	66.61	74.94	78.93	79.47	117.88	80.56	19.23
Viet Nam	19.69	26.05	30.07	38.01	49.86	64.47	38.03	16.63

Table 4.24

Average monthly wages for 11 Asian developing countries ($ per month)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean	SD
Bangladesh	45.81	44.47	45.84	50.16	52.43	51.27	56.80	54.87	61.63	72.80	78.44	-	55.87	11.08
Cambodia	-	-	-	-	44.52	-	-	71.59	-	76.02	-	-	64.04	17.05
China	93.95	109.08	124.57	140.64	160.29	185.11	218.00	270.85	346.50	393.35	449.82	-	226.56	122.22
India	77.67	79.67	79.01	86.22	92.19	96.40	97.15	113.26	119.18	117.20	137.17	-	99.56	19.60
Indonesia	46.31	51.50	70.42	84.21	94.22	94.15	105.96	111.47	113.50	111.12	142.51	-	93.22	28.64
Malaysia	382.55	394.97	414.66	431.16	446.10	490.66	524.91	589.44	620.00	589.99	682.64	770.97	528.17	123.66
Pakistan	58.52	-	57.60	-	70.02	-	82.85	94.97	93.50	93.46	101.22	112.52	84.96	19.19
Philippines	-	113.76	114.42	110.72	108.95	116.26	133.22	150.80	163.50	159.18	177.28	191.19	139.94	29.70
Sri Lanka	51.80	48.68	52.85	54.99	56.97	61.28	65.87	68.33	81.58	-	-	-	60.26	10.32
Thailand	-	149.78	153.72	162.71	171.77	183.53	207.06	236.11	267.18	253.21	291.94	325.84	218.44	60.31
Viet Nam	-	-	7.62	-	10.06	-	13.63	-	86.76	118.32	131.63	-	61.34	57.66

Wages in textile and apparel manufacturing industry. This section reports the monthly wages specified in the textile and apparel manufacturing industry in China, India, Malaysia, and the Philippines (Table 4.25). Among these four countries, Malaysia had the highest average monthly wages, while India had the lowest one. Similarly, although China had the second highest wages in textile and apparel manufacturing industry, its textile and apparel export values were still much higher than all the other countries. For the other three countries, their textile and apparel export values were inversely proportional to their average monthly wages in textile and apparel manufacturing industry. Therefore, we inferred that labor costs were still critical factors that influence Asian developing countries' textile and apparel export performance (except for China).

Table 4.25

Average monthly wages specified in textile and apparel manufacturing industry for China, India, Malaysia, and the Philippines ($ per month), (2001-2011)

	China		India		Malaysia		Philippines	
	Textiles	Apparel	Textiles	Apparel	Textiles	Apparel	Textiles	Apparel
2001	66.85	82.54	-	-	-	-	156.93	134.67
2002	72.60	89.22	17.17	14.32	-	-	-	-
2003	80.47	99.70	29.92	28.47	-	-	171.14	138.80
2004	90.08	112.67	29.22	27.24	-	-	-	-
2005	107.78	126.49	32.48	31.55	377.95	276.22	-	-
2006	125.06	148.42	98.28	93.58	366.65	287.92	-	-
2007	151.92	183.09	95.07	127.67	389.19	350.29	-	-
2008	194.51	222.69	127.01	119.58	422.99	341.54	262.94	199.34
2009	221.75	249.00	104.03	100.72	403.48	319.69	-	-
2010	266.70	289.40	114.26	100.77	500.55	363.16	276.08	216.92
2011	347.68	374.14	-	-	542.67	462.45	-	-

Manufacturing competence

This section reports the number of production facilities and number of employees for six Asian developing countries, including Cambodia, China, India, Indonesia, Malaysia, and the Philippines. According to the results from hypotheses testing, the number of employees only had a direct impact on textile export intensity. Therefore, this section comparatively discusses the relationships between manufacturing competence (number of production facilities and number of employees) and export intensity.

