Journal of Global Business and Trade

Vol.11 No.1 May 2015

The Journal of Global Business and Trade IAGBT

International Academy of Global Business and Trade

Journal of Global Business & Trade

Vol.11 No.1 May 2015

IAGBT

ISSN : 1946-5130

Journal of Global Business and Trade

Vol.11 No.1 May 2015

Published by
International Academy of Global Business and Trade

The Journal of Global Business and Trade IAGBT
www.ipfw.edu/jgbt

ISSN 1946-5130
http://dx.doi.org/10.20294/jgbt.2015.11.1.1

Journal of Global Business and Trade

www.ipfw.edu/jgbt

Enhancing Brand Equity in an Emerging Market: An Investigation of Korean Fashion Brands in China

Han-Mo Oh *

Department of International Trade, Chonbuk National University, South Korea

Received 17 March 2015 Revised 26 April 2015 Accepted 20 May 2015

ABSTRACT

Although international firms often face challenges as competition for world markets intensifies and as market preferences become global, diverse opportunities appear to be prevalent for international marketers of consumer products and services in emerging economies such as China. In addition to the economic resurgence and future promise, the political and cultural environments in China have provided Korean firms with an opportunity to do business in the country. While some Korean fashion brands have had a strong performance in the Chinese market, other brands have not. Nevertheless, prior studies do not satisfactorily address the reasons that some Korean fashion brands are successful and popular in China. The present study aims to investigate Korean fashion brands' current positions in the Chinese market and to propose useful strategies that enable Korean fashion firms to be more competitive in China. Based on the perspective of brand-equity dimensions, the current study proposes strategies that allow international firms to enhance their brand equity in an emerging economy.

***Keywords**:* brand equity, brand position, emerging market, fashion brands, international marketing
JEL Classifications: F23, M16, M31

I. Introduction

Marketing managers often face challenges as competition for world markets intensifies and as market preferences become global. Still, diverse opportunities appear to be prevalent for international marketers of consumer products and services in emerging economies such as China because new consumers are springing up (Jain, 2006). In particular, China has led all world economies with gross domestic product (GDP) growth rates of more than five percent in recent years (Vietor, 2007). Because of this rapid growth, China is currently the third-largest economy in purchasing power parity (Wilson & Purushothaman, 2003). Some forecasts suggest that by 2020, China will surpass Japan in terms of GDP and purchasing power parity and that by 2050, China will be the leading economy of the world, followed by the United States and India (Hawksworth, 2006). China's remarkable economic resurgence and future promise have made many firms enter this country's market (Wilson & Purushothaman, 2003).

In addition to the economic resurgence and future promise, the political and cultural environments in

*E-mail address: ice1004@jbnu.ac.kr

China have provided Korean firms—specifically fashion firms—with an opportunity to do business in the country. Since China established diplomatic relations with Korea in 1992 and singed a cultural agreement in 1994, the two countries have made much progress in the cultural, educational and academic sectors. In 1996, *Shunsegae* from Korea opened in Shanghai's Pudong New Area to sell products of more than 20 varities and thereby attracted a lot of attention for Korean fashion brands from Chinese consumers. Later, the Korean government achieved success by utilizing the strategies for culture-orientated national development. As a result, the tornado of the Korean wave swept across Asian countries. In effect, many Korean fashion brands entered the Chinese market; exquisite Korean costumes in department stores and franchised stores are often favored by white-collar ladies and their prices, therefore, are almost equal to those of international famous brands.

Despite the changes in the Chinese market, it is not necessarily the case that the market entry led these firms to survival and success in the country. Perhaps the survival and success of the firms that compete in China depend heavily on how they manipulate their resources. Among these resources, brand can be a key marketing resource not only because brand equity manifests a firm's relationship with consumers but also because trademark laws prevent rivals from stealing the value of a firm's investment in developing a brand's equity (Hunt & Morgan, 1995). Thus, to survive and succeed in an emerging market, specifically in China, firms should acquire, develop, nurture, and leverage an effectiveness-enhancing portfolio of brands (Hunt, 2010).

Nonetheless, previous studies do not satisfactorily address how successfully Korean fashion brands compete in in China. Against this background, the present study first aims to investigate Korean fashion brands' current positions in China. Second, this study attempts to suggest how Korean fashion firms can enhance their brand-equity in the Chinese market.

The current study is organized as follows. In the next section, a conceptual framework of brand-equity dimensions is shown. This paper then presents an analysis of fashion brands' positions in the Chinese market by focusing on Korean fashion brands. After this, the paper expounds strategies for Korean fashion firms to enhance their brand-equity. Finally, this paper concludes with implications for practice.

Ⅱ. Conceptualization of Brand-Equity Dimensions

A brand is defined as the use of a name, term, sign, symbol, and/or design intended to identify the market offerings of one seller and to differentiate them from those of the seller's competitors (Aaker, 1991). Brand-equity refers to the differential effect of brand knowledge on consumer response to the marketing of that brand (Keller, 1993). The rationale of brand-equity strategy is that firms need to obtain, develop, cultivate, and leverage an effectiveness-enhancing portfolio of brands (Hunt, 2010). This chapter articulates the typical sources of a fashion brand's equity including brand loyalty, brand name awareness, quality perception, and brand associations.

2.1. Fashion Brand Loyalty

Fashion brand loyalty is where a person buys products from the same brand repeatedly rather than from other brands (Keller, 2013). In marketing, brand loyalty consists of a consumer's commitment to repurchase or otherwise continue using the brand. This can be demonstrated by the repeated buying of a product or service or other positive behavior such as the word-of-mouth effect (Boulding, Kalra, Staelin, & Zeithaml, 1993). Brand loyalty includes consumers who become habitual buyers, satisfied buyers, emotional buyers and/or loyal buyers (Mowen & Minor, 2006). Brand loyalty is not just repurchasing. Consumers may repurchase a brand due to conditionality of a situation or lack of viable alternatives (Jones, Mothersbaugh, & Beatty, 2002). Nonetheless, the real brand loyalty refers to consumers' high relative attitude toward the brand expressed

through repurchase behavior. Fashion brand loyalty can be a great asset to the firm; consumers are willing to pay higher prices or less for the particular brand and bring new consumers to the firm (Reichheld, 1993).

Developing fashion brand loyalty is increasingly important in low-profit generation. The objective of a brand is not merely making profit but also creating brand value (Guest, 1964). High brand loyalty represents that each user can become a living advertisement. In this regard, it would naturally attract new consumers (Dick & Basu, 1994). A fashion firm with high brand loyalty and sales means a relatively active position in the negotiation channel. Furthermore, the firm would operate more smoothly than others while expanding access to products and easier access to favorable trade terms. Building brand loyalty is a principle for enhancing brand-equity.

2.2. Fashion Brand Name Awareness

A brand's name encompasses the years of advertising, goodwill, the evaluation of the product's quality, the experience in the product, and other beneficial attributes that the target market associates with the market offering (Kang, 2011; Lee & Ang, 2003). A brand's image is located at the core of business identity and strategy (Choi & Kim, 2011; Strizhakova, Coulter, & Price, 2008). In effect, global brands, such as Kodak, Sony, Coca-Cola, McDonald's, and Toyota play an important role for firms in invading foreign markets.

A fashion brand's name awareness is the scope of which a fashion brand is recognized by potential consumers and associated with a particular fashion product. Brand awareness is related to the functions of brand identities in the perception and memory of consumers. A fashion brand's name awareness can be reflected in the way consumers can identify the brand under various conditions (Keller, 1993). Brand awareness includes brand recognition and brand development and protection. Brand recognition refers to the ability of consumers to correctly differentiate the brand; consumers can respond to a certain brand after viewing its brand images or visual packaging (Percy & Rossiter, 1992). Brand development and protection refers to the ability of consumers to do accurate formation and retrieval of a brand in their memory (Keller, 2013). Consumers' reaction to a brand could lead to awareness while the attitudes can influence such awareness.

Building and maintaining brand awareness is very important for a fashion firm in enhancing its brand equity. Brand awareness is the most important among marketing methods. In developed markets, brand awareness has displaced product awareness as a principal element for selecting the market (Keller, 2003). Only by long-term effort and ensuring quality and value can a brand product that is widely popular with consumers be created. Strong fashion brand awareness can pull the product's price up and increase demand for it. In addition, strong brand awareness is helpful in increasing the benefits of economic scale (Kotler & Keller, 2015).

2.3. Quality Perception

Quality perception is a critical element for consumer decision-making. It can be defined as a consumer's perception of the overall quality or superiority of a market offering in terms of its intended purpose, relative to alternatives (Boulding, Kalra, Staelin, & Zeithaml, 1993). Quality perception reflects the evaluation of product functions, features and reliability from consumers. Perceived quality is directly related to the reputation of the company that manufactures the product (Mowen & Minor, 2006). Consumers may look on branding as an aspect of products or services, as it often serves to denote a certain attractive quality or characteristic. They frequently judge the quality of a market offering on the basic of a variety of information that they associate with the offering (Yee & San, 2011).

Perceived quality is necessarily objectively determined in part because it is a perception and because judgments about what is important to the consumers involved. Thus, the perceived quality of a fashion product is an intangible, overall feeling about a brand. From another point of view, extrinsic attributes

are clues that surface in products such as brand name, brand image, price of product, the country of origin among others. Perceived quality has a direct impact on consumer purchase decision and brand loyalty, particularly during the time consumers have little or no information on the products that they are going to purchase (Aaker, 1991).

2.4. Brand Association

Brand association is the connection made in the minds of consumers between a given product or service and the category it is classified in (Moore & Lehmann, 1982). Brand association is anything which is deep-seated in the consumer's mind about the brand (Keller, 2013). Brand should be associated with something positive so that consumers relate a brand to being positive. Brand associations are the attributes of brand which come into a consumer's mind when the brand is talked about. It is related with the implicit and explicit meanings which a consumer relates/associates with a specific brand name. Brand association can also be defined as the degree to which a specific product/service is recognized within its product/service class/category (Keller, 2013). When a firm chooses a brand name, the name should reinforce an important attribute or benefit association that forms its product positioning. At its strongest, brand association will lead people to ask for something by brand instead of the generic name for products in that category.

In addition to building up associations with particular product categories, brand association also involves associating products with particular attributes. When members of the public want things in specific categories with particular attributes, the goal is to have the brand come to mind rather than to have a consumer look for a generic product (Keller, 2013).

Ⅲ. Analysis of Brand Positions

Brand position refers to a distinctive place in the minds of the target market (Ries & Troug, 2000). A good brand position helps clarify the brand's essence, identify the goals the brand help the consumer can achieve, and show how the brand does so in a unique way (Keller, 2013). This chapter presents an analysis of the brand positions of Korean fashion firms and their rivals in China.

3.1. Korean Fashion Brands' Positions in China

Because of sluggish domestic demand, Korean fashion firms have begun to explore the Chinese market. They aim to make the Chinese market a second domestic demand base for them. Therefore, an increasing number of Korean fashion firms and brand clothes have entered the Chinese market and constantly expanded their market shares in China. In the 1980s or 1990s, the Korean garment industry entered the Chinese market with the purpose of making China an export base through its cheap labor. Nonetheless, in recent years, Korean fashion firms have begun to enter China with their own brands in order to meet the needs of the Chinese domestic market. This strategic change can be attributed to the rapid economic development of China and its increasing demand for apparel consumption.

Korean fashion brands in the Chinese market have a common characteristic: they only make some consumer groups the target market with the size of such consumer groups being not very large. The most notable feature of market development of Korean firms in China is that Korean firms do not fight for the lion's share of the market, but concentrate on developing the gaps in the Chinese clothing market. These enterprises catch the need and hobbies of small consumer groups and then design and make the clothing that meets the needs of different consumer groups. Faced with the consumption features and hobbies of different groups at different levels, Korean enterprises achieve success through launching readily marketable products. This is also one of the reasons for the *Korean Wave* to come into being.

3.2. Foreign Rival Brands' Positions in China

As the supply of homemade apparel continues to exceed demand, the high-end and upscale clothing consumer markets in China have been occupied by a large number of international well-known brands and second-tier brands. Meanwhile, with the constant cooperation between the Chinese apparel industry and foreign enterprises in design, production and marketing, more and more international fashion brands have entered the Chinese market in the form of territorial production.

American garment firms continually enlarge the scale of purchasing of Chinese garment firms to try to control the top of the garment industrial chain. After the quota is cancelled, the prices of China's textiles and garments are even lower and the price advantage of Chinese garment gradually appears. Nevertheless, Chinese firms are not familiar with the ways of direct export sales, so they have not established a mature international market network. To seize the great opportunities of cancelling export quotas in China, the American garment industry tends to invest directly in Chinese garment firms or purchase Chinese firms through acquisition, and they also send their senior executives to China.

Many French garment firms come to China because the potential luxury market in China's mainland is very huge. More and more French firms are quickening the speed of seizing China's luxury garment market. This is because the choices of Chinese consumers on fashion brands changes very quickly. The potential market would be occupied by other brands. Most French brands that come to China are large-scale luxury-goods enterprises, such as Crocodile, Givenchy, Remy Martin, and Louis Vuitton. French sellers think that the symbolic meaning of luxury goods in China weakens and the enjoyment of luxury goods increases. In addition, the consumption group tends to be feminine and younger and ages vary from 18 to 30. Thus, firms running luxury goods have a promising future in China.

China's rich follow-up labor resources and its huge domestic market capacity make Japanese fashion firms unite together to tap the Chinese market. These Japanese brands enter various market subdivisions which are involved in women's dress, gentlemen's clothing, underwear, and sportswear. To exploit China's cheap labor, most Japanese fashion firms have invested in, set-up plants, and conducted processing for trade or export. These Japanese firms have changed their strategies in recent years. Now the firms take their brands, high-end clothing materials and designs to China and seek Chinese partners to tap China's market. Still, they use China's cheap labor to process their products and then sell the products to Chinese consumers.

Ⅳ. Strategic Propositions

Building a strong fashion brand requires careful planning, a long-term commitment, and creatively designed and executed marketing. Drawing on the perspective of brand-equity dimensions, this section develops several propositions for Korean fashion firms to achieve a competitive advantage in China.

4.1. Developing Brand Awareness

Developing brand awareness is one important aspect in marketing Korean fashion brands in China. It is imperative and helpful to analyze the response of Chinese consumers toward the change in packaging, advertising, products and messages sent through various vehicles. Working toward creating an image in the minds of the consumers is not the last thing a firm should aim to do. Inviting consumer feedback and maintaining a constant presence in the market is equally essential. The consumer should not have to come looking for the brand when he/she is in need of making a second purchase of the product. Dealerships and outlets at convenient places should make the consumer think of specific brands as the most convenient and best solution to their clothing needs. To develop brand awareness in China, Korean fashion firms should consider establishing brand awareness and ingraining brand image.

4.1.1. Establishing Brand Awareness

First, Korea fashion firms should establish brand awareness in China. When the name of the company is automatically recollected because the consumer very promptly associates the brand with the product category, it is called a top of the mind awareness of the product. For Korean fashion brands, through promotion strategy, it is important to let consumers know about these brands within a short period of time. The brand should be highlighted in the process of promoting brand positioning and core values to build an emotional bond between products and consumers and to allow consumer cognition of the brand. Advertising is just one element of marketing communication in China, which can be divided into the following areas: (a) advertising with a mass media approach to promotion and (b) celebrity endorsement is a good marketing strategy in Chinese market. Nevertheless, the cost is high in the case of celebrity endorsement; therefore, Korean fashion firms need to select celebrities carefully in terms of who can represent the brand most suitably. In addition, advertisements on billboards at shopping plazas, department stores, high consumption places and magazine advertisements can be selected as marketing communication venues. Other marketing communication elements include sales promotion, personal selling, direct marketing, which involves taking the message to the consumer by sending a message or e-mail to promote the brand, and digital marketing, which can entail using an online shop. Shopping online is very popular in China. Therefore, Korean fashion brands should advertise using this channel.

4.1.2. Ingraining Brand Image

Second, Korea fashion firms should ingrain brand image in China. Nowadays, most of the foreign brands in China use guerrilla marketing to catch consumer attention at a low cost. Such marketing campaigns can allow Korean fashion brands to compete with international luxury brands by carving out narrow but profitable niches. These tactics include extreme specialization, aiming every effort at favorably impressing the consumers, providing service that goes beyond the consumers' expectations, fast response time, quick turnaround of jobs, and working hours that match the consumer's requirements.

4.2. Creating Brand Association

Brand association is the connection made in the minds of consumers between a given product or service and the category it is classified in. At its highest level, brand association of Korean fashion brands can propel Chinese consumers to ask for products carrying Korean brands instead of generic products. Brand association also involves associating products with particular attributes. When Chinese consumers want fashion products in specific categories with particular attributes, the goal is to have the Korean fashion brands come to mind rather than to have a consumer look for a generic brand product. To create brand association, Korean fashion firms should consider three parts: brand culture, consumer relevance, and corporate social responsibility in China.

4.2.1. Brand Culture

To create brand association, Korean fashion firms should develop brand culture in China. Brand culture is a company culture in which employees “live” the brand values, solve problems and make decisions internally, and deliver a branded consumer experience externally. To be relevant to consumers and sustainable over time, Korean fashion brands should operate much like any culture. Korean firms should develop an ethos and a worldview that they absolutely believe in and then should act in accordance with it. If the brand truly represents an ethos and worldview which is attractive to consumers, they will embrace the brand as part of their own identity. Korean fashion brands need to create their brand culture. Whether or not the brand has deliberately defined and shaped its internal culture, it is influencing the brand’s success right now. Brand internal culture—what the brand collectively values, how the brand does things, and the brand’s commonly

held beliefs and expectations—defines a brand. It manifests itself everywhere: in how employees interact with one another, the care they take in performing their jobs and the way they treat consumers. Korea has its own cultural features and characteristics. Korean fashion brands should display their own advantages.

In addition, Korean fashion brands need to develop brand culture in China. Consumers are more likely to connect with a brand if they have a good understanding of what it is about and this is reinforced by the experience the staff delivers. When dealing with a brand where employees truly believe the values and mission, consumers can feel the difference from the moment they walk in. When employees are on board, it translates to a better and more consistent service experience, which in turn builds trust, loyalty and business. Developing a culture for every Korean fashion brand in the new market can substantially help consumers build brand identity and brand loyalty.

4.2.2. Consumer Relevancy

The second area of developing brand association is sustaining consumer relevance. Sustaining consumer relevance requires the following three venues. First, Korean fashion brands should decide on price information for their product when they enter the Chinese market. The specific price or product level has often been given the most attention when a brand faces a new market. Second, either packaging or product appearance information makes Chinese consumers remember the brand by leaving an impression in their minds. Third, user imagery and usage imagery decide what kind of consumers would purchase Korean fashion brands and under what kind of circumstances they would choose Korean fashion brands. User imagery communicates the life-style of the user. User imagery results in a user-driven image which is transferred to the brand. Brand personality of Korean products needs to be updated with changes in user imagery and information so that the Korean fashion brands remain contemporary and relevant in China. Consumers' real concern has been about what they can obtain from different brands. Korean fashion brands have various design styles and factors lacking in the Chinese market. Accordingly, the Chinese market needs products different from what the domestic market offers. Positive brand associations are developed if the product which the brand depicts is durable, marketable and desirable. Consumers should be persuaded that a brand possesses the features and attributes which satisfy their needs. This will lead to Chinese consumers having a positive impression of Korean fashion brands. Positive brand association helps an organization gain goodwill and obstructs a competitor's entry into the same market.

4.2.3. Corporate Social Responsibility

Korean fashion firms should engage corporate social responsibility (CSR) activity in order to create brand association in China. CSR is a concept that has attracted worldwide interest and acquired a new resonance in the global economy. In recent years, this focus on CSR has been derived from intensifying globalization and international trade, which have reflected an increased business competition and new demands for enhanced transparency and corporate citizenship (Dima & Ramez, 2007). CSR is a process with the aim to embrace responsibility for the company's actions and encourage a positive impact through its activities on the environment, consumers, employees, communities, stakeholders and all other members of the public sphere who may also be considered stakeholders.

