FDI, Indigenization Policy, and Development
: Case of Automotive Industry

By

Hyunjeong Kim

Dissertation

Submitted to
KDI School of Public Policy and Management
In partial fulfilment of the requirements
For the Degree of

Ph.D. in Public Policy

Fall 2010

FDI, INDIGENIZATION POLICY, AND DEVELOPMENT
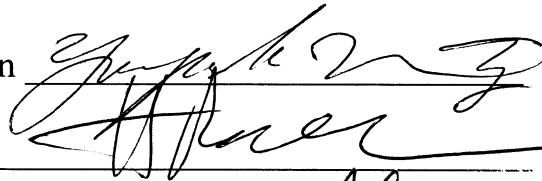## : CASE OF AUTOMOTIVE INDUSTRY

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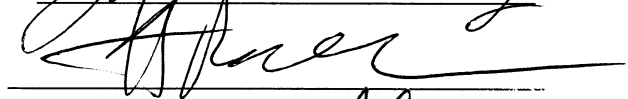For the Degree of

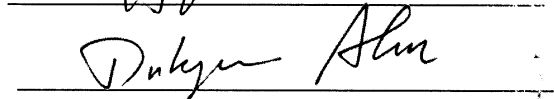**Ph.D. in Public Policy**

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ABSTRACT

This dissertation questions the role and policy functions of local content requirements(LCR) in the FDI in the automotive industry and how it should be regulated in the international forum governing multilateral trade and economic affairs. Among many factors influencing the FDI inflow to the country, what would be the most important factors, and will LCR of the host country deter inward foreign investment? Further, does the LCR help industrial development of host country pursuant to its policy goal? To give answers to these questions, the dissertation analyzes FDI's determinants in the automotive industry, and the impact of LCR on the industrial development in the host country. Finally, it attempts to give implications and suggestions for the national policy makers and also for the delegations for future multilateral investment treaty. We first question the logic of current WTO rule that prohibits LCR alleging its trade and investment distorting effect. Then, it suggests how investment should be regulated in the multilateral system without prejudice to the development of industry in the less developed countries.

There have been many researches on the FDI theories and determinants, but in this dissertation we focused on the industry specific elements, namely automotive industry. From the empirical work covering 42 automobile producing countries, we found that generally market size or demand force was the foremost FDI determinant in the automotive industry, although different patterns of FDI were witnessed across regions. Also, LCR's linkages effect with local industry and spillovers to the productivity enhancement was demonstrated through panel data analysis. Thus, confirming the economic role and benefits of LCR to the host country, and limitations of the current framework disparaging its contribution for development, it concludes that LCR needs to be regulated in other multilateral venue. Here, multilateral investment treaty is suggested as an alternative to the WTO system, although it would be tough and challenging task for the global community.

Keywords: Automotive Industry, Overseas Production, Foreign Direct Investment, Local Content Requirements, Performance Requirements, WTO, TRIMs Agreement, Development, Multilateral Investment Treaty

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ABBREVIATION

ASEAN   Association of South East Asian Nations

BIT   Bilateral Investment Treaty

CBU   Completely Built UP

CEPT   Common Effective Preferential Tariff

CKD   Completely Knocked Down

CPI   Corruption Perceived Index

DSB   Dispute Settlement Body

FDI   Foreign Direct Investmentt

FTA   Free Trade Agreement

GATS   General Agreement on Trade of Services

GATT   General Agreement of Tariffs and Trade

JV   Joint Venture

KD   Knocked Down

LCR   Local Content Requirements

MAI   Multilateral Agreement on Investment

MFN   Most Favored Nation

MIT   Multilateral Investment Treaty

MNC   Multinational Corporation

NAFTA   North America Free Trade Area

OEM   Original Equipment Manufacturer

PTA   Preferential Trade Agreement

ROO   Rules of Origin

RVC   Regional Value Content

SCM   Agreement on Subsidies and Countervailing Measures

SCM   Supply Chain Management

TRIMs   Trade-Related-Investment-Measures

UNCTAD   United Nations Council of Trade and Development

UNIDO   United Nations Industrial Development Organization

WTO   World Trade Organizatio

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First of all, I am very grateful to my Supervisor and members of Committee at KDI School: Professor Younguck Kang, Professor Hun Joo Park, Professor Seung-Joo Lee, and Professor Jinsoo Lee, for their understanding and trust that supported me to complete this dissertation. I also thank for their criticism and constructive comments. Their valuable comments made the dissertation better than it would have been. I thank Professor Duk-geun Ahn, who led me to this field of study, and always inspired me with his insights and academic prowess. I also appreciate staffs of KDI School, especially Ms. Hye-jung Yang. Without her help and thoughtfulness, it would have been impossible for me to get through all this.

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Chapter I. Introduction

Automotive industry constitutes the crucial part of a state's industry, not only for its relative importance in the national economy, but also for its contribution to the development of related industries. Automobile is a mechanical yet complex apparatus. It is the product of collaboration and convergence of diverse state-of-the-art technologies: mechanical engineering, electronic engineering, ergonomics, dynamics, material science, industrial design, and many more. Simply speaking, a car is made of 30,000 parts. In terms of industry scope, it ranges from steel industry, materials industry, parts and component industry, design industry, assembling industry, marketing and so on. Thus, automotive industry virtually refers to the union of all above mentioned industries. Due to its forward and backward linkage effect, countries have contrived to foster automotive industry, both developing and developed countries.

Generally, manufacturing automobiles requires large initial investment and fixed cost. Thus, automotive industry is characterized by increasing returns to scale. Theoretically, it would be the most effective for the firms to produce cars in the home country and export them to foreign markets worldwide. In that case, the world would have just a handful of countries producing automobiles, around 10 countries at most. However, it has not been the case in the real world. Since 1990s, the most notable change in the automotive industry was geographical fragmentation in the production activity of multinational corporations, i.e. growing overseas production. Global vehicle manufacturers have actively been building production facilities outside their home country, and now more than 30 countries which do not have national vehicle manufacturer are producing cars in its territory.

To promote domestic industry, the hosting governments sometimes provided incentives for the foreign investors or regulated their operations by industrial policies and requirements. The policies were mostly regulations on local contents constituting a vehicle. The principal aim of these requirements was to indigenize the foreign establishments in its local industry. If there were no requirements on local contents, firms again would export all necessary parts and components or modules from home country to the foreign assembly sites rather than produce or procure them locally. There would be limited forward linkage effect for the host country since plant will be nothing more than an assembly line. Thus, many governments enforced performance requirements such as local content requirements, and vehicle manufacturers were resistant thereto. There have been six WTO dispute cases regarding this issue. As for the investment policies, automotive industry is the most sensitive and affected industry.

Hence, global automotive industry nowadays is characterized by multinationality of vehicle makers at the firm level, proliferation of FDI at the country level, and investment measures such as local content requirements at the policy level.

1. Understanding the FDI in the Automotive Industry

1) Overview

(1) Growing Trend of Overseas Production

In fact, the overseas production has been increasing in almost every industry in the form of foreign direct investment for the past couple of decades. In general, when vehicle exports to a certain market increase beyond a certain extent, some portion of the volume switches to local production. Thus, usually the major players in the automotive industry are producing not just in their country of nationality, but in many places where they find significant demand. Thus, 'fragmentation of Multinational Enterprises' has been going on in the automotive industry. Undergoing frequent M&As[1] and numerous vehicle manufacturers disappearing from the history, the map of automotive industry changed a lot and now it is taking the shape of globalized industry.

As a matter of fact, overseas investment and production in the automotive industry is not a new phenomenon. It has been going on from the outset of 20th century: the two leading manufacturers of the United States, GM and Ford have expanded overseas production since 1910s in Europe. Now, overseas production became the major business strategy among global players[2], and Japanese automobile companies have their plants in Thailand, the United States, Brazil, as well as in Japan. Not only Japanese but almost every global maker is producing outside its territory of nationality, although the level of globalization would be all different both in absolute and relative terms. There are two direction of globalization in the automotive industry: i) overseas production vis-à-vis domestic production is increasing in both absolute term and relative term, and ii) it is spread to more manufacturers. US firms and European firms were the first generation overseas producers, and then Japanese firms took the lead, and now there are many more late movers, notably Korean firms and recently Indian and Chinese firms.

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[1] M&A was very active in the automotive industry in 1960s and 1990s. Compared to early 1960s and the end of 2000, number of auto makers in the world almost halved. For detail, see the Appendix I.

[2] The first movement of overseas production was made by mostly US makers in the early 20th century in Europe.

The two way map in the next page shows these changes. Horizontal axis indicates the production units, and the vertical axis indicates the proportion of overseas production against the total production. As the company locates in the upper side of the map, the share of its overseas production is large, and thus it can be said that the company is more globalized. The first graph shows makers' position in 2004, and the second graph was mapped based on 2008 data. By comparing the two graphs, it can be found that almost every firm moved to upper right direction, i.e. growth based on globalization. In 2004, companies tend to gather around within the down left side in the map, whereas in 2008 they were more scattered and moving towards the right direction.

Also, developing country's makers like Proton (Malaysia) and Tata (India), in its initial development stage, usually belong to this quadrant. However, globalization in these emerging makers is progressing very fast. See how Tata went straight up to its place in 2008 compared with 2004. Tata motor's surprising speed of globalization is mainly owing to cross-border M&A: it recently acquired former Ford brands, Jaguar and Landrover. Chinese makers are not shown in this map, but some of them are also globalizing very fast after the Global financial crisis in 2008, especially Chery and Geely Motors.

<Figure I-1>Distribution of Automakers by Production capacity and the ratio of overseas production (2004 & 2008)
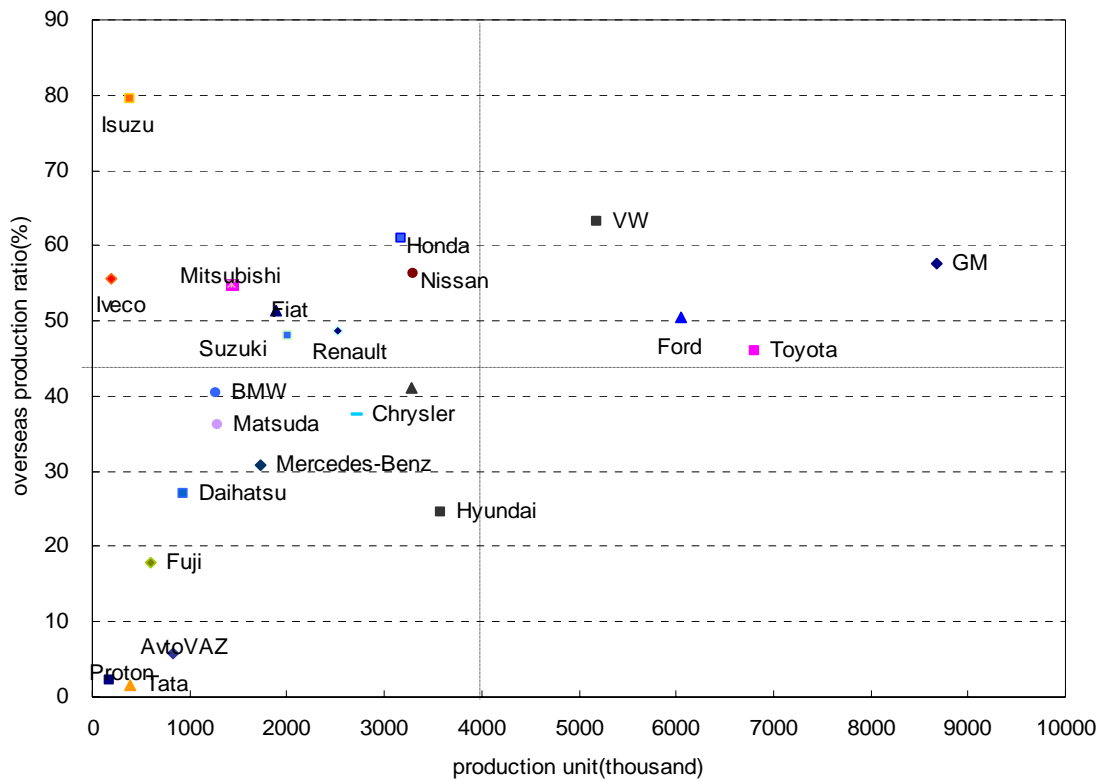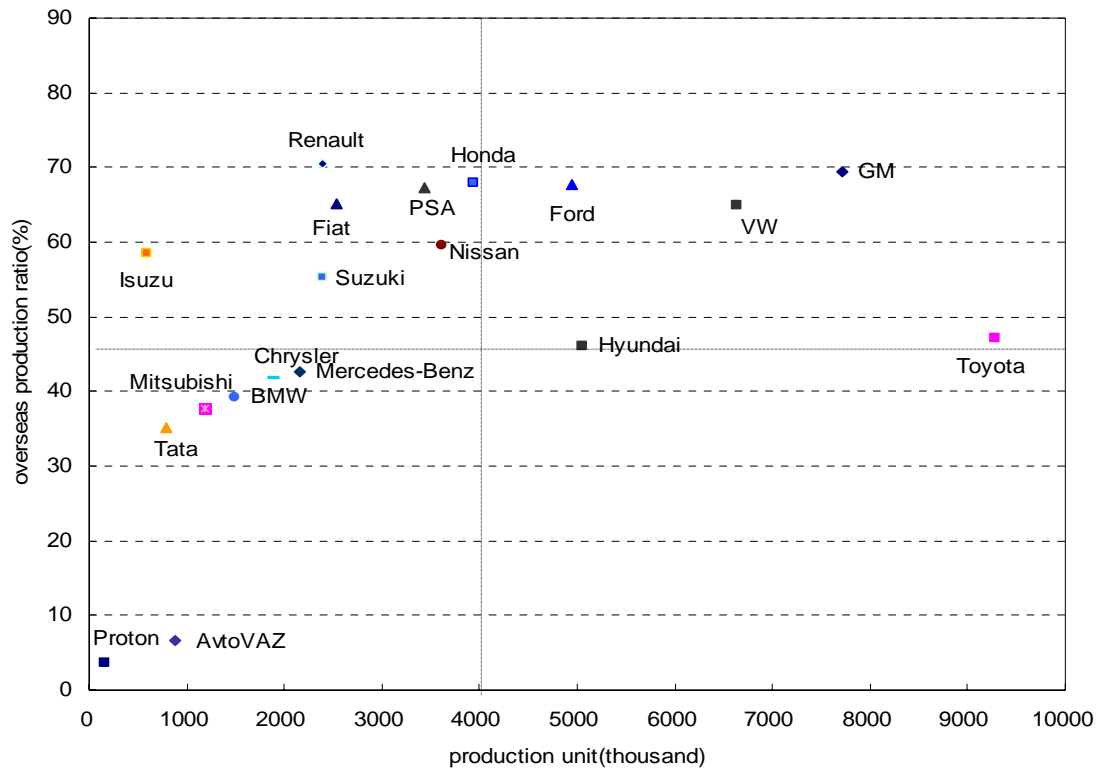
Source: reorganized from FOURIN(2006, 2010)

(2) Theory of FDI and MNC

i) Classical Economic Theory: Factor Movement and Investment

In the perspective of traditional economics, the phenomenon of overseas production or investment was viewed as movement of factors, or more specifically movement of capital. In the traditional trade theory, countries produce goods according to their comparative advantage, in technology or factor endowments. They then export thus produced goods to foreign countries. As trade increases under free trade, the demand for abundantly endowed factor goes up, and consequently the concerned factor price goes up and eventually, factor price converges across countries. This is the classic 'factor-price-equalization theorem. In theory, there will be no need or motivation for foreign investment if there are no trade barriers. However, the real world is far from free trade situation and there is thin probability of reaching free trade in the near future; therefore, there always will be gap in factor prices among countries. In this sense, firms have dual incentives to invest in foreign country: to utilize the host country's cheaper labor costs or lower interest rates, and to escape tariff burden.

Mundell(1957) noted that there were growing overseas production by firms, and analyzed this production activity abroad as having lots to do with the disparity in factor price across countries, and also growing factor mobility. He further found the substitutive relationship between trade and factor movement. As impediments to trade rise, factor movement increased; increase in restrictions to factor movement stimulates trade. His theory assumed perfect competition in the market and homogeneous production function, etc, modeling the two extreme cases of perfect factor mobility but no trade, or factor immobility with free trade. This was somewhat remote from the reality, but this provided with clues to many incidents in those days; increased protection in Britain in the nineteenth century stimulating capital exports and international trade growth in the interwar period when factor movement was highly restricted, etc.