Number of production facilities. This section reports the number of production facilities for six Asian developing countries in textile and apparel manufacturing industry (apparel manufacturing industry for Cambodia) (Table 4.26). Among these six Asian developing countries, the number of production facilities has increased three times in China from 2000 to 2010 in both textile and apparel manufacturing industries and slightly increased in Cambodia in apparel manufacturing industry. The number of production facilities was fluctuant for Malaysia during the period 2000-2010. Indonesia had a stable number of production facilities in both textile and apparel manufacturing industries, while India was the same in the apparel manufacturing industry. The number of production facilities decreased for India in the textile manufacturing industry and for the Philippines in both textile and apparel manufacturing industries.

Table 4.26

Number of production facilities in textile and apparel manufacturing industry for 6 Asian developing countries, (2000-2010)

	Cambodia		China		Indian		Indonesia		Malaysia		The Philippines	
	T	A	T	A	T	A	T	A	T	A	T	A
2000	-	190	10968	7064	-	-	-	-	530	2682	-	-
2001	-	188	12065	8037	-	-	2037	2275	-	-	332	791
2002	-	-	13248	9061	-	-	1892	2028	-	-	-	690
2003	-	197	14863	9717	-	-	1847	1883	383	1617	299	700
2004	-	206	17144	10901	-	-	1892	1908	-	-	-	678
2005	-	-	22569	11865	16364	4167	1934	1922	253	342	-	674
2006	-	305	25345	13072	19246	4573	2809	3256	-	-	-	638
2007	-	288	27914	14770	12215	3646	2820	2917	-	-	-	311
2008	-	285	33133	18237	8389	2923	2355	2655	-	6289	-	371
2009	-	-	32412	18265	12809	4563	1949	2045	1481	3589	-	274
2010	-	247	33384	18547	-	-	-	-	-	-	185	360

Note: T Textile manufacturing industry. A Apparel manufacturing industry.

The number of production facilities for Cambodia and China displayed inverse developing trends to that for textile and apparel export intensity. These results indicated, although the textile and apparel manufacturing industries were progressing, they still had a lower developing speed compared to other industries with fewer contributions to exports. The trends in the number of production facilities for India, Indonesia, and the Philippines were consistent with those for textile and apparel export intensity, indicating the textile and apparel manufacturing industries in these countries have been declining. We concluded the number of production facilities influenced textile and apparel export intensity in different ways among Asian developing countries.

Number of employees. This section reports the number of employees for six Asian developing countries in the textiles and apparel manufacturing industry (apparel manufacturing industry only for Cambodia) (Table 4.27). China's number of

production facilities has increased two times from 2000 to 2010 in the textile manufacturing industry and four times in the apparel manufacturing industry from 2000 to 2010. The number of employees for Cambodia has increased three times from 2000 to 2010 in the apparel manufacturing industry. To the contrary, the number of employees for the other four countries has decreased from 2000 to 2010 in both textile and apparel manufacturing industries.

Table 4.27

Number of employees in textile and apparel manufacturing industry for 6 Asian developing countries, (2000-2010)

	Cambodia		China		India		Indonesia		Malaysia		Philippines	
	T	A	T	A	T	A	T	A	T	A	T	A
2000	-	122.6	3270	1200	-	-	-	-	46.1	77	-	-
2001	-	-	3010	1210	-	-	678.7	462.2	-	-	49.205	135.518
2002	-	210.4	2800	1300	-	-	-	-	-	-	-	-
2003	-	234	4991.6	2891.9	-	-	-	-	44.8	81.1	39.642	143.335
2004	-	245.6	5191.6	3202.6	-	-	545.507	444.904	-	-	-	-
2005	-	270	5909.6	3460.6	995	414	567.042	451.975	25.15	37.409	-	-
2006	-	317.1	6154.3	3775.7	1128	500	572.71	583.634	22.278	37.67	-	-
2007	-	348	6262.6	4141.9	942	418	558.766	523.118	23.494	34.592	-	-
2008	-	327.1	6520.6	4587	922	518	484.732	495.518	18.479	34.592	20.59	100.835
2009	-	-	6170.4	4493.1	630	243	366.441	384.101	16.605	30.785	-	-
2010	-	-	6473.2	4470	-	-	-	-	15.32	28.694	25.248	86.379

Note: T Textile manufacturing industry. A Apparel manufacturing industry.