For Chinese consumers, a socially responsible company makes safe, high-quality products (Aida, 2007). Such a CSR strategy is useful for Korean fashion firms expanding in the Chinese market for several reasons. First, Korean fashion firms' CSR engagement may encourage collaboration and team learning with Chinese local firms to be licensed. Second, Korean fashion firms' CSR engagement may promote the maintaining of good relationships with local partners. Firms are able to push for continuous quality improvements and selling cost reductions by establishing a strong distribution channel. The long-term benefits of these pointers create a better value for

stakeholders. Korean fashion firms can use some common ways to practice CSR to enhance brand-equity in China such as environmental sustainability, community involvement, and ethical marketing practices.

4.3. Building Brand Loyalty

Brand loyalty is viewed as a multidimensional construct (Aaker, 1996). Korean fashion brands should cater to Chinese market needs and create more value for consumers in order to cultivate consumers' brand loyalty. In return, brand loyalty can improve the profit of those firms. To build brand loyalty in China, Korean fashion firms should consider three strategies: localization, premium brand development, and effective communication efforts.

4.3.1. Localization

To build brand loyalty, Korean fashion firms should choose a localization strategy based on thorough market research. Market research should cover various aspects of the target market and analyze colors, lengths, and materials of the clothes used by fashion brand manufacturers to predict which style could take hold. This research should focus on localization by analyzing any downtrend (old fashion trend), megatrend (currently in vogue), assorted items (must-have clothing), and sprout items (fashions which indicate a new trend).

Korean fashion firms need to concentrate efforts on thorough, long-term localization and market research, then categorize and organize the data. After extensive market research, the clothing manufacturers should be able to find subtle distinctions between regional markets, put forward ways to differentiate patterns, clothing colors, designs, and identify why they needed an exclusive design organization for Chinese market.

Korean fashion brands' localization strategy should be reflected in resources management. This strategy involves development of local human resources or talent cultivation. Local human development strategy is based on citizen participation and the objective of the course is to build the capacity of local staff members in such a way that they have the ability to overcome development problems. If employees become managers, they should receive training in Korea. This training includes learning languages and corporate culture while working at the firm. This may enhance worker competencies so that employees have a competitive spirit.

4.3.2. Premium Brand Development

Korean fashion firms should develop premium brands in order to build brand loyalty in China. Because of China's high economic growth and increased income levels, Chinese consumers often spend more money in purchasing clothing than others. In this regard, Korean fashion firms should consider a skimming strategy based on product quality rather than market-penetration strategy.

To secure premium brand positioning, Korean fashion brands need to reject the types of general retail stores and instead target high-end department stores visited mostly by wealthy consumers. Establishing a truly premium business means offering a unique and excellent product. Premium services rely on their manufacturers and processes, while premium products differentiate themselves with materials and craftsmanship.

The following two aspects merit attention when securing premium brand positioning. First, a quality position is necessary. The quality of a given product is one of the most important components of a clothing brand; this can be combined with other positioning strategies rather easily. In addition, value or price positioning using a high-end tack exploits the psychological belief that the more expensive something is, the more intrinsically valuable it must be. Both are crucially dependent on quality. Firms also cement their brand as the provider of high-quality, value-priced products or services. The quality of the products is the foundation of consumer loyalty to the brand. Many famous brands in the world tell us that consumer brand loyalty, in a certain sense, is the

loyalty to the quality of the product. Only high quality products can really build a "golden signboard" in the eyes of consumers. Product innovation would lead consumers towards improving quality.

4.3.3. Effective Communication Efforts

Korean fashion firms should strengthen effective communication efforts in order to build brand loyalty in China. Before a brand begins to create a message, a firm should think about the target market. Firms should allow the consumers to know what they can expect from Korean fashion brands that they would not gain from the competitors. Korean fashion firms may consider sending out a simple survey. These firms should decide on a marketing communications mix. Depending on the market and target consumers, some communications channels can be more effective than others. Marketers should find the most efficient combination of channels. Korean fashion firms should expand excellent after-sale service to establish a good and stable cooperative relationship with consumers.

4.4. Strengthening Quality Perception

Quality perceptions are shaped by functional experiences as well as emotional experiences the consumer associates with the product and company. Brand managers need to understand how consumers perceive and select brands in specific product categories and market segments. To strengthen quality perception, Korean fashion firms should consider market segmentation strategy, product planning, and quality strategy.

4.4.1. Market Segmentation Strategy

Market segmentation is a marketing strategy that involves dividing a broad target market into subsets of the consumer, who have common needs and priorities, and then designing and implementing strategies to target them. Market segmentation strategies may be used to identify the target consumers and provide supporting data for positioning to achieve a marketing plan objective. Fashion firms can provide more chances for salesman due to centralized consumer bases. Thus, these firms can adopt a suitable commodity, price, circulation and advertisement in different markets. They should study the consumption and life-styles of the target market to determine suitable commodities to sell.

With the exception of the high-income class, there are 500 million middle class individuals with purchasing power in China. The middle class dominates China's consumption class. Chinese consumers are often sensitive to price because of the limitation of the living environment, as well as the change of their social status. In this regard, a part of Korea clothing brands can focus on the middle class, especially females who are sensitive to fashion and active in social activities.

4.4.2. Product Planning

When a brand enters a foreign market it has to establish marketing and brand strategy. In particular, differentiation in marketing for the domestic market and foreign market is needed because of differences in business environments between countries. Furthermore, firms should understand the target market by considering their internal resources and capabilities as well as the market environment. This understanding of the brand's market and response competence have led to growth strategies that Korean fashion brands can undertake to understand consumers' needs and offer brands and products applicable to these needs at the right time. For instance, E-land, a Korean fashion firm, forecasted that the demand for foreign premium clothes of consumers belonging to the upper class would increase China's economic growth process (Kim & Kim, 2013). It determined that premium costume products and brands would be needed in order to attract the Chinese market. Moreover, to meet the needs of target Chinese consumers, Korean fashion firms should supply completely different products to the market by having a brand, which were already launched in Korea, which uses design and high-quality fabric. In doing so, it should be able to position itself as

a foreign brand in the Chinese market. Fashion firms based on marketing understanding and response competence for Korean clothing brands in the domestic market offer brands and products that can meet consumers' needs that change according to the dynamism in the environment. In addition, for an understanding of the Chinese market that would lead to the supply of appropriate products at the right time, capability in planning and designing necessary products is needed. Korean fashion brands should supply premium brand products suited to Chinese target consumers.

4.4.3. Quality Strategy

To strengthen quality perception, Korean fashion firms should consider a quality strategy. The economic level and purchasing power of high-income groups in China are not so much lower than those in Korea. The Chinese market is the place for advertisements from enterprises from all over the world which gain generous profits from them. If any company entering the Chinese market still holds that China is a developing country and a low price market, the company will fail. To succeed in the Chinese market, Korean fashion brands must compete with other countries' brands for qualified commodities.

Most foreign brands that entered the Chinese market in the past emphasized mass production. They seldom develop new commodities and lack commodities with high value addition. Korean fashion brands should change from the usual expectation that low prices dominate the market. These Korean firms should transform by creating advanced merchandise and develop new qualified merchandise. Producing high-end products means the pursuit of higher quality compared to other brands. First of all, the raw material should be high-end. Qualified clothes should be used to add its current value.

V. Conclusion

The Chinese market has evolved into a huge market with an annual growth rate of 10% since the period of reform and when it opened up to the rest of the world. Resident incomes have increased and their consumption modes have also changed. Thus, brands are gaining importance in the clothing market. Korean fashion brands boast of their increasing popularity in China due to cultural exposure. Therefore, the cognition of Korean fashion brands has been elevated with the number of Korean fashion brands increasing despite the slowdown of the Chinese economy and deterioration in the production environment. Recently, many Korean fashion firms perceive that China has become an important target consumer market for Korea. Korean fashion firms have accelerated integrated specialization in production, planning, and sales. With the increasing popularity of Korean fashion brands, the entry of Korean retailers in China is expected to accelerate in the coming years.

In addition, Chinese consumers prefer clothes which exude comfort, individuality, stylishness, and which are manufactured by famous brands. At the same time, China's clothing industry is striving to enhance their product grades by utilizing more medium-and-top notch materials, increasing value addition, high-tech application, and the improvement of clothes' comfort, which is conducive to upgrading product structure and boosting competitiveness. At present, consumers buy clothes based on fashion, culture, brand, and personal image. The Chinese clothing market is evolving from one where consumers buy clothes just to meet their needs to one where they pursue fashion in order to showcase their individualities.

Since 1996, Korean fashion brands have started entering the Chinese market and executing a chain of strategies to promote development in China. Considering that China is not a single market and has a population with various levels of purchasing power, apart from the low price products which have decreasing public attention, it is rather favorable for low or medium-priced products to enhance brand image. Because of China's high economic growth and

increased income levels, the quality of a given product is one of the most important components of a clothing brand. Furthermore, enhancing brand-equity is also essential in this regard.

In addition to enhancing Korean fashion brand-equity in China, there are suggested strategies from four perspectives: developing brand awareness, creating brand association, building brand loyalty, and strengthening quality perception. Having good knowledge of Chinese culture and characteristics is important in enhancing brand-equity in the Chinese market.

Based on the current situation of the clothing market and preferences of consumers in China, the present study develops several strategic propositions. First, Korean fashion firms should divide the Chinese market based on region, class, characteristics and differences. Second, Korean fashion firms should develop high quality and unique brands. Third, Korean fashion firms should adapt differentiated pricing systems according to local conditions, such as economy, region, and class. Fourth, Korean fashion firms should maintain diversified circulation channels, especially in department stores.

The current study research sums up some experiences for reference and matters to enhance brand equity. In spite of the achievements in this paper, there are also some limitations. First, the common successful cases are mainly based on famous brands. Therefore, the results can offer references to small and medium brands. Second, this study relates only to a study based on theoretical and literature review. Thus, the implications of the study are limited in that respect.

References

Aaker, D. A. (1991). *Managing brand equity: Capitalizing on value of a brand name*. New York, NY: The Free Press.

Aaker, D. A. (1996). Measuring brand equity across products and markets. *California Management Review, 38*(3), 102-120.

Aida, S. (2007). The book of five concepts for management: Based on Miyamoto Musashi's the book of five rings—the spirit of being well-skilled in wielding both the sword and the pen. In J. J. Ramsden, S. Aida, & A. Kakabadse (Eds.), *Spiritual motivation: New thinking for business and management*, Ch. X, (pp. 24-39). Basingstoke: Palgrave Macmillan.

Boulding, W., Kalra, A., Staelin, R., & Zeithaml, V. A. (1993). A dynamic process model of service quality: From expectations to behavioral intentions. *Journal of Marketing Research*, *30*(1), 7-27.

Dick, A. S., & Basu, K. (1994). Customer loyalty: Toward an integrated conceptual framework. *Journal of the Academy of Marketing Science*, *22*(2), 99-113.

Dima, J., & Ramez, M. (2007). Corporate social responsibility (CSR): Theory and practice in a developing country context. *Journal of Business Ethics*, *72*(3), 243-262.

Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing, 57*(1), 1-22.

Keller, K. L. (2003). Brand synthesis: The multidimensionality of brand knowledge. *Journal of Consumer Research*, *29*(4), 595-600.

Keller, K. L. (2013). *Strategic brand management: Building, measuring, and managing brand equity*. New York, NY: Pearson.

Kim, Byoung-Goo., & Kim, Gyu-Bae. (2013). A study on the Chinese market entry strategies of Korean fashion companies: The case of E-land. *International Business Review*, *17*(4), 189-220.

Kotler, P., & Keller, K. L. (2015). *Marketing management*. New York, NY: Pearson.

Choi, Jin-Ah., & Kim, Dong-Weon. (2011). Global marketing strategies of online game companies: The case of Korean companies' localization in Japan. *International Business Review*, *15*(3), 175-200.

Guest, L. (1964). Brand loyalty revisited: A twenty year report. *Journal of Applied Psychology*, *48*(2), 93-97.

Hawksworth, J. (2006). *The world in 2050: How big will the major emerging market economies get and how can the OECD compete?*. New York, NY: PricewaterhouseCoopers.

Hunt, S. D. (2010). *Marketing theory: Foundations, controversy, strategy, resource-advantage theory*, Armonk, New York, NY: M. E. Sharpe.

Hunt, S. D., & Morgan, R. M. (1995). The comparative advantage theory of competition. *Journal of Marketing*, *59*(2), 1-15.

Jain, S. C. (2006). *Emerging economies and the transformation of international business: Brazil, Russia, India and China (BRICs)*. Northampton, MA: Edward Elgar Publishing.

Jones, M. A., Mothersbaugh, D. L., & Beatty, S. E. (2002). Why customers stay: Measuring the underlying dimensions of services switching costs and managing their differential strategic outcomes. *Journal of Business Research*, *55*(6), 441-450.

Kang, Myung-Soo. (2011). A study of Korea and China brand personality dimensions on feel and low involvement product. *International Business Review*, *15*(2), 133-149.

Lee, Y. H., & Ang, K. S. (2003). Brand name suggestiveness: A Chinese language perspective. *International Journal of Research in Marketing*, *20*(4), 323-335.

Moore, W. L., & Lehmann, D. R. (1982). Effects of usage and name on perceptions of new products. *Marketing Science*, *1*(4), 351-370.

Mowen, J. C., & Minor, M. S. (2006). *Understanding consumer behavior*. New York, NY: Thomson.

Percy, L., & Rossiter, J. R. (1992). A model of brand awareness and brand attitude advertising strategies. *Psychology and Marketing*, *9*(4), 263-274.

Ries, A., & Trout, J. (2000). *Positioning: The battle for your mind*. New York, NY: McGraw-Hill.

Reichheld, F. F. (1993). Loyalty-based management. *Harvard Business Review*, *71*(2). 64-73.

Strizhakova, Y., Coulter, R. L., & Price, L. A. (1998). Branded products as a passport to global citizenship: Perspectives from developed and developing countries. *Journal of International Marketing*, *16*(4), 57-85.

Vietor, R. H. K. (2007). How countries compete. Boston, MA: Harvard Business School Press.

Wilson, D., & Purushothaman, R. (2003). *Dreaming with BRICs: The path to 2050* (Global Economics Paper No. 99). New York, NY: Goldman, Sachs, & Company.

Yee, J., & San, N. C. (2011). Consumers' perceived quality, perceived value and perceived risk towards purchase decision on automobile. *American Journal of Economics and Business Administration*, *3*(1), 47-57.

ISSN 1946-5130
http://dx.doi.org/10.20294/jgbt.2015.11.1.13

Journal of Global Business and Trade

www.ipfw.edu/jgbt

Do Long-run Relationships Exist Between Net Foreign Direct Investments and Real Output In Philippine Industries?

Hilary June E. Dela Peña[a] and Zenaida M. Sumalde[b] *

[a] *Department of Economics, University of the Philippines Los Baños, Republic of the Philippines*
[b] *Department of Economics, University of the Philippines Los Baños, Republic of the Philippines*

Received 28 February 2015 Revised 13 April 2015 Accepted 20 May 2015

ABSTRACT

This paper examined whether there were long-run relationships between net foreign direct investments (NETFDIs) and real output in the aggregate and across major industry sectors (agriculture, industry and services) in the Philippine economy. The general concern was to find out the causality or the leader-follower relationships that exist. In view of this, the correlogram and Dickey-Fuller tests were performed to determine the stationarity of the variables which were a pre-requisite to further tests that establish the long-run connection. Results of the correlogram and Dickey-Fuller tests showed that real output for the whole economy (Gross Domestic Product or henceforth, GDP) and, except for agriculture, real GDP across major industry sectors are non-stationary at level form, but became stationary after their first differences. On the other hand, the NETFDIs variables were all stationary at level form, which implies the absence of trends of NETFDIs in the country. Since FDIs were already stationary at level form, further tests to determine the long-run relationships could no longer be established. This indicates that only short-run relationships exist between real output and NETFDIs in the Philippines. Results of the regression analysis showed that NETFDI has no effect on real GDP, which may be due to the "crowding-out" of investments inherent in the Philippine economy

Keywords: stationarity test, correlogram, net foreign direct investment, philippines
JEL Classifications: C32, F21, F47

I. Introduction

Foreign direct investments (FDIs) have been one of the sources of investment in most developing countries like the Philippines. FDIs "are investments made to acquire a lasting interest by a resident entity in one economy in an enterprise resident in another economy" (IMF, 1993). These could be outflows, the case of the direct investor investing outside his resident economy, or inflows where those investments are captured by the host country. FDI inflows across developing and transitioning economies have been extremely stable amidst the international financial and economic crises with an all-time high of a 12% increase and contribution of at least half of the world's FDI stock in 2010 (UNCTAD, 2012).

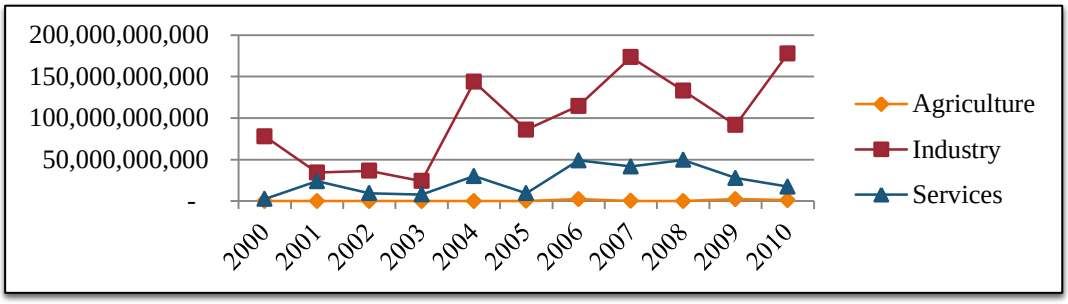
According to the National Statistical Coordination Board of the Philippines (NSCB) (2011), FDI inflows include capital or equity contributions, reinvested earnings, technical fees and royalties, bonds and other debts, and imports converted into equity. These are of

* Corresponding author,
E-mail address: zcm.sumalde@gmail.com

two types, namely approved FDIs and BOP NETFDIs. Approved FDIs consist of foreign investment commitments that may come in the near future. These may include equity + Loans + Reinvested Earnings, while BOP Net FDIs are non-residents' placements less non-residents' withdrawals + reinvested earnings + net inter-company loans and are recorded at the time the transactions occur.

Approved foreign direct investments in the Philippines are generally increasing, averaging around Php 124 billion (US$ 2.64 billion) during the first decade of 2000, or from 2000 – 2010 (NSCB, 2012). With regards to the industrial classification, the industry sector dominates foreign direct investments, taking over 80% of the total approved FDIs averaging Php 99 billion (US$ 2.11 billion) worth of investments in the last ten years, while agriculture had the least (see Fig. 1).

Fig. 1. Approved Foreign Direct Investments by Sector, 2000-2010.



Source: National Statistical Coordination Board (NSCB) (2012).

In general, developing these sectors through FDIs would contribute to the industrialization of the economy not only by its mere output contribution but also in other key areas such as employment generation, competitiveness, productivity enhancement, economic integration, market access, linkages and the ever-important spillovers to the economy. Moreover, the diversification of investments among liberalized economies has enabled both the industrialized and developing countries to grow and develop their industries, whether they are in agriculture, industry, or services. Thus, many countries compete for such investments to be poured into their sectors through mechanisms and policies. Results of the study of Blomstrom, Lipsey and Zejan (1994) showed that inflow of foreign direct investment is one of the determinants of the growth rate of a country of high income, but not for low income ones. With these, the main problem that this paper wishes to address focuses on the kind of relationships present between FDI and each sectors' output growth among the Philippine industries. The long-term relationship is important to examine the cause and effect relationship between FDI and real outputs in major Philippine sectors while the short-term relationship would be the basis for determining the effects of the FDIs on the growth of each sector.

To answer this, the following objectives are formulated: (1) to describe the trends of net FDI inflows across the agriculture, industry and services sectors for the years 2004-2011 and the real output of these sectors in the same time frame; and (2) to determine the absence or presence of long-run relationships between net FDI flows and the real output of each sector.