After Mundell's classical economic interpretation on the overseas production, Kojima(1975) and Wong(1986) reinforced some substitutive relationship between foreign investment and international trade claimed by Mundell, but their research could be differentiated in that they noted foreign investment was not totally substituting trade, but to some point was complementing it. As trade between two countries increased, firms of the exporting country made investments in the importing country, which reduced trade volume somewhat, but did not eliminate trade altogether. This seemingly contradictory observation happens due to imperfect market and product differentiation.[3]

Markusen(1995) added on the previous economists literature, keeping the association of FDI with international trade, and studied the multinational firms and their investment with the tool of equilibrium analysis. He discovered that there was some missing point in the traditional theory. He tried to incorporate industrial organization aspect into trade models, and give individual firms an important place in the theory. Among economists, Markusen was the most comprehensive theorist on multinational firms and FDI. He also embraced business perspective in his analysis, referring to various business scholars, including Dunning. Thus Markusen's theory was different from the previous literature treating foreign investment and overseas production just as part of the theory of portfolio capital flows. The capital, if unrestricted, flows from where it is abundant to where it is scares. However, in real life, individual firms' foreign investment cannot be aggregated to a huge mass of capital flowing freely around the globe. The FDI, unlike portfolio investment requires complicated and sometimes bureaucratic process of decision making and the top management's bold resolution because it is hard to revoke.

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[3] The substitutional relationship between FDI and trade was evidenced in many cases: e.g. the decreasing export to Europe or the United States by Korean vehicle makers as local production increased. However, export cannot go to zero, because there is limit in local production in terms of volume and number of models produced.

As Markusen recognized multinational companies had actual control and power in the international trade and investment, firms were given more leading role in the theory of FDI.

In short, classical theories on FDI note that it is alternative to international trade, as one of a mode of foreign sales. They explain why there have been FDI and overseas production, but do not really explain why certain firms in a certain industry are more engaged in FDI, how FDI in certain industry is different from those in other industries, where firms choose to make investment, etc. Answers to these questions might be better addressed in the business theories, where firm's behavior and decision making is the core topic of research.

ii)   Management Literature

As firm's role in the transnational investment has been emphasized, there have been numerous researches on why firms engage in foreign operations. This stream of research developed into theory of Multinational Corporations(MNC). 'Multinational Corporation' refers to a corporation or an enterprise that manages production or delivers services in more than one country. These studies usually started where in reality they find seemingly contradiction or weakness in the traditional economic approach on FDI. As MNCs increased in number globally, this approach gained persuasion. The fundamental difference between economic approach and management approach is that classical FDI theory explains motivation or advantage in a country or location, whereas MNC theory finds these factors are created by firm.

Hymer(1976) pointed out the shortcoming of interest rate theory, that is factor cost of capital as the motivation of direct investment. He found rationale of overseas production in that multinational firms seek to grasp central control and ownership of the foreign operations because by doing so the firm can monopolize the advantage and it can control the price and output to maximize profit. Reluctance to licensing or partnership with local company can be explained by his theory very well. His theory extends to vertical integration. With imperfect market, firms try to avoid using local market when procuring materials and factors of production by appealing to horizontal or vertical integration or by finding another mechanism of coordination. He further argued that the firm would rather choose to integrate the foreign producer into their administrative structure.

Vernon(1966) is well known for his product cycle theory, explaining the trade and foreign direct investment. Vernon is an economist, but his theory had relevance with and

application utility in the business world and thus was widely recognized and appreciated in the managerial field. The three stages of product cycle are new product, maturing product, and standardized product. In the initial stage, products are developed and produced in developed countries and from the second stage, less developed countries start producing the products and in the third stage, the production locus move to the less developed countries.

Magee(1977) extended Vernon's product cycle for individual product to industry technology cycle. The industry technology cycle starts from the appropriability theory of the creation of technology by multinational firms. The appropriability theory suggests that MNCs are specialists in the production of information which is less efficient to transmit through markets that they produce sophisticated technologies. Each product Magee argued that firms specializing in the development, production and marketing of important experience good, new information. Thus, his three stages of industry cycle was invention, innovation, and standardization. At the Invention stage, optimal firm size is small, and industry structure is very competitive. At the Innovation stage, firms get larger and the industry structure is concentrated. At the final stage, the goods are standardized and the appropriability declines. Thus the industry structure becomes again competitive, prevailed by medium to small size firms. Applying this theory to automotive industry, pretty much of what have happened in the history of automotive industry development can be explained. Presumably, the global automotive industry is at the end of second stage, about to move on to the third stage. The appropriability of technology is declining; new firms from the emerging markets are producing value cars at cheap price, and Korean makers have almost did catch up with the technology of western makers. Still, the industry structure is concentrated, but going to be more competitive as a number of makers are burgeoning, growing and catching up in the emerging markets.

The most comprehensive and effective explanation was presented by John Dunning's Eclectic Paradigm: the most renowned theory on multinational firms. He stated ownership-specific advantage, location advantage, internalization advantage as the determinants of firm's overseas production.

Ownership-specific advantage refers to the intangible assets such as technology, intellectual property, brand, marketing expertise, human resource, etc. that are source of the competitiveness of the firm, and the capability to organize efficient production and sales system, by mixing these intangible assets with various tangible assets. Firms with this kind of advantage have incentives to achieve multinationality, which enhances operational flexibility by offering wider opportunities of arbitraging, production shifting and global sourcing of inputs.

Location advantage is the assets specific to a particular location. For example, natural resources, cheap labor costs, incentives offered by the host country governments, trade barriers, and high demand growth are the location advantage of developing countries. On the other hand, developed countries have the political and economic stability, infrastructure, and advanced technology, human resources as their location advantage.

Lastly, internalization advantage signifies that when firms move ownership-specific advantages to foreign countries, it is more efficient for them to establish subsidiaries to internalize overall transactions, rather than trading with other firms or entering into contracts. This explains why firms prefer direct investment to licensing or contract.

2) Major Drivers of FDI in the Automotive Industry

Overseas production in the automotive industry is, in other words, dispersion of final assembly of one manufacture. For a couple of reasons, global automobile manufactures place their production close to the end markets. Here, these reasons are categorized and explained in three aspects: demand side, supply side, and political aspect.

(1) Demand Side Motivations

i) Growing Demand in the Emerging Markets

Perhaps, the increase in FDI could be better understood in the light of growth of firms rather than a theory of foreign investment. When firms grow significantly in volume, domestic market is not enough anymore. Growth speed slows as market is saturated and demand is not growing at the speed of firm's growth. In order for the firm to keep growth, it needs larger market to sell its products. Foreign market is the necessary and sufficient condition for a sustainable growth of firms. Countries in the period of 'motorization' are the best target of MNCs.

To this end, major portion of FDI in the automotive industry is made by OEMs in the developed world to the developing countries. China is the number one recipient of FDI by global OEM, and is followed by India and Brazil. Recently, Russia is emerging as another big region receiving FDI by foreign OEMs. Almost every major global producer have production base in Russia. Historically, FDI into the developing countries were motivated by the easy access to natural resources and abundant labor force, but now vigorous FDI in the emerging markets including BRICs is mainly motivated by its market potential.

ii)   High Protection of the Automotive Industry and Barrier Circumvention

However, these emerging markets are mostly protected by high tariff barriers. Countries like India has prohibitive tariff of 100%.   It is practically impossible to access this market by exportation.   Even when governments negotiate on free trade agreement, motor vehicle is usually the most controversial and sensitive sector in the manufacturing industry so that it usually remains to the last minute unsettled as a potential deal breaker, before concluding the agreement.

Therefore firms choose overseas production to penetrate the market.   Generally, higher the tariff is in a certain country, there are more incentives to make investment in the country.   Tariff is the most direct cause of overseas production, when regarding foreign investment as an alternative to exportation.   There is substutional relationship between export and overseas production.

iii) Product Differentiation

Vehicles, much more than other manufactured goods, are affected by the geographical location of the market: natural environment such as climate and topography, consumer characteristics and preference, road and traffic regulations, income level and so on.   This distinct local preference led to great degree of product differentiation in the automotive industry.[4]   Moreover, the world car in the 1980s and 1990s was not a big success.[5]   It convinced firms that global vehicle market is far from homogenous. Knowing the segmented nature of regional markets, the attempt of 'world car' was running counter to this long-lived truth.   In order to satisfy many consumer needs and preferences with homogenous product, cars were over-engineered, which damaged the cost structure of the company.   In fact, there is almost no truly global model: even world best selling cars like Ford Fiesta and Toyota Corolla are modified for the individual markets.   OEMs now tend to develop models specific to certain region or markets.[6]   They sometimes

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[4] Mostly, passenger cars produced and sold by global makers are roughly categorized into three groups in most cases: global model, general model, and local model.   Global models cover almost every region, with minor modifications in the design and specifications in the different markets.   Honda Accord and Civic are exemplary global models.   General cars are sold in a couple of regions without big changes in the design.   On the other hand, local cars are customized to the specific region in terms of design and platform.   Good examples are VW's Gol(South America) and Santana(Asia)[4], Honda Pilot(North Ameirca) and Odyssey(North America).   Even global models have variations according to the market segments, consumer preference and income level, etc.

[5] Ford Mondeo and Fiat Palio are notable examples of World car.

[6] These are often witnessed in Europe, South America and almost every emerging markets.   Hyundai is producing Europe specific models: 'i series.' and Ce'ed.   Toyota's product lineup in Europe is

establish design centers in the overseas market such as China and India, to alter the design to fit the preference and needs of local consumers. Thus, it is anyway hard to achieve the maximum economies of scale while producing all the different trims of models even if production is concentrated in the home country.[7]

Product differentiation in the automotive industry went further than the lineup strategy with diverse models. Even within a model, there are slight modifications according to the local market's culture, geography and consumer's preference. With many versions and trims, it is very hard to handle the production in one place. It is better to locate production site near the end market to enhance flexibility of production and contact and communication with the local market.

(2) Supply Side Motivations

i) Cost Reduction

Vehicle manufacturers also make FDI to reduce production cost. Since mid 1990s, European makers have been shifting their production to Central and Eastern Europe, to exploit the cheap labor cost, and geographical vicinity to Western Europe. Spain used to be the major FDI recipient by these makers before. Among the Eastern European countries, Poland was rated the most favorable location for vehicle production for its infrastructure, endowment with skilled labor force, and adjacency to Western Europe market. Now most European makers have production facilities in Central and Eastern Europe. Typically, these cost-cutting investments took place within region, in a few locations where input costs are low and supply is abundant. This usually brought about regional cluster specializing in the production of vehicles.

<Table I-1 > Historical View of European Makers' operation in Eastern Europe

Maker	Strategy	Model
VW	Acquired Skoda (1991) Czech: Skoda production base Slovakia: VW 4WD Poland: VW small commercial vehicle Hungary: Engine	Skoda Fabia (Saloon/HB/SW) Superb VW Polo/Golf/SLW

completely different from any other markets, e.g. Yaris, Auris, and Avensis, whose names are unfamiliar to even Japanese consumers. India is overflowed with these local models: Hyundai Santro, Honda Jazz, Toyota Etios, etc. Of course, these models are produced locally.

[7] To solve this inefficiency, OEMs usually leverage common platforms over multiple products, typically utilized by European manufacturers.

Renault	Full-scale manufacturing since 1998 Concentrated around Slovenia, Romania, Turkey Export Thalia from Turkey to Eastern Europe Brand divided into Renault and Dacia	Renault Clio/Thalia, Symbol/Kangoo Dacia X 90
PSA	Full-scale manufacturing since 1998 Brand divided into Peugeot and Citroen Czech: Joint venture with Toyota, supply base toward Western Europe	Peugeot 206-106, Citroen C3, Peugeot Partner, Citroen Berlingo
Fiat	Established FAP(Fiat Auto Poland) in 1992, and produced mid-to-low price small car for Western Europe	Palio/Weekend/Siena, Fiat Gingo

Source: Global Insight

ii) Efficiency Maximization

The US makers are the biggest producer in North America including domestic market, but apart from the United States, they are the most committed investor and producers in Canada and Mexico.　GM has seven plants in Canada and Mexico, three in Canada and four in Mexico.　Ford is currently operating four plants in Canada and Mexico, two in each.　It was triggered by the regional integration: North American Free Trade Agreement(NAFTA).　Since NAFTA, automotive industry of North America has been restructured.　GM and Ford has relocated some of their vehicle assembly plants and engine or other component manufacturing plants to exploit the low labor costs and rents while maintaining proximity to the market and related value chains.

iii) Advantage of Internalization

There can be many types of international business in the automotive industry. <Table I-2> shows list of various patterns of international business in the automotive industry.　Subcontracting or KD production is prevalent typically in less developed countries such as Southeast Asian countries or Russia.　Recently, foreign investment has increased substantially.　Direct foreign investment includes joint venture and wholly owned subsidiary.[8]　Wholly owned subsidiary could be newly established operation or ownership by M&A.　The typical business term for the newly established subsidiary is Greenfield investment.　M&A is also frequent.　Exportation involves the lowest level of internalization, and as it goes from ⓓ to ⓜ, the degree of internalization increases.

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[8] Good example of joint venture is global manufacturers operating in China: Beijing-Hyundai, Shanghai-GM, etc.

<Table I-2> Patterns of International Business in the automotive industry

Export	Indirect	ⓐ Intermediary Trade by Exporters		
	Direct	ⓑ Export by Manufacturer to the Foreign Importer		
		ⓒ Export via Foreign Subsidiary		
International Contract	Technical Cooperation	ⓓ Licensing and Franchising		
		ⓔ Joint Technology Development		
	Parts Production	ⓕ Subcontract Production		
		ⓖ KD Parts and Components Supply		
		ⓗ Divided Production among Companies		
	Complete Vehicle Production	ⓘ Original Equipment Manufacturing, Consignment Production		
		ⓙ Joint Production		
Foreign Investment	Indirect	ⓚ Portfolio Investment		
	Direct	ⓛJoint Venture	Majority Ownership	Newly Established vs. Equity Partnership Or M&A
			Equal Ownership	
			Minority Ownership	
		ⓜWholly Owned Subsidiary	Newly Established vs. Acquisition	

Source: Korean Automotive Research Institute

<Figure I-2 > Lifecycle in the mode of Market Entry

Global OEMs usually go through four stages pertaining to its extension to the global market: domestic sales, export, licensing/KD assembly, and full-scale production via FDI. Generally, firms keep raising the degree of internalization in the foreign market

strategy.   This cycle often replicates in individual foreign markets.

(3) Financial Motivation: to hedge exchange rate risk

In fact, financial risk management was a very huge factor in the FDI decision, especially in the developed countries.   Automobiles are very sensitive to exchange rate than any other manufactured goods because car's unit price is much higher compared to other products such as home appliances and computers, etc.   In countries adopting free floating exchange rate system, the exchange rates can be very volatile. Sometimes, exchange rate fluctuation can count around one third of the production cost, which is way higher than the cost penalty caused by tariff.   Tariff imposed on cars in the developed countries are usually less than 10%, but when the currency of the exporting country appreciates against the importing country, the export price can jump up by 30% in the market country. Complete vehicles are one of the most expensive consumer goods, and thus they are very vulnerable to exchange rate changes.   Therefore, vehicle manufacturers have incentive to produce cars in the market country to hedge the foreign exchange risk.

Japanese OEMs' have been vulnerable to the strong yen and exchange rate risk. In this background, Japanese OEM's were one of the earliest manufacturers to go abroad and engage in overseas production.   In 1985, overseas production of Japanese makers were less than one million units, but in 2005 it ballooned 10 million units, more than ten folds in 20 years.   Their domestic production in 2009 was about 7.8 million units, overtaken by overseas production[9].   Also, Japanese OEM's recent poor performance in the US and European countries since 2009, right after the global financial crises, can be also partly understood by weakening price competitiveness due to high yen.[10]

(4) Political Motivations

Sometimes political motivations drives firms migrate to other region or countries. Sturgeon and Biesebroeck(2009) also pointed out that political pressures on automakers to build where they sell have encouraged the dispersion of final assembly.   It is a minor motivation, and not a direct cause of overseas production, but can play a certain role in

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9 In 2008, domestic production was almost the amount of overseas production, but in 2009 Japanese makers reduced domestic production sharply due to global economic downturn.   However, the growing overseas production caused the quality control issue, and the sensational 'Toyota Recall' was the backfire.

[10] Ironically, it became the alleged cause of fallout in the quality management, damaging the fame and trust of these global makers which won their recognition in the global market by its invariable quality and consumers' confidence therein. This supposedly caused Toyota's global recall incident pertaining to the accelerator pedal problem.

shaping the patterns of FDI. Automotive industry is one of the most politically sensitive sectors among manufacturing industry. It is often witnessed in the trade agreement negotiation that concessions on the automotive industry are concluded at   the last minute of negotiation.

i)   External: Trade Pressure

Usually, as export increase, firms face obstacles, mostly in the form of trade dispute by the importing country governments for unbalanced trade or alleged unfair business activities, such as dumping. This causes major uncertainties and cost for the company.