Similar to the results from hypotheses testing, the number of employees for Cambodia and China displayed inversed developing trends to those for textile and apparel export intensity. The results indicated although the textile and apparel manufacturing industries were progressing, they still had a lower developing speed compared to other industries with less contribution to exports. The trends in the number of employees for India, Indonesia, Malaysia, and the Philippines were consistent with those for textile and apparel export intensity, indicating the textile and

apparel manufacturing industries in these countries have been declining. We concluded the number of employees influenced textile and apparel export intensity in different ways among Asian developing countries.

Transportation services and logistics

This section reports the results of lead time and logistics performance for 11 Asian developing countries in 2007 and 2010. This section first discusses the relationships between lead time and export performance and then the relationship between logistics performance and export performance. Since export value is the measurement that can directly reflect a country's export performance, this section uses export value to represent export performance.

Lead time. This section reports the median time (the value of 50 percent of the shipments) from shipment point to port of loading for 11 Asian developing countries in international trade) (Table 4.28). All the countries' lead time decreased from 2007 to 2010 except China. The differences in lead time among all 11 Asian developing countries were slightly, ranging from 1.9 days (Sri Lanka) to 4 days (India) in 2007 and from 1.3 days (Sri Lanka) to 2.8 days (China) in 2010. The countries with excellent textile and apparel export performance did not rank in the top among Asian developing countries. We inferred when the differences in lead time were slight, lead time would not influence buyers' decision and a country's export performance in Asian developing countries.

Table 4.28

Lead time for 11 Asian developing countries, (2007 and 2010)

	2007		2010	
	days	Rank	days	Rank
Bangladesh	2.3	2	1.4	3
Cambodia	2.7	6	1.3	1
China	2.6	5	2.8	11
India	4	11	2.3	8
Indonesia	2.5	4	2.1	7
Malaysia	3.4	8	2.6	10
Pakistan	3.2	10	2.3	8
Philippines	2.3	2	1.8	6
Sri Lanka	1.9	1	1.3	1
Thailand	3.4	8	1.6	5
Viet Nam	2.8	7	1.4	3

Logistics performance. This section reports the logistics performance for 11 Asian developing countries in international trade (Table 4.29). Five Asian developing countries' logistics performance indexes increased from 2007 to 2010, including Bangladesh, China, India, the Philippines, and Vietnam. The indices of frequency with which shipments reach consignee within scheduled or expected time kept a higher level than the other indices, indicating Asian developing countries were able to meet the most important requirement for logistics in textiles and apparel international trade. Among all the Asian developing countries, China, India, Malaysia, and Thailand had better logistics performances than the other countries. At the same time, China, India, and Thailand had excellent export performances in textile and apparel international trade. We concluded, compared with lead time, logistics performance had a closer relationship with textile and apparel export performance. Better logistics performance could be a country's comparative advantage and improve its textile and apparel export performance.

Table 4.29

Logistics performance for 11Asian developing countries, (2007 and 2010) (1=low, 5=high)

	Year	Bangladesh	Cambodia	China	India	Indonesia	Malaysia	Pakistan	Philippines	Sri Lanka	Thailand	Vietnam
Overall	2007	2.47	2.5	3.32	3.07	3.01	3.48	2.62	2.69	2.4	3.31	2.89
	2010	2.74	2.37	3.49	3.12	2.76	3.44	2.53	3.14	2.29	3.29	2.96
Ability to track and trace consignments	2007	2.46	2.53	3.37	3.03	3.3	3.51	2.57	2.65	2.58	3.25	2.9
	2010	2.64	2.5	3.55	3.14	2.77	3.32	2.64	3.29	2.23	3.41	3.1
Competence and quality of logistics services	2007	2.33	2.47	3.4	3.27	2.9	3.4	2.71	2.65	2.45	3.31	2.8
	2010	2.44	2.29	3.49	3.16	2.47	3.34	2.28	2.95	2.09	3.16	2.89
Ease of arranging competitively priced shipments	2007	2.46	2.47	3.31	3.08	3.05	3.36	2.72	2.77	2.31	3.24	3
	2010	2.99	2.19	3.31	3.13	2.82	3.5	2.91	3.4	2.48	3.27	3.04
Efficiency of customs clearance process	2007	2	2.19	2.99	2.69	2.73	3.36	2.41	2.64	2.25	3.03	2.89
	2010	2.33	2.28	3.16	2.7	2.43	3.11	2.05	2.67	1.96	3.02	2.68
Frequency with which shipments reach consignee within scheduled or expected time	2007	3.33	3.05	3.68	3.47	3.28	3.95	2.93	3.14	2.69	3.91	3.22
	2010	3.46	2.84	3.91	3.61	3.46	3.86	3.08	3.83	2.98	3.73	3.44
Quality of trade and transport-related infrastructure	2007	2.29	2.3	3.2	2.9	2.83	3.33	2.37	2.26	2.13	3.16	2.5
	2010	2.49	2.12	3.54	2.91	2.54	3.5	2.08	2.57	1.88	3.16	2.56