II. Methodology

2.1. Conceptual Framework

Apart from the infusion of capital, multinational enterprises (MNEs) are major sources of tax revenues, thus reinforcing government expenditures for infrastructures, institutional and other outlays necessary for the country's development (National Economic Development Authority (NEDA), 1974). Moreover, MNEs are also sources of technology, thus filling the gap between savings and investments of developing countries.

Perhaps the most important contribution of FDI to the host country is its ability to generate a multitude of spillovers, which Ruffin (1993) calls the "trading of entrepreneurial services and ideas". These include the enhancement of human capital through the transferability of technical know-how and managerial and marketing expertise from the MNEs to the local laborers and later, to the populace. These spillovers occur given that there are proper linkages set in place. In the Philippines, these linkages have grown among the industry sectors such as automotive, machinery, electronics and garments (Aldaba & Aldaba, 1994).

Given the necessary assets of the host country, such as its comparative advantage (i.e., labor force and natural resources) and basic economic and political conditions, the presence of these foreign firms fosters linkages. Linkages between the foreign and local firms occur through the production of intermediate inputs in which the latter benefits from productivity gains and competitiveness through imitation and innovation. This expansion thus leads to the increase in the aggregate output pushing the country towards industrialization (Aldaba, 1994).

From the foregoing discussion, there is a need to analyze the relationship of FDI with aggregate output. The relationship was modeled through the autoregressive distributed lag (ARDL) model that will determine the absence or presence of long-term relationships, and if these exist, the Granger causality model will be used to determine the leader-follower relationships of GDP and FDI. If no long-term relationship exists, the short-term relationship between NETFDI and GDP will be assessed.

2.2. Nature and Sources of Data

The data used in the study were gathered from several sources such as the Bangko Sentral ng Pilipinas (BSP), the National Statistics Office (NSO) now known as the Philippine Statistical Authority (PSA), and the National Statistical Coordination Board (NSCB). The general variables in the study are monthly data (converted into quarterly data) of net foreign direct investments converted in million pesos (NETFDI) and gross domestic product in million pesos at constant prices (GDP) for the period 2004 to 2011. Table 1 summarizes the data gathered by source.

Table 1. Data and Sources Used in the Study

Variable	Data	Source
Net Foreign Direct Investment (NETFDI)	Originally in US$ million and were converted to Php millions using the exchange rates at the time the FDIs were released and deflated using the CPI (2000 = 100) Composed of non-residents' placements less non-residents' withdrawals + reinvested earnings + net inter-company loans Recorded at the time the transactions occurred	Bangko Sentral ng Pilipinas (BSP)
GDP by sector	Quarterly data of Real Gross Domestic Product of Agriculture, Services and Industry Sectors from 2004 - 2011(in Php million) (2000 = 100)	Electronic data from NSCB website
Employment	Converted into millions	NSCB Statistical Yearbooks
GDI, Gross Domestic Investment	Gross capital formation at constant prices; includes outlays & additions to the fixed assets of the economy plus net changes in the level of inventories (2000=100)	Electronic data from NSCB website

2.3. Analytical Procedure

The stationarity tests were performed to determine whether the series of the FDI, GDP variables are fit for testing their long-run relationships. Moreover, in time series analysis, the basic assumption is that data should be stationary or the data could be thought of as having a random or stochastic process. From which, the concrete data, such as the sample, is regarded as the realization of this process from which inferences can be drawn (Gujarati, 1995).

In context, stationarity is characterized as having a constant mean and variance at any point in time. Simply, stationarity implies that the mean and variance should be stable across time, limiting the infinite tendency of the variance. This means that the data are not affected by the time trend such that data values only vary due to their distances from each other and not because of the time in which they occur. Following this, the covariance of the data would also rely on the lag *k* between time periods and not on the actual time in which the covariance was derived. These assumptions are summarized below.

$$\text{Mean: } E(Y_t) = \mu$$

$$\text{Variance: } Var(Y_t) = E(Y_t - \mu)^2 = \sigma^2$$

$$\text{Covariance: } \gamma_k = E[(Y_t - \mu)(Y_{t+k} - \mu)]$$

Otherwise, if the assumptions aforementioned do not hold, the time series is non-stationary, which in most cases are exhibited by economic time series data. If this happens, it becomes imperative to "cure" or "stationarize" the data in order to proceed with unbiased and valid results necessary for testing their long-run relationships. This however, needs confirmation whether indeed the data exhibits stationarity or not. There are methods which examine this characteristic, including the use of the correlogram and the Dickey-Fuller (DF) test (Gujarati, 1995).

The correlogram test is a graphical method based on the autocorrelation function (ACF), or in this case, sample autocorrelation function, to determine the stationary characteristic of the time series (Gujarati, 1995). Using the sample covariance, $\hat{\gamma}_k$, at lag *k*,

$$\hat{\gamma}_k = \frac{\sum(Y_t - \bar{Y})(Y_{t+k} - \bar{Y})}{n}$$

and sample variance,$\hat{\gamma}_0$

$$\hat{\gamma}_0 = \frac{\sum(Y_t - \bar{Y})^2}{n}$$

where n is the sample size and $\bar{Y}$ is the sample mean. From here, the sample ACF can be computed at lag *k* using the ratio of the two:

$$\hat{\rho}_k = \frac{\hat{\gamma}_k}{\hat{\gamma}_0}$$

By plotting the sample ACF, $\hat{\rho}_k$, with lag *k*, the sample correlogram can be defined. The non-stationary nature of the time series can easily be seen in the sample correlogram which would exhibit a high autocorrelation coefficient even at longer lags. On the other hand, in a stochastic stationary process, the autocorrelation should be zero for lags greater than zero. Based on the correlogram, the null hypothesis that the time series is stationary will be accepted if it lies within the 95% confidence interval, or at the left side of the boundary. On the other hand, if it lies beyond 95%, then the time series is said to be non-stationary. Another test to verify the stationarity characteristic is through the Dickey-Fuller (DF) test (Gujarati, 1995).

In summary, the correlogram and DF Test would show the stationarity of a variable whether at level form or in their first or higher-order differences. In establishing their long-run relationships, this requires that all variables be integrated of order 1, or I(1), which becomes stationary after their first differences and not in their level form. Being stationary in their first differences means that the variables exhibit a "random walk". This "random walk" characteristic happens when the trend or behavior of the variable increasingly

moves further away from the origin and from its previous position, as time goes by, implying long-term effects. Unlike the stationary behavior at level form, I(0), in which fluctuations are noticeable around a constant, and thus, have constant mean and variance over time, the random walk process can be thought of as fluctuations around an upward trend. Because of the inherent upward "wandering" of the random walk variable, or I(1), through time, it is possible to see whether the other variables also share the same exact upward long-run trend through co-integration or other methods that establish long-run relationships. The effect of the trend is then subdued through differencing, thus becoming a stationary variable at first difference (Gujarati, 1995; Greene, 2002).

If there is no long-term relationship, the study adopted the modified production function from the models of Atique, Ahmad and Azhar (2004); Adhikary (2011); and Yalta (2012) in determining the effects of FDI on output. These incorporated the trade openness variable as suggested by literature (Shan, 2002 cited in Yalta 2012). The linear model was adopted without lags due to data limitations. The model is expressed as:

$$Y_{t,s} = \beta_0 + \beta_1 EMP_{t,} + \beta_2 \mathrm{GDI}_t + \beta_3 NETFDI_{t,s} + \beta_4 OPEN_t + \mu_t$$

where t = quarter; β_0 = constant, intercept; β_i = slopes of the model; coefficients of variables; Y = output in million pesos measured by GDP in constant prices at time t; EMP = employment in millions; GDI = gross domestic investment in million pesos; NETFDI = net foreign direct investment in million pesos; and μ_t = error term. The model is applied for the whole economy and agriculture, industry, and services sector.

The hypothesis is that employment (EMP) and gross domestic investment (GDI) positively affect the economy's output since these are both factors of production. Trade openness (OPEN) will positively affect GDP if there is positive trade balance. Trade openness also creates a conducive investment atmosphere in that lesser tariff and non-tariff barriers facilitate repatriation of investments. It is also postulated that a higher degree of openness indirectly affects growth through faster absorption of new technologies (Edwards cited in Adhikary, 2011).

III. Results and Discussion

3.1. General Behavior of the Sectoral Real Output and NETFDI

Over the sample period, the average real output of the Philippine economy was about Php 1.20 trillion (U$.02 trillion). Likewise, during the sample period, the country employed about 34.12 million people and attracted around Php 10.09 billion worth of net foreign direct investments, which roughly accounts for about 0.79% of the total output. Among the sectors, the services sector led with Php 699.65 billion (US$14.89 billion) in terms of average real output, followed by the industry and agriculture sectors, implying that agriculture is the least productive (see Table 2). In fact, the computation of the country's total factor productivity (TFP) growth rate in agriculture reveals low estimates compared to other Asian countries (Habito & Briones, 2005).

In terms of NETFDI, the industry sector is more aggressive in attracting FDIs with an average of Php 5.28 billion (US$0.11 billion), followed by the services sector with Php 2.45 billion (US$0.05 billion) and the agriculture sector with only Php 10.19 million (US$0.22 million). However, although the industry and services sector attract a majority of the NETFDIs, there are also instances of massive withdrawals or repatriation of investments back to the home country (or country of origin).These withdrawals are revealed in the negative minimum amount of investments, as compared to the zero minimum NETFDI reflected by the agriculture sector.

Table 2. Summary Statistics of Real Output and FDI Variables by Sector, Philippines, 2004 - 2011

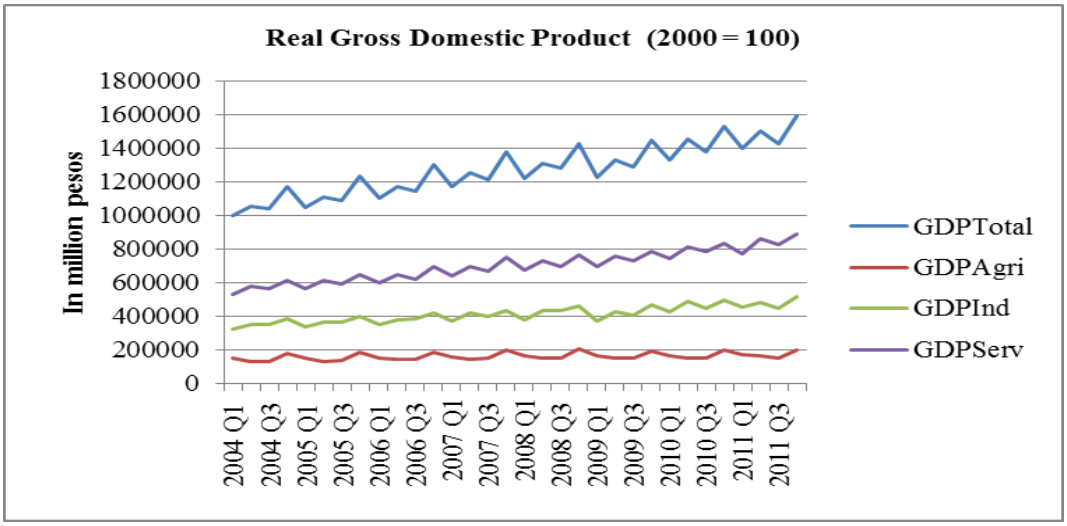
Variable	Obs	Mean (Php Million)	Std. Dev. (Php Million)	Min (Php Million)	Max (Php Million)
Real GDP	32	1,265,625.00	157,826.70	1,000,000.00	1,600,000.00
Real GDPAGRI	32	160,059.50	21,638.59	127,171.00	201,512.00
Real GDPIND	32	411,010.60	50,012.47	322,430.00	514,103.00
Real GDPSERV	32	699,649.60	94,352.20	530,496.00	886,523.00
Total Net FDI	32	10,085.97	8,444.19	-2,702.18	30,416.20
Agri Net FDI	32	10.19	22.59	0.00	109.14
Ind NetFDI	32	5,280.64	7,205.41	-6,633.36	24,759.80
Serv NetFDI	32	2,448.16	3,462.98	-6,228.50	11,665.90

Sources: NSCB (2012) and BSP (2012).
Note: US$1.00 = Php 47.00 (average conversion rate over the sampling period).

3.2. Trends in Real Output

In terms of GDP, the total real output of the economy is generally increasing, with observable peaks in the latter quarters of each year (Fig. 2). The same trend can be observed by sector, although the services sector had the greatest contribution to total GDP and agriculture had the least throughout the period. Based on NSCB (2012) quarterly estimates, GDP growth of the whole economy for the 2004 – 2011 period is pegged at only 5.0 %, with the weakest at only 0.5% in the third quarter of 2009 and the strongest at 8.9% during the second quarter of 2010. The expansion of the economy during the 2004, 2007 and 2010 periods can also be accounted for by the growth of the services sector posting an average growth rate of 6%, and on the aggregate this accounts for 55% of total GDP, thus toppling the other industries. This is mainly attributed to retail trade and the business process outsourcing industries that ultimately revived the economy from the financial crisis. On the other hand, the slowdown of the economy in 2009 can be attributed to external shocks, particularly the global financial crisis and natural calamities, (ADB, 2010) while the highest growth in 2010 may be due to government expenditures during the election.

Fig. 2. Trends in Total and Sectoral Real Output, Philippines, 2004 – 2011



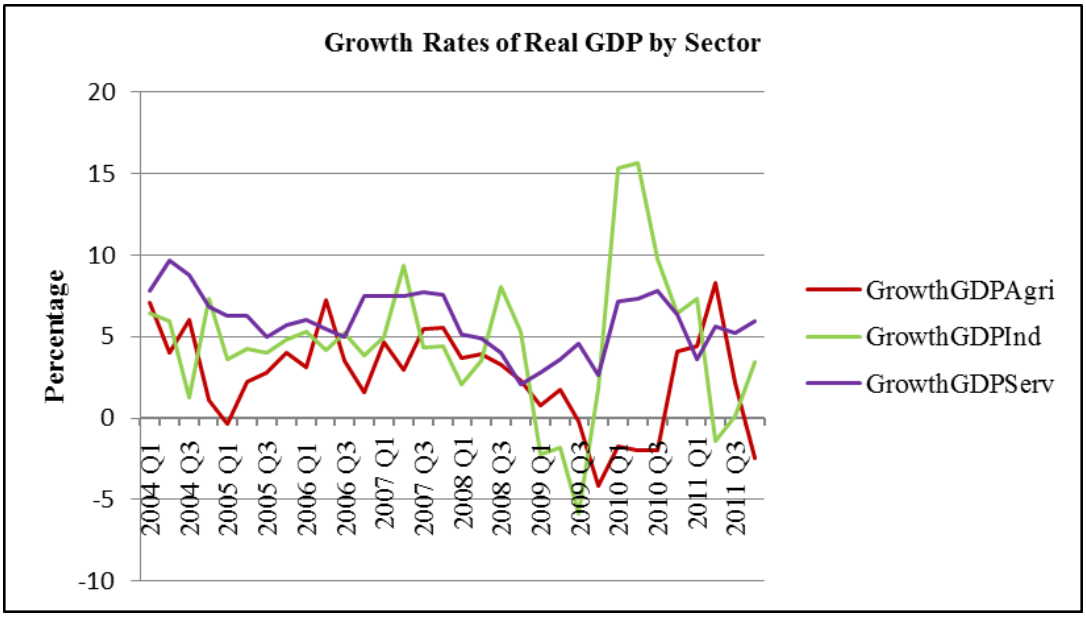
Source: NSCB (2012).

Fig. 2 and Fig. 3 also reflect the agriculture sector being the most depressed among all the sectors in terms of output performance, accounting for only 13% of the real GDP and growing at an average rate of only 3% despite the country's claim of being an agricultural country. Agriculture's real GDP continues to remain stagnant and unresponsive to trends in the whole economy. The probable causes of this, aside from natural calamities, are also the lack of appropriation of investments in the agriculture sector leading to a lack of access and inadequacies in infrastructure, technology, and financing, among others. (Habito & Briones, 2005).

Fig. 3 also supports the industry sector's major role in lifting the economy from a slump by registering a growth rate of 16% in 2010 due to increased export demand for electronic manufactures (ADB, 2010). It is also apparent that the increasing trend of the total real output is driven not only by the services sector but also by the industry sector as well which accounts for about 34% of the country's real GDP (Fig. 4). A closer look at the graph indicates that increases in real output of the industry are relatively not as buoyant as that of the services sector. Even with heightened participation of massive assembly processing of technology-based commodities in the country, many characterize the industry sector as being homogeneous and marked by high-import content, specifically in the exports of manufactured electronics, thereby resulting in poor value-addition (Austria, 2003).

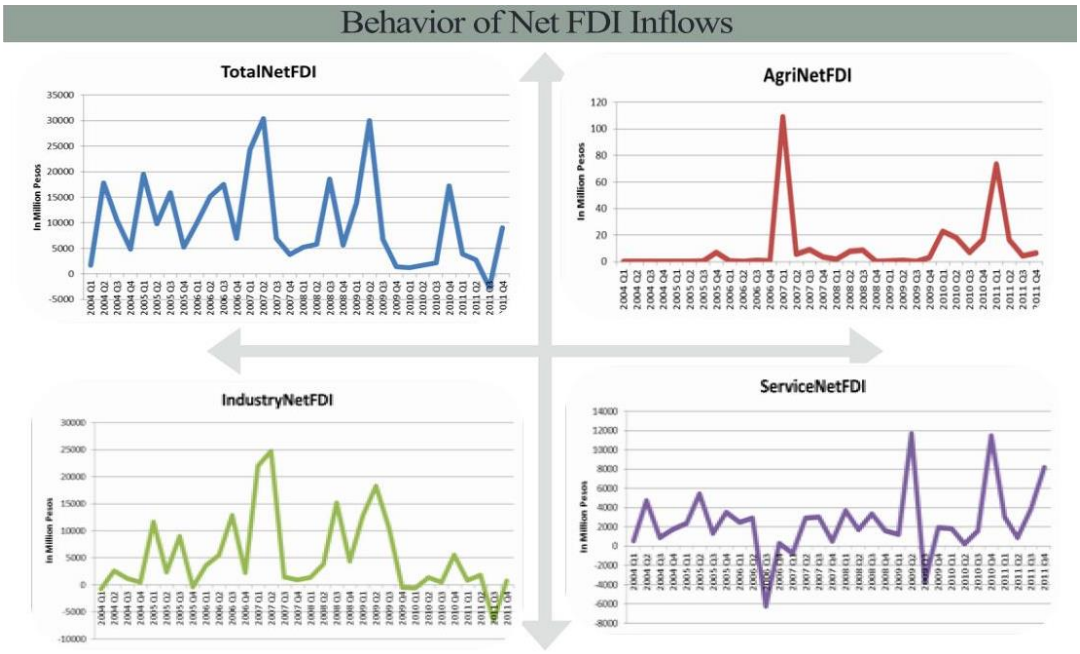
Overall, there is a general positive atmosphere in terms of the Philippine's annual growth rate such that it was able to jump from 9th place during the period of 2002-2004 to 5th place during the period of 2005-2010 in comparison with its ASEAN neighbors (NSCB, 2012).

Fig. 3. Growth Rates of Real GDP by Sector, Philippines, 1st Quarter 2004 - 4th Quarter 2011



Source: NSCB (2012).

Fig. 4. Trends in Total Net FDI Inflows and by Sector, Philippines, 2004 – 2011



Source: BSP (2012).

3.2.1. Net FDI Flows

Although there is an apparent growing trend for total output, specifically in the industry and services sectors, this is not necessarily the case for net foreign direct investments. As shown in Fig. 4, total NETFDI showed no specific trends, but actually reflected a decreasing trend by the late 2000s. It is also apparent that NETFDIs seem to jump during the first few quarters of the year and then drop in the last quarters. This trend is the opposite of the behavior of output which peaks in the last quarters. Thus, this negates the growth of NETFDIs in the country. This behavior may be attributed to the repatriation or withdrawals of investments and profits back to the origin country.