<Figure I-3> Production in the US by Asian and non-Asian OEMs(million units)

Source: Global Insight

Japanese car makers were experiencing export-driven growth until 1970s, but since 1980s export growth were decreasing because of the trade conflicts with US and European countries due to Japan's high exports volume and market share growth in that region.   As a solution to the growing trade imbalance, US and EU demanded Voluntary Export Restraint (VER) from Japanese manufactures in 1981, and thus Japan's automobile export dropped starkly. To tackle this situation, Japanese makers started overseas production, first in the United States in 1982 by Hondas. Ever since, production increased every year, so that in 1985, it was only 300,000 units per year, but the number doubled in three years and in 1995, it was over 2 million units.   In 1993, Japanese makers' US production figure

outnumbered their exports to the US market.

ii) Internal Trade Union

The political motivations can be found within the home country. The stiffness of trade unions in the automotive industry causes additional cost or uncertainty on the part of the firm. Labor in the automotive industry shows high tendency of unionization. Besides, trade unions in the automotive industry are the most powerful unions, for example UAW(United Automobile Workers) in the United States, CGT(Confederation Generale du Travail) of France, FIOM(Federazione Impiegati Operai Metallurcigi) in Italy, and Korean Automotive Labor Unions, and many more, at the firm level, industry level and national level. The authority of each trade union is different by countries, but generally they have stakes and power in some important management decisions. It is undisputable fact that these organizations are necessary for the healthy national economy and fair society, but in simple management aspect, they deteriorate operational flexibility and increase overall production costs.

The cost-increasing effect of harsh trade unions has caused many automotive manufacturing companies to migrate their production facilities to foreign countries with lower wage and welfare standards, and more employer friendly countries, mostly developing countries.

2. Policies and Measures on the FDI

1) Performance Requirements in the Automotive Industry

When multinational firms make foreign direct investment in a certain host country, they are subject to the laws and regulations, and the policy of the host country. Those can be divided to roughly two categories: pre-entry stage regulations and post-entry stage related regulations. Among them, performance requirements fall under post-entry group and they are the most relevant measures in the foreign investors' practical operation. The definition of performance requirements is, according to the definition of UNCTAD, "stipulations requiring foreign investors to meet certain specified goals with respect to their operations in the host country." Throughout the 1970s, governments of developing and developed countries alike have resorted to performance requirements as a means to promote industrial and economic development. They were particularly common in the automotive, chemical and petrochemical, and computer and informatics sectors.

Generally, host governments impose performance requirements on the foreign investment for the following policy objectives: to strengthen the industrial base and increase domestic value added, to create employment, for technology transfer and catch-up, to generate exports and thus maintain balance of payments, etc. If there is one key word that can sum up all these objectives, it would be 'development'. Host governments adopt various performance requirements to enhance the benefit of inward FDI, and thereby accelerate the industrial and economic growth and development.

<Table I-3> Prohibited performance requirements in the TRIMs Agreement

Types of PR	Details
Local Content Requirements	The purchase or use by an enterprise of products of domestic origin or form any domestic source
Trade Balancing Requirements	An enterprise's purchase or use of imported products is limited to an amount related to the volume or value of local products that it exports. Or import restrictions related to the enterprise's volume or value of local production that it exports.
Import Restrictions	General import restrictions related to product used in local productions
Foreign Exchange Balancing Requirements	Measures that restrict an enterprise's access to foreign exchange for imports to an amount related to the foreign exchange inflows attributable to the enterprise.
Domestic Sales Requirements	The exportation of products is restricted in terms of particular products, volume or value of products, or volume or value of local production

Source: UNCTAD

Here, various performance requirements especially relevant with automotive industry are explained. They are roughly divided into four types. First, at the pre-entry or point of entry stage is joint ventures or domestic equity requirements. Among the other three are in the post-entry stage: one is R&D and technology transfer requirements, which are qualitative requirements, and the other is local content requirements and export performance requirements which are somewhat quantity-oriented approach.

(1) Joint Venture and Equity Ownership Requirements

This is a compulsory joint venture or equity ownership requirement, mandating joint venture with local counterpart or limiting the full ownership of the investment. Host governments use these requirements for a number of reasons. In some cases, they are implemented for national security or public interest reasons. This explanation is more relevant with the those industries such as telecommunications, energy industry such as oil and electricity, natural resource such as steel and mining industry, transportations and financial industry such as banking and insurance. However, it is usually not the case for general manufacturing industry. The main practical rationale for this requirement is to enhance chances of technology and knowledge of the foreign investor being diffused to the local companies. By forming one joint company, the local firms can have better access to the technology and various other intangible know-hows of the advanced foreign firms.

Evidently, in case of India, there are several empirical and case studies reporting that domestic equity requirements have helped to promote the formation of joint ventures, and consequently in some cases generated externalities in the form of local learning and quick absorption of knowledge brought in by the foreign partners.

This kind of requirements has rapidly disappeared. Now there is hardly any country imposing these requirements on FDI, at least in the automotive industry. At the moment, only China is restricting foreign ownership. For a global manufacturer of completely vehicles to operate in China, it has to organize a joint-stock company with a Chinese partner, which owns at least 50% of the company's equity[11]. Thus, every global OEMs which have presence in China are represented by joint-venture company: FAW-Volkswagen Automotive Co., GM-SAIC, Hyundai-Beijing, etc. In effect, it is plainly discernable that China's local automotive industry is growing very fast, both in terms of scale and technology.

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[11] WTO(2006)

(2) R&D and Technology Transfer Requirements

Technology transfer is directly related to the industry development of the host country. Therefore, it has been the most important policy objectives of host governments. However, foreign investor firms are reluctant in transferring technology to local firms because they are afraid that those local companies can some day drag them in the global market with low price and equal quality. Besides, R&D function of global firms is in general concentrated in home countries, and therefore, investment host countries sometimes are degraded to a simple factory base, and ironically are retarded in technological development due to excessive reliance on FDI. Thus, the policy option for the host government is either mandating the technology transfer requirements or offering incentives for investors to willingly transfer technology.

Although mandatory application of R&D and technology transfer requirements is not common in practice, some developing countries call for these requirements. In China, foreign auto manufacturers are required to set up their own R&D departments along with the production facilities. In India, R&D requirements may be imposed to ensure more investment in R&D for absorption and adaptation of imported technology. Russia recently imposed the requirement for investors to establish design center. Southeast Asian countries were extensively adopting those requirements, especially on Japanese firms.

(3) Local Content Requirements

At the close of the Uruguay Round, the only remaining prohibited TRIMs were local content and trade balancing requirements in the automotive industry. Local content requirement(hereinafter referred to as LCR), or domestic content requirement, is the most useful tool among other performance requirements by incorporating local firms into the production chains of foreign investors. LCR has evolved from a very strict form of mandatory local content rule that require minimum percentage of inputs from domestic sources, to a more flexible form which is a condition for the receipt of an incentives such as tariff exemption or subsidy. One remarkable fact worth noticing is that LCRs have been enforced uniquely in the automotive industry, in most countries.

Table below is a summary of how countries enforced various local content requirements and the current state of the rules. Almost every developing country had once implemented local content requirements. By 2005, the official requirements had been expired in most of the countries.

<Table I-4> Local Content Requirements in Various Countries

Country	Local Content Rule
Malaysia	- Elimination of 11 items from Local Material Content Program in 2002.1. Remaining 19 items were abolished at the end of 2003. - Still, there is administrative guideline encouraging local content usage.
Thailand	In 2000, the local content requirement was abandoned, but CKD tariff was raised from 20% to 33%, offsetting the effect.
Pakistan	LCR has been used as a part of deletion program. Used to link tariff exemptions with local content until 2005.
Philippines	In 2003, the local content requirement was abolished.
Vietnam	The official TRIMs are eliminated, but the Prime Minister decision stipulates that regular vehicles have to have a local content of above 60% by 2010.
Cambodia	Gradual indigenization is required, starting from 6% in the first year, to 65%, with yearly raise of 3%.
India	Local content requirements in law were phased out, except for companies established within Special Economic Zone.
China	New KD Rule provides that parts and components that have the character of complete car are subject to tariff for complete car.
Russia	In automotive industry alone, there are local content requirements. For duty free treatment, foreign investor has to make investment of at least 250 million dollars and procure local content above 50%. For the preferential treatment on KD tariff(2%~12%) investor has to procure local content up to 30% within 54 months.
Canada	Local content requirement was abolished in 2001.
Mexico	Local content requirement was eliminated in 2004, and there are no formal requirements. However, firms not satisfying the NAFTA Rules of Origin's valued added criteria cannot export to the US or Canada duty free.
Argentina	Local content requirement was enforced until 2003. According to MERCOSUR Common Automotive Policy in force since August 2008, local content rate required for duty free treatment within the region is 30% for PV, 25% for trucks.
Brazil	Local Content Requirement is employed as investment incentives.
Venezuela	Local content over 33%, 3% tariff reduction
Iran	According to local content rates, tariff is discriminated.
Egypt	Incentive measures in the form of customs duty reductions(until 2005) Local Content Required(%) / Reduction in Import duty(%): 20 / 25 30 / 30 40 / 40 50 / 50 60 / 60 Over 65 / 75 All excise duties incurred on local inputs are also refunded.

Source: WTO

(4) Export Performance/Trade Balancing Requirements

Export obligations or trade balancing requirements have been often applied in countries promoting export-led growth. The main objectives of the host governments by imposing export performance requirements could be simply expanding the exports, to diversify the export destination countries, or to balance payments to foreign countries. On the other hand, Brazil, Mexico and Thailand used export requirements for triggering a burst of export-focused investments. Thailand, by imposing export requirements on foreign affiliates, prompted Japanese automobile producers to integrate Thailand into their global production networks. Rodrik(1987) and Greenaway(1991) found that in the presence of oligopolistic behavior and tariff distortions, export performance requirements can benefit host countries by reducing payments to foreign owners, reducing output in excess supply and by shifting profits to locally owned firms.

<Table I-5> Export Obligations in major Countries

Country	Export Obligation
Indonesia	There are trade balancing requirements, but not contingent upon investment.
Thailand	When producing in the Special Economic Zone, 100% of the products should be exported for duty-free treatment.
Philippines	Foreign firms in the free trade area are supposed to export 7% of production.
India	Producers locating in SEZ or export-oriented firms are required to accomplish the designated export performance under MOU with Indian government.
China	Used to impose export obligation in some industries. Now, there is practically no export obligation.
Mexico	Export obligations are only applied to companies in Maquiladora, allowing domestic sales based on the previous year's export volume.
Argentina	Export obligation is limited to automotive industry. Originally, imported parts are considered locally procured when three times of the import value(FOB) is exported. This rule was abolished in 1983 and the ratio of import and export was relaxed to 1:0.5 in 1991, 1:0.8 in 1992, 1:1 in 1993.
Brazil	Export performance is required with regard to Export Promotion Program.
Chile	Exemption from customs duties for imports of CKD and SKD for vehicle assembly, provided that they are offset by exports of domestic components of equivalent value within 12 months.
Uruguay	For each US dollar of exports, they may import at a tariff that is 13%p lower than the tariff applicable to new vehicles assembled in the place of origin.
Egypt	Under Article 102 to 106 of the Customs Law, the duty drawback scheme allows a full refund of customs duties paid on imports of inputs and components used in the manufacture of finished products provided that the finished products are exported to a free zone within two years of the date of payment of the duties.

Source: WTO

2) Disputes concerning Automotive Industry

Thus, various performance requirements were implemented in the automotive industry, and in most countries, local content requirements were implemented only in the automotive industry.   However, some of the performance requirements are prohibited by TRIMs Agreement, and now most of the TRIMs in other industry were eliminated as recommended and scheduled by the WTO.[12]   At the core of these issues lie the conflicting interests between the foreign investors and the host country governments. The host government, providing the great value of favors to the foreign investors, it wants to make sure that the foreign investor is contributing to the domestic industry and economy.   The term, 'performance requirement' can be understood in this context.

As a matter of fact, there were thirteen trade disputes in WTO regarding host country's investment regulations, or more specifically performance requirements.   It is worth noticing that six of them were addressing automotive industry.   Besides, the six cases are all that WTO disputes pertaining to the automotive industry.   This signifies that there is a close link between trade-related-investment-measures and automotive industry.

<Table 1-6> WTO Disputes pertaining to Automotive Industry

Case Name	Case Number	Invoked Agreement
Brazil-Autos(1996)	WT/DS51, WT/DS52, WT/DS65, WT/DS81	GATT, SCM, TRIMs
Indonesia-Autos(1996)	WT/DS54, WT/DS55, WT/DS59, WT/DS64	GATT, SCM, TRIMs
Canada-Autos(1998)	WT/DS139, WT/DS142	GATT, GATS, SCM, TRIMs
India-Autos(1999)	WT/DS146, WT/DS175	GATT, TRIMs
Philippines-Autos(2000)	WT/DS195	GATT, SCM, TRIMs
China-Auto Parts(2006)	WT/DS339, WT/DS340, WT/DS342	GATT, SCM, TRIMs

Source: WTO

These dispute cases provide fertile ground from which we can study and analyze the application of legal principles dealing with investment measures.   Also, a couple of implications can be derived from this fact.   First, indigenization in the automotive industry is critical concern for the host country, and second, the current international trade regime is hostile toward the host country's indigenization policy.

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[12] This will be examined in more detail in Chapter IV.

3. Structure of the Dissertation

So far, we had overview of FDI in the automotive industry: how they developed in what background and motivations. Also, we have covered FDI-related policy environment and major issues thereupon. In the policy perspective, the impacts of performance requirements are manifold. In terms of trade, they can influence trade flows by affecting competitive relationship between foreign and local products, and sometimes used to deter the investor's roundabout export in order to shunt tariff barrier of the host country. In the investment point of view, they can influence investment flows in that they affect the decision of foreign investor whether to make investments or not in a certain country. They can also contribute to the production and development of the host country. The objective of this dissertation is to verify the link between these policies and FDI, and also between the policy and the industry development.

Thus, chapters ahead will look into each link. Chapter II, as an extension and development from Chapter I, will find out which factors are significant in determining the FDI location in the automotive industry with empirical analysis. Finding out the determinants, characteristics and peculiarity of automotive industry will be considered. In addition to this, it will look at the link between LCR and FDI inflow, whether LCR has investment distorting effect.

In Chapter III, LCR's role in the host country's view and investor perspective will be both investigated. Almost every developing country has employed local content regulation as a policy tool, and what are the rationale beneath. Also, how LCR can influence in shaping the foreign OEM's presence in the host country in terms of value chain networks. Here, we also investigated whether the LCR has accomplished its development objective, empirically substantiating the correlation between local content requirements and the industrial development of the host country; whether they provide positive effect on the industrial development.

Lastly, in Chapter IV, we have reviewed how FDI is regulated in the existing multilateral trade system, specifically with respect to the trade-related investment measures; and what are the limitations and controversies of the current system. Then, the current system condemning the LCR would have to be under second thought. Further, it discusses how investment should be regulated in the multilateral system, not through the glass of trade-oriented regime, and without prejudice to the development of industry in the less developed countries.

Chapter II. Determinants of FDI Location in the Automotive Industry

1. **Overview**

    1) Literature Review

        (1) Determinants of FDI

The modern research on the theory of transnational corporations and FDI can be categorized to roughly two groups: first, why firms go abroad to produce, i.e. the background and motivation of FDI, and second stream is where they make investment i.e. the location determinants of FDI. This type of research focuses on external variables affecting the firm's decision.

Dunning's four types of direct foreign investment, resource-seeking, market-seeking, efficiency seeking, and strategic-asset-investment, can effectively show both motivation and geographic determinant of FDI. First, resource-seeking FDI refers to location advantage in supply factor. This type of FDI is the oldest form of MNC involvement to cut down production cost, utilizing the abundant natural resources and cheap labor, typically in developing countries. On the other hand, market-seeking FDI refers to demand factor: market size, growth, trade openness, etc. Market-seeking investment became major motive for investing in the manufacturing sector in the developing countries in the 1960~70s. Generally, market-seeking investment in manufacturing industry is a substitute for exporting from the home country, often due to trade barriers in host countries. Thus, Dunning's theory reverts to classical theory of factor movement stimulated by tariff barriers impeding final goods trade. Further, it has trade-reducing effects on the end-products, but trade-creating effects in inputs or intermediate goods used in production. Significant transport costs, differences in consumer tastes and the need to adapt a product to local conditions and inputs can be other causes of market-seeking investment. Efficiency-seeking FDI means location advantage for certain value chain. This type of investment occurs when MNCs locate part of their value–added chain abroad in order to improve the profitability of their overall operations. This has been the major motivations for Japanese investment in Southeast Asia, the United States investment in Mexico and Central America, and European investment in Central and Eastern Europe. Finally, strategic-asset-seeking investment usually takes place at an advanced stage of the globalization when firms invest abroad in order to acquire intangible assets such as technology, marketing capabilities, brand, and

distribution networks.   These four categories provide with the comprehensive framework for FDI determinant studies.   In the real business practices, FDIs are not based on a single motivation, but usually combination of two or more types.