Exchange rate.

This section reports the exchange rate for 11 Asian developing countries during the period 2000-2011. According to the results from hypotheses testing, exchange only had a direct impact on textile and apparel export intensity and value before the removal of quota system. Therefore, this section discusses the relationships between exchange rate, export intensity, and export value before the removal of quota system.

Among 11 Asian developing countries, the exchange rates for Bangladesh, Cambodia, India, Indonesia, Pakistan, Sri Lanka, and Vietnam devalued, while for China, Malaysia, the Philippines, and Thailand were appreciated during the period 2000-2011. According to the results from hypotheses testing, the exchange rate had positive impact on textile and apparel export intensity in China, which meant the exchange rate devaluation should be responsible for the growth of textile and apparel export intensity. Similarly, the exchange rate had a negative impact on textile and apparel export value in China, which indicated the exchange rate devaluation would reduce textile and apparel export value. Among the countries with an exchange rate devaluation, the exchange rate devaluation resulted in the decrease of textile and apparel export intensity as well as an increase in textile and apparel export value. The exception for this case was the exchange rate devaluation in Bangladesh and Vietnam led to the increase of apparel export intensity. Among the countries with exchange rate appreciation, the relationships between exchange rate, textile and apparel export intensity, and value for Malaysia and Thailand were consistent with those for China.

Table 4.30

Exchange rate for 11 Asian developing countries (National currency per US dollar), (2000-2011)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bangladesh	52.17	55.97	57.52	58.33	59.33	64.23	68.77	68.87	68.58	69.03	69.61	74.06
Cambodia	3840.75	3916.33	3912.08	3973.33	4016.25	4092.50	4103.25	4056.17	4054.17	4139.33	4184.92	4058.50
China	8.28	8.28	8.28	8.28	8.28	8.19	7.97	7.61	6.95	6.83	6.77	6.47
India	44.94	47.18	48.57	46.57	45.26	44.06	45.27	41.35	43.52	48.42	45.73	46.67
Indonesia	8403.58	10256.46	9318.95	8573.73	8937.57	9709.45	9165.76	9141.34	9660.15	10385.65	9083.18	8765.56
Malaysia	3.80	3.80	3.80	3.80	3.80	3.79	3.67	3.44	3.33	3.52	3.22	3.06
Pakistan	53.94	61.74	59.59	57.74	58.39	59.60	60.29	60.73	70.72	81.70	85.19	86.34
Philippines	44.26	50.97	51.61	54.21	56.05	55.05	51.28	46.12	44.50	47.64	45.10	43.31
Sri Lanka	76.84	89.50	95.68	96.52	101.19	100.45	103.97	110.59	108.35	114.96	113.05	110.56
Thailand	40.19	44.49	43.01	41.54	40.26	40.26	37.91	34.24	33.36	34.34	31.73	30.49
Vietnam	14166.81	14798.88	15267.26	15509.53	15740.15	15854.42	15990.66	16083.51	16448.92	17799.75	19137.14	20657.25

The exception for this case was the Philippines, since its exchange rate appreciation caused a decrease in textile and apparel export value. Therefore, we concluded the exchange rate influences textile and apparel export performance among Asian developing countries in different ways.

Tariffs.

This section reports the average MFN applied tariff rates for 11 Asian developing countries during the period 2000-2011. This section discusses the relationships between tariffs and export performance among these Asian developing countries.