The peak attraction of total NETFDIs was in 2007 when the economy was growing. This was followed by a major downturn in 2008 due to the global financial crisis. NETFDIs picked up again in the early periods of 2009 and then experienced a longer slump, even having negative figures or withdrawals in the later quarters of 2011. Comparing the behavior of NETFDIs by sector, it is apparent that there is relatively a larger magnitude of NETFDIs in the industry sector, reaching a peak of over Php 24.8 billion (US$0.53 billion) in the second quarter of 2007. This is followed by the services sector with a peak of Php 11.7 billion (US$0.25 billion) in the second quarter of 2009, but this dropped in the subsequent quarters. The agriculture sector has the least amount of NETFDIs peaking only at Php 109 million (US$ 2.32billion) in the first quarter of 2007. It is observed that NETFDI in the agriculture sector is more resilient in that there are no negative NETFDIs, showing signs of growth particularly in the last quarters of 2009 and beyond.

3.3. Stationarity Tests

To establish the long-run relationship between FDI and real output, it is imperative that the variables are non-stationary at level form but stationary at first difference or are integrated of order 1, I(1). To reiterate, being stationary in their first difference means that the variables exhibit a "random walk" trend which becomes subdued and stationary after the first

difference. This is done through the stationarity tests. To confirm the stationarity of the variables, the correlogram method was used.

The correlogram tests plot the sample autocorrelation function using its lags. Based on the correlogram, the null hypothesis that the time series is stationary will be accepted if it lies within the 95% confidence interval or if at least 5% of the lags through spikes are beyond the shaded region; otherwise, the time series is non-stationary.

3.3.1. Correlograms for Real Output

For the output variables, results of the correlogram show that real output variables exhibit non-stationarity characteristics and are particularly noticeable for the total, industry and services sectors (Fig. 5). Thus, it can be implied that a majority of the real output variables exhibit "random walk" or upward wandering trends. This non-stationarity nature thus reflects that the past events affect the current level of real total output and outputs of the agriculture, industry and services sectors. In order to pacify the trends and make these variables stationary, transformation through differencing was done. It turns out that even after the maximum of 20 differences, the variables are still non-stationary as found in the correlograms in Fig. 6.

Fig. 5. Correlogram Results for Output Variables in Level Form (Total and by Sector)

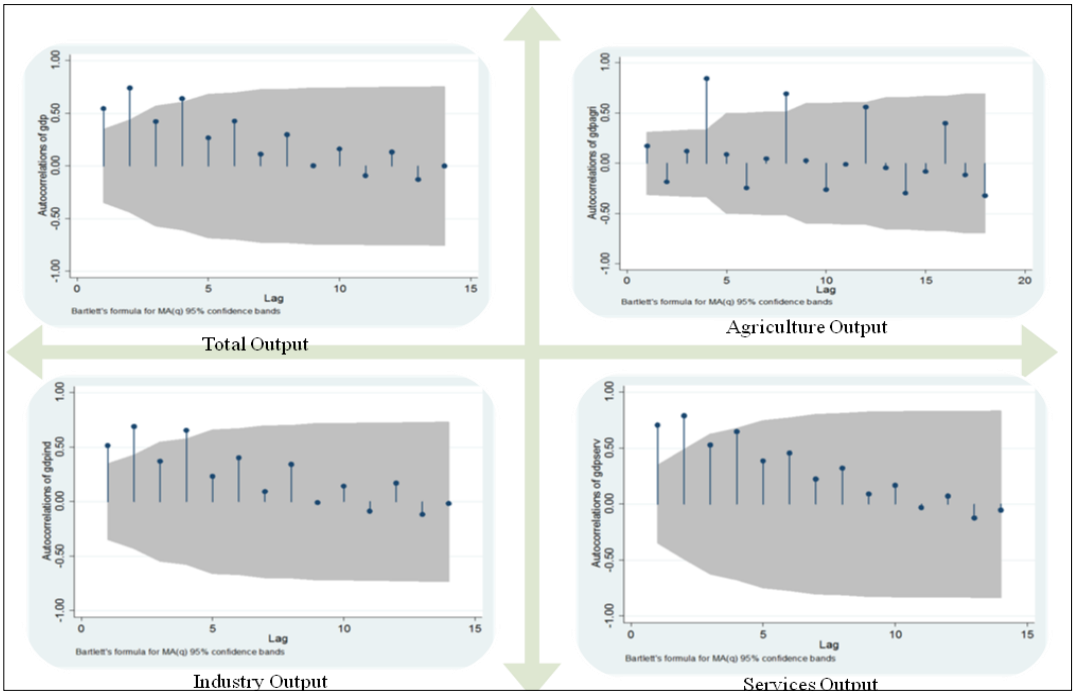
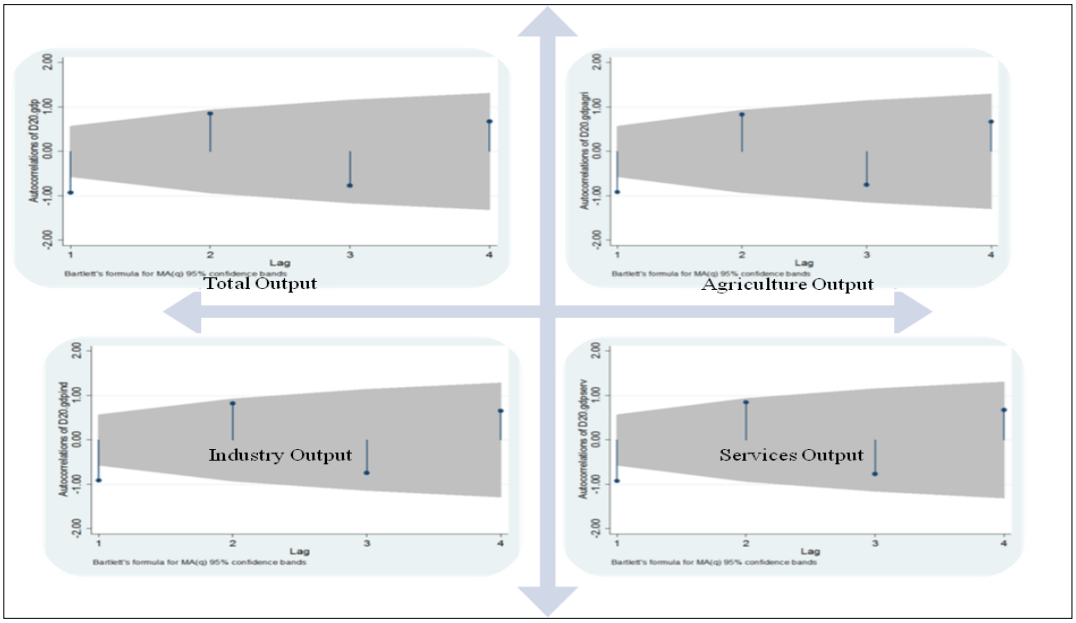


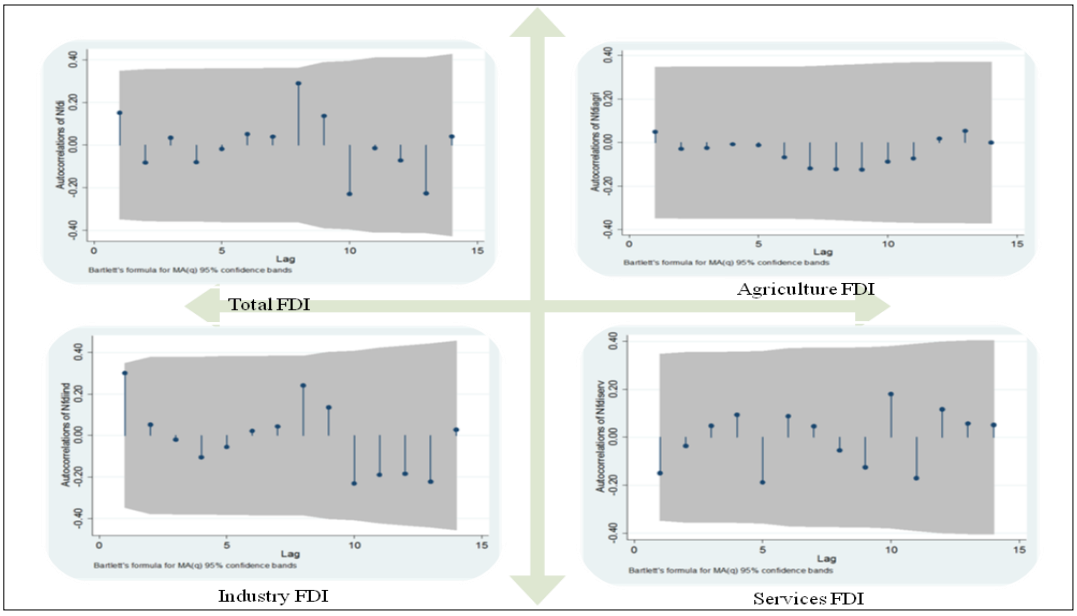
Fig. 6. Correlogram Results for Real Output Variables after the 20th Difference



3.3.2. Correlograms for NETFDI

The correlograms in Fig. 7 illustrate stationarity of all NETFDI variables and affirm the relatively static movement of all NETFDI flows in the country. All NETFDI variables are stationary at level form.

Fig. 7. Correlogram Results for All NETFDI Variables



3.4. Dickey-Fuller Tests

Results of the correlogram were verified using the Dickey-Fuller (DF) Test. Results are consistent with the correlogram in that total GDP, GDP in industry and services are stationary after first difference, and that GDP in agriculture is already stationary at level form (Table 3). Similarly, the DF test for NETFDI affirms the result of the correlogram. Because FDI is already stationary at level form while the FDI and GDP variables, except for agriculture, are stationary at first difference, this means that no long-run relationship can be established and that only short-run relationships exist between real output and NETFDI.

Table 3. Results of the Dickey Fuller Test for Real Output and Net FDI by Sector, Philippines

Variables	t-stat	p-value	Stationarity
GDP	-2.372	0.1499	
First Differenced: D.GDP	-18.569	0.000***	Stationary, I(1)
GDPAGRI	-4.917	0.000***	Stationary, I(0)
GDPIND	-2.589	0.0953	
First Differenced: D.GDPIND	-15.461	0.000***	Stationary, I(1)
GDPSERV	-1.648	0.4583	
First Differenced: D.GDPSERV	-31.404	0.000***	Stationary, I(1)
TOTAL NetFDI	-4.700	0.0001***	Stationary, I(0)
AGRI NetFDI	-5.140	0.0000***	Stationary, I(0)
IND NetFDI	-3.959	0.0016***	Stationary, I(0)
SERV NetFDI	-6.074	0.0000***	Stationary, I(0)

Note: ***Statistically significant at 1% level.

3.5. Effects of Net FDI on Real Total Output

Since it was established that no long-run relationship exists between Net FDI and real output in the Philippines, an ordinary least squares regression was used to determine the effect of FDI and real GDP. In addition, other variables such as employment (EMP), gross domestic investment (GDI) and trade openness (OPEN) were included as independent variables. Results showed that only employment is the significant variable in the model at 1% and significance (Table 4). This would imply that increasing the labor employed by 1 million workers would significantly increase output by about PhP 62.5 billion (US$1.33 billion) in the economy.

Overall, the model is well matched with the goodness of fit, adjusted R^2, at 0.8093, which means that about 81% of the variation in GDP is captured by the model and can be explained by the changes in the explanatory variables. The F-statistic also affirms this with the model being highly significant at 1% level.

On the other hand, the non-significance of the GDI and TOTALNETFDI would suggest that local as well as international investments in the economy have not necessarily affected the output of the economy in the study period. This is consistent with the result of Blomstorm et al. (1994) where it was found that "inflows of direct investment were an important influence on growth rates for higher income countries, but not for lower income ones". For the Philippines, this might be due to the "crowding-out" of investments inherent in the country's economy in which benefits from investments are not felt and linked in other sectors (Aldaba, 2010). In addition, since the data used in the study are net FDIs – that is net of withdrawals or repatriated investments abroad – it could well be the case that there are large withdrawals that affect re-investing activities of FDI in the economy as seen in drops and negative net flows of FDI in the country. Furthermore, the negative, although non-significance of the coefficient of trade openness, may be due the negative trade balance of the economy during the period covered by the study.

Table 4. OLS Regression Results with Real Total Output

Independent Variable	Regression Coefficient	Standard Error	t-values	VIF
Intercept	-691025**	305057.9	-2.27	
EMP	62597.21***	7960.617	7.86	1.48
GDI	0.3004828	0.2580634	1.16	1.75
TOTALNETFDI	-0.1420761	1.547101	-0.09	1.11
OPEN	-250282.3	128105.6	-1.95	1.40
N= 32				1.44
F (4,27) = 33.90				(Mean VIF)
Prob> F = 0.0000*				
R2 = 0.8339				
Adj R2= 0.8093				
Root MSE = 68913				
DW-Stat: 2.122114				

Note: ***Significant at: 1%; **5% level.

IV. Summary and Conclusions

This paper attempted to examine if there are long-run relationships between NETFDI and real output of the whole Philippine economy and by major sectors such agriculture, industry and services. The general concern was to find out the causality or the leader-follower relationships that exist. In view of this, the variables were subjected to correlogram and Dickey-Fuller tests to determine the stationarity of the variables – a pre-requisite to further tests that establish the long-run connection.

For the period from 2004 to 2011, there is a general increasing trend in real GDP, although there is a slight dip at the onset of the global financial crisis in 2009. By sector, the services sector's increasing growth disparity against the other sectors is apparent and is accountable for more than half of the total output of the economy. In contrast, although the agriculture sector of the country employs more workers than the industry sector, it performs the weakest in terms of output share.

Notwithstanding the chunk of foreign investments in these sectors, it is noticeable that there are instances when there are negative values for these investments, but this can be attributed to the mass withdrawals of these investments being repatriated back to the origin country. This is in contrast with NETFDIs found in the agriculture sector which does not exhibit negative net values, although the sector was found to be growing at a slower pace.

Real GDP for the whole economy and the services and industry sectors are non-stationary at level form but became stationary after their first differences. This reflects that there is indeed the presence of upward long-term trends for output variables. On the other hand, the FDI variables were all stationary at level form and predispose the absence of trends of FDIs in the country. This may be because of the limitation in terms of available dataset on NETFDIs that cover only eight years. Since this is the case in which FDI, being one of the variables, is already stationary at level form and implies no general trends, further tests to determine the long-run relationships such as cointegration could no longer be established. Thus, it is apparent that only short-term analysis can be carried out in this case.

It may be interesting to know according to World Bank (2007) as cited in Canlas (2008), the top five reasons why firms do not invest in the Philippines include macroeconomic stability, corruption, high cost of electricity, inefficient tax structures, and regulatory/policy uncertainty. Therefore, in order to address these problems, there is a need for wide-ranging policies and fine-tuning of the implementation, monitoring and evaluation of old policies so that improvements in the business climate in the Philippine economy may increase the confidence of investors.

Though this study enabled us to determine the effects of NETFDIs on output and provided some analysis for the short run, it might be interesting to see how FDIs could affect the sectors and sub-sectors, the labor market, and the whole economy in the future with a longer data set providing a wider horizon for other methods and interpretations that were not carried out in the study such as identifying (if there will be) long-run relationships through co-integration and other causality methods.

References

Adhikary, B. K. (2011). FDI, trade openness, capital formation and economic growth in Bangladesh: A linkage analysis. *International Journal of Business and Management*, *6*(1), 16-28.

Aldaba, R. M. (1994). Foreign direct investment in the Philippines: A reassessment (No. RPS 1994-10). Philippine Institute for Developmet Studies.

Aldaba, R. M., & Aldaba, F. T. (2010). Assessing the spillover effects of FDI to the Philippines (No. DP 2010-27). Philippine Institute for Development Studies.

Asian Development Bank. (2010). *Asian Development Outlook: 2004-2010 Philippines*. Manila, Philippines: Author.

Atique, Z., Ahmad, M. H., & Azhar, U. (2004). The impact of FDI on economic growth under foreign trade regimes: A case study of Pakistan. *The Pakistan Development Review*, *43*(4), 1-11. Retrieved from http://www.pide.org.pk/pdf/PDR/2004/4/Part II/Zeshan%20Atique.pdf

Austria, M. S. (2003). The Philippines in the global trading environment: Looking back and the challenges ahead (No. DP 2002-15). Philippine Institute for Development Studies.

Bangko Sentral ng Pilipinas. (2012). *Net Foreign Direct Investments, CPI, Exchange Rates of the Philippines*. Retrieved from http://www.bsp.gov.ph

Canlas, D. B. (2008). *Philippine labour market outcomes and scenarios: 2000-2015*. ILO, South-East Asia and the Pacific.

Green, W. (2002). *Econometric analysis*. New Jersey: Prentice Hall.

Gujarati, D. (1995). *Basic econometrics*. Singapore: McGraw-Hill Inc.

Habito, C. F., & Briones, R. M. (2005). Philippine agriculture over the years: Performance, policies and pitfalls. In conference entitled "*Policies to Strengthen Productvity in the Philippines*," *sponsored by the Asia-Europe Meeting (ASEM) Trust Fund, Asian Institute of Management Policy Center, Foreign Investment Advisory Service, Philippines Institute of Development Studies and the World Bank, held in Makati City*. Retrived from http://siteresources.worldbank.org/INTPHILIPPINES/Resources/Habito-word.pdf

International Monetary Fund (IMF). (1993). *BOP Manual* (5th ed.). Washington, DC: Author, 86.

National Economic and Development Authority. (1974). *Sharing in development: A programme of employment, equity, and growth for the Philippines*. Manila, Philippines: Author.

National Statistical Coordination Board. (2012). *Information*. Retrived from http://www.nscb.gov.ph

Ruffin, R. J. (1993). The role of foreign investment in the economic growth of the Asian and Pacific region. *Asian Development Review*, *11*(1), 1-23.

United Nations Conference on Trade and Development (UNCTAD). (2012). *World investment report 2012: Towards a new generation of investment policies*. Switzerland: United Nations Publication. Retrieved from http://unctad.org/en/Pu blicationsLibrary/wir2012_embargoed_en.pdf

Yalta, A. Y. (2012). Revisiting the FDI-led growth hypothesis: The case of China. *Economic Modelling*, *31*, 335-343.

ISSN 1946-5130
http://dx.doi.org/10.20294/jgbt.2015.11.1.27

Journal of Global Business and Trade

www.ipfw.edu/jgbt

Governance Mechanisms of Logistics Service Integrated Network

Fen Wang [a] and Taewon Kang [b]*

[a] *Department of Logistics Management, Zhejiang Ocean University, China*
[b] *Department of Logistics, Kunsan National University, South Korea*

Received 11 March 2015 Revised 20 April 2015 Accepted 20 May 2015

ABSTRACT

The logistics service integrated network is the primary factor in the logistics integrated service. This paper analyzed both the connotation and structure of the logistics service integrated network. It elaborated on the governance logic of the logistics service integrated network in terms of relationship, interaction and collaboration. Since the governance model of a logistics service integrated network is dominated by contractual governance, this paper discussed its macro-governance mechanisms (e.g. trust mechanism, reputation mechanism, culture mechanism and joint sanctions mechanism) and micro-governance mechanism (e.g. entry barriers mechanism, incentive and restrictive mechanism, coordination mechanism and information feedback mechanism) so as to promote a coordinated effect on the logistics service integrated network.