There is growing volume of empirical researches on the determinants of FDI, i.e., firms' decision where to locate their investment.   Size of the economy such as GDP and population has proven to be the most relevant factor to induce FDI in most of the empirical studies(Root and Ahmed(1978); Schneider and Frey(1985); Lucas(1993); Barrel and Pain(1999); Drabek and Payne(2001); Nunnenkamp(2002))

Also, many empirical studies examined the impact of labor costs.   Schneider and Frey(1985) researched on the effects of GDP, infrastructure quality, labor cost, and country risk(political instability).   They found that these variables all affected firm's investment decision.   Labor cost is one of the supply factors of the FDI including abundance in the natural resource, which can be categorized to the resource-seeking FDI.   In fact, labor cost is a high priority factor taken into consideration when automotive manufacturers make decisions on the overseas production location.

Although many of the research on the determinants on FDI put more weight on the economic variables than policy variables, there are some studies that focused on political or social elements as determinants of FDI.   Corporate tax, and average tariff, integration with global economy, denoted by the number of RTAs are widely accepted in the literature as having an effect on the FDI inflow (Gotopoulos and Louri(2002)).

Openness of the host country was frequently used as a variable.   Asiedu(2001) rightly pointed out that impact of openness on FDI depends on the type of investment. When investments are market-seeking, trade restrictions can have a positive impact on FDI because when foreign firms seek to serve local markets with high trade barriers, they need to set up subsidiaries in the host country to jump high tariff.   It is exactly the case of many vehicle manufacturers, deciding to make fixed investments in the developing countries, generally less open economy.   Moreover, when the foreign company once makes investments in the host country with high barriers, they are also under protection from imports of competitors from 3rd countries.

Integration with global economy, frequently indicated by the number of RTA can be understood as a policy variable, but its market-size effect was emphasized in many researches.   Jaumotte(2004) investigated whether the market size of a regional trade agreement is a determinant of FDI received by countries participating in the RTA.   In order to test for a regional market size effect, the model introduced an alternative measure of market size which takes the value of the regional market size for countries belonging to the RTA.   In that case, when a country is not a member of any RTA, its market size in the

model is identical to the domestic market size. Of course, positive correlation between the RTA market size and FDI was found. However, it has limitations in that the RTA effect can be exaggerated for those small size countries with many RTAs. Also, it should be noted that not all the RTAs have reached perfect state of liberalization.

Aswicahyono and Hill(1995) examined foreign ownership as a determinant of investment by examining manufacturing sector of Indonesia.

On the other hand, Wheeler and Mody(1992) and Lipsey(1999) conducted similar empirical studies, and they included tariffs and other trade barriers among the variables. However, they did not find specific importance from this variable as a determinant of FDI. Nunnenkamp(2002) also concluded that non-traditional determinants such as cost factors, complementary factors of production and openness to trade have typically not become more important with preceeding globalization. In many studies including Drabek and Payne(2001), Lucas(1993), Barrel and Pain(1999), corporate tax and investment regulations were found to be less meaningful in deciding FDI.

Besides macroeconomic factors and policy factors, competing firm's strategy can also be a determinant. Knickerbocker(1973) made a very insightful finding from the actual investment decision of MNCs. He noticed that it was not just locational variable that might determine the spatial distribution of economic activity, but the strategies of firms in response to these variables and to the anticipated reaction of their competitors. His observation can well explain the automotive manufacturers' behavior in these days; why firm's FDI are usually concentrated in a couple of locations to form a kind of focal point of investment. Firm 1 chooses a country as its location of FDI, soon to be followed by other firms. China, India, and Russia are the notable examples of this phenomenon. Instead of finding other underinvested country, so called 'blue ocean' as business community put it, they are flocked together in the same country. One possible explanation is that by following the leader in the FDI, firms can reduce uncertainty, risks and various costs. Knickerbocker argued that oligopolists who wish to avoid destructive competition would normally follow each other into new markets in order to safeguard their own market position.

More and more researchers are including the policy variables and business environments in their model. Some empirical studies proved that these variables have certain impact on FDI, while some showed little influence on the FDI flow. Yet, the most significant variables are economic factors: generally, market size and growth potential have been the most decisive factors in firm's FDI decision.

(2) LCR as a Hindrance to FDI

Quite recently, especially at the time around establishment of WTO, local content requirement have entered the center of FDI research theme. Arguably, it was intended to seek economic justifications with regards to the prohibition of performance requirements in the TRIMs Agreement. However, less attention has been paid to the local content requirements in terms of FDI determinant aspect. They rather paid more attention to the negative effect of LCR on trade.

Among the early researches demonstrate the relationship between LCR and FDI was Root and Ahmed(1978). They tested 44 economic, social, political, and policy variables for their significance in determining the attractiveness of a country as an investment recipient, using multiple discriminant analysis. Among the policy variables, there were corporate taxation, tax incentive laws in terms of complexity, and also tax incentives in terms of liberality, attitude toward joint ventures, limitations on foreign personnel, and local content requirement. Of the six policy variables, only corporate taxation turned out to be significant discriminator. Local content requirements as well as other variables did not have substantial influence on the investment determination.

Grossman(1981) conducted a theoretical work showing the role and effect of content protection and content preference. He discerned that content protection was like a tariff protection for the domestic intermediate goods and subsidy for the foreign investor. Content preference scheme, as we call it, local content requirements, also works like a subsidy to the final goods producer, but for the local intermediate goods industry, it may or may not provide protection. Thus, content protection and content preference scheme brought resource allocation effect in terms of domestic content. However, he warned that this policy may not achieve its original objective to raise the level of value added and overall output in the local intermediate goods industry, if the local industry is under monopoly.

Qui and Tao(2001) showed that LCR affects the firm's modes of entry to a market: export or FDI. Their argument was that FDI is more likely to be adopted for a lower LCR. They also asserted that less efficient firms are more likely to adopt the FDI mode than more efficient firms in case employment is the main source of FDI benefit to the host country. Yet, they conditioned that when technological upgrading is the main benefit to the host country, the local content rate can be higher for the more efficient firms. Their first argument shows that LCR can exert adverse impact on the FDI in the host country, and secondly, high LCR usually attract only less competitive firms to the host country. Overall, they concluded that LCR is a negative factor in terms of FDI inflow.

At least, their second argument seems not really valid in the business world. In fact, the most efficient firms are intensively engaging in overseas production. It is because overseas production means higher risk for the investor than production at home country. Operating the overseas plants without hitch and yielding decent level of profits are something that firms with low efficiency and low competitiveness cannot manage. Besides, there are many counterexamples showing that local content requirements are not the sufficient condition for firm's decision to choose between FDI and export. For instance, there are many foreign firms building production facilities in China and Russia even though their local content requirement is tight. Sometimes, firms adopt mixed strategies, FDI and export at the same time.

More recently, there was a survey project done by European Round Table of Industrialists(ERT). In the survey, 28 countries were scored ranging from 0 to 6 according to the restrictiveness of performance requirements.(0 for the most liberal countries and 6 for the most restrictive). One of the many interesting finding was the already low level of performance requirements.[13] Moreover, there was little link between the index of performance requirements and the FDI stocks per capita. The coefficient of LCR was statistically insignificant, which was the opposite to the firm belief that performance requirements are impediments to inflow of FDI.

Surprisingly, there has been little evidence that LCR had negative determinant of FDI. In fact, there were many examples showing that FDI was more prolific in countries with tighter LCRs. One possible explanation to this seemingly contradiction is that there are other determinants with more direct influence on the FDI. Another explanation is that countries imposing LCR usually offset the costs with other incentive offers for the foreign investor: i.e. government incentives and grants might have surpassed the cons of LCR. Some scholars see the incentive competition to attract FDI is more distorting and detrimental to the FDI and economic welfare. Moran(1999) maintained that economic costs from host government incentives to the foreign investors and the performance requirements are equivalent.

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[13] Average score was below 2 in 1992 and it declined to below 1 in 1999.

2) Observations on the Automotive Industry

(1) Oligopolistic Structure: Imperfect Competition

Before discussing the FDI determinants in the automotive industry, it is recommended that we understand the characteristics and particularity of automotive industry shown in its historical development.

Automotive industry requires large initial investment for building production facilities, and research and development, advertising, etc. Therefore, economies of scale are important in the automotive industry, in terms of production and other management activities. In this background, global manufacturers kept building large scale production facilities, and this further drove firms into much more fierce competition, and firms lacking in scale economy or competitiveness were weeded out, resulting in the oligopolization of the industry structure. Many small size companies and brands were sold to surviving mass production brands.[14] While the number of makers has been decreasing since existing makers are merged and acquired by more efficient makers, there are far less new entrants into the industry due to the high entry barriers of automotive industry: high capital cost and R&D necessity, etc.

There was international oligopolization theory in the automotive industry. It was predicted that there would be only 8~10 manufactures remaining through the 1980s, which did not happen yet. With regards to the oligopolization of automotive industry, Fujimoto presented three scenarios about what the world automotive industry is going to look like.

i) Growing competition drives out marginal companies
ii) Countries build higher barriers against other regions, thus forming blocs
iii) Companies form multi-layered global network

i) has been going on in the global automotive industry for the past decades: even GM was bankrupt in the aftermath of Global Financial Crisis. ii) is true in a figurative way, though it cannot literally happen because raising trade barriers over its binding level is against the international obligation under WTO. Indeed, countries are forming regional blocs to protect its regional economy from competition from other blocs: examples are EU, ASEAN, Mercosur, etc. In fact, Fujimoto picked iii) among these scenarios, as most probable one. This perhaps describes the current status of FDI by global companies.

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14 As of August 2009, Porsche was the only remaining premium brand that has been sustaining autonomy when it was finally acquired by Volkswagen Group.

<Table II-1> Number of World Automotive Manufacturers from 1960s to 2000s

Car Maker	1960	1970	1980	1990	2000
GM					
Ford					
Chrysler					
AMC					
Jeep					
Stude Baker					
American Total	6	4	4	3	2
Ope[(2)]					
Vauxhall [(2)]					
BMW					
Mercedes-Benz					
VW					
Audi					
Porche					
Seat					
NSU					
Renault					
Citroen					
Pugeuot					
Simca/Talbot					
Alban					
Fiat					
Ferrari					
Avalt					
Auto Bianca					
Lancia					
Alfa Romeo					
Maserati/Tetomaso					
Innocenti					
Ramborghini					
Autstin/Maurice/BL					
AEC					
Jaguar					
Guy					
Conpentri Climax					
Reyland					
Triamph					
Rover					
Rolce-Royce					
Roots					
Lotus					
Aston Martin					
Volvo					
Saab					
Western Europe Total	35	22	17	12	6

Toyota					
Nissan					
Matsuda					
Honda					
Mitshubishi					
Daihatsu					
Suzuki					
Fuji Heavy Industry					
Isuzu					
Prince					
Hino					
Japanese Total	10	9	9	9	5
Hyundai					
Daewoo					
Kia					
Samsung					
Tata					
Mahindra & Mahindra					
Proton					
Perodua					
FAW					
Dongfeng Motors					
SAIC					
Chang'an Motors					
Beijing Motors					
Geely					
Chery					
Other Asian Total[3]	6	7	12	15	12
Grand Total	57	42	42	39	25

Source: updated from Fujimoto (1995)

Note: 1) M&Aed firm is not counted.
2) Opel and Vauxhall were acquired by GM in 1920s.
3) Currently, almost 120 local makers exist in China. Only major makers are listed.

The table shows reduction in the number of auto makers and it evidently shows clear trend of oligopolization. In forty years, the number of automobile manufacturers halved. Oligopolization takes place first in a country, and then in a region and finally in the global market. In the United States, there were 324 automobile makers in 1920. Now only 3 of them are left. In china, it is known that almost 120 local makers are operating. Eventually, most of them will disappear and only major players will survive. This restructuring and oligopolization is accelerated by M&A among makers. Mergers & acquisition occurred frequently in the automotive industry, especially in 1960s and late 1990s. As was shown in the table in the previous section, number of makers decreased sharply from 1960s to 1970s, and once again from 1990s to 2000s.

<Table II-2> History of M&A in the Automotive Industry

year	Acquiring Firm		Acquired Firm		Type of M&A
	Company	Nationality	Company	Nationality	
1965	VW	Germany	Audi	Germany	acquired 90%
1966	Nissan	Japan	Prince	Japan	Merger
1968	Fiat	Italy	Auto-bianca	Italy	Acquired 100%
1969	Fiat	Italy	Lancia	Italy	Acquired 100%
1974	Peugeot	France	Citroen	France	merger
1978	PSA	France	Talbot	France	Merger
1986	VW	Germany	SEAT	Spain	Acquired 100%
1987	Fiat	Italy	Alfa Romeo	Italy	Acquired 100%
	Chrysler	US	AMC	US	merger
1989	Ford	US	Jaguar	UK	Acquired 100%
	GM	US	Saab	Sweden	Acquired 50%
1990	VW	Germany	Skoda	Czech	Acquired 70%
1994	BMW	Germany	Rover	UK	Acquired 100%
1996	Ford	US	Mazda	Japan	Acquired 33.4%
1998	Hyundai	Korea	Kia	Korea	
	Proton	Malaysia	Lotus	England	Acquired 80%
	Daimler-Benz	Germany	Chrysler	US	Merger
1999	Ford	US	Volvo	Sweden	Acquired
2000	Ford	US	Land Rover	Germany(BMW)	Acquired
	Renault	France	Samsung	Korea	Acquired 70%
	Daimler-Chrysler	Germany	Mitsubishi	Japan	Acquired 34%
2002	GM	US	Daewoo	Korea	Acquired 51%
2005	SAIC	China	Ssangyong	Korea	Acquired 50%
2007	Cerberus	US	Chrysler	US	Acquired 80%
2008	Tata	India	Jaguar Land Rover	US(Ford)	Acquired
2009	Volkswagen	Germany	Porche	Germany	Acquired
2010	Geely	China	Volvo	US(Ford)	Acquired

Note: Cerberus Capital Management is a private equity fund, not OEM.

As a consequence of this oligopolization, almost every world leading auto maker is mega-corporation. There are more than 100 vehicle manufacturers on the globe, and about half of them are mass production firms and global Top 10 makers are producing more than 70% of the total global production, and global Top 5 are producing about half of total global production. This concentrated firm structure by the global oligopolization much affected the unique feature and characteristic of automotive industry, and consequently influenced the shaping of FDI and value chain system. To sum up, scale economies of automotive industry contributed to what it now looks like, i.e. oligopolistic

structure, and this again brought about the unique FDI pattern of automotive industry.

<Figure II-1> World vehicle production share by top 10 makers (%)

Maker	Share
TOYOTA	13.0
GM	10.8
VW GROUP	9.3
HYUNDAI	7.1
FORD	6.9
HONDA	5.5
NISSAN	5.1
PSA	4.8
FIAT GROUP	3.6
SUZUKI	3.4

Source: Marklines(2008)

(2) Production Pulled by Demand

FDI in the automotive industry is concentrated into roughly three regions: Asia, North America, and Europe.   The reason why FDI is rushing to these regions is because they are the biggest sales markets.   Until 1990s, the relative importance of Asia has been weaker than Europe and North America.   In the early years, FDI has been more active in the Western hemisphere.   However, as sales in Asia ballooned during the past decade, FDI is rushing to this region.   Production in Asia has almost doubled during the past decade, 18 million units in 2000 to over 30 million units in 2009.   From <Figure II->, it can be confirmed that global production in Asia takes almost half of the global production in 2009.

By comparing the two graphs in the next page, it can be found that vehicles are mostly produced where they are sold, although it does not match perfectly.   Sales in Asia in 2009 were about 20 million units, while production was over 30 million units. Production growing faster than sales signifies that Asia is the production base for the global market.   At any rate, overall production follows sales distribution in general.