Among 11 Asian developing countries, India had the highest tariff rate before the removal of the quota system in 2005, while Bangladesh had the second highest tariff rate among 11 Asian developing countries. The average MFN applied tariff rates for most of countries have been decreasing during the period 2000-2011. The tariff rates for Cambodia, China, India, and Vietnam have decreased over 50% from 2000 to 2011, and at the same time, these countries had a sharp increase in textiles and apparel export values. The countries with a small decreasing rate in tariff usually had a slow increase in textile and apparel export values. The tariff rate for Bangladesh, Pakistan, and Thailand has been decreasing during the beginning and the middle of the research period and then started to increase by the end of the research period. During the period the tariff decreased, each plunge in tariff rates was accompanied by an increase in textile and apparel export value. Therefore, we concluded tariff rate had

a negative impact on textile and apparel export performance in Asian developing countries.

Table 4.31

Average MFN applied tariff rates for 11 Asian developing countries (unweighted in %), (2000-2011)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	%
Bangladesh	22.2	21	21	19.5	18.2	15.5	15.5	14.5	14.8	20.5	20.5	20.5	-7.7
Cambodia	17	16.7	16.3	16.3	15.6	14.1	-	12.5	12.4	-	12.8	7.8	-54.1
China	16.4	15.4	12.3	10.7	9.8	9.2	8.9	8.8	8.6	8.1	7.9	7.9	-51.8
India	32.7	30.9	28.4	-	28.4	16	14.5	14	9.7	10.1	9.6	9.9	-69.7
Indonesia	7.8	6.1	6.4	6	6.1	6	6	5.8	-	5.2	4.7	5.2	-33.3
Malaysia	8	7.5	7.5	7.4	-	7.5	6.3	5.9	5.6	5.3	5.4	5.4	-32.5
Pakistan	23.6	20.2	17.2	16.8	16.2	14.6	14.8	14.9	14	14.7	14	14	-40.7
Philippines	7.2	6.9	5.3	4.5	5.3	5.4	5.4	5	5.4	5.3	5.3	5.3	-26.4
Sri Lanka	9.3	8.9	8.9	8.7	9.9	11.3	11	10.7	-	10.1	9.3	8.4	-9.7
Thailand	16.8	14.8	-	13.8	-	10.7	11	10.3	10.6	10.8	17.7	17.1	1.8
Vietnam	15.1	15.2	14.2	13.7	13.9	13	11.9	11.7	8	-	7.1	-	-53

CHAPTER 5: SUMMARY AND CONCLUSIONS

This chapter includes a summary of the research results and provides interpretations of the findings. Conclusions, implications, limitations, and recommendations for future research are discussed.

Results Summary and Discussion

Since the end of the 20th century, considering the low costs in Asian developing countries, textile and apparel retailers from developed countries have started to source globally instead of manufacturing products domestically to reduce costs and become more competitive in textile and apparel markets (Allen, 2008; Gibbon & Thomsen, 2005). However, since global sourcing has extended organizations' supply chains on a worldwide scale (Zeng & Rossetti, 2003), other factors, such as suppliers' capability lead time, logistics service, and trade barriers, should also be seriously considered. Therefore, it is important for buyers to determine the comparative advantages of supplier countries, and suppliers to understand the determinants of their export performance to become more competitive in international trade.

The purpose of this study was to understand the developing trends and determinants of Asian developing countries' textile and apparel export performances over the twelve years (2000-2011). The main analysis was conducted in three stages: (1) analyzing the textile and apparel export performance among 11 Asian developing countries, (2) testing the hypothesized relationships between determinants and textile

and apparel export performance using a vector autoregressive (VAR) errors model approach, and (3) comparing the impact of determinants on textile and apparel export performance.

Export performance

Export intensity, export value, and export growth were used to measure textile and apparel export performance among Asian developing countries. First, the textile and apparel industry was a pillar industry in some countries (e.g., Pakistan), but at the same time, contributed little to total exports in other countries (e.g., Malaysia and the Philippines). This finding implies the importance of the textile and apparel industry is different in international trade among Asian developing countries. In addition, almost all textile and apparel export intensity in all the Asian developing counties has been decreasing, which implies textile and apparel manufacturing industry is a sunset industry in Asian developing countries.