Keywords: logistics service network, macro-governance, micro-governance
JEL Classifications: D01, D21, L22

I. Introduction

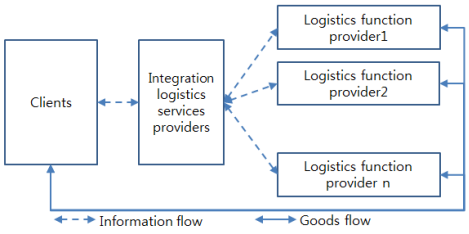
The logistics service integrated network refers to an organizational network system that is constructed through certain supply and demand chain by logistics service integrators and logistics function providers. The aim is to satisfy the logistics demand of the customers. In the logistics integrated service, the core enterprise is the logistics service integrators. It integrates the logistics resources of function-type logistics enterprises to complete the integrated logistics service demands (e.g. physical, capital and information flow) of the customers (Liu, 2007; Tian, 2002). The participants of a logistics service integration network consist of clients, logistics function providers and logistics service integrators. In Fig. 1, the clients refer to the logistics service demanders and the final objects of service, whether they are the same or not. Only when the operation network of the logistics service integrators is integrated with that of the logistics service demanders can they promptly respond to customers' needs. In terms of logistics function providers, the cost of storage and transportation has accounted for over 2/3 of the total cost. Hence, the warehousing-type and transportation-type function providers must be taken into consideration in calculating the cost. In addition, with the increasing demand for distribution services among clients, the distribution-type function providers became important

* Corresponding author,
E-mail address: twkang@kunsan.ac.kr

participants in international logistics. This includes cargo agency, customs declaration and other intermediary companies. The logistics service integrators play a role of central command during the logistics service process. It accepts the customer's operation information. Then it transfers the information to the logistics function providers. Next, it offers operation instructions to the logistics function providers according to the customer's request. Simultaneously, the firm reports the results to the clients. Hence, the logistics service integrators are the designer and organizer of the whole logistics activity. It needs the resources and processes of all member enterprises to coordinate the logistics service from the global context (Tian, 2002).

In view of the organizational relationship, the logistics service integrators and logistics function providers have horizontal cooperation. However, from the business point of view of their cooperation, there is vertical cooperation of mutual supply and demand. Hence, the logistics service integrated network is a chain network. Needless to say, the logistics function providers may be providing the same kind of logistics function service.

Fig. 1. Logistics Service Integrated Network

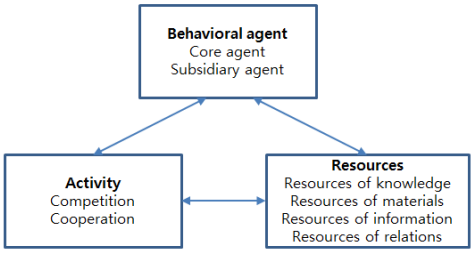


The logistics service integrated network is important to the logistics service integrators in order to gain strategic advantages, create values, and reduce risks. However, this mode of operation is complex and it needs synergy. This depends on the excellent governance model and mechanism which will be analyzed in the following part.

II. Organizational Structure of the Logistics Service Integrated Network

Hakansson and Snehota (1995) put forward the basic variables of network organizational structure, namely behavioral agent, activities and resources, to analyze the structural organization of logistics service integrated network (Fig. 2).

Fig. 2. Organizational Structure of Logistics Service Integrated Network



2.1. Behavioral Agent

The behavior agent of a logistics service integrated network consists of logistics service integrators, logistics function providers, and customers, among others. In addition, it also includes related agencies such as training institutions and financial institutions, among others. There are two kinds of core agents: the logistics service integrators and logistics functional providers. The core agents implement and complete the logistics service to realize incremental value. The other related ones are called subsidiary agents. The research on logistics service integrated network lies in the relationship among core agents. The logistics service integrators, as core enterprises of value agents, can fully play the role of subsidiary bodies, especially the financial institutions. The aim is to enhance the incremental value of the logistics service integrated network. One useful example is Great China Logistics, which uniformly purchases oil cards from Sinopec.

In the logistics service integrated network, the logistics service integrators construct, guide and coordinate the whole value process. The logistics services integrated network is an organizational

network that has a leader. The logistics services integrator is the leader of the whole network organization. It coordinates and controls logistics function providers through contracts, instructions and other information. It also exchanges this information with the outside world. The logistics function providers, as members of the enterprise, employ their own functional logistics abilities to complete the assigned tasks. Consequently, both parties create value to achieve a win-win situation for the whole network organization.

2.2. Activities

In the logistics services integrated network, activity refers to the various activities where behavioral agents transfer and exchange logistics capacities with each other. These interactions are basic among network organization behavioral agents. There is a mutual supply and demand relation between logistics services integrators and logistics function providers. The interactions are mainly competitive and cooperative in nature. In the cooperative relationship, the logistics services integrators acquire logistics capabilities from the logistics function providers since it could rapidly coordinate logistical requirements to satisfy the demands of clients. According to the research results from logistics enterprises, logistics services integrators mainly hope that both the quantity and quality of logistics capabilities from the logistics function providers can fully meet the demands. In the competitive relationship, on the other hand, it seems there is a benefit game between the logistics services integrators and the logistics function providers in terms of the price, quantity, and quality of the logistics capability. Both parties hope to maximize their own interests. Cooperation and competition exist between the logistics services integrator and the logistics function provider. For example, in order to ensure the quantity and quality of logistics capability, the logistics services integrators will usually not cooperate with just one logistics function provider for one particular logistical task. The integrators will select many logistics function providers so that these logistics function providers offering the same services will compete in terms of price, quantity and quality. For example, Guangzhou Hehuang Logistics selected three leased line enterprises on the transportation from Shanghai to Wuhan.

In a logistics services integrated network, it is interaction that promotes the relations among agents and increases dependence between each other. Therefore, if both sides have a benign interaction, the cooperation between the logistics services integrators and logistics function providers will be smoother, more durable, and adaptable.

2.3. Resources

The cooperation between the logistics services integrators and logistics function providers is based on the cooperation of logistics capability. Both parties cooperate through the exchange of logistics capabilities. However, during the logistics process, the activities and resources are intertwined. The completion of activities requires resources which must be deployed so that the logistics abilities will improve and become more valuable. The logistics services integrated network has a number of resources. Hence, it provides an excellent channel for the diffusion and sharing of various resources. These resources can be classified as: (1) material resources which include a variety of logistics machineries, equipment and facilities used in the logistics services integrated network; (2) information resources which consist of various information about the clients' material flow and information on facilities and equipment from the logistics function providers; (3) knowledge resources which consist of the knowledge and ability operated by various function providers; and (4) relationship resources such as social relation resources inside the logistics integrated services network.

Ⅲ. Governance Logic of Logistics Services Integrated Network

Network governance refers to a series of arrangements among behavioral agents and the activities in the network organization. It is based on a three-dimensional governance logic model of the network organization as put forward by Sun (2003), namely (1) relationship, (2) interaction and (3) synergy. This paper elaborated on the governance logic of logistics services integrated network.

3.1. Relations among the Joints

In a logistics services integrated network, because of the uneven qualities of China's logistics function businesses, only a few enterprises can cover the national market. The logistics function providers in the developed regions have stronger abilities while those who are in the poor regions have weaker abilities. In order to continue to serve the clients, the logistics services integrators must ensure that it has a stable and reliable team of logistics function providers. Since the integrators depend on the logistics function providers to a certain degree, their relationship is different from the task-oriented guiding bureaucracy and profit-oriented guiding principle of market organization. It becomes an interactive guide which aims to form cooperation and coordination between the two sides. In order to obtain a stable business, the logistics function providers will also coordinate with the demands of the logistics services integrators.

The relationship between the logistics services integrators and logistics function providers has experienced a process from weak coupling to strong coupling. At the early stage of cooperation, when the logistics services integrators know little about the logistics capabilities of the logistics function providers (whether tangible factor capabilities or intangible operation abilities), they would select several logistics function providers as their partners. The cooperation period is usually about six months to a year. As their cooperation advances further, the logistics services integrators becomes more familiar with the service abilities of the logistics function providers. At this point, the integrators would have the information to eliminate a number of unqualified function providers and provide more orders to the qualified function providers. When the logistics services integrators expand businesses in some underdeveloped-logistics regions, they would cooperate with these qualified function providers. The integrators would even support the function provider in expanding its businesses so that both sides can achieve a win-win cooperation. For example, logistics in Northeast China were underdeveloped and there were relatively few transport service providers from Shanghai to the Northeast. However, the clients of certain logistics services integrator needed to transport a large amount of goods to the Northeast. In order to satisfy the needs of the clients, this logistics services integrator selected and cooperated with a logistics function provider. In the process, it helped the function provider to expand its market in the Northeast. This reflected a relationship of strong coupling. It is this strong tie that strengthens both sides and promotes a benign interaction between them.

3.2. Coordination and Interaction between the Joints

In a logistics services integrated network, in order to complete the integration of logistics services, the integration of various stages of logistics operations, logistics information and logistics functions, as well as the coordination among various behavioral agents are needed. In the process of cooperation, the behavioral result between joints is a mutually functional relationship. It is not only the function of its own efforts, but also the functions of the behavioral results of the other joints. Hence, each joint must coordinate and interact so as to achieve an excellent cooperation. Therefore, co-governance is a basic requirement for interaction. All the clients, function providers and logistics services integrators must reach a consensus on the cooperation.

In the operational process of the clients' supply chain, they start from the demands of final clients and synchronize that with both production planning and logistics. In the logistics services network, on the other hand, the logistics services integrators standardize and

modularize its own operational procedures and that of the logistics function providers. This would include transportation procedures, warehousing procedures, ex-warehousing procedures, and distribution standard procedures, among others. The standardized business procedures are the smallest units of internal control in an enterprise. This becomes the behavioral basis of the operations in a logistics enterprise since it has strong practicability and a clear standardized and modular business procedure. It allows each link of logistics to be more standardized. It can also ensure the quality of logistics operations, as well as smooth communications among the logistics function providers and between the logistics function providers and other enterprises (i.e., clients related enterprises). It makes the logistics activities of all the enterprises in the supply chain closely and properly coordinated.

In the cooperative mechanism, the logistics service integrators and the logistics function providers must have contractual arrangements on the price, service quality, service quantity and profit distribution, among others. Especially important is the agreement in case of unpleasant surprises. For example, when the cost of the logistics function providers experiences a large fluctuation, it should ensure conduct of task.

3.3. Results of Interaction: Synergistic Effects

According to research results, an excellent logistics service integrator must have a team of stable logistics function providers for coordination. This kind of coordination is different from the market organization and administrative organization in a logistics service integrated network. In fact, it is a complementary coordination of the self-organization.

The long-term interaction between the logistics service integrators and the logistics function providers gives them a sense of mutual recognition. The increasing interaction frequency between the logistics service integrators and logistics function providers can promote a mutual understanding, increase the intimacy of their cooperation, increase mutual trust, and promote their coordination and cooperation.

IV. Governance Model and Governance Mechanism of Logistics Service Integrated Network

4.1. Governance Model of Logistics Service Integrated Network: The Contractual-based Governance

In the logistics service integrated network, there are weak relationships and strong relationships between the logistics service integrators and the logistics function providers. The weak relationship generally focuses on market trading while the strong relationship focuses on the strict rules, norms and constraints which can create a synergistic effect in the network. This is an example of contractual governance. The written and legally binding contract of the logistics service integrated network stipulates that all participants' powers and responsibilities are explicated to realize an incentive and restrain influence on the participating agents, and ensure a stable and effective operation of logistics service integrated network. In restricting the opportunistic behaviors of the participating agents, the contractual governance is a rather effective means. Hence, the variability of contract must be taken into consideration when formulating the contract of logistics service integrated network. Although the cooperation among APEC members has continuity, the Chinese market is not stable, especially the market factors such as prices of labor and oil, among others. Even if the current contract can ensure an effective operation of the network organization, it is also necessary to adjust the contract at some point in time in order to protect the interests of partners.

Of course, the contract is often not complete. It is quite costly to just rely on the constraint stipulated in the contract for the coordination and control of the network organization. There is also a need to trust that the low-cost provider will fulfill its function. Enterprises formed trust during their long-term cooperation. Hence, their trust relationship can ensure

the stability of the network (Grandori & Soda, 1995). The participating agents, on the other hand, can trust each other based on reputation and culture, among others. If the participants have an excellent reputation, it is easy to obtain the recognition and trust of partners. If the participants have the same culture, both parties could establish trust and lay a solid foundation for cooperation.

4.2. Governance Mechanism of Logistics Service Integrated Network

To experience a synergistic effect in the network organization, an effective governance mechanism must be used for motivating the members of the network organization. The governance mechanism of network organization consists of macro-governance mechanisms and micro-governance mechanisms. Macro-governance mechanisms include a trust mechanism, reputation mechanism, culture mechanism and joint sanctions mechanism. On the other hand, the micro-governance mechanisms include an entry barriers mechanism, motivation and constraint mechanism, coordination mechanism and information feedback mechanism (Sun, 2006).

4.2.1. Macro-governing Mechanism

4.2.1.1. Trust Mechanism

The trust mechanism in the logistics service integrated network can ensure that the network members abide by the requirements of the contract to achieve the organizational goals which stabilize the network organization. The primary trust comes from the previous interactive experience of the participants, the reputation of both parties and each other's evaluation of strength. Continuous trust comes from equal cooperation, information sharing and communication, team learning such as procedural justice in the cooperation, reasonable distribution of benefits, sharing of key information and studying together. A stable trust relationship comes from the trust guarantee mechanism and outstanding personal relations. An excellent trust guarantee mechanism refers to making compensation and punishment measures when the participants violate the trust, offering economic and reputation motivations for the cooperative enterprises, and enhancing the exit barriers of the enterprises, among others.

4.2.1.2. Reputation Mechanism

In an uncertain environment, the trading parties pay particular attention to their partner's reputation. A sound record of cooperation is the basis for in-depth cooperation. The logistics function providers must face many logistics service integrators. They will treat the logistics service integrators in a different way according to the actual status of the logistics service integrators. Since the benign reputation of the logistics service integrators can attract more high-quality logistics function suppliers and clients, the logistics function providers of higher reputation can promote further cooperation with the logistics service integrators. The logistics service integrators, as the core enterprise in the network, have to establish their own reputation to establish a stable logistics service integrated network, as well as to manage the logistics function providers.

4.2.1.3. Cultural Mechanism

The culture of logistics service integrated network refers to the participants' common values and norms of behavior. As the links involved in the logistics service are too many and their processes are too long, establishing a set of information transfer specifications and behavioral specifications, as well as rules in the unexpected conditions is needed. This ensures that the service process is rigorous, the quality of service is stable, and the trading process for the logistics capability is simplified so as to improve trading efficiency. Therefore, the establishment of a cultural mechanism is an important method to improve the operation efficiency of the logistics service integrated network.

4.2.1.4. Joint Sanctions Mechanism

The joint sanctions mechanism is seen when the participants who have violated the behavioral rules of a network are penalized. The losses include the loss of future interests, reputation and pressures from members. It defines acceptable behaviors by presenting the consequences of non-compliance. This reduces the uncertainty of behaviors by increasing the cost of opportunistic behaviors (Jones, Hesterly, & Borgatti, 1997). In the logistics service integrated network, the logistics service integrators, as the core enterprises, put forward clear requirements for the function providers under the prerequisite of quality-first logistics service. It puts forward specific punitive measures against opportunistic behaviors so that the joint sanctions mechanism will help to achieve the goal of the network organization.

4.2.2. Micro-governance Mechanism

Micro-governance mechanism is the operational mechanism of the logistics service integrated network. It plays a regulatory role in the logistics service integrated network, which is conducive to the stable operation of logistics service integrated network.

4.2.2.1. Entry Barriers

With the expansion of the scale of logistics service integrated network, the logistics service integrators, as the core enterprises, have a lot of relationships to coordinate so that the quality and strength of cooperation with the logistics function providers will be inevitably weakened. Setting up entry barriers can reduce the number of trading partners in the network, strengthen the relationship contract of logistics function providers, and ensure that transactions are operated among logistics function providers with similar capabilities. For example, the carriers of Guangzhou HUTCHISON Logistics selected the appropriate number of trading partners according to the transportation capacity of logistics function providers. After several instances of cooperation, they have established a stable team of suppliers, limited the number of trading partners, increased the frequency of interaction, and laid a solid foundation for building strong ties and common behavioral regulations. In addition, the strong coupling reduces various changes of the participants, such as cooperation anticipation, cooperation skills, and cooperation goals, among others. This has laid the foundation for the repeated gains of participants that led to the reduction of coordination cost and the improvement of the participants' cooperative efficiency.

4.2.2.2. Motivation and Constraint Mechanism

The establishment of a motivation and restraint mechanism is beneficial to the integration of different resources to the network organization participants, the amalgamation of multi-culture, the building of the trust relationship so as to promote the cooperation of the participants, and the motivation mechanism which mainly includes economic motivation and cultural motivation. The logistics service integrated network can fully utilize the advantages of the core competence from the logistics service integrators and logistics function provider. They can better satisfy the clients' demands for logistics integration. Sharing the benefits and risks is advantageous to the logistics service integrators and logistics function providers in the economy. Cultural motivation, sincerity, frequent interactions and open communications can better coordinate mutual expectations, eliminate misunderstanding in the cooperation, and improve the efficiency of cooperation. The constraint mechanism mainly includes the interdependence constraint, a self-enforcing constraint and collateral constraints. An interdependence constraint exists when the logistics service integrators depend on the logistics capabilities of the logistics function providers in the logistics service integrated network while the logistics function providers depend on the resources of the logistics service integrators. Both parties will form a logistics services integrated network and agree on the quality target, task division, service period and cost, among others. Self-constraint, on the other hand, refers to the

constraints on behaviors imposed by the participants themselves. Since the cooperation cycle between the logistics service integrators and the logistics function providers is relatively long, the logistics function providers' performance in the early stage can be observed. No one dares to destroy the cooperation at the cost of their own reputation; hence, they are certain to restrict their behaviors. The collateral constraint exists when the participants invest a specific unrecoverable asset into the network. This forms a credible commitment or "negative selection motivation" that makes the joints locked in the network. For example, in order to ensure the safety of the goods, the logistics service integrators will usually charge a deposit from the carrier to avoid default.

4.2.2.3. Coordination Mechanism

The participants in the logistics service integrated network have decision-making power. Each party has its own interests and demands. They cannot completely control their partners. Therefore, there will inevitably be various problems and conflicts in the process of cooperation. For this reason, there is a need for a coordination mechanism. The coordination mechanism focuses on the contractual means and realizes the control of the network organization members through the motivation and constraint function. The aim is to ensure that each participant's decision is in accord with the interests of the whole network organization. Different product supply chain networks coordinate according to the inventory. In the logistics service integrated network, it needs to match the supply capacity and demand for logistics service. There is a need to coordinate the network organization since service products are intangible and could not be stored. The objects to be coordinated among the participants are the ordering and delivery of the logistics service capabilities. From the point of view of an individual trader, the focus of the logistics service integrators should be stable service quantity and quality of the logistics function providers. From a long-term perspective, the logistics service integrators will value a team of logistics function providers that could create stable cooperation. Therefore, for the coordination mechanism of the logistics service integrated network, the coordination mechanisms such as the logistics capacity quantity (the logistics capacity ordering quantity and capacity investment), the logistics service quality and the profit distribution were presented in this paper. The aims of the mechanisms are to reduce opportunistic behaviors in the network organization, achieve risk-sharing, and establish motivation to promote the sharing of benefits so as to ensure a coordinated operation of the logistics service integrated network.

4.2.2.4. Information Feedback Mechanism

An integrated logistics solution requires that the logistics service integrators integrate all of the logistics activities in the clients' supply chain to achieve systematic integration and management. An excellent information processing platform is a technical foundation where the logistics service providers, the clients and the logistics function providers transfer the information. It is also the basis of all logistics operations. The complexity of the logistics network comes from the spatiality of the clients' goods, the dispersed geographic locations of the clients, and various service elements. Only through the technical supports of the information systems and the real-time information sharing of each member enterprise can various logistics operations run smoothly. Hence, an excellent information processing technique is the core competitive strength of the logistics services integrators (Persson & Virum, 2001). Therefore, in the logistics services integrated network, the logistics services integrator must establish an excellent communication mechanism with the clients and logistics function providers. In the actual operation, many logistics services integrators will assess the information feedback ability of logistics function providers so as to ensure that the whole logistics links operate smoothly and to realize the coordination of the logistics service integrated network.