<Figure II-2> World Vehicle Sales by Region from 1995-2009[15](million units)

Source: Global Insight(2010)

<Figure II-3> World Vehicle Production by Region from 1995-2009(million units)

Source: Global Insight(2010)

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15 The sales in Asia has been increasing, except in 1998.　The slide in this year was due to the Asian financial crisis that hit hard Korea and most of the ASEAN countries.

This might seem like a natural phenomenon, but it is often not the case in other industries. Sturgeon(2009) also noted on the distinctive feature of globalization in the automotive industry. He compared automotive industry with other globalized industries such as apparel and electronics industry which shows global-scale patterns of integration; e.g. Apple's iPods are sold worldwide while they are produced and supplied from a few assembly plants in China. On the other hand, plants of auto makers are more scattered around the world.

Besides, this looks contradictory to the characteristic of the automotive industry: increasing returns to scale. The fragmentation of production units by region or market base is disadvantageous to realize the economies of scale. If the location is broken down to country level, it might look a little different, but at the regional level, it can be concluded that production base pretty much follows the market.

(3) Relatively High Local Content Rate

Pertaining to the reason why local content in the automotive industry is higher than other manufacturing industries, especially electronics, Kuroiwa(2006) sympathized with Baba(2005) in that there are three primary factors: transportation costs, industry architecture, and industrial or trade policy of the host government.

Parts and components used in motor vehicles are much larger and heavier than those used in electronic goods. That is, higher transportation costs affect assemblers and OEMs' decision to procure parts and components from local supplier. Trim parts such as injection moldings are cheap and easy to produce but bulky so that its transportation costs are high. In general, bulky items such as pressed bodies, chassis, or plastic injections are better produced locally. Engines are both large and heavy so that they are also often produced or assembled locally.[16]

Thus, when vehicle manufacturers build plants in a foreign country it usually accompanies suppliers to be located in the vicinity. Usually, most of the major tier-1 suppliers join the overseas production. Thus, global OEMs build their supply networks in the overseas production base. On the other hand, electronic companies' FDI do not bring many subcontractors to the foreign production base. They mostly import parts and intermediate goods from various global suppliers from all over the world.

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[16] On the other hand, electronic components such as ECU(Electronic Control Unit) or airbags are small in volume and expensive: so their unit price is high whereas unit transportation cost is low. Those are ideal items for shipment. Usually, electronic parts and important functional components are imported from home country.

<Table II-3> Local content rates in the Automotive and Electronics Industry

Industry	Local Content	IND	PHI	THA	MAL	SIN	AVE
Automotive Industry	Local Content(90)	77.8	66.6	53.7	56.8	53.2	61.6
	ASEAN Content(90)	78.3	67.2	55.0	57.5	57.1	63.0
	Local Content(00)	83.7	66.4	59.8	68.5	58.7	67.4
	ASEAN Content(00)	84.5	71.5	61.9	72.2	63.5	70.7
Electronics Industry	Local Content(90)	66.1	52.2	40.5	56.2	47.3	52.5
	ASEAN Content(90)	69.2	58.4	51.2	64.6	55.5	59.8
	Local Content(00)	80.6	34.5	39.1	36.6	50.1	48.2
	ASEAN Content(00)	82.4	42.7	50.8	53.8	61.0	58.1

Source: Asian International Input-Output Tables (1990, 2000)

<Table II-3> adds evidence to this observations. Comparing local content rates between automotive and electronic industry in the same country at the same year, it is always higher in the automotive industry in all countries.

Secondly, as for the industry architecture, Kuroiwa cited example of Toyota's JIT(Just-In-Time) production system[17] which necessitates geographical proximity. Timely coordination between parts supplier and assembler is crucial part of JIT, and thus promotes local procurement. This kind of production system is common not only in other Japanese OEMs but also in Korean OEMs[18]. Perhaps, this is the underlying reason why Japanese makers, in general, show high localization in the overseas production compared to American or European Makers.

Architecture of the automotive industry is another reason.[19] These days, modularization is in progress in automotive industry. However, automotive industry's architecture is more integral rather than modular compared to electronic industry, and parts

[17] Just-in-time production system is an inventory strategy that reduces in-process inventory, producing quality products through the elimination of waste, inconsistencies, and unreasonable requirements on the production line.
[18] Hyundai, with its JIS(Just-in-sequence) system which is almost identical to the JIT, exhibits also high rate of local content rate. JIS is a supply management skill that emphasizes sequence as well as time.
[19] Fujimoto (2004) classified industries into three types according to their architecture: closed integral industry, closed modular industry, and open modular industry. Typical examples of closed integral architecture include automotive industry, motorcycle industry, and game software industry. The two most common closed modular industries are main frame computer and Lego. Lastly, open modular architecture is observed in PC system, internet products, bicycles, and financial products.

and components of motor vehicles are not readily substituted by other suppliers. Therefore, when OEMs manufactures in foreign countries, they often continue to purchase parts and components from their home countries. To shift the supply channel, they need time to build relationship with local suppliers or they rather choose to be accompanied by the home country suppliers.

3) Raising Questions and Hypotheses

As previously mentioned, Dunning found that there were four types of direct foreign investment: resource-seeking, market-seeking, efficiency seeking, and strategic-asset-investment. Among the various elements in resources including raw material, intermediate goods, labor cost, etc, labor cost would be the most relevant variable. Market-seeking activity is well understood intuitively. Market related variables are sales volume, GDP, annual economic growth and so on. Efficiency here indicates efficiency in the production. Resource is generally an important factor for MNCs when choosing the location of overseas production, but in the automotive industry its significance is relatively limited.[20]

However, in the real cases, consideration on labor cost comes next to market related factors. Firms first choose the region or targeted market based on the market size and potential of growth, and then picks the plant site considering other various factors. Thus, resource is the secondary consideration in case of automotive industry.

For example, when Hyundai/Kia decides to build production plant in Czech and Slovakia, the decision is based on the fact that those two countries are abundant with skilled labor at cheap cost among European countries, but this decision comes next to the preceding decision of choosing Europe as the firm's next target market. In other words, market related variables are macroscopic factors which firms consider when establishing the business strategy, whereas labor costs and other resource related variables are more microscopic factors, considered when working out the concrete action plan.

For MNCs manufacturing automobiles, the most important motivation would be market-seeking behavior. In practice, this type of behavior can be divided to two subgroups; basically, when firms try to enter the market for its size and growth potential, and another scenario is when the targeted market is highly protected and thus hard to penetrate by export. Developing countries usually raise high trade barriers in automotive sector for a number of reasons. Thus local production is a useful and sometimes the only

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[20] For example, firms in the electronics industry usually consider resource factors first, such as labor costs, rents, access to raw materials, and then the market size.

viable option for multinational auto makers in entering these markets. Almost every global manufacturer is rushing to China and India to build plants.

Besides, there came another type of market-seeking activity. Recently, bilateral and regional integration has been proliferating among many developing countries as well as developed countries. By building production facilities where regional bloc is formed or expected to be formed, auto makers can enjoy enlarged market, exporting vehicles duty free to the country's free trade bloc. Kia and Hyundai Motor Company's Slovakia and Czech plants are the instance. Czech and Slovakia were not members of EU at the moment of Kia/Hyundai's decision to build Greenfield plants in these countries, but they were expected soon to be admitted to the European Union and in 2004, they became the members of EU. Kia Motors Slovakia started production in December 2006, and Hyundai Czech plant construction began in April 2007. Vehicles produced in these Central European plants are exported to Western Europe as well as other Eastern European countries.

Efficiency-seeking investments are typically vertical investment: FDI in the intermediate goods in foreign countries to supply complete vehicle assembly plants in other locations. Strategic-asset-seeking investment does not yet explain much about overseas production in the automotive industry. systematic division in the parts and components industry, and strategic partnership between foreign investor and local maker.

Hypothesis 1
Market related factors are the most significant determinant in the automotive manufacturers' FDI.

It is generally believed that investment restrictions affect foreign direct investment in a negative way, deterring FDI inflow. However, ironically, we see a host of auto makers construct production facilities in developing countries where there usually are all kinds of trade and investment restrictions. If a host country's market is attractive enough, investors can willingly take the terms and conditions of investment that host country presents. The investor will decide to invest in the host country regardless of the existence of any performance requirements as long as the gains from investment surpass the cost of satisfying the requirements; i.e. the equilibrium is determined where the value of investment equals cost of entering the market.

The matrix below shows firms' behaviors under different markets and different investment environment. Firms would plainly decide to make investments in an attractive market with FDI friendly environment; however, they would not make investment in an

unattractive market, and it is less likely if it is burdened with tight rules and regulations. However, it is not obvious in the case of ① and ②.

<Table II-4> Firm's investment decision matrix

	Tight regulations	Investor-friendly environment
Attractive market	①	Invest
Unattractive market	Do not invest	②

Even under tight regulations, firms could invest in the country, if the market is very promising.   On the other hand, even under investment friendly environment, firms could decide not to enter a market, if it does not offer decent market opportunity.   One good example of ① is China.   In China, there are relatively high barriers to investors in the stage of admission and operation as well.   Foreign firms are often required to build R&D facility, mainly aimed at technology transfer.   Also, local procurement is highly encouraged, and their ownership is restricted.   However, foreign manufacturers are willing to make investments in this market and indeed there are hardly any major auto makers not having presence in China because they are sure that it will pay off.[21]   On the other hand, countries with virtually no investment barriers but small market size scarcely attract foreign direct investments.

Thus, what we can witness regarding the relationship between investment and regulatory environment in the real world is that market overrules rules.   Second hypothesis of this empirical study are related to this observation.

Hypothesis 2
Presence of local content requirement in the host country does not adversely affect the FDI inflow to the country.

If we get both of the expected results from the empirical analysis, we would be able to conclude that increasing returns to scale is the most important feature in the automotive industry.   This can also provide with underlying cause of the oligopolistic structure of global automotive industry.

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[21] There are 22 foreign OEMs in China as of the end of 2009.

2. Empirical Verification in the Automotive Industry

1) Methodology and data

(1) Model and Variables

To work on our two hypotheses, we need an econometric model to see what determines the inflow of FDI to the country. As we have already discussed, firms generally consider demand and supply conditions of the host country when deciding FDI location. These variables include market size, growth potential, labor costs, trade openness, business friendliness, etc. Thus, inflow of FDI is a function of these variables: positive function of market size, economic growth, trade openness, etc and negative function of labor costs, level of restrictions, corruption, etc.

FDI=f(Market size, Growth, Wage, Trade openness, Business friendliness, …)

Among these variables, market size and growth potential are the traditional variables in the gravity models of international trade, although distance was not considered in this model. Wage and other cost factors are reflection of cost-minimizing and efficiency maximizing firm's strategy. Trade openness has relevance with FDI, in that there is substitutional relationship between FDI and trade. Variables regarding business friendliness can include various institutional factors and general infrastructure. Thus, we come up with our model:

$$FDI_i = ß_0 + ß_1 GDP_{it} + ß_2 Growth_{it} \qquad\qquad (2.1)$$
$$+ ß_3 Wage_{it} + ß_4 Tax_{it} + ß_5 CPI$$
$$+ ß_6 Tariff_{it} + ß_7 PTA_{it} +$$
$$+ ß_8 LCR + \varepsilon_{it}$$

The dependent variable FDI was measured by number of foreign OEMs operating in country i during the year, instead of FDI inflow to the country in dollar terms. The reason I used number of foreign OEMs over FDI inflow data is first, consistent cross-country data on industry level FDI inflow in monetary term could not be found. They were mostly presented in broader industry categories, and sometimes denominated in their national currencies. Second reason is because the FDI inflows are usually captured by balance of payment accounts, which understate capital spending of foreign manufacturers

in the host country.   There have been cases in the existing literature where firm entry was used as dependent variable.[22]

GDP is a proxy for market size.   It should exhibit significant positive sign, as growing demand and market opportunity was the primary motivation for global makers' FDI.   In the similar context, GDP growth can be also a significant estimator because it signifies market potential.   Wage is the factor price that the firm employs in production activity.   It is expected to show negative coefficient because it is the cost of production. Tax denotes corporate income tax: this is also expected to show negative sign because this is also a sort of cost for the firm.   CPI is a corruption perceived index, indicating the level of corruption or transparency in the country.   Tax and CPI are barometer of business environment of the country.   Tariff and PTA are variables related to openness to trade. Since tariff is cost of exportation, higher the tariff, firms have more incentives to make FDI in the country.   Therefore, positive coefficient is expected from tariff.   PTA is number of countries that country i has preferential trade arrangement.   As value of PTA is higher, firms have more incentives to make production base in that country to make use of the network of preferential trade relation with other countries.   LCR is an investment measure of host country on the foreign investor.   It restricts investor's supply chain management, and thus it could exert negative effect on the FDI.

From this empirical analysis, we will figure out which determinant is the most crucial factor in firm's decision to make FDI in a certain location.   It also tries to prove that investment regulation effect business friendly environment is much less than other factors such as macroeconomic conditions and market potentials, etc.   Further, it tries to show that those investment regulations have minimal effect on firms' investment decisions. However, this study could be differentiated from previous studies in that the subject is confined to local content in the automotive industry and its impact on FDI inflow in the industry.

Through this empirical work, the two hypotheses will be investigated; which determinants have most relevance with firms' FDI decision; whether local content regulations adversely affect FDI inflow.

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[22] Orr(1974) and Mata(1993)'s firm entry model postulated the relationship between the entry rate and other factors as such.   Geroski(1991) also used firm entry model in that rate of entry into a market is positively related to the level of expected post-entry profits, which depend on the level of barriers to entry and other structural factors of the market.   Following is the equation of the firm entry model:

$$E_i = \beta_0 + \beta_1 Growth_{it} + \beta_2 SIZE_{it} + \beta_3 AGE_{it} + \beta_4 MNC_{it} + \beta_5 MES_{it} + \varepsilon_{it}$$

This model was originally designed to estimate the indigenous firm entry by the inflow of FDI and other factors, but here we made some modifications to measure the relationship between foreign firm's entry and other variables.

(2) Data and Sample

(a) Number of Foreign OEMs

This data was obtained in the IHS Global Insight. The number was counted based on foreign makers producing more than 100 units of vehicles in the year.

(b) Macroeconomic data

GDP, per capita GDP, and annual GDP growth were obtained in IMF database. GDP and GDP per capita are in current prices, whereas annual percentage change is based on real GDP. GDP and GDP per capita in all countries are denominated in US dollar. GDP indicates market size, and GDP growth signifies growth potential of the market. Both of them are expected to show positive coefficient.

(c) Average Wage in the Automotive Industry

Wage includes all payments in cash or in kind paid to "employees" during the reference year in relation to work done for the establishment. The average wage was calculated from the total wage and salaries paid in the automotive industry(ISIC 34) divided by the total number of employees in the industry.

(d) Corporate Income Tax

Corporate tax rate was mostly obtained in OECD database, and non-OECD member's data was from various sources. This variable can be a barometer showing the business friendliness of the host country, and also it composes the cost of the firm. Therefore, this variable is expected to have negative coefficient.

(d) CPI(Corruption Perceived Index)

CPI is the extent of corruption perceived by business people and country analysts, ranging from 0 to 10. Higher the value, more transparent is the society. It is surveyed and released annually by an international organization called Transparency International. It can be also interpreted as barometer of business friendliness. It is expected to show positive correlation to the FDI.

(e) Tariff

Information on tariff was mostly found in WTO and in some cases, in national statistics sites on trade affairs.   Sometimes they offer weighted average of tariffs within tariff chapter (in this case Chapter 87) based on the trade volume, but more countries do not report weighted average.   Here, only HS 8703(passenger vehicles) was used: excluding HS 8702(buses), 8704(commercial vehicles) and other parts and accessories used to make HS 8702, 8703, and 8704.   Under HS 8703, there are numerous tariff lines based on engine types and engine displacements, and sometimes tariff rates for each tariff items are different.   In that case, the highest applied rate was used.

(f) Number of PTA

The data regarding PTA was mostly obtained from the WTO website.   For countries that joined WTO later than the launch of WTO in 1995, information regarding the PTA was not available.   In such cases, various national sources were complemented.   PTA include all forms of economic integration arrangement whose degree of integration is higher than Free Trade Agreement(FTA).   Thus, Customs Union and Economic Union are also counted.

(g) Local Content Requirement

Information on local content requirements was mostly found in WTO TPRM report, and various other policy documents of individual countries.   As mentioned before, local content requirements were hard to present in numeric term.   More detailed information on how the LCR was actually implementation can be found in the Appendix II.   For the empirical analysis, it is represented as binary value, indicating the presence(1) or absence(0) of the requirement.   Also, considering that it takes years for the policy to take full effect, we used lagged value by 3 years.