Second, Asian developing countries had increased trends in textile and apparel exports, especially after the removal of the quota system in 2005. This finding verifies China's textile and apparel export values were significantly higher than all the other Asian developing countries, indicating China still has comparative advantages in the textile and apparel international trade. This finding is opposite to Ishtiaque's (2005) conclusion, which believes China may lose its leader position in textile and apparel product exports, due to increasing labor costs. In addition, the economic crisis had a negative impact on textile and apparel export performance. This finding shows textile

and apparel export performance can be influenced by economic levels, immediate and short term impacts.

In addition, the textile and apparel export growth rates were different among the Asian developing countries. The removal of the quota system in 2005 accelerated the growth of the textile exports for some countries, but decelerated this for others. This finding verifies elimination of the quota system influence on Asian developing countries comparative advantages and leads to global textile and apparel industry under reconstruction. This results is consistent with that was determined by Dutta (2008) and Tewari (2008).

Hypothesis testing

The vector autoregressive (VAR) error model was applied for estimating the parameters and testing the hypotheses (See Table 4.22) proposed in this study, using the SAS 9.3 software and the VARMAX procedure. The structural model solution revealed labor costs only had a significant impact on textile and apparel export values (H1b-(1) and H1b-(2)) and the number of employees only significantly influenced the textile export intensity (H2a-(1)). In addition, the exchange rate had a significant impact on export intensity (H3.2a-(1) and 3.3a-(1)) and value (3.2b-(1) and 3.3b-(1)) in both textile and apparel industry sectors before the elimination of the quota system. The other relationships were not statistically significant.

The results showed labor costs had a significant positive impact on textile and apparel export value (H1b-(1) and H2b-(2)). This suggests low labor costs are no longer the crucial reason for buyers to choose supplier country. Buyers from

developed countries have become concerned with the social responsibility to build a healthy brand image. Buyers from developed countries still select suppliers from Asian developing countries, due to much higher labor costs in developed countries. However, which Asian developing country selected does not solely depend upon the labor costs. This implies low labor costs may be comparative advantages for Asian developing countries to attract buyer sourcing in Asian, but for a specific Asian developing country, low labor costs will not be the most crucial comparative advantage. This is contrary to previous research that indicates labor costs are the most important factor to determine textiles and apparel export performance in a specific country (e.g., Abraham & Sasikumar, 2011; Kaplinsky & Morris, 2008; Zhang & Hathcote, 2008).

The number of employees only had a negative relationship with textile export intensity (H2a-(1)). A possible explanation for this result is the textile manufacturing industry in a sunset industry in most of the Asian developing countries. As the number of employees in the textile manufacturing industry increases, they still contribute less and less to the total exports for a specific country. In addition, the number of employees had no statistically significant relationship between export value and export growth, indicating the number of employees is not a determinant of textile and apparel export performance. This is opposite that a country, which is relatively facilities- and labor-abundant, has a comparative advantage in producing the commodity and usually has excellent export performance (Czinkota, Ronkainen, & Moffett, 1999).

The exchange rate had a significant positive relationship with textile and apparel export intensity and a negative relationship with textile and apparel export value before the elimination of the quota system. First, this finding implies the elimination of the quota system influences the relationship between the exchange rate and export performance. Before removal of the quota system, the exchange rate has a direct impact on textile and apparel export performance. However, after the elimination of the quota system, the exchange rate has a limited impact on textile and apparel export performance. Second, the devaluation of the currency exchange rate will improve the textile and apparel's contribution to a country's total exports. This implies the devaluation of currency can bring more benefits to textile and apparel exports compared to other commodities. This conclusion supports the general consensus that exchange rate depreciation raises the profitability of export supply (Edwards & Alves, 2006). In addition, the exchange rate was positive related to the textile and apparel export value before the elimination of the quota system. This implies the devaluation of the currency exchange rate is one of the factors that should be responsible for the increase of textile and apparel values. This finding confirms the increase of the exchange rate shrinks income and then income's effect will lead exporters to export even more to avoid the utility depression effect of a large reduction in their export earnings (Kasman & Kasman, 2005).

Determinants of export performance

Determinants of textile and apparel export performance included labor costs, number of production facilities, number of employees, lead time, logistics

performance, exchange rates, tariffs, and quotas. A case study was employed in this study to explore the similarities and differences in the determinants of export performance among Asian developing countries.