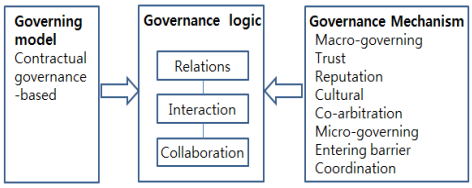
The purpose of both the macro-governance mechanisms and micro-governance mechanisms are to

ensure a coordinated operation of the logistics services integrated network. The motivation and constraint mechanism and coordination mechanism are very important parts of the governance mechanisms.

V. Conclusion

Logistics integrated service is an advanced form of logistics service (Hertz & Alfredsson, 2003). Chinese logistics service integrators are usually inefficient in the layout of logistics facilities. The logistics service networks are generally concentrated in certain specific markets and it is difficult to meet the needs of the clients in other regions.

Fig. 3. Logistics Service Integrated Network



The logistics service integrated network is a network system constructed by the clients, the logistics function providers and the logistics service integrators. This collaborative operation is beneficial for the integrated logistics service, but it needs the control logic and governance mechanisms as a guarantee. The governance logic of the logistics service integrated network follows the view of relationship-interaction-collaborative logistics service. The governance model of the logistics service integrated network is based on contractual governance. Hence, both the macro-governance mechanism and the micro-governance mechanism were taken into consideration in the governance mechanism (Fig. 3).

References

Grandori, A., & Soda, G. (1995). Inter-firm networks: antecedents, mechanisms and forms. *Organization Studies, 16*(2), 183-214.

Håkansson, H., & Snehota, I. (1995). Stability and Change in Business Networks. In H. Håkansson, & I. Snehota (Eds.), *Developing Relationships in Business Network* (pp. 269-329). London: Routledge.

Hertz, S., & Alfredsson, M. (2003). Strategic development of third party logistics providers. *Industrial Marketing Management, 32*(2), 139-149.

Jones, C., Hesterly, W., & Borgatti. S. P. (1997). A general theory of network governance: Exchange conditions and social mechanisms. *Academy of Management Journal, 22*(4), 911-945.

Liu, W. H. (2007). *Coordination research on the capacity cooperation in the logistics services supply chain*. Shanghai: Shanghai JiaoTong University.

Persson, G., & Virum, H. (2001). Growth strategies for logistics service providers: A case study. *International Journal of Logistics Management, 12*(1), 53-64.

Sun, G. Q. (2003). The governance logic of the relationship, interaction and synergy in the network organization. *Chinese Industrial Economy, 11*, 14-17.

Sun, G. Q. (2006). The governance boundary of the network organization: Basic connotation, restricted factors and main functions. *Journal of Shanxi University of Finance and Economics, 2*, 80-85.

Tian, Y. (2002). Research on the selection of suppliers in the building of logistics service supply chain. *Logistic Technique, 5*, 21-23.

ISSN 1946-5130
http://dx.doi.org/10.20294/jgbt.2015.11.1.37

Journal of Global Business and Trade

www.ipfw.edu/jgbt

Choice Modelling and Simulation of Low Emission Vehicles under Different Policy Scenarios in the Philippines

Hadji C. Jalotjot[a]* and Yoshikuni Yoshida[b]

[a] *Center for Strategic Planning and Policy Studies, University of the Philippines Los Baños, Republic of the Philippines*
[b] *Department of Environment Systems, Graduate School of Frontier Sciences, The University of Tokyo, Japan*

Received 14 February 2015 Revised 9 April 2015 Accepted 20 May 2015

ABSTRACT

Using stated preference data from 300 respondents of a discrete choice experiment, a conditional logit model was estimated to determine preference for low emission vehicles (LEV) and to simulate vehicle share in Metro Manila, Philippines. The model shows that among different vehicle types, there is highest preference for diesel vehicles. Among LEVs, only hybrid electric vehicles (HEV) have a preference level comparable to diesel and gasoline vehicles. Least preferred by the respondents are liquefied petroleum gas and battery electric vehicles (BEV). Initial simulation of vehicle share shows a high share of HEV and BEV, suggesting the large effect of emission levels on choice. However, when acquisition cost and the number of available vehicle models in the Philippines are accounted for, simulation results show a significantly reduced market share for HEV and BEV with AutoLPG vehicles gaining a higher share. The potential co-benefits from reduced emission and fuel savings and the vehicle owners' preference for lower emission levels are the main factors for adopting LEVs. However, LEVs remain expensive to most Filipino vehicle owners. A significant price reduction and an increase in available LEV models can facilitate faster adoption of LEVs among Filipino vehicle owners.

Keywords: choice experiment, vehicle choice, low emission vehicles
JEL Classifications: C15, Q56, Q58

I. Introduction

1.1 Low Emission Vehicles in the Philippines

Vehicle choice plays an important role in reducing air pollution. In urban areas, the future levels of air pollution from vehicles depend on the proportion of new car buyers who opt for less polluting vehicles (Ewing and Sarigollu, 1998). Low emission vehicles (LEV) provide an opportunity for reducing air pollution because of their higher fuel economy and the lower emission factor of their fuels. LEVs include compressed natural gas (CNG) vehicles, electric vehicles (EV), liquid petroleum gas (AutoLPG) vehicles, hybrid vehicles (HEV) with electrical and internal combustion motive systems (United Nations Framework Convention on Climate, 2012).

The adoption of LEVs in the Philippines is low compared to conventional vehicles (i.e., gasoline and diesel vehicles). Existing LEVs in the market include AutoLPG vehicles, BEV, and HEV. AutoLPG vehicles are mostly taxis in Metro Manila estimated at 19,000 (Department of Energy, 2011) plus an

* Corresponding author,
E-mail address: hcjalotjot@up.edu.ph

undetermined number of private vehicles fitted with an AutoLPG system. For the BEV, the Department of Energy (2011) reported only 560 units of BEV in 2010, which increased to 623 units in the first half of 2011. An Asian Development Bank project aims to have 100,000 electric tricycles by 2016, but only 20 are operational as of 2012 (Asian Development Bank, 2011). The HEV, introduced only in 2007, is priced almost double that of a conventional vehicle of similar model, make and size. The high cost of an HEV is mainly due to import duties and taxes which account for at least 40% of the vehicle retail price. Unofficial report states an average of two to three units sold per month.

The low level of adoption is not surprising considering the low LEV adoption in high-income countries due to a limited number of refueling (recharging) stations, high refueling (recharging) costs, safety and liability concerns, technologies and performances improvements in the competition, and high costs for consumers (Romm, 2006).

1.2. Challenges in Promoting the LEV

Increasing the adoption level is necessary to realize the potential pollution abatement from the LEV. This involves overcoming commercial obstacles often faced by green innovators including low willingness-to-pay of consumers for environment-friendly products (Kemp & Pontoglio, 2011). In the Philippines, fiscal and non-fiscal incentives for manufacturers and importers of LEVs are being proposed to address some of these obstacles. Despite this, it is imperative to have an understanding of consumer choice as environmental legislation may not necessarily be an important factor in innovations as customer pressure is (Del Río, Carrillo-Hermosilla, & Könnölä, 2010).

The National Environmentally Sustainable Transport Strategy for the Philippines (National Center for Transportation Studies, 2011) identified promotion of alternative fuels and low emission vehicles as one of the many strategies in reducing energy consumption and emission of air pollutants, and in enhancing sustainable mobility. However, NESTS acknowledged that the Philippines still struggles with the economic operation of its transportation sector with survival and sustainability far from being reconciled particularly at the local level. Recognizing the barriers and understanding the behavior towards proposed technological and policy solutions become essential because the behavioral responses of individuals to the actions of business and government will always be of interest to a wide spectrum of society (Louviere, Hensher, & Swait, 2000). This will inform policy makers and make them "confident that the policies they pursue will bring about the desired technological changes at acceptable costs" (Horne, Jaccard, & Tiedemann, 2005, 60).

Market disadvantage and lack of cost-effectiveness also confront LEVs and alternative fuel vehicles (Romm, 2006). Current generation of EVs are much more expensive such that it will not gain an advantage even if social costs of conventional vehicles are internalized (Funk &Rabl, 1999). This is further complicated by a market trend that focuses on driving performance instead of its environmental goals (Choi & Oh, 2010) and the automotive industry being locked-in on internal combustion engines despite regulations aimed at stimulating environmental innovations (Dijk &Yarime, 2010). Furthermore, social pressures only have an indirect impact on technological trajectories, mainly through the politics that influence technological development (Dijk &Yarime, 2010).

Despite these challenges, evidence suggests acceptance and adoption of LEVs mostly in industrialized countries. In South Korea, while gasoline vehicles are still the primary choice, alternative fuel vehicles (AFV) offer a viable alternative to conventional vehicles (Ahn, Jeong, & Kim, 2008). In a choice simulation in Canada, Ewing and Sarigollu (1998) revealed as high as a 55% share of AFVs in one scenario and as high as a 50% share of EVs in another. Including attitudinal factors in a follow-up study, Ewing and Sarigollu (2000) estimated similar shares for AFVs and EVs. As high as a 60% share of LEVs for personal cars was estimated in local

Japanese cities (Kuwano, Zhang, & Fujiwara, 2005). In the Philippines, Rubite and Tiglao (2004) modelled vehicle ownership in Metro Manila using several household and respondent characteristics as predictors. There is currently no study on vehicle choice model. This study is an attempt to model vehicle choice in the Philippines.

1.3. Objectives

The objective of this study is to model vehicle choice among owners of personal vehicles (i.e., privately-used vehicles). By modelling vehicle choice, this study provides information about vehicle preference that can be useful in the promotion of LEVs. This study specifically a) identified vehicle attributes that affect consumer choice; b) determined if vehicle owners have preference for LEVs; and c) estimated the potential market share of LEVs under various scenarios.

II. Survey Design and Data Collection

A discrete choice experiment survey was undertaken to gather data for the estimation of a vehicle choice model. All possible vehicle types were included in the survey to encourage the widest range of technological solutions to avoid adhering to sub-optimal technologies (Kemp, 1997 as cited by Del Río et al., 2010)

There is insufficient sales data on LEVs due to low adoption; hence, a stated preference method is more appropriate than a revealed preference method. A choice experiment was used because it resembles the actual decision making process undertaken by consumers. It allows determination of specific vehicle characteristics that have significant impact on consumer choice. This is useful especially in simulating market share under various scenarios.

2.1. Choice Experiment Design

A choice experiment is composed of several choice sets. Each choice set has one or more goods (called alternatives) from which respondents choose one. Each alternative is characterized by different attributes as shown in Fig. 1. For this study, attributes were identified based on the literature review. Attribute levels were identified using the study objectives and relevance to the concerned population as a guide. The relevance of the attributes and attribute levels was validated through an informal online survey with 52 respondents. The vehicle attributes and the attribute levels (Table 1) are classified as monetary, non-monetary and environmental (Bunch, Louviere, & Anderson, 1996; Potoglou & Kanaroglou, 2007).

The choice experiment was designed following the procedure described by Bunch, Louviere, and Anderson (1996). To reduce cognitive difficulty in answering the choice experiment, the number of alternatives per choice set was limited to two plus an option not to choose. Thirty choice sets were created and randomly assigned into three blocks with 10 choice sets per block which reduced the choice experiment into a manageable size. Each block was answered by 100 respondents.

Fig. 1. An Example of a Choice Set

CHOICE SET 1 of 10

If these were your final vehicle choices, which one would you choose?

FEATURES	Vehicle K	Vehicle A
No. of kilometers in a full tank or full charge	More than 450 kilometers	Less than 200 kilometers
Level of emission	Same as present day vehicle	At least 20% LESS than present day vehicle
Fuel cost of travelling 100 kilometers	Php600	Php400
Purchase price	Less than Php700,000	Between Php700,000 to 1million
Engine	Hybrid Gas-Electric	Electric
Incentives (vehicle registration, parking, and tax)	NO incentive	WITH incentive
I WILL BUY VEHICLE	☐ K	☐ A

☐ I WILL NOT BUY EITHER OF THE VEHICLES

Table 1. Vehicle Attributes and Attribute Levels Used in Choice Experiment Design

Attributes	Levels	Variable Name
Fuel / Engine Type (*ENGINE*)	Gasoline	*GAS*
	Diesel	*DIESEL*
	AutoLPG-Gasoline dual-fuel	*LPG*
	Hybrid electric	*HEV*
	Battery electric	*BEV*
Purchase Price in Php'000 (*PPRICE*)	Less than Php700	*LessP700*
	Php700 to Php1,000	*P700to1m*
	More than Php1,000	*MoreP1m*
Range of full tank or charge (*RANGE*)	200km	*r200km*
	450km	*r450km*
	More than 450km	*Over450km*
Cost of driving 100 kilometers of travel in Php (*C100KM*)	Php400	*C100km*
	Php600	
Parking / registration incentive / tax incentive (*INCNTV*)	WITH Incentive	*WITH_incntv*
	NO Incentive	*NO_incntv*
Emission Level(*EMIS*)	100%, 80% of present day passenger car	*EMIS*

2.2. Questionnaire Design and Survey

The respondents of this study are owners of privately-used vehicles excluding two- and three-wheeled motorcycles. It was assumed that private vehicle owners have the financial capability and flexibility in choosing a vehicle compared to owners of public utility vehicles. This is important since LEVs included in the choice experiment are considered more expensive than conventional vehicles.

Purposive sampling was used due to lack of accurate listing of the relevant population. Respondents were randomly selected in pre-determined areas in Metro Manila, specifically shopping malls and business districts. A survey company was hired for the fieldwork. The face-to-face interviews were undertaken from September to November in 2011. Considering time and cost constraints, the number of respondents was limited to 300 vehicle owners.

III. Choice Model Specification

Data from the choice experiment was fitted into a conditional logit model. The basic utility specification is as follows:

$$\text{Utility (U)} = GAS\times\beta_{GAS} + DIESEL*\beta_{DIESEL} + LPG\times\beta_{LPG} + HEV\times\beta_{HEV} + BEV\times\beta_{BEV} + LessP700\times\beta_{LessP700} + P700to1m\times\beta_{P700to1m} + MoreP1m\times\beta_{MoreP1m} + r2ookm\times\beta_{r200km} + r450km\times\beta_{r450km} + Over450km\times\beta_{Over450km} + WITH\_incntv\times\beta_{WITH\_incntv} + NO\_incntv\times\beta_{NO\_incntv} + C100km\times\beta_{C100km} + EMIS\times\beta_{EMIS} + NONE\times\beta_{NONE}.$$

The variables *C100KM* and *EMIS* were treated as quantitative variables which allow for flexibility in the simulation of vehicle choices. Simulation was done using a simple spreadsheet application, MS Excel.

IV. Results and Discussion

4.1. Socio-economic Characteristics of Respondents

Table 2 shows the characteristics of the survey respondents. More than half of the respondents (61%) are male. The sources of income are through employment (59%) and business (34%). The respondents have a relatively high income with 51% reporting a household monthly income of at least Php100,000, more than three times the Metro Manila average for all households in 2011. This is expected because of the purposive sampling which targeted vehicle owners assumed to have above average income.

Nevertheless, the over-sampled high income segment of the population is rather desirable with regards to cleaner technology (Potoglou & Kanaroglou, 2007).

Table 2. Socio-economic Characteristics of Respondents (n=300)

Variable	Category	Relative Frequency
Sex	Female	39%
	Male	61%
Occupation	Employed	59%
	Self-employed / Businessman	34%
	None	7%
Monthly household income	Php15,001 to 30,000	6%
	Php30,001 to 75,000	25%
	Php75,001 to 100,000	18%
	Over Php100,000	51%
	Mean / Median / Mode	
Age	36.8 / 35 / 30	
Household size	5.2 / 5 / 5	
Household members with income	2.8 / 2 / 2	
Number of vehicles	1.9 / 1 / 1	

Note: US$ 1 = Php 43.29.

The respondents have a mean age of 36.8 years. Average household size is 5.2, which is close to Metro Manila average of 5 but an increase from the 4.3 reported by the Metro Manila Urban Transportation Integration Study (Rubite & Tiglao (2004). The average number of vehicles owned is 1.9 per household, buta majority own only a single vehicle (mode and median). Most of the respondents are well-educated having attended a university or have earned post-graduate units or degree.

4.2. Vehicle and Travel Characteristics

The mean age of the respondents' vehicles is 8.8 years. None of the respondents reported using an LEV or AFV. More than one-third (69%) of the vehicles use gasoline and the rest use diesel. Data for 2005 from the Land Transportation Office (2005) showed a similar proportion of gasoline and diesel vehicles in Metro Manila for all types of vehicles (i.e., personal and public utility vehicles). However, considering only personal cars, the same data reported a higher proportion using gasoline (84%) with the rest using diesel.

The respondents' daily travel is generally short with a mean of 18.7 kilometers. All respondents reported making at least one 100-kilometers trip in the past year. The distance of 100 to 200 kilometers per trip was reported the most by the 135 respondents (45%). Such travel distances were made an average of 11.7 times a year. A longer distance of 200 to 300 kilometers was reported by 56 respondents (19%), 300 to 400 kilometers reported by 39 (13%), and over 400 kilometers by 51 respondents (17%). The average annual travel is 7,727 kilometers. These figures are self-reported estimates based on the respondents' recall.

4.3. The Choice Model

Estimates of the conditional logit vehicle choice model are shown in Table 3. The base variables used were *MoreP1m* for the attribute PURCHASE PRICE, *r200kms* for the RANGE, and *NO_inctv* for the attribute INCENTIVE. All coefficients of the model are highly significant at the 5% significance level except for the range variable *Over450km*. The signs of the coefficients met theoretical expectations except for the range variable *r450km*, which is negative implying that the longer range is less preferred than the shorter one. Since the attribute level *Over450km* is still preferred over *r200km*, the negative coefficient of *r450km* means that respondents could have disregarded *r450km* and paid attention only to the upper (*Over450km*) and lower (*r200km*) limit of the

variable RANGE. Overall, the model is statistically significant at 1% significance level and was used in simulating market share of vehicles.

Table 3. Conditional Logit Model Estimates

Variables	Coef. (β)	Std. Err	P>|z|
DIESEL	0.211	0.076	0.005
LPG	-0.367	0.093	0.000
HEV	0.200	0.091	0.027
EV	-0.264	0.077	0.001
LessP700	0.258	0.056	0.000
P700to1m	0.233	0.056	0.000
Over450km	0.077	0.056	0.173
r450kms	-0.235	0.056	0.000
WITH_incntv	0.243	0.040	0.000
C100KM	-0.001	0.000	0.000
EMIS	-0.011	0.002	0.000
NONE	-3.062	0.226	0.000
Number of obs = 9000			
LR $chi^2(12)$ = 1427.51			
Prob> chi^2 = 0.0000			
Pseudo R^2 = 0.2166			
Log likelihood = -2582.0818			

4.4. Potential Adoption of HEVs and BEVs

Potential adoption of HEVs and BEVs was initially assessed based on a) willingness-to-pay for the next vehicle purchase vis-a-vis price of LEV; b) daily travel distance vis-a-vis range of the vehicle; and c) a combination of both. Considering only the willingness to pay for the next vehicle purchase, 13% of the respondents are considered potential adopters, i.e., willing to spend the amount (Php1.5 million or US$34,090[1]) close to the current price of the HEV and BEV. Considering only the range of the vehicle and the daily travel of the respondents, 97% are potential adopters, i.e., those who travel 75 kilometers or less daily. Combining both criteria, results show that only 10.3% of the respondents are potential adopters. These are respondents with WTP of at least Php1.5 million for their next vehicle purchase and who travel 75 kilometers or less daily.

4.5. Market Share Simulation

Three market share simulations using the conditional logit model were done to account for other vehicle attributes besides price and range. Simulation 1 is a straightforward application of the choice model. In Simulations 2 and 3, constraints such as price and available number of models for all vehicle types were added to mimic real world situations. Due to the purposive sampling used in the survey, generalizations from the simulation results should be done with caution. However, results still provide important insights on vehicle choices in the Philippines.

4.6. Policy Scenarios for Market Share Simulation

Vehicle shares were estimated for 11 different scenarios. Each scenario is characterized by vehicle characteristics which are assumed to be due to policy affecting technology and market situations. The scenarios used in this analysis are described in Table 4.