Most of the independent variables are pertaining to the national economy except (b) and (e).   The two variables are data specific to the automotive industry.   Existing studies on FDI determinant analyze the national economy or general manufacturing industry, or service industry as their object of research.   However, narrowing the scope of the research to automotive industry, this study aims to show that FDI determinant in the automotive industry are distinguished from other industry.

The sample is in the form of panel data of covering 42 countries which produces vehicles and regularly publish production data. The countries not producing vehicles were excluded from the sample, because it can lead to paradoxical results like countries with favorable environment for investment have zero FDI. Approximately 50 countries have automotive industry, but not all of them provide with official data regarding the vehicle production. The time period of analysis is from 1995 to 2006. The reason the period was limited to 2006 is because as of 2010, not many data pertaining to automotive industry is available from 2007.

<Table II-5> Summary Statistics

	obs	mean	Std. dev.	min value	max value	unit of measure
No. of Foreign OEMs	504	6.359	4.666	0	22	Number
GDP	504	756.559	1703.765	12	13399	Billion $
Wage	364	10767.38	10382.08	311.56	116274.1	US $
Growth Rate	504	3.66	3.35	-13	12	%
LCR	504	0.34127	0.47460	0	1	Binary
RTA	504	13.88	12.62	0	43	Number
Tariff	442	37.22	54.49	0	300	%
Corporate Tax	500	33.092	6.907	15	56.8	%

<Table II-6> Correlation Matrix

	fOEM	GDP	wage	Growth	LCR	RTA	tariff	CPI	Tax
fOEM	1.000								
GDP*	0.105	1.000							
wage*	-0.262	0.312	1.000						
Growth	0.130	-0.058	-0.139	1.000					
LCR	0.275	-0.395	-0.395	-0.059	1.000				
RTA	-0.213	-0.127	0.393	-0.019	-0.431	1.000			
Tariff	0.417	-0.214	-0.381	0.042	0.407	-0.297	1.000		
CPI	-0.429	0.204	0.516	-0.122	-0.464	0.435	-0.382	1.000	
Tax	0.033	0350	0.276	-0.112	-0.054	-0.137	-0.171	0.137	1.000

Note: * In the correlation, this variable is included as ln(variable)

(3) Econometric Specification

Since our goal was to find the determinant of FDI among various economic and institutional variables with regards to the location, but not the time-series effect, we do not need to employ panel approach for our FDI model. Basically, we used Pooled OLS. Since all the observations are single independent, there are some assumptions to be made when using pooled OLS.

(1) $E(\varepsilon_{it}) = 0$, for all i and t
(2) $var(\varepsilon_{it}) = \sigma^2$, for all i and t
(3) $cov(\varepsilon_{it}, \varepsilon_{jt}) = 0$, for all $i \neq j$ and $t \neq s$
(4) $cov(x_{it}, \varepsilon_{jt}) = 0$, for all i and t

However, since our dataset is in panel structure, there remain a couple of problems using pooled OLS. It does not consider country specific effects, and therefore the composite errors can be serially correlated. In that case, the pooled OLS method fails to address the issue of unobserved heterogeneity and endogeneity. Therefore, to fix the heteroskedasticity problem, we used panel GLS and between effects method to see the genuine cross-country effect of each variable.

2) Result of Regression

(1) Basic Model

From regressions using our basic model (2.1), we obtained similar results, but the number of statistically significant variables were fewer in the between effects model than the other two equations. GDP and tariff were significant in all three equations at 1% level. This can be interpreted that market size and trade barrier matters most for the multinational companies as FDI determinant. Number of PTA and LCR showed positive coefficient in all three equations, and PTA was significant in the Pooled OLS model, LCR in the Pooled OLS and Panel GLS. Thus, number of PTA also positively affected the FDI as expected. Engaging in preferential trade agreement such as FTA has the market size boosting effect, since it enhances market access to other countries. CPI was negatively related with FDI in all three equations, and significant in the first two regressions. This is contrary to our expectation; rather there were more FDI in less transparent countries. Wage and tax showed negative coefficients as expected, but they were weak

estimator of FDI. Growth rate, which was expected to be also an important factor, were not significant, either.

<Table II-7> Regression Results of Basic Model(n=344)

FDI	(1)Pooled OLS	(2)Panel GLS	(3) Between Effects
ln(GDP)	1.541*** (0.172)	1.637*** (0.083)	2.071*** (0.577)
GDP Growth	0.096 (0.064)	0.027 (0.031)	0.259 (0.319)
ln(Wage)	-0.424 (0.278)	-0.149 (0.153)	-0.238 (0.824)
Tariff	0.035*** (0.005)	0.041*** (0.003)	0.040** (0.016)
Tax	-0.003 (0.031)	-0.034* (0.017)	-0.019 (0.120)
PTA	0.041** (0.017)	0.013 (0.010)	0.041 (0.071)
CPI	-0.597*** (0.111)	-0.576*** (0.064)	-0.416 (0.353)
LCR	1.818*** (0.549)	1.436*** (0.290)	3.508 (2.291)
R-square	0.4292		0.5253
LR test	-	Chi-sq=1696.77 Prob(Chi sq)=0.0000	-

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level
　　　Figures in the parentheses are standard errors.

From this result, it can be inferred that market size and cost of export is the most significant factor, while wage and corporate tax level are not critical factors of consideration when firms make investment decision. Since tariff jumping behavior of firms can be interpreted as an attempt to enhance market access, tariff can be also categorized as market related variable. Thus, our first hypothesis was verified: market-related factors are the most significant determinant in the automotive manufacturer's FDI decision. In other words, FDI in the automotive industry is demand-side-pulled investment rather than supply-side motivated. Wage, corporate tax, and transparency are variables related to production cost, and they turned out to be not as influential as the above factors.

In addition, it turned out that presence of local content requirement does not negatively affect FDI. It showed positive coefficient, and in some equations, they were significant. This is more meaningful result, because here FDI is limited to car manufacturing industry. It could be the case that LCR positively affects to FDI in the parts manufacturing industry, but negatively affects FDI in the car manufacturing industry. Thus, our second hypothesis was verified as well.

(2) Model with Interaction Variables

By intuition, growth rate seem to be positive determinant for FDI because growth potential of the market is important factor for global OEMs. Global makers' rush to China and India is primarily based on market size itself, but another important factor is motorization. When a country enters into motorization stage, the demand soars. In general, motorization begins when a country is industrialized or when there is growing middle class in the demography. That is, motorization is highly related to growth rate or income level. When a country's economy grows at high speed, usually motorization follows: the United States in 1920s, Korea in 1970s, China since 2000, etc. Thus, historically GDP growth is highly correlated with motorization. However, it was not significant in our analysis.

Then, we presume that growth rate alone is not a significant estimator of FDI inflow, but it might have relevance when it is combined with market size. In a fast growing country where market size is not large enough, motorization can still happen, but it is not an attractive factor so as to induce FDI. Rather, firms will choose exportation to these markets. Thus, we added interaction variable of GDP and growth rate, ln(GDP)*Growth, in the Pooled OLS regression.

<Table II-8> Regression with Growth Interaction Variables(n=344)

FDI	(1)	(2)	(3)
ln(GDP)	1.541*** (0.172)	0.850*** (0.223)	1.393*** (0.177)
Growth	0.096 (0.064)	-0.965*** (0.248)	-
Ln(GDP)*Growth	-	0.210*** (0.045)	0.031*** (0.011)
ln(Wage)	-0.424 (0.278)	-0.215 (0.269)	-0.241 (0.274)
Tariff	0.035*** (0.005)	0.038*** (0.005)	0.035*** (0.005)
Tax	-0.003 (0.031)	0.012 (0.030)	-0.002 (0.030)
PTA	0.041** (0.017)	0.040** (0.017)	0.036** (0.017)
CPI	-0.597*** (0.111)	-0.619*** (0.108)	-0.619*** (0.111)
LCR	1.818*** (0.549)	1.305** (0.537)	1.749*** (0.535)
R-square	0.4292	0.4584	0.4340

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level
Figures in the parentheses are standard errors.

The interaction variable had positive effect on FDI inflow as we hypothesized. While coefficient of ln(GDP)*Growth was significantly positive, the coefficient of Growth instead turned to negative. Therefore, in the equation (3), the original variable 'Growth' was dropped, and the interaction variable still showed significant positive coefficient, although the magnitude of the coefficient decreased. That is, firms decide FDI based on growth rate only when market size is big enough. From this result, we find that growth rate is jointly significant with market size. However, from a different angle, this is reinforcing evidence that market size is the primary consideration for FDI decision.

Similar process was replicated with Wage variable. Wage is certainly not a trivial factor in firm's overall operation and investment decision. As in the case of growth rate, we suppose that wage alone is not significant, but it can be significant and relevant variable when combined with other variables, i.e. GDP. Exactly the same thing happened here:, the interaction variable was significant and negative, while the original wage variable became positive in equation (2). We drop the wage variable, and the interaction variable maintains the significant coefficient, while the magnitude decreased. Again, wage was jointly significant with GDP. This can be interpreted that firms decide to invest in a country not just because wage level is low, but when it is coupled with large size market. Wage is an important factor, but next to market size.

<Table II-9> Regression with Wage Interaction Variables(n=344)

FDI	(1)	(2)	(3)
ln(GDP)	1.541*** (0.172)	8.330*** (1.223)	2.816*** (0.487)
Growth	0.103 (0.064)	0.027 (0.062)	0.067 (0.064)
ln(Wage)	-0.312 (0.275)	3.920*** (0.779)	-
Ln(GDP)*ln(Wage)	-	-0.763*** (0.132)	-0.136*** (0.046)
Tariff	0.035*** (0.005)	0.036*** (0.005)	0.033*** (0.005)
Tax	-0.007 (0.031)	0.013 (0.030)	0.006 (0.031)
PTA	0.036** (0.017)	0.031* (0.017)	0.040*** (0.017)
CPI	-0.623*** (0.111)	-0.622*** (0.106)	-0.541*** (0.109)
LCR	1.752*** (0.542)	1.694*** (0.517)	1.664*** (0.536)
R-square	0.4265	0.4784	0.4389

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level
Figures in the parentheses are standard errors.

(3) Regional Sample Model

Regional distribution of FDI has changed over the last century. In the early years, FDI has been more active in the Western hemisphere. FDI proliferated first in Europe, and was followed by North America including the United States since1980s. Recently, it moved to Asia, especially China and India. As demand in Asia ballooned during the past decade, FDI is rushing to this region. From the historical perspective, we can also draw implication that market opportunity was the key motivation in the FDI.

In a spatial or geographic aspect, another implication is that FDI in different locations can be explained by different determinants and motivations. For example, rationale of FDI in the advanced economies like Europe and the US can be found in the market size. Sometimes they can be attributed to the political pressure as explained in Chapter I. On the other hand, FDI in developing countries, such as India, ASEAN countries, and China can be explained by growth potential and high tariffs as well market size. FDI in South American countries were mainly in order to circumvent the high barriers to trade.

<Table II-10> Different patterns and motivations of FDI by Region

Region	Motivation	Makers
Europe	Market, Resource	GM, Ford, Toyota, Hyundai
North America	Market, Politics	Japanese Big3, Hyundai
South America	Barrier Circumvention	US Big3, Fiat, Toyota
China, India	Market, Barrier Circumvention	GM, Ford, Japanese Hyundai
Southeast Asia	Market, Barrier Circumvention	Japanese Big3

Thus, narrowing the sample to countries in the same region, we might get different result and that would give us implications about the regional characteristics of FDI pattern. We now analyze with Asian 12 countries with our basic model, using Pooled OLS, Panel GLS, and between effects model. <Table II-11> shows that GDP, wage, tariff, number of PTA, transparency, and LCR were significant estimators in Asia. Between effects model was weak in that not many variables was significant, probably due to limited sample groups.

Comparing the result with our full same analysis in <Table II-7>, result is somewhat different. The magnitude of GDP and number of PTA's coefficient grew bigger, while that of tariff became weaker. LCR still is positive and significant coefficient, and the magnitude of coefficient increased. It would be possible to interpret that LCR's

investment inducing effect is bigger in the Asian region.   If the dependent variable was denominated as number of foreign owned establishments including the parts supplier, the result would have been more evident.

On the other hand, tax was not significant estimator in Asia, either.   Most notable difference is that wage variable is now significant in equation (1) and (2).   Thus, wage was not a significant estimator in the full sample, but narrowing the sample to a more homogeneous group of countries, it became significant.   This can be interpreted in several ways: first, FDI made in this region was more based on wage factor consideration than other region.   Second is that limiting the scope of option for FDI location to Asian region, wage became an important factor.   To find out which interpretation would explain the result better, we do one more regional analysis with Europe.

<Table II-11> FDI determinant in Asian region(n=78)

FDI	(1)Pooled OLS	(2)Panel GLS	(3) Between Effects
ln(GDP)	2.589*** (0.601)	1.594*** (0.477)	4.901* (1.207)
GDP Growth	0.040 (0.107)	0.062 (0.055)	-0.041 (0.458)
ln(Wage)	-0.992* (0.567)	-1.054*** (0.366)	1.183 (1.425)
Tariff	0.026*** (0.008)	0.032*** (0.007)	0.013 (0.023)
Tax	-0.101 (0.106)	-0.033 (0.029)	-0.482 (0.308)
PTA	0.247*** (0.052)	0.167*** (0.039)	0.274 (0.150)
CPI	-1.295*** (0.406)	-1.061*** (0.176)	0.237 (1.104)
LCR	4.975*** (1.346)	2.809*** (0.844)	24.606* (6.233)
R-square	0.5970		0.9583
LR test		Chi Sq=89.78 Prob(Chi sq)=0.0000	

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level

Now we narrow the full sample to EU member countries, excluding Russia, Turkey, and Ukraine.   The sample includes 17 countries and 161 observations.   The result shown in <Table II-12> is strikingly different from both the basic model analysis and the Asian region analysis.   Wage variable, which became important factor in Asia was still insignificant, and it showed even positive relationship with FDI in equation (2).   On the other hand, corporate tax became significant estimator in Europe.   LCR, which used to be positive factor both in Asia and worldwide, turned out to be negative factor, though it was

only significant in the Pooled OLS model. Perhaps this result corresponds with the former findings and conclusion of many economists and researchers in Europe: that presence of LCR in the country does not help promote but undermine the free flow of investment. It can be presumed that the investment diverting effect of LCR can prove right in the developed world.

The most notable difference can be seen in the tariff and PTA. These two variables were very powerful determinant in the previous two analyses, but in Europe they were all insignificant and the sign is negative. How can we interpret this result? We can apply the two kinds of interpretation from Asian region case. According to the first interpretation, FDI in this region was made regardless of tariff and PTA network of countries, but the decision was rather based on other factors Secondly, limiting the scope of FDI location within Europe, tariff and PTA network were not prominent decision factors. From the global perspective, FDI in Europe, especially in Eastern Europe were made targeting the large market, thanks to the economic integration to form a single market. Therefore, second interpretation holds better; tariff or PTA cannot be a merit among EU member countries, so other factors are taken into consideration.

<Table II-12> FDI determinant in Europe(n=161)

FDI	(1)Pooled OLS	(2)panel GLS	(3) Between Effects
ln(GDP)	1.002*** (0.212)	0.819*** (0.128)	1.628 (0.966)
GDP Growth	0.086 (0.111)	-0.111* (0.061)	0.640 (1.214)
ln(Wage)	0.414 (0.315)	0.964*** (0.269)	-1.641 (2.007)
Tariff	-0.004 (0.012)	-0.001 (0.010)	-0.119 (0.096)
PTA	-0.001 (0.022)	-0.003 (0.011)	-0.058 (0.173)
Tax	-0.070** (0.029)	-0.106*** (0.017)	-0.103 (0.162)
CPI	-0.714*** (0.116)	-0.689*** (0.078)	-0.700 (0.516)
LCR	-2.057* (1.123)	-0.978 (0.636)	-4.264 (4.208)
R-square	0.4155		0.6211
LR test		Chi Sq=273.53 Prob(Chi Sq)=0.0000	

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level

3. **Conclusion and Implications**

From observations on the overseas production pattern and the empirical analysis, we confirmed that market size is the key factor in determining FDI location, and production cost including wage level was the secondary factor.   Tariff was another significant factor.   FDI is alternative to export and thus their substitutional relationship can be confirmed from this result.   In fact, tariff-circumvention can converts to market-seeking behavior, according to Dunning.   High tariff is very powerful incentive for the foreign makers, first because it can reduce the cost of export, and secondly once they enter the market, then it is highly protected from global competition pressure among other foreign companies.   Growth rate and wage were both not significant by themselves; they can play positive role in FDI decision at some point, but not the primary factor as important as GDP, i.e. market size.   However, they were relevant factor in FDI decision, jointly with market size variable.