The results indicated labor costs influenced textile and apparel export performance in different ways among Asian developing countries. Generally speaking, the Asian developing countries with higher labor costs are usually accompanied with poorer export performance. This supports the opinions that low labor costs affect buyers' decisions and influence the national textile and apparel industry's competitiveness and export performance (Abernathy, Abernathy, & Weil, 2006). However, there still are some countries, for example, China, with higher labor costs have excellent export performance. A possible explanation is the other comparative advantages, like high product quality and excellent logistics services, can make up the disadvantage of higher labor costs. Similarly, the number of production facilities and the number of employees influenced textile and apparel export intensity in different ways among Asian developing countries.

Lead time and logistics performance are other critical factors that influenced export performance. Since differences in lead time among Asian developing countries were slight, lead time did not influence textile and apparel export performance significantly among Asian developing countries. In fact, among Asian developing countries, logistics performance had a closer relationship with textile and apparel export performance. This finding supports the opinions that a country's logistics and

transportation services have a significant impact on the country's comparative advantage and export performance in a global economy (World Bank, 2009a).

Among Asian developing countries, the currency exchange rates had different developing trends. The countries with currency exchange rates devaluation usually had a decrease in textile and apparel export intensity and an increase in textiles and apparel value. This demonstrates the currency exchange rate depreciation raises the profitability of export supply and improves a country's comparative advantage as well as export performance (Edwards & Alves, 2006; Kaplinsky & Morris, 2008). However, among the countries with currency exchange rate appreciation, this appreciation caused an increase in textile and apparel export value, which is consistent with the opinion that an increase in the exchange rate shrinks income and then income's effect will lead exporters to export even more to avoid the utility depression effect of a large reduction in their export earnings (Kasman & Kasman, 2005). Therefore, we conclude currency exchange rate had a different impact on textile and apparel export performances among Asian developing countries.

Tariffs had a negative impact on textile and apparel export performance in Asian developing countries, especially after the elimination of the quota system. The reduction in tariffs will improve export performance since they raise the price received by exporters (Edwards & Alves, 2006). The tariffs influence textile and apparel export performance among Asian developing countries in the same way. Another trade barrier, quota, has been the largest single expense in the total costs of ownership of imported textiles and apparel products (Christerson, 1994). The

elimination of the quota system in 2005 significantly improved some Asian developing countries' textile and apparel export performances. However, the other countries' textile and apparel industry started to lose comparative advantages and had poorer export performances. A possible explanation for this phenomenon is the withdrawal of the quota system, which only contributes to nations' competitiveness in the global trade for most large, labor surplus export countries, such as China and India (Abraham & Sasikumar, 2011; Zhang & Hathcote, 2008).

Theoretical Contributions

The present study contributes to the determinants of textile and apparel export performance in Asian developing countries. A number of studies have explore the determinants of export performance in other industries or utilized data collected almost ten years ago (e.g., Abraham & Sasikumar, 2011; Zhang & Hathcote, 2008). Few studies have focused on the determinants of textile and apparel export performance in recent years, especially after elimination of the quota system. This study fills several gaps in the literature and theoretically and empirically investigated the determinants of textile and apparel export performance in Asian developing countries. The findings support the conclusions from some previous research and are contrary to others. This study made an important step towards understanding the determinants of textile and apparel export performance, and aids in building a research model of determinants for textile and apparel export performance in Asian developing countries.

The theory of comparative advantage and global value chain framework assume labor costs, manufacturing competence, and transportation services and logistics to determine the price of products and eventually export performance, in general (Gereffi & Memedovic, 2003; Krugman & Obstfeld, 1999). This study successfully examined the impact of the above determinants on export performance in the textile and apparel industry. First, the statistical results and case study suggest low labor costs had a positive impact on textile and apparel export performance in some Asian developing countries, while they had a negative impact on others. This indicates low labor costs are comparative advantages for some countries, but not for others. Similarly, manufacturing competence also influences textile and apparel export performance in different ways among Asian developing countries. Therefore, the insight gained from this study implies in the textile and apparel industry, the determinants of export performance may differ from country-to-country and research focusing on comparative analysis should take into account country differences. Second, the results from this study indicate when the differences in lead time are slight among supplier countries, lead time is not a determinant for export performance in the textile and apparel industry. Instead, logistic performance determines textile and apparel export performance among supplier countries geographical close to each other.