Table 4. Scenarios Used in Estimating Vehicle Share.

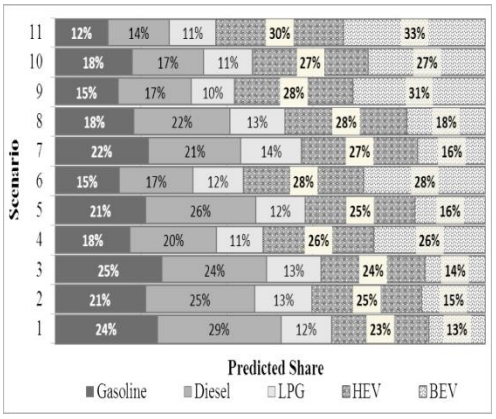
Scenario	Description
1 (Base Scenario)	• LEVs present in the market • Vehicle price in descending order: HEV and EV, Diesel, AutoLPG, gasoline • No incentives, similar cost of travel, and equal emission levels assumed for all vehicle types.
2	• Incentives given to AutoLPG vehicles, HEV and EV
3	• Disincentives in the form of price increases for diesel and gasoline vehicles. The rest of the vehicle characteristics are the same as in Scenario 1.
4	• Reduced emission level for LEV – AutoLPG at 70%, HEV at 50%, and EV at 0% • Emission for gasoline and diesel vehicles reduced to 90% and 95% respectively • The rest of the variables are the same as in Scenario 1.
5	• Lower cost of travel for LEV. The rest of the variables are the same as in Scenario 1.
6	• Combination of Scenarios 2 and 4.
7	• Combination of Scenarios 2 and 3.
8	• Combination of Scenarios 2 and 5
9	• Combination of Scenarios 4 and 5
10	• Combination of Scenarios 4 and 3
11	• Combination of Scenarios 2, 4, and 5 • Best situation for LEVs

[1] US$1 = Php44.

4.7. Simulation 1: Using the Base Model

Fig. 2 shows the result of the market share estimates for Simulation 1. In Scenario 1, diesel vehicles have the largest share (29%) overtaking gasoline vehicles (24%). The HEV's share is at 23%, BEV 13% and AutoLPG vehicles at 12%.

Fig. 2. Result of Simulation 1



As expected, incentives resulted in a small increase in the market share of LEVs (Scenario 2). However, incentives were enough for HEVs to have an equal share with diesel at 25% and have a higher share over gasoline.

Price increase for diesel and gasoline vehicles (Scenario 3) decreased the share of diesel vehicles by 4% but surprisingly increased the share of gasoline vehicles by 1%. This implies shifting of preference towards gasoline vehicles, especially when the price difference with diesel vehicles becomes sufficiently large. Among the LEVs, the increase is highest for HEVs at 2%.

The reduced emission (Scenario 4) increased the share of HEVs and BEVs to 26%, each surpassing gasoline (18%) and diesel (20%). The highest gain in share is reflected by BEVs at 13%, implying that emission level has a big impact on vehicle choice.

The higher cost of travel (Scenario 5) decreased the share of gasoline and diesel vehicles by 3% each while increasing the shares of HEVs and EVs by the same percentage each.

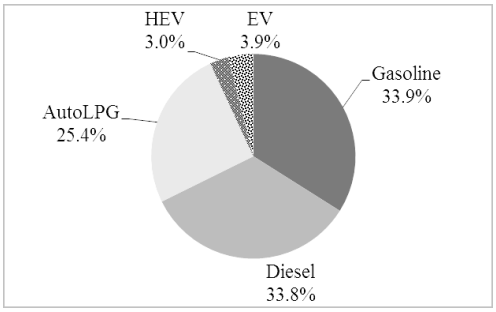
Among the different combinations of scenarios, Scenario 11 resulted in the highest total share of LEVs – AutoLPG (11%), HEVs (30%) and EVs (33%). This is a result of a combination of favorable conditions for LEVs such as low emission levels, lower cost of travel and the presence of incentives. Among these variables, emission level is the main contributor to the increase in market share.

4.8. Simulation 2: Price Constraint for LEVs

A large discrepancy can be observed in the share of HEVs and BEVs in Simulation 1 and the initial assessment in Section 4.4 because the price of these vehicles was not considered as a constraining factor in Simulation 1. Simulation 2 addressed this by estimating vehicle choice in two stages. The first stage is similar to Simulation 1 where all vehicle types are included but the resulting vehicle shares represent only 10.3% of the total vehicle choices (i.e., the proportion of potential LEV adopters in Section 4.4). The first stage means that potential LEV adopters can opt for LEVs or conventional vehicles.

The second stage includes only gasoline, diesel and AutoLPG vehicles. The resulting vehicle share represents the remaining 87.7% of the total vehicle share (i.e., non-adopters). This stage eliminated LEV as a choice for those whose willingness-to-pay is below the price of LEV. Only Scenario 11 was used in Simulation 2 since it captures the most optimistic scenario for LEVs.

Fig. 3. Result of Simulation 2



Results of Simulation 2 show the share of HEVs dropped to 3.0% and EVs to 3.9% (Fig. 3). This significant reduction in vehicle share proves that the high price of HEVs and BEVs significantly reduces their potential market share by limiting the number of potential buyers. This is despite the positive impact of low emission levels on choice probability of HEVs and BEVs.

4.9. Simulation 3: Number of Available Models as Constraining Factor

Conventional vehicles currently have more models/variants available to consumers compared to LEVs, which translates to a higher probability of being chosen. As explained by Ben-Akiva, Gunn and Silman (1984, p. 254), using models for trips and destinations, specific or elemental destinations can be grouped into an aggregate destination. They stated that *the choice probability of an aggregate alternative is equal to the probability that the decision-maker chooses one of its elemental alternatives.* Applied to vehicle choice, it can be rephrased as the probability that one type of vehicle will be chosen is equal to the probability that a buyer chooses one of its model/variants. Hence, the more models available for a vehicle type, the higher the probability of it being chosen.

By including the number of available models for each vehicle type, we can further assess the potential share of LEVs in a more reasonable manner. Consider the basic form of the choice model:

$$\text{Prob}(a \mid C = a,b,c,\ldots J) = \exp(\mu V_a)/\sum_{j=a}^{J} \exp(\mu V_j),$$

where it is assumed μ=1 for all alternatives and respondents, implying homogenous characteristics for both. By allowing different values for μ, the differences in the number of models available can be accounted for in estimating market shares.

An inventory of the vehicles in the Philippines shows that there are more models/variants of gasoline than diesel vehicles (Table 5). LEVs have far less number of available variants. There are a total of 217 gasoline variants, 144 diesel variants, and 3 HEV variants. All existing AutoLPG vehicles are gasoline vehicles retro-fitted with an LPG fuel system. There is also no existing model of BEV available from any of the major car companies in the Philippines.

Table 5. Number of Variants from Major Car Manufacturers by Vehicle Type

Vehicle Type	Total No. of Variants
Gasoline	217
Diesel	144
HEV	3
AutoLPG	0
BEV	0
TOTAL	364

Source: http://www.auto-searchphilippines.com/

Different situations characterized by a different number of model variants for each LEV were used to simulate the market share of each vehicle type in Simulation 3 (Table 6).

Table 6. Situations by Vehicle Type for Simulation 3

Situation	Number of Variants				
	Gas	Diesel	AutoLPG	HEV	EV
LEV_1 – "near future"	217	144	3	3	1
LEV_2 – " LEV increase in variant"	217	144	33	33	27
LEV_2b – "LEV price reduction"	217	144	33	33	27
LEV_3 – "drastic change"	217	217	217	217	217

The key assumptions for this simulation are:

- The number of variants for gasoline and diesel vehicles remains the same for all situations.
- AutoLPG vehicles refer to those capable of running on LPG without fuel retrofit.

- HEVs have a higher number of variants than BEVs since the current condition shows that there are far more variants of HEVs.
- The vehicle characteristics used in estimating the probabilities were the same as in Scenario 11.

Simulation 3 was undertaken in two stages similar to Simulation 2. As expected, the number of model variants played a significant role in determining the share for each vehicle type as shown in Table 7. Due to a higher number of variants for gasoline vehicles, it has a higher market share for all simulated situation seven though diesel engines have the higher preference level in the choice model. However, the share of diesel vehicles have increased compared to the current situation and the previous simulation results.

Table 7. Result of Simulation 3

Scenarios	Share (%)				
	Gasoline	**Diesel**	**AutoLPG**	**HEV**	**EV**
LEV_1 – "near future"	60.9	38.4	0.6	0.1	0.04
LEV_2	56.1	35.9	6.2	0.9	1.0
LEV_2b	48.2	35.8	5.8	4.7	5.4
LEV_3 – "drastic change"	33.9	33.8	25.4	3.0	3.9

Increasing the number of variants of LEVs was expected to reduce market share of gasoline and diesel vehicles since the model variants for these vehicles remained constant in all the situations. For LEV_1, results show a much lower share for HEVs at 0.1% and EVs at 0.04% which is a result of the combined effects of a low number of potential adopters and a low number of available variants.

In LEV_2, the shares of HEVs and BEVs remained low at 0.9% and 1%, respectively. The share of LPG which was as high as 29% in Simulation 2 was reduced to only 0.6% and 6.2% in LEV_1 and LEV_2, respectively, due to the lower number of available model variants.

By reducing the price of HEVs and BEVs to Php1 million (US$27,727) in LEV_2b, the number of potential adopters increased which consequently increased the share of HEVs to 4.7% and EVs to 5.4%. This is a five-fold increase from LEV_2.

The drastic increase in the available variants for all LEVs as described in LEV_3 showed exactly the same result as in Simulation 2 (see Fig. 3). By setting the number of variants constant for all vehicle types, its effect on probability is removed by making the simulation similar to Simulation 2. In this case, AutoLPG vehicles benefitted the most as it is not affected by the price constraint.

In all situations, AutoLPG vehicles gained the highest market share among LEVs. This is due to its lower price compared to HEVs and BEVs, hence, not restricting it to individuals with high willingness to pay. The opposite can be said of HEVs and BEVs since only a small fraction of the respondents are assumed to be "potential adopters". This alone limited their share considering that the potential adopters may in fact choose other available vehicle types. The main barrier for LEVs, specifically HEVs and EVs, is price and the limited number of variants/models available. Even though both can increase LEV adoption, for practical reasons, government policy should focus on pricing then on increasing the available models.

V. Conclusion

A vehicle choice model was estimated from a choice experiment data. The results indicate that there is shifting preference from gasoline to diesel engine vehicles. Battery electric vehicles are least preferred among LEVs but there is an emerging preference for AutoLPG and HEV. Simulation of potential market shares shows that in the absence of a price constraint, LEVs can achieve significant vehicle share. However, HEVs and BEVs can be twice as expensive as a conventional vehicle of similar model and make and

have a smaller number of available model/variants on the market. Considering price and model availability of the vehicles, further simulations show very low potential market share of HEVs and BEVs while AutoLPG has a decent share because it is not affected by the price constraint. This study concludes that there is preference for cleaner vehicles, especially HEVs, although simulation results show a very small potential market share. Consistent with economic theory, a significant price reduction of LEVs from current levels can stimulate adoption of LEVs. Through simulation, it was shown that increasing the number of LEV models in the market can also help boost adoption of LEVs.

Future vehicle choice modelling studies can improve the model estimated in this study, specifically in the number of respondents, the sampling design, and geographical coverage of the survey. External validity can be improved by using a more appropriate sampling procedure such as random sampling of vehicle owners and by expanding the geographical coverage of the survey to include other major cities in the country. Model estimates can be improved by using choice sets that are customized to the characteristics of the respondents, and by estimating a choice model that overcomes the limitations of a conditional logit model such as a mixed logit model.

References

Ahn, J., Jeong, G., & Kim, Y. (2008). A forecast of household ownership and use of alternative fuel vehicles: A multiple discrete-continuous choice approach. *Energy Economics*, *30*(5), 2091–2104. doi:10.1016/j.eneco.2007.10.003

Asian Development Bank. (2011). *Electric vehicles hold promise of bluer skies for Manila*. Retrieved fromhttp://www.adb.org/news/electric-vehicles-hold-promise-bluer-skies-manila

Ben-Akiva, M., Gunn, H. F., & Silman, L. A. (1984). Disaggregate trip distribution models. *Doboku Gakkai Ronbunshu, 1*(347), 1–17. doi:10.2208/jscej.1984.347_1

Bunch, D. S., Louviere, J., & Anderson, D. (1996). *A comparison of experimental design strategies for choice-based conjoint analysis with generic-attribute multinomial logit models*. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?.doi=10.1.1.196.4913&rep=rep1&type=pdf

Choi, H., & Oh, I. (2010). Analysis of product efficiency of hybrid vehicles and promotion policies. *Energy Policy*, *38*(5), 2262–2271. doi:10.1016/j.enpol.2009.12.014

Del Río, P., Carrillo-Hermosilla, J., & Könnölä, T. (2010). Policy strategies to promote eco-innovation. *Journal of Industrial Ecology*, *14*(4), 541–557. doi:10.1111/j.1530-9290.2010.00259.x

Department of Energy. (2011, October). *The Philippine energy sector*. Powerpoint presented at Visayas Energy Forum 2011, Cebu, Philippines.

Dijk, M., & Yarime, M. (2010). The emergence of hybrid-electric cars: Innovation path creation through co-evolution of supply and demand. *Technological Forecasting and Social Change*, *77*(8), 1371–1390. doi:10.1016/j.techfore.2010.05.001

Ewing, G. O., & Sarigollu, E. (1998). Car fuel-type choice under travel demand management and economic incentives. *Transportation Research Part D: Transport and Environment, 3*(6), 429–444. doi:10.1016/S1361-9209(98)00019-4

Ewing, G. O., & Sarigollu, E. (2000). Assessing consumer preferences for clean-fuel vehicles: A discrete choice experiment. *Journal of Public Policy & Marketing, 19*(1), 106–118.

Funk, K., & Rabl, A. (1999). Electric versus conventional vehicles: Social costs and benefit in France, *4*(6) 397–411.

Horne, M., Jaccard, M., & Tiedemann, K. (2005). Improving behavioral realism in hybrid energy-economy models using discrete choice studies of personal transportation decisions. *Energy Economics*, *27*(1), 59–77. doi:10.1016/j.eneco.2004.11.003

Kemp, R., & Pontoglio, S. (2011). The innovation effects of environmental policy instruments—A typical case of the blind men and the elephant? *Ecological Economics*, *72*, 28–36. doi:10.1016/j.ecolecon.2011.09.014

Kuwano, M., Zhang, J., & Fujiwara, A. (2005). Analysis of ownership behavior of low-emission passenger cars in local Japanese cities. In K. Satoh (Ed.), *Proceedings of the Eastern Asia Society for Transportation Studies* (Vol. 5, pp. 1379–1393). Bangkok, Thailand: Eastern Asia Society for Transportation Studies. Retrieved from http://www.easts.info/online/proceedings_05/1379.pdf

Land Transportation Office. (2005). Number of Motor Vehicles Registered, By Type of Fuel Used, By Region, By Classification & Type of MV (All MV Classifications) ANNUAL 2005. Retrieved from http://www.lto.gov.ph.

Louviere, J. J., Hensher, D. A., & Swait, J. D. (2000). *Stated Choice Methods (Analysis and Applications)*. New York, NY: Cambridge University Press.

National Center for Transportation Studies. (2011). *Formulation of the National Environmentally Sustainable Transport Strategy for the Philippines.* Manila, Philippines: Author.

Potoglou, D., & Kanaroglou, P. S. (2007). Household demand and willingness to pay for clean vehicles. *Transportation Research Part D: Transport and Environment,12*(4), 264-274. doi:10.1016/j.trd.2007.03.001

Romm, J. (2006). The car and fuel of the future. *Energy Policy, 34*(17), 2609–2614. doi:10.1016/j.enpol.2005.06.025

Rubite, C. P., & Tiglao, N. C. C. (2004). Development of a car ownership model in Metro Manila. *Philippine Engineering Journal, 25*(1), 35–50.

United Nations Framework Convention on Climate. (2012). *Clean Development Mechanisn (CDM) Methodology Booklet* (2nd ed., Vol. 2012). Bonn, Germany: United Nations Climate Change Secretariat.

ISSN 1946-5130
http://dx.doi.org/10.20294/jgbt.2015.11.1.49

Journal of Global Business and Trade

www.ipfw.edu/jgbt

Outward Processing Scheme in the Free Trade Agreements of South Korea

Shinkyuo Lee *

Department of International Trade, Paichai University, SouthKorea

Received 21 March 2015 Revised 29 April 2015 Accepted 20 May 2015

ABSTRACT

South Korea has entered into some Free Trade Agreements (FTAs) that contain special provisions of outward processing provisions. With the aid of the outward processing provisions, the goods manufactured or processed in the Kaesong Industrial Complex (KIC) are classified as originating from South Korea for the purpose of duty free treatment under the applicable agreements. This paper summarized the contents of the rules of origin and analyzed some outward processing provisions stipulated in major FTAs in Korea. It also suggested some alternatives and options in the outward processing provisions that the enterprises in the KIC can take advantage of. Efforts and support of public agencies are required to promote the use of FTAs.

Keywords: FTA, Kaesong industrial complex, outward processing provision
JEL Classifications: F10, F14

I. Introduction

Rules of origin are used to determine the country of origin of a product for purposes of international trade. There are two common types of rules of origin depending upon the application. These are the preferential and non-preferential rules of origin.

Determining the country of origin of a product is important for properly assessing tariffs, enforcing trade remedies (such as antidumping and countervailing duties) or quantitative restrictions (tariff quotas), and recording statistical data. Other commercial trade policies are also linked with origin determinations such as country of origin labeling and government procurement regulations.

Korea has traditionally relied mainly upon overseas markets through an active export strategy that helped the country achieve its remarkable economic growth. The total volume of Korea's external trade amounts to approximately 70% of its gross domestic product (GDP). Given such imperative reasons, Korea has no option but to proactively forge FTAs in order to maintain its foreign markets since 1998. Korea has established and put into effect FTAs with Chile (2004), Singapore (2006), EFTA (2006), ASEAN (2007), India (2010), the EU (2011), Peru (2011), the USA (2012), Turkey (2013), Australia (2014) and Canada (2015) as of August, 2015. It also signed agreements with China, Columbia, Vietnam and New Zealand.

If goods are not entirely grown or manufactured in the targeted country or region, specific rules of origin may apply. These rules of origin can be very detailed

*E-mail address: sklee@pcu.ac.kr

and specific and vary from government to government and preference to preference.

In recent years, the FTAs that Korea has established with Singapore, EFTA, ASEAN, India, Peru, Columbia, China and Vietnam contain outward processing (OP) provisions that extend the benefit of preferential tariff rates to the goods manufactured or processed in the Kaesong Industrial Complex (KIC). OP refers to the temporary exportation of goods for additional processing and the KIC is an outward processing zone in the People's Democratic Republic of Korea (North Korea) where South Korean companies are allowed to establish manufacturing plants and to employ North Korean laborers. As the term "temporary" indicates, the finished goods are always imported back to South Korea for domestic consumption or permanent exportation. Currently, South Korea does not impose any tariff on North Korean products because the South Korean government regards inter-Korean trade as 'trade within a nation.' Other countries, however, do not consider the two Koreas as one customs territory and treat goods that have been processed in the KIC as North Korean goods. These OP provisions explicitly stipulate that goods that undergo processing in the KIC originate from South Korea for the purpose of determining its treatment under the applicable FTA. These goods are determined to originate from South Korea for the purposes of duty-free treatment under the applicable FTAs.

This paper defined the rules of origin and analyzed outward processing provisions in major FTAs with Korea. It also presented some useful strategies that the exporters of goods manufactured in the KIC can take advantage of.

II. Rules of Origin

Determining a good's country of origin is important for properly assessing tariffs, enforcing trade remedies such as anti-dumping and countervailing duties or quantitative restrictions and recording statistical data. The country of origin is defined as the country of manufacture, production or growth of any article of foreign origin entering customs territory. There are two types of rules of origins, namely preferential and non-preferential (Kawal & Wignaraja, 2011).