The most significant finding here is the myth of LCR's investment distorting effect.   We could not find any evidence that LCR had systemic negative effect on the FDI even excluding intermediate goods industry.   Rather it exhibited positive correlation with the inflow of foreign OEMs.   We already supposed that LCR could attract more investment in the parts industry, and it again might have affected positively the vehicle assembly industry as well.   By region, it was more distinct in the Asian region, while the positive effect became weaker in Europe.

Further, it can be evidently shown that there is increasing returns to scale in the vehicle manufacturing.   Generally, full scale overseas plant considering economies of scale should have 200,000~300,000 units annual production capacity.   Therefore, building a plant of this size in foreign country means that the annual sales volume is above 10 million units, assuming that the investor's market share is around 5%.   There are three countries(or bloc) that qualify this threshold: China, EU, and the United States. Otherwise, the country should be in the motorization, as in India, or should have preferential market access to many countries by numerous FTA networks to make the export hub in the region.

Another finding was that FDI determinants can differ across countries and regions. We also inferred that global manufacturers first decide the general region or country according to the market size, and then when deciding plant site within the region or country, consider the production cost factors such as wage, tax, and road infrastructure, etc. This is because terms and conditions of investment including the rents and taxation can be negotiable with the state or local government.   Since automotive industry has large

employment and linkage effect to related industries, governments often compete in offering benefits and incentives to win the investment.   In this context, countries within a region are rivals with each other in hosting the FDI.   Frequently, FDI is concentrated to one or two countries in a region; within a country, the plants flock together to 3~4 spots.

Competition within a region can be another factor.   The Table below shows global vehicle makers' major production sites in four developing regions. MNCs tend to pick a single country within a region and concentrate its resources and thus production capacity in that country.   This is again to do with economies of scale.   Unless the market size of the host country is large enough, almost every country is subject to the competition within the region with its neighbors.   It is even more so when the countries are bound together in a free trade area.   China is by itself a regional focal point, free from competition for its huge market and growth potential.   India is also independent as China, but as its economic integration with South Asia becomes deeper, it could possibly become the focal point in the South Asian region.   Russia is also a sure candidate of regional focal point in the CIS countries and some eastern European countries exclusive of the EU members.

<Table-13> Regional Focal Point of investment by Major Manufacturers

	Southeast Asia	South America	Eastern Europe*	Africa
GM	Thailand(100%)	Brazil(71%)	Poland(72%)	Egypt(66%) South Africa(34%)
Ford	Thailand(93%)	Brazil(77%)	Poland(99%)	South Africa(100%)
VW	-	Brazil(93.8%)	Czech(68%)	South Africa(100%)
PSA	-	Brazil(58%)	Czech(53%) Slovakia(47%)	Morocco(56%) Egypt(44%)
Renault	-	Brazil(57%) Argentina(31%)	Romania(58%)	Morocco(91%)
Fiat	-	Brazil(90%)	Poland(97%)	-
Toyota	Thailand(53%)	Brazil(45%) Argentina(45%)	Czech(100%)	South Africa(100%)
Honda	Thailand(60%)	Brazil(100%)	-	-
Nissan	Thailand(60%)	Brazil(100%)	-	South Africa(74%)
Suzuki	Indonesia(94%)	-	Hungary(100%)	-
Mitsubishi	Thailand(77%)	Brazil(93%)	-	-
Hyundai	Malaysia(63%)	-	Slovakia(57%) Czech(43%)	-

Source: Global Insight(2009)
Note: the numbers in ( ) indicates the share of production within the region.
    * Eastern Europe here refers to the new members of EU.

Thus, MNCs tend to spread their production sites globally, but within a region, they tend to flock together with their competitors. This clustering is partly related to imperfectly competitive nature of automotive industry and market, and partly due to the increasing returns to scale of parts industry.

To summarize, it was shown that most vehicle makers consider market size and the export barrier as the most significant factor when deciding FDI location. The importance of market size factor is the evidence that the automotive industry has increasing returns to scale.

In this way, FDI in the automotive industry is based on market, and thus it can be viewed as localization as well as globalization. One might say it is glocalization. Globalization based on demand side can be far from optimization strategy in terms of production side because production related variables such as input price fall behind in the priority relative to market related variables. Strictly speaking, global automotive industry is not in the optimal status due to its increasing returns to scale. However, this inefficiency is more or less complemented by the regionalization. At least within a region, some cases are witnessed that OEMs build optimized production system and supply chain based on comprehensive and balanced consideration of market-related and production-related factors.

Chapter III. LCR and Industry Development

1. **Rationale of LCR: Host Country vs. Investor's View**

    1) LCR's Economic Role and Effect: Host Country's View

    As literature on FDI studies is accumulated, the focus of research has change from analysis on FDI patterns, direction and determinants; to FDI's role in growth and development.   Consequently, primary role of FDI policies are also changing; from means to attract more FDI to device to promote development.   In this context, LCR has become a very important policy instrument.

    (1) Resource allocating Effect

    There are basically two types of LCR: mandatory local content rule and tariff incentives for higher local content.   Both of them have resource allocating effect: employing more domestic component and less imported component than no LCR situation.   To the perspective of importing country, LCR has trade reducing and market distorting effect.   Here, it is assumed that procurement from local source is more costly than import from home country.[23]   In the view of trade economist, the former is more of a quantitative restriction, while the latter resembles tariff which works by price mechanism.

    a) Mandatory Local Content Rule

    In the initial stage of vehicle production, countries often require mandatory local content rates in percentage of value, or announce a list of parts and components(often called as 'deletion program') that should be procured from local suppliers.   These kinds of rules were extensively used in 1980s and early 1990s in most of the countries imposing performance requirements: Mexico, Argentina, Thailand, Cambodia, Philippines, and in China before the WTO accession.   Even after these countries changed their local content requirements to incentive type rules, some items or rules were maintained as mandatory, especially in the commercial vehicle sector.

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[23] It is presumed that parts produced in India would be cheaper than the same item produced in Korea. However, in most cases it turns out to be the opposite.   Thanks to economies of scale, unit cost in developed countries is lower than in the developing countries in many occasions.

<Figure III-1> Effect of Mandatory Local Content Rule

The graph shows how a firm adjusts the procurement plan pursuant to the local content rule. The curve represents an isoquant for a firm producing a car using imported and domestic components. Let us assume that labor and capital is constant. The line WW indicates the free trade relative price of imported to domestic parts. Thus B represents the cost minimizing combination of imported and domestic components under no LCR, and OW represents the cost of making a car in this circumstance. However, when there is a mandatory local content rule prescribing 60% of minimum local content, the firm uses the combination of imported and domestic components at point A. OW" is the cost of producing a car under 60% local content rule. When the minimum rate is reduced to 50%, the combination moves to A´, and the amount of domestic components would be reduced by W´W", while imported components would increase. Here, the cost of production is lowered to OW´, even though it is still higher than OW.

b) Tariff/Tax Benefits

As the industry develops, countries usually relax their local content requirements from mandatory percentage rule to tariff discrimination according to the product's local content rate. Some governments provide tariff or tax benefits for foreign producers that use domestic parts and components above certain minimum level. Until recently, these kinds of rules were most frequently observed in Malaysia, Venezuela, Canada, and Russia.

This is different from mandatory local content rule in that import is allowed regardless of the amount of local content in the product. There are basically two kinds of tariff discrimination: differentiated tariff rates according to the amount of local content, and the other is imposing different tariffs on products by shifting tariff classification based on the local content rates, which would be subject by higher tariff rate. The former type is the most common case that was seen in Indonesia, India, Canada, etc. The latter type is not as common as the former. It was once tried in China as a new KD rule[24], but it was found in violation of WTO obligations, and thus recommended to repeal. When a foreign investor supplies the host country's market by KD production, manufacturers export KD sets from the home country to assembly plants in the host country. Usually, in a country where KD production takes up a significant portion of its vehicle production, separate HS codes for the KD sets are designated, and the tariff rates for these KD sets are normally lower than those for complete vehicles. In case of China, the tariff authority imposes tariff for complete vehicles, which is 25%, on the KD sets or components whose tariff is normally around 10%, if local content rate does not reach the threshold value, i.e. 60%. In both cases, the relative price of imported components and domestic components is higher than under no such requirements.

<Figure III-2> Effect of Tax/Tariff Benefits

As previously explained, without local content requirements, firms produce cars at point B with the relative price WW.   Under the mandatory local content requirements the minimum level of domestic content was determined, and thus it worked similarly with quantitative restriction.   On the other hand, the tax or tariff incentive system is the price based approach.   Under this scheme, the relative price of imported components increases, which leads the firm to use more domestic components.   With relative price DP, the procurement combination takes place at point A.   In this case, the production cost also increases from OW to OW".   When the preferential treatment is lessened, the relative price decreases a little bit, and the firm produces at point A´, and the production cost is lowered from OW" to OW´.   If the domestic component's price becomes cheaper, then the slope of DP gets steeper and the domestic procurement will increase.

To conclude, by imposing LCR use of domestic input increased, although the mechanism was somewhat different in the two types of LCR.   Thus, LCR has resource-allocating effect in the global production aspect; however, it can be called import-substituting effect in the trade aspect.

(2) LCR's Surplus Transferring Effect

The graph shows partial equilibrium analysis of domestic supplier and foreign supplier production under LCR.   D is a demand curve of foreign investor for parts and components.   The horizontal line S_W the supply curve in the world market, and OS is the supply curve in the host country.   When the host country impose LCR, the supply curve moves up to S_{LCR}.   Higher the line, stricter is the investment regulations.   When there is no LCR, the foreign investor procures Oa from local source, and aQ from the world market, presumably from home country.   When there is LCR, the domestic supplier's production increases from Oa to Oa´.   Imports from home country decreases from aQ to a'Q'.   Certainly, LCR has shifted some portion of import to domestic production.

How about welfare effect? The welfare can be broken down to producer surplus, consumer surplus, and government surplus.   Producer surplus is again divided into foreign producer's surplus and domestic supplier's surplus.   Consumer surplus decreased a lot, due to higher domestic parts price and less quantity.   Domestic supplier's surplus increases from △Obd to △Oce.   □efhi goes to host government as tariff or tax revenue.   There is no change in foreign producer's surplus.   while domestic supplier and government surplus increased.   Overall welfare decreases by the amount of △dei and △fgh, which were originally belonged to consumer surplus.   Consumer includes foreign OEM, operating in the country, because this is not the final good.   Therefore, by

imposing LCR, some part of foreign OEM's surplus is transferred to host country; LCR has surplus transferring effect, or rent-shifting effect. The cost penalty mostly attributed to the foreign OEM, and this works as a subsidy to the local parts supplier. In other words, cost penalty associated with LCR is social tax or CRS expense for the foreign investor to the host country.

Then, does LCR decrease the overall welfare? From this graph, it seems that it does. However, it is widely recognized that FDI and increased production in the host country generates externality such as technology and productivity spillover, or social values including employment and wage spillover, etc. These intangible benefits and effects may big enough to compensate for the deadweight loss. However, this argument is limited to the host country's welfare. From the global perspective, the aggregated total welfare is more likely to decline.

In conclusion, local content policies generate economic benefits to the local economy as long as the components that are localized as a result of the policy generate more social value than the cost penalties associated with higher domestic prices. Thus, the equilibrium is determined where the value of investment equals cost of entering the market. However, under the current system where the performance requirements are prohibited in general, benefits of such country with attractive market with great growth potential will be transferred from the host country's government and industry to the foreign investor firm.

<Figure III-3> partial equilibrium analysis on host country vs. investor surplus

(3) FDI inducing effect in the Upstream industry

There are roughly 4 kinds of procurement channel for the foreign investor as in :<Table III-3>.   Since there are conflicts of interest between the foreign investor and the host country as examined just now, they show very different preference.   My best choice is the other's worst choice.   Host country prefers mode (2) the best, and this is the least preferred option for the foreign investor.   For the foreign OEM, this method is not a desired choice because of many reasons.   First, they cannot guarantee the quality of products; the cost is higher due to low scale of production; besides it is costly to change the supply channel for technical problems[25]; lastly, there is cost of technology transfer, etc.

Mode (1) is the least preferred choice for the host country, but it has the advantage for the foreign OEM in that the foreign OEM can take full advantage of economies of scale, and quality control is easier.   By imposing LCR, the host country can effectively eliminate option (1).   Since (2) is investor's least wanted choice, decision is made among (3) or (4).   This, in turn, induce additional FDI to the host country.

<Table III-1> preference on the mode of procurement (host country vs. investor)

Mode of Procurement	(1)Import from Existing supplier	Local Procurement		
		(2)Local supplier	(3)Partner supplier's local presence	(4)Vertically Integrated supplier's local presence
Host Country's Preference	4th	1st	2nd	3rd
Investor's Preference	1st*	4th	3rd	2nd

Moreover, LCR can increase irreversibility of investment.   Once the supply network is built in the host country with large amount of initial investment, the supply system is maintained after the local content requirement is phased out, or when the home country and host country enter into a preferential trade agreement to eliminate tariff between the two countries.   On the other hand, if the plant was just for assembly purpose with CKD or KD set, there is high chance that the investment is pulled out altogether.   Therefore, LCR is a very effective policy for the host country to foster intermediate goods industry and vehicle assembly industry at the same time.

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[25] The parts and components used in a vehicle are specially customized to that vehicle from the design stage.   Compatibility of Parts and components in the automotive industry is very low compared to that of electronic goods.   This is due to the closed architecture of automotive products.

2) LCR's Influence on Global Supply Chain: Investor's View

Firm's FDI decision in the vehicle assembly plant can be different from its global supply chain management decision. Why automobile markers locate production plant in the foreign country was reviewed in the first and second chapter: it was empirically proven that market size(demand for automobiles) and trade barriers were the most important factors. However, global supply chain management (SCM) does not necessarily go along with these motivations. The characteristics of the industry are crucial factors in firms' decision whether to locate parts suppliers near the assembly plant or to ship them from home country. Economies of scale and industry architecture are the two most important features that affect firm's global sourcing strategy.

<Table III-2> is a typical cost structure of an automobile manufacturing firm. In the unit cost analysis, the manufacturing cost takes more than 50% of the total cost of production excluding overhead costs and sales promotion expenses. Then, among the manufacturing cost, material cost takes about 87%, while labor cost and others are 13%. In general, employee cost or wage generally takes 8~10% of the manufacturing cost. The huge chunk of cost comes from purchasing the materials and intermediate goods. Therefore, procurement and supply network strategy is very important for firm's cost reduction and overall profitability.

<Table III-2> Example of Price-Cost breakdown of Automobile Production

Cost Category	Cost Contributor	Share of MSRP*(%)
Vehicle manufacturing	Material Cost	42.5
	Assembly labor and Other manufacturing cost	6.5
Production Overhead	Transportation/Warranty	5.0
	Amortization and Depreciation Engineering/R&D	14.5
Corporate Overhead	Pension and Health Care Advertising and Overhead	7.0
Selling	Price Discounts	5.0
	Dealer markup	17.5
Sum of Costs		97.5
Profit	Automobile Profit	2.5
MSRP		100.0

Note: Based on ANL methodology and Borroni-Bird Presentation (Vyas et al, 2000)
    * Manufacture Suggested Retail Price

(1) Integral Architecture and Lean Production

As Fujimoto(1991) pointed out, automobile production is an integral industry[26], where more than 20,000 parts are combined and integrated to work as one seamless entity. Therefore, assembling cars is a very sensitive operation from assembling electronic goods such as computer, which is closer to modular product. In manufacturing integral products, proximity of supplier location is desired, because timely coordination between parts supplier and assembler is crucial. Besides, as lean production system[27], which was introduced by Japanese OEMs became stylized as the mainstream production method, geographical proximity of suppliers became more of a prerequisite. For these reasons, it might be in the foreign investor company's own interest to localize the supply network system as well as in the host country.

Perhaps, this is the underlying reason why Japanese makers, in general, show higher localization level in the overseas production compared to American or European Makers. They usually make comprehensive range of FDI covering almost entire supply chain. Still, they are capable of management in cost reduction while procuring mostly from local sources, largely thanks to the organizational or corporate culture: collaborative workplace atmosphere.

Western OEMs are relatively behind this localization capability compared with Japanese OEMs. However, these days western OEMs tend to enhance local content rate in foreign operation based on the judgement that it would be more profitable in the long run. In China, foreign OEMs have constantly endeavored to raise the local content rate, partly due to policy concern, and partly due to business consideration. For example, Ford, aiming to reduce procurement cost by an average of 30~40%, established a procurement center in Shanghai to expand procurement in China. Its partner Mazda also tries to raise local content rate from less than 50% at the end of 2005 to 90% by 2010, with the entry of allied suppliers into China.