In addition, the existing export performance determinants literature believes the determinants of export performance also include exchange rates, tariffs, and quota. Previous research did not reach a consensus on the impact of exchange rates on export

performance. This study offers empirical evidence of the impact of exchange rates on export performance in the textile and apparel industry and explains why there exists some disagreement. According to the results from this study, the impacts of exchange rates on export performance in textile and apparel industry are different between countries with currency exchange rate devaluation and those with currency exchange rate appreciation. Second, this study successfully explored the impact of tariffs on export performance in the textile and apparel industry. The findings of this study indicate tariffs have a significantly negative impact on textile and apparel export performance, similar to those in other industries, especially after elimination of the quota system. Finally, this study also enhances an understanding of the impact of the economic level on textiles and apparel export performance. Consequently, the accomplishment of this study represents an in-depth cross-country analysis of the determinants of export performance in the textile and apparel industry among Asian developing countries.

Practical Implications

A number of practical implications both for supplier countries and global sourcing managers is derived from this study. This study clearly reports the impact of determinants on the textile and apparel export performance among Asian developing countries. From the perspective of a supplier country, Asian developing countries should thoroughly understand the determinants of export performance to enhance their competitiveness. First, low labor cost is no longer a crucial factor for an excellent textile and apparel export performance. Therefore, suppliers from Asian

developing countries should enhance their comparative advantages by more effective approaches, such as improving product quality or production efficiency instead of by paying employers low wages. In addition, logistics performance is another crucial determinant for textile and apparel export performance among Asian developing countries. To enhance their comparative advantages, suppliers should focus on a high level of logistic services to become more attractive and competitive in the international trade. Finally, since trade-related factors are determinants of textile and apparel export performance, suppliers are recommended to thoroughly understand trade regulations and policies and adjust their business strategies to anticipate the future as it emerges.

From the perspective of buyers, comprehensively considering the determinants of textile and apparel export performance is helpful to make global sourcing strategy. First, low labor costs should not be the primary factor to determine the supplier country. According to the results from this study, countries with higher labor costs, such as China, still have excellent textile and apparel export performance. In fact, a growing concern in social responsibility forces buyers from developed countries to abandon sweatshops in Asian developing countries to avoid damaging their brand image. In addition, given logistic services as an important determinant of textile and apparel export performance, buyers are recommended to choose suppliers who can provide a higher level of logistic service to save buyers' financial and human resources. Finally, since exchange rates, tariffs, and quotas are also crucial determinants for textile and apparel export performance, buyers from developed

countries should not only consider the direct costs, such as labor costs and transportation costs, but carefully consider some indirect costs brought by trade barriers to reduce the total ownership costs. A helpful strategy can only be made after comprehensively consider both direct and indirect costs.

Limitations and Future Studies

The study has several limitations. First, the present study was conducted using secondary data collected from each country's available industry and government databases. A particular concern was accuracy of data sets, since the data collection process cannot be fully controlled by the researcher. The outcomes from this study were influenced by the precision of secondary data sets currently available. Second, some data sets were missing for certain measurements in specific years so the analysis was not based on complete data sets. Therefore, it is unknown whether there were some special or unexpected events that may have influenced the results of this study. Third, hypothesis testing was based on data sets collected from three Asian developing countries with complete data. This choice was made because monthly data sets were required to conduct a time series analysis.

The findings from this study serve as a platform for future research regarding the determinants of textile and apparel export performance in Asian developing countries. First, this study only statistically examined the impact of labor costs, number of employees, and exchange on textile and apparel export performance. Future research can test the impact of other determinants on textile and apparel export performance. Second, this study used secondary data sets to explore the determinants

of textile and apparel export performance. Future research can collect primary data from the perspective of suppliers or buyers to analyze the determinants of textile and apparel export performance subjectively. Finally, future research is encouraged to investigate effective strategies to improve textile and apparel export performance, based on the understanding of determinants of export performance.

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