2.1. Non-preferential Rules of Origin

Non-preferential rules of origin are used to establish the country of origin for determining the origin labeling, compliance on quotas, anti-dumping, anti-circumvention rules and proper statistical records. When goods are wholly obtained and produced in a single country, it is relatively easy to determine its origin. Difficulties arise in determining origin arise when goods are manufactured and assembled inmore than one country (Hirsch, 1998).

Under non-preferential rules, two major principles apply. First, goods that are wholly grown or manufactured in one particular country are attributed to that country. This is known as the wholly obtained criterion. Second, if an imported product consists of components that are from more than one country, a criterion known as substantial transformation is used to confer origin. In most cases, the origin of goods are determined to be the last place in which it was substantially transformed into a new and distinct article of commerce based on a change in name, character or use. Making the determination about what constitutes a change sufficient for goods to be considered substantially transformed is the juncture at which an origin ruling can prove to be quite complex (Jones & Martin, 2012).

2.1.1. Wholly Obtained Criterion

Wholly obtained are goods naturally occurring goods such as live animals born and raised in a given country, plants harvested in a given country or minerals extracted or taken in a single country. The definition of wholly obtained also covers goods produced from wholly obtained goods alone or scrap

and waste derived from manufacturing or processing operations or from consumption (Coyle, 2004).

2.1.2. Substantial Transformation

Traditional substantial transformation rules state that goods originate from the last country where they were exported. The substantial transformation of goods requires more than just a change in the article. It requires that an article be transformed into a new and different article. Substantial transformation captures the purpose of origin determination in a simple and concise manner (Bailey, 1997).

The change in tariff classification method determines the origin of goods by specifying the change in tariff classification of the Harmonized System of Tariff Nomenclature ("Harmonized System") required to confer origin on goods. Because the Harmonized System has been adopted by countries representing 90% of the world's trade, it provides a uniform, hierarchical nomenclature to be used in defining origin determinations for all goods in international trade (Hirsch, 2002).

The Harmonized System's hierarchical framework and its nearly universal acceptance among trading nations permit the drafters of the rules of origin a tremendous flexibility to define classification changes in a precise manner that sustains exceptions and special rules without sacrificing objectivity, certainty or identity (Ikenberry, 1988).

While the Harmonized System reflects the most sophisticated and refined tariff classification system, it is just a system primarily designed for the dual purposes of commodity classification and compilation. Because it was not designed to be used for origin determination, changes in classification are not always an appropriate or effective test for determining origin. Therefore, an origin scheme based on change in tariff classification must be supplemented by a list of exceptions that describe (1) when a sufficient transformation has occurred despite the lack of a change in tariff classification; (2) when a change in classification is not sufficient; and (3) which processes are not sufficient to confer origin even though they lead to a change in tariff classification (Lee, 2007).

Once the product is classified, the change in tariff classification method of determining origin is conceptually simple and easy to apply. The classification of goods can give rise to problems because goods are not always classified in a uniform manner despite the substantial efforts of the Harmonized System Committee (Menomn, 2009).

The value-added test defines the degree of transformation required to confer origin on the good in terms of a minimum percentage of value that must come from the originating country or a maximum amount of value that can come from the use of imported parts and materials. If the percentage does not fall within the accepted range, the last production process will not confer origin (Trefler, 1993). If the determination is for non-preferential purposes, origin will be conferred on a prior country. If it is for preferential purposes, no further origin determination is necessary unless the prior county is also a beneficiary country under a preferential trading agreement with the importing county (Ferner, 1997).

The value-added test can generate substantial compliance costs for companies. Further, it can generate substantial uncertainty because the test ignores exchange rate risk and fluctuations in the price of raw materials, and the possible daily changes in status of goods as the currency values or price of raw materials fluctuate among others.

The specified tests of origin process, also referred to as technical tests, prescribe certain production or sourcing processes that may confer originating status. The specified process test serves as a useful supplemental test because it is easily tailored to meet a specific situation in a clear and precise manner (Gadbaw, 2010). However, it is not a satisfactory primary test of origin because it would be extremely difficult, if not impossible, to define a process test for an array of products made and then continually update these rules for new products and technological advances in production.

2.2. Preferential Rules of Origin

Preferential rules of origin are part of a free trade area or preferential trade arrangement which includes tariff concessions. These trade arrangements might be unilateral, bilateral or regional trade arrangements. The rules of origin determine what goods can benefit from the tariff concession or preference in order to avoid transshipment. NAFTA is an example of a trade agreement that offers tariff concessions for goods that originate according to its rules (Jones and Martin 2012).

Preferential rules of origin are applied by countries that offer certain trade partners zero-duty or reduced-duty access for their imports as a means of determining the eligibility of products to receive such preferential access. These rules of origin are required to prevent trade deflection or simple transshipment, whereby products from non-preferred countries are redirected through a free trade partner to avoid the payment of customs duties. They are meant to ensure that only goods originating in participating countries enjoy duty preferences. Rules of origin are thus integral to preferential trade agreements such as bilateral and regional free trade agreements and to the non-reciprocal preferences that industrial countries offer to developing countries (Jeong, 2007). Cadot (2006) found utilization rates of preferences to be positively related to preferential margins and negatively related to the restrictiveness of the rules of origin.

III. Outward Processing Provisions in Korean FTAs

Outward processing allows community goods to be processed abroad. When it comes back into the community where it will be put into free circulation, a duty has to be paid only on the value added abroad. The OP provisions in the South Korean FTAs are designed to extend the benefit of duty-free trade to the products manufactured or processed in the KIC. The KIC is an outward processing zone (OPZ) in the People's Democratic Republic of Korea (North Korea) where South Korean companies are allowed to establish manufacturing plants and employ North Korean labor. South Korea has included OP provisions in its FTAs with other countries. These OP provisions explicitly stipulate that goods that undergo processing in the KIC originate in South Korea for the purposes of determining its treatment under the applicable FTA. With the aid of the OP provisions, these goods are determined to originate in South Korea for the purposes of duty free treatment under the applicable FTAs (Lee, 2014).

3.1. Korea-EFTA FTA

Korea and EFTA adopted another approach which is based on the provision allowing outward processing (Article 13, Annex 1). This approach was taken because goods produced in the KIC generally meet the requirements for Korean origin when all the processing and value added that occurred in South Korea are taken into account.

South Korea's bilateral agreement with EFTA was signed and came into force in September 2006. Annex I of the Agreement's rules of origin (Appendix 4 to Annex 1) provides for both the territoriality principle (Article 12) and an outward processing exemption from the principle (Article 13). As with the South Korea-Singapore and South Korea-ASEAN 10 FTAs, the South Korea-EFTA FTA (Appendix 4 of the exemption to Annex I) instituted two types of outward processing schemes, namely general and specific regimes.

Paragraph 2 of Appendix 4 provides special outward processing for an industrial zone in a non-Party nation. Though not explicitly specified, the non-Party in this case implies North Korea with its Kaesong Industrial Complexes. For the final good undergoing outward processing in Kaesong, the first condition is that the total value of non-originating input does not exceed 40% of the price of the final products for which originating status is claimed (Appendix 4 to Annex 1). The condition puts a ceiling on the non-originating input which is defined as any non-originating materials added inside, as well as materials added and all other costs accumulated outside the party

concerned, including transportation costs. The second condition is that the value of originating materials exported from the party concerned is not less than 60% of the total value of the materials used in manufacturing the re-imported material or product. This condition adds another constraint on the value of non-originating material that can be added outside the territories of the parties as a proportion of the value of the re-imported material.

The important feature of the EFTA rules of origin related to the Kaesong Industrial Complex is that the value added in the KIC will constitute non-originating inputs in determining the origin of the final product. As more processing is done in the KIC, it becomes more likely that the total value of the non-originating inputs will exceed 40% of the price of the final product or the value of the originating material will be less than 60% of the re-imported material, thus failing the first condition.

3.2. Korea-Singapore FTA

In the Korea-Singapore FTA, both sides agreed that the goods listed in Section 1 of Annex 4B when processed outside the territory of Korea shall be originating when the final goods are exported directly from the territory of Korea to the territory of Singapore (Article 4.3). In Section 2 of the Annex, it is provided that Korea may add goods to the table unless Singapore indicates otherwise (Section 2, Annex 4B). In addition, it is stated that the goods cover those produced in the KIC and other industrial zones on the Korean Peninsula.

This scheme was double-winged: general reciprocal and special regimes. Under the general regime, both Parties are able to use the scheme with regards to any non-Party if two conditions are met. First, non-originating content including offshore content shall not exceed 40% of the final good's FOB price. Second, originating content shall account for more than 60% of the FOB price. Product coverage is broad and includes plastics, nuclear and machinery products, and cars.

The KIC outward processing in the Korea-Singapore FTA is an outward processing arrangement of the same type as the ISI arrangement under the US-Singapore FTA. In both arrangements, the amount of value added that can occur outside the territories of the parties are not limited. Judged by the degree of transformation done in the exporting party's territory, both arrangements detract from the substantial transformation rule because the only requirements are that the product's classification is listed in the Annex and the products are exported from the party's territory.

3.3. Korea-US FTA

A consistent and significant goal for South Korea in the FTA talks was securing preferential treatment for products made in the KIC in North Korea, a position the United States adamantly opposed throughout most of the negotiations. Located near the North Korean city of Kaesong, 40 miles north of Seoul, the KIC is designed for South Korean companies to employ North Korean workers. In the South Korea-U.S. FTA, South Korea accepted NAFTA-plus rules of origin: a change in tariff classification test and value-added tests. For most goods, an exporter may choose between build-up and build-down tests. Cars were subject to the NAFTA net cost test.

In the final Korea-US FTA agreement, the two sides reached a compromise on the KIC. On the one hand, the agreement does not include any reference to the complex, and KIC products are not eligible for the agreement's special treatment provisions. On the other hand, a binational committee will be formed to study the possibility of eventually incorporating products from Outward Processing Zones (OPZs) including those like the KIC that are located in North Korea (Chapter 22, Annex B).

Annex 22-B to Chapter 22 on institutional provisions of the Agreement entrusted a "Committee on Outward Processing Zones on the Korean Peninsula" ("the Committee") to determine this issue after the FTA came into force. Once established, the Committee is to be comprised of officials of both Parties who shall determine the issue of identifying

geographic areas that may be designated as outward processing zones.

The agreement identified three general categories for which the committee is to develop more detailed criteria: progress in the denuclearization of North Korea, development of intra-Korean relations; wages; business management practices; the environment and labor standards. For the third category of issues, the committee is to consider relevant international norms as well as the situation prevailing elsewhere on the Peninsula. After the committee has developed the criteria, the OPZ provisions in the FTA laid out a three-step process by which products made in the KIC could be incorporated into the FTA. First, the committee must deem that an outward processing zone meets the criteria it has established. Second, the two governments must agree that the FTA should be amended accordingly. Third, both governments must seek legislative approval for any amendments to the Agreement with respect to outward processing zones. The agreement does not lay out the size or composition of the committee, how committee members will be chosen, or the procedures by which the committee is to arrive at decisions except that decisions would have to be reached by unified consent.

Although Annex 22-B does not designate specific OPZs that will receive preferential treatment under the Agreement, it does provide for a committee on outward processing zones to be formed to designate zones to receive preferential treatment. The Annex requires that in addition to delegating zones to benefit from the Agreement, the committee on OPZs must establish criteria that must be met before goods from any outward processing zone may be considered originating goods for the purpose of the agreement including labor standards and practices.

These standards must give due reference to the situation prevailing elsewhere in the local economy and the relevant international norms (Annex 22B.5). The committee determines whether the zone has met the criteria and any decisions reached by unified consent of the committee shall be recommended to the parties which shall be responsible for seeking legislative approval for any amendments to the agreement with respect to these zones (Annex 22B.3).

IV. Strategies for Outward Processing Schemes

The goods produced in KIC are mostly exported to Australia, Russia, China and Middle Eastern countries. South Korea did not enter into FTAs with other countries except Europe. One of the main reasons why the goods are not exported to FTA member countries is that the acceptable outward processing requirements are difficult and complicated. As the acceptable criteria of outward processing and the methods of issuing country of origin certificate are different according to FTAs, it is difficult for small and medium sized companies to satisfy those requirements. Most of the goods produced in the KIC are textile goods that are not competitive in the ASEAN and India. Even though South Korea has entered into many FTAs that contain special provisions that extend the benefit of preferential rates to the goods manufactured or processed in KIC, South Korea had a difficulty in taking advantage of these provisions.

4.1. Active Government Support

In order for the companies in the KIC to take advantage of benefits from the outward processing provisions in FTAs, active support of government related organization such as the Korean Customs Service, the Ministry of Unification and the Ministry of Trade, Industry and Energy are needed. Practical support should be given to those companies involved so that they can take advantage of those outward processing provisions. As the enterprises doing business in KIC are mostly small and medium sized ones, the government-related organizations need to help those enterprises. The present government project, FTA consulting business for small and medium enterprises, needs to be extended to those enterprises in the KIC.

4.2. Development of a Special C/O Program for OP

South Korea has included OP provisions in its FTAs with other countries. These OP provisions stipulate that under processing in the KIC originates in South Korea for determining its treatment under an FTA. The enterprises in the KIC had a hard time in understanding the complicated criteria and it is necessary for the government to develop a special program so that the enterprises can manage the country of origin for the outward processed goods. It is also necessary for present FTA-PASS in the Korean Customs Service and FTA-Korea in the Korean Trade Association to be specialized and developed so that the enterprises in the KIC can use these provisions. Through this management program, the enterprises verify country of origin for the goods manufactured in KIC and other countries.

4.3. Renegotiation for the Goods in the KIC

It may be difficult to change or modify the agreements or provisions already agreed. However, South Korea needs to review if there is any possibility to change the list of goods manufactured in the KIC. The goods not manufactured in the KIC should be excluded from the list and the goods which are manufactured or will be manufactured in the future in the KIC need to be added to the list. A review of the FTAs approved five years after the agreement went into effect, such as with Chile, Singapore, EFTA, and ASEAN, among others, can be considered. South Korea needs to consider that the goods manufactured in the KIC should be regarded as of Korean origin in the Korea-Chile FTA which does not have OP provisions yet. Also, Korea should do its best to include the goods manufactured in the KIC in OP list in the future FTAs that Korea will enter into.

4.4. Establishment and Management of a Committee on OP Zones

The Korean government should put a great deal of effort into establishing the committee on outward processing zones on the Korean peninsula. As Korea agreed to establish the committee on outward processing zones in the FTA with the EU and Australia, it is necessary to establish the committee and to decide the goods acceptable as soon as possible. Except for the Korea-US FTA, there are no political obstacles in other FTAs and the goods manufactured in the KIC originate in South Korea immediately if their governments approve it.

4.5. Development of Various FTA Business Models

An FTA aims to eliminate tariffs on the goods imported gradually. Rather, it is necessary to develop various business models for FTAs and approach those countries creatively. For example, parts manufactured in China and Korea can be brought to the KIC and the goods manufactured using those parts can be exported back to China. The parts brought from China can be regarded as of Korean origin and the goods manufactured are naturally regarded as of Korean origin. The goods can be exported to China where it can manufacture the goods again using the goods imported from Korea. Consequently, the goods can be exported to other countries where China has entered into FTAs.

V. Conclusion

Currently, South Korea does not impose any tariff on the products that are processed in the KIC because the South Korean government regards inter-Korean trade as internal trade within a nation. Other countries, however, do not consider the two Koreas as one customs territory and treat any goods that have been processed in the KIC as originating in North Korea. The KIC plays an important role in inter-Korean relations because it allows cultural and economic exchange between the two Koreas.

Some of the FTAs Korea has entered into contain outward processing provisions. The KIC is an outward processing zone in North Korea where South Korean companies are allowed to establish manufacturing plants and employ North Korean laborers. The outward processing clause has been applied to some goods according to FTAs with EFTA, ASEAN, India, Peru, Columbia, China and Vietnam, and Singapore, among others. However, the effectiveness of the clause is being questioned as Korean enterprises have been unsatisfied. This study compared outward processing provisions in the major FTAs that Korea has entered into.

It was found that the outward processing provisions are less effective and difficult to apply under FTAs due to complicated regulations. Also, some goods have mistakenly benefited from the preferential tariff scheme due to confusion with other originating goods.

The study suggested that efforts and support of public agencies are required to solve such problems and promote the use of outward processing provisions. Practical support should be given to those enterprises involved so that they can take advantage of those outward processing provisions. More efforts from the government are needed to develop a special program so that the enterprises can manage the country of origin for the outward processing goods.

Korea needs to review if there is any possibility of having renegotiations to change the list of goods manufactured in the KIC. The goods not manufactured in the KIC should be excluded in the list while the goods manufactured or will be manufactured in the KIC should be added in the list. The government should put a great deal of effort into establishing the committee on outward processing zones on the Korean peninsula. Also, it is necessary to develop various business models for FTAs and approach those countries creatively. More efforts and assistance to expand specialized origin management programs, enhance post management for approved exporters, renegotiate to adjust the allowable range of goods subject to outward processing and developing various business models that utilize FTAs are needed.

References

Bailey, M. A., Goldstein, J., & Weingast, B. R. (1997). The institutional roots of American trade policy: Politicians, coalitions and international trade. *World Politics*, *49*(3), 309-338.

Cadot, O. A., Estevadeordal, A., Suwa-Eisenmann, A., & Verdier, T. (2006). *The origin of goods: Rules of origin in regional trade agreements*. UK: Oxford University Press.

Coyle, J. (2004). Rules of origin as instruments of foreign economic policy: An analysis of the integrated sourcing initiative in the US-Singapore free trade agreement. *Yale Journal of International Law*, *29*(1), 545-580.

Gadbaw, R. M. (2010). Systemic regulation of global trade and finance: A tale of two systems. *Journal of International Economic Law*, *13*(3). 551-574.

Ferner, A. (1997). Country of origin effects and HRMin a multinational companies. *Human Resources Management Journal*, *7*(1), 19-37.

Hirsch, M. (1998). The asymmetric incidence of rules of origin: Will progressive and cumulation rules resolve the problem?. *Journal of World Trade*, *32*(4), 41-53.

Hirsch, M. (2002). International trade law, political economy and rules of origin: A plea for a reform of the WTO regime on rules of origin. *Journal of World Trade*, *36*(2), 171-188.

Ikenberry, G. J. (1988). Conclusion: An institutional approach to American foreign economic policy. *International Organization*, *42*(1), 219-243.

Jeong, Hyung-Gon. (2007). North Korea's economic development and external relations: Economics of the Kaesong Industrial Complex. *Korea's Economy*, *23*, 69-73.

Jones, C. V., & Martin, M. (2012). International trade: Rules of origin (CRS Report for Congress RL34524). Retrieved from http://www.crs.gov

Kawal, M., & Wignaraja, G. (2011). Asian FTAs: Trends, prospects, and challenges. *Journal of Asian Economics*, *21*(1), 1-22.

Lee, P. (2014). Are the outward processing provisions in the South Korean free trade agreements consistent with the law of the World Trade Organization?. *Boston College International and Comparative Law Journal*, *37*(1), 52-102.

Lee, Yong-Shik. (2007). The beginning of economic integration between East Asia and North America?: Forming the third largest free trade area between the United States and the Republic of Korea. *Journal of World Trade*, *41*(5), 1091-1123.

Menonm, J. (2009). Dealing with the proliferation of bilateral free trade agreements. *The World Economy*, *32*(10), 1381-1407.

Moon, Sang-Bok. (2010). Demystifying the impasse of the Korea-Japan FTA. *Journal of International and Area Studies*, *17*(2), 1-19.

Ruddy, B. (2010). The critical success of the WTO: Trade policies of the current economic crisis. *Journal of International Economic Law*, *13*(2), 475-495.

Trefler, D. (1993). Trade liberalization and the theory of endogenous protection. *Journal of Political Economy*, *101*, 138-160.