<Table III-3> shows the example of India: local content rates by models and makers, and this is the typical pattern of local content in the host country. By makers, the domestically owned makers like Tata and Hindustan Motors exhibit 100% local content rate; among foreign makers Asian makers and volume makers show higher local content

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[26] Fujimoto (2004) classified industries into three types according to their architecture: closed integral industry, closed modular industry, and open modular industry. Typical examples of closed integral architecture include automotive industry, motorcycle industry, and game software industry. The two most common closed modular industries are main frame computer and Lego. Lastly, open modular architecture is observed in PC system, internet products, bicycles, and financial products.

[27] Lean production system's key factors are flexibility of production, pull method(instead of push method), minimization of inventory(Just-in-Time, JIT), etc.

rates than western makers and premium vehicle makers. Even within a maker, local content rate is different by models; bigger the sales volume, higher the local content rates.

<Table III-3> Local content rates by makers and models in India

Maker	Model	Local Content Rate
Daimler	-	10%
BMW	-	10%
Eicher Motors	-	95%
Fiat	Palio Stile	75%
GM	Tavera	93%
Hindustan Motors	-	100%
Honda	Jazz	70%
Hyundai	Santro King	90%
	Accent	75%
	Sonata	30%
Suzuki	800	95%
	Alto	90%
	Zen Estilo	90%
	Swift	85%
	SX4	25%
	Omnivan	95%
	Wagon R	80%
	Gypsy	81%
Tata	-	100%
Toyota	Innova	70%
Volvo	-	40%

Source: Korea Automotive Research Institute

(2) Closed Product Architecture

Due to the closed architecture of automobile, parts cannot be readily substituted by other suppliers. Usually, OEMs have long-term business relationship with their suppliers[28], although global sourcing is becoming popular especially among Western OEMs. When OEMs manufactures in foreign countries, they tend to keep the existing supplier relationship in the home country.[29] To shift the supply channel, they need time to renew and build

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[28] On average, Asian OEMs keep long-term relationship with their suppliers with minimum 50% of the total suppliers, as strategic partners with OEM.

[29] This is more prominent among Japanese OEMs. They usually have vertically integrated supplier relations, based on long-term relationship.   Thus, Japanese OEMs are slower to change the supplier channel, than Western OEMs: heavily dependent on global sourcing, they are more swift in changing the sourcing channel.

relationship with local suppliers.   Moreover, the locally produced parts often lack the quality the OEM requires.   In fact, overseas production more often entails quality problems.[30]   In controlling the quality of parts, long term relationship with supplier is more advantageous and changing the supplier often raises uncertainties and risks.

In this background, it is not a simple matter for the OEM to change the supplier channel.   If firms have to source parts locally to comply with the regulations or to qualify for government incentives, they rather choose to be accompanied by the home country suppliers in the host country.   In other words, if the host government imposes local content requirements, it often leads to additional FDI.

(3) Bigger Economies of Scale in the Upstream Industry

As evidentially shown in chapter II, there are economies of scale in the automotive industry.   Besides, the scale economy is larger in the upstream, such as parts manufacturing and R&D stage than in the assembly stage.[31]   Therefore, it would be the most efficient for the manufacturer when product development and parts or module manufacturing processes remain in the home country and locating the assembly line in the overseas market.   Parts and components produced in the host country are usually more expensive and quality is not easily controlled.[32] If the foreign OEMs consider only price and quality of the intermediate good, provided that delivery conditions are equivalent or can be ignored, there is not much reason for them to procure from local suppliers.

For the foreign OEMs to build its own supply chain in the vicinity of assembly plant, scale economy should be secured.   In other words, the local market size and production scale should be large enough for the local supply chain to be efficient and sustainable in terms of profitability.

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[30] Toyota's recall incident can be an example of quality management failure in overseas production. Toyota accused CTS, the US parts maker, of supplying defective accelerator pedals.

[31] For this reason, parts supplier usually produces small number of items and supplies multiple assembly plants and sometimes multiple OEMs in order to enhance the economies of scale.

[32] In general, OEMs consider three standards when making procurement decision: price, quality, and delivery.

2. Development Effect of Local Content Requirements

1) Literature on FDI, LCR and Development

(1) FDI's impact on Development

Compared to trade effect studies on development, history of empirical studies of foreign investment's effect on development is relatively short, since FDI is a rather recent phenomenon than trade. It was not until 1990s when considerable volume of econometric analysis of FDI's impact on development was pouring that FDI was incorporated to the mainstream of economic research. While empirical studies regarding foreign investment was growing large in volume, conventional researches still paid more attention to movement of factors and the increased return on factor consequently. In many contexts, movement of factor referred to capital movement, i.e. portfolio investment. Another stream of studies focused on substitution effect vs. complementary effect between FDI and trade. These research trend somewhat reflected that researchers were still engrossed in the trade economics and they understood FDI as a derivative of trade. They were not ready to deal with FDI as an independent subject of study. Also, there was somewhat more substantive reason. First of all, it was hard to capture the FDI's impact on development, how FDI affected the host country's economic development. It was even hard to tell how FDI influenced the host country's industry, by what path and how. Some leading economists later named it spillover effect, or linkages effect of FDI.

Caves(1974) pioneered the study on economic benefits of FDI as spillover to the host country industries. He noted that the benefits do not directly come from the presence of foreign subsidiary or the efficiency of the firm itself. He divided the spillovers in three categories: productivity level increase of domestic firms cased my the multinational firms: removal of distortions in the host country market by the foreign subsidiary's competitive pressure: and the transfer of technology expedited by the competitive pressure by the MNCs.

Globerman(1979) was also one of the earliest researchers on productivity spillovers by FDI. He did empirical study on the labor productivity growth in Canadian manufacturing industries. He confirmed that there were differences in labor productivity among plants and that difference derived from spillover efficiency benefits associated with FDI. Then, he found the different spillover efficiency among plants in the industry's capital intensity, plant-level economies of scale, and average work hours per employee.

Among many economists who studied the impact of FDI on development, Markusen and Venables(1999) is among the earliest that investigated on this subject. They showed that multinationals can exert positive effects on the development of indigenous firms, through the creation of linkages with indigenous suppliers through increase in demand for intermediate products and changes in prices. Most of the empirical studies on the development effect of FDI notes that externality of FDI can induce various linkage effect that brings about the industrial development. More concretely, they argued that multinationals can change the structure of imperfectly competitive industries in the host country by fostering the development of domestic intermediate good producing firms, which in turn may have positive effects on the development of domestic final good producing firms.

Qui and Tao(2001) suggested two forms of FDI benefit. One is employment created by the FDI, given that each unit of output from FDI requires a certain amount of local input. The second is technological upgrading provided by the FDIs. Gorg and Strobl(2002) showed that through creation of linkages effect multinationals can exert positive effects on the development of indigenous firms in the case of Irish economy. Here, the linkages effect by the presence of MNCs was decomposed to three effects: first, competition effect, as multinational firms compete with domestic firms and crowding out them. Second effect is additional demand for the domestically produced intermediate goods, and third effect is the fall in the price of intermediate goods. Their finding from the study was that presence of multinational companies has positive effect on the indigenous entry, which can be interpreted as industrial development. Fotopoulos and Louri(2002) also maintained that multinationals stimulate local industrial development by spillover effect based on the empirical study on the Greek manufacturing firms from. They tried to show how positive impact on growth and development was transferred from multinational firms to domestic firms. Lipsey and Sjöholm(2005) noted on the wage spillover effect and productivity spillover, from the Indonesian manufacturing industry. In this study, they found that there were not much wage spillovers in the developing countries like Indonesia, whereas there were evidence of that kind of effect in the United States and the United Kingdom.

These studies confirmed the positive impact of FDI on the development by examining how the entry of foreign investor affects the productivity of domestic firms through spillover effect, backward linkage effect, or technology transfer.

However, there were researches skeptical about the growth impact of FDI. Carkovic and Levine(2005), from an empirical study with macroeconomic data, concluded that there was no universal relationship between FDI and growth, i.e. FDI did not exert a

robust, independent impact on economic growth when other factors are taken into account. Regarding the paradoxical results against the previous empirical works demonstrating positive impact of FDI in development, they found the cause in the data. They commented that microeconomic studies generally shed pessimistic evidence on the growth-effect of FDI, many macroeconomic studies find a positive link between FDI and growth. Thus, macroeconomic studies have more explanatory power over the real world, but their models are actually less precise in that they usually do not control for endogeneity, country-specific effects, and the inclusion of lagged dependent variables in the growth regression. Also, to correct the deficiencies in existing cross-country studies, they used panel data method and utilized Generalized Method of Moments(GMM) instead of OLS. Nunnenkamp(2003) shared the view of Carkovic and Levine(2005) that growth impact of FDI are ambiguous due to highly aggregated FDI data, and FDI does not guarantee development of host country. He found out that host country's policies are of over-riding importance to spur economic development from FDI, through research in Latin America during the 1980s and 1990. He studied the role of exogenous factors, corporate strategies, the role of economic policy, and found that sustainability of macroeconomic stabilization, government credibility, openness to trade, etc were most relevant issues in terms of FDI. Kohpaiboon(2009), by examining the technological spillover in the Thai manufacturing industry, found that advanced technology associated with MNC affiliates does not always spill over to the local firms. The extent of spillovers largely depends on the nature of the trade policy regime. He asserted that only industries operating under liberal trade policy regime experience positive horizontal FDI spillovers. Javorcik(2009) has also found evidence of spillovers from multinationals to the supplying sectors in Czech.

Looking for the reason why the spillover effect was different from countries to countries, firm-specific characteristics did not answer the question very well. Instead, they argued that certain country specific effect might bring about the difference in the ability to benefit from the presence of FDI. It might be due to too small size of domestically owned firms, or the lack of capability of those firms from the foreign investor firms. They pointed out that heavy protection of domestic sector can be detrimental to the capacity building of domestic firms. In other words, policy or institutional variable can be a crucial factor to determine the FDI's growth effect of the host country. Görg and Greenway(2004) investigated productivity, wages and exports spillovers in developing, developed and transitional economies. They built up on the existing studies of Blomstrom and Kokko(1998) and Lipsey(2002) by highlighting the policy dimension of the host country. Hansen et al(2008) recommended differentiation of FDI promotion policies for developing countries.

(2) Role of Policy: LCR and Industrial Development

From recognition among some economists and researchers that FDI itself does not bring the development of host country, policy and institutional factors of host country gained weight in the FDI studies. However, local content requirement has received little attention in the literature of empirical studies of FDI. Though there were substantial volume of researches paying attention to the policy role determining the growth effect of FDI, there are not many studies focusing on the policy effect of local content requirement on the industrial development, and even less are specifically addressing the automotive industry. However, LCR's economic effect and automotive industry cannot be separated because LCR is frequently limited to automotive industry. UNIDO(1986) reported that among 50 countries, 27 of them have local content requirement on FDI in the automotive industry alone in 1980. LCR can tremendously affect the supply chain of the industry, as we looked over in the first part of this chapter.

Grossman(1981) was among the earliest researcher that analyzed the effects of content protection on resource reallocation, especially the intermediate goods. He understood that local content requirements had protection effect of the domestic intermediate goods industry, and the actual effectiveness of the policy depends on the substitution possibility of production, the supply condition in the domestic industry, and the market structure. Lahri and Onno(1998) also focused on the policy implications of FDI and suggested optimal policy combination. They characterized optimal level of LCR, based on the number of domestic firms, the number of foreign investors, and the firm's cost. The most intensive and earnest study on LCR in the automotive industry were provided by Veloso(2001). He understood the underlying issues of LCR in the automotive industry, and its development policy aspect, but he rather focused on firms' production pattern under LCR; firm's supply chain management and content decision based on cost modeling in the industrial engineering perspective. These studies focused on the LCR's resource allocating effect or FDI inducing effect rather than the industry growth effect.

Researchers who tried to find out the welfare effect of LCR, generally found negative result: Davidson et al(1985) demonstrated that LCR had cost increasing effect, which reduces the world output and world welfare, and also source country's(home country's) welfare. Belderbos et al.(2002) observed that LCR protect vertically integrated domestic industries, and induce inward FDI in intermediate goods production. They claimed that LCR has negative impact on the host country in that LCR causes new market distortions by promoting FDI at an inefficiently small scale of operation. Moran(2005)

found that mandatory joint venture requirements(foreign ownership limitation) and domestic content requirements raise foreign affiliate production costs and thus hinder host country economic growth.   He therefore argued that foreign investors should be free to source from wherever they wish and allowed whole or majority ownership to increase host country welfare and promote growth.   Ohdoi(2009), by using dynamic general equilibrium analysis, proved lemmas indicating that reducing LCR can raise welfare not only in the home country.

On the other hand, there were some positive results on LCR's development effect. Hollander(1987) found that LCR at a proper level can increase welfare; he considered welfare effects from a foreign multinational's response to an LCR, by shifting more production stages to the host country, and found that small LCRs can increase welfare. Richardson(1993) analyzed that under perfect competition and constant returns to scale, LCR no longer affect the price of the intermediate goods.   Davidson et al.(1985) also pointed out that LCR shifts monopoly rent of the foreign investor to the host country's domestic firms.   They found that if output of the host country exceeds the sales of the investor and the demand is linear, LCR can increase welfare.   Also, it can increase employment of the host country, but to a certain extent because as LCR is imposed, FDI declines afterwards. Jordaan(2010) found that input-output linkages between FDI firms and local suppliers may act as an important transfer mechanism of positive externalities. Younger generation maquiladora firms were generating larger positive local impact by using much more local suppliers.

Thus, development effect of LCR is under controversy.   Typically, developing countries' governments are advocates of the legitimacy and necessity of LCR and claim they need the requirements to properly protect their national economy from huge and heartless capital of multinational corporations.   On the other hand, developed countries' governments and MNCs argue that those requirements are clearly against the international rules and obligations, and moreover they are not effective tool in promoting the host country's development.   In this context, this dissertation tries to show whether LCR has positive effect on automotive industry's development of host country.

The relative difficulty of analyzing development effect lies in several reasons. One of them is the vagueness of the term 'development'.   When we talk about economic development, it sometimes refers to the economic growth, most frequently represented by the GDP growth rate.   As it was pointed out by some researchers, it is easy to show the positive proof between FDI and development with macroeconomic data.   On the other hand, development in a certain industry can be tricky.   It can be measured in numerous ways, which reflects that industrial development is the combination of many factors, and

thus hard to disentangle. In fact, when Markusen and Venables(1999) mentioned the terminology 'development', it meant more intangible development in the industry, e.g. technology development spilled over from the foreign investor to the indigenous firms. Gorg and Strobl(2002) pointed out that although Markusen-Venable model appears to provide a very intuitive tool to analyze the impact of FDI on host country development, there has not been any empirical study investigating the effects exactly as described in the model.

Regarding the dataset, majority of previous studies usually looked into a time-series development effect in one country of interest, or cross-sectional comparative research. Time-series data in one country in a specific industry can have both feature of quantitative method and case study, and therefore it is suitable to show the spillover from MNC to the local industry. The spillover is a quite microeconomic concept: productivity spillover or wage spillover can happen at the firm level, or sometimes plant-level. On the other hand, the data are sometimes at the industry level or the macro-economy level. Gorg and Strobl(2001) once argued that panels, using the firm level data are the most appropriate estimating framework. However, firm-level data is very hard to obtain and manage. Cross-sectional dataset generally showed positive relationship between FDI and economic development. However, in that case, the possible bias was due to the selection problem, i.e. it is hard to distinguish whether FDI actually contributed to the local firms' productivity or the host country economy growth. The multinational firms may have invested in inherently productive sectors or countries. Also, the cross-sectional data analysis fails to show the development of a certain country's economy or industry over a longer period of time. Using panel data, much of this selection bias can be resolved, but there still may remain problems in the data especially when the panel data is combined from both developed and developing countries. Blonigen and Wang(2005) pointed out the possible bias in the data pooling, which may lead to misleading results.

So far, there has seldom been extensive cross-country comparative research on the specific industrial development during substantial span of time. By using panel dataset, this dissertation study can be differentiated from the former literature in that it examines LCR's growth promoting effect in the automotive industry; and also it looks into both cross-country differences in terms of LCR's policy effect.

2) Hypotheses

The general objective of this study is to find out what role the government policy does play directly or indirectly in the host country's industrial and economic development. More concretely, this study tries to show linkages effect between FDI and industrial development promoted by local content requirements. When the host government imposes local content requirements, the foreign investors should use more domestically procured parts, or source from its affiliates by building its own supplier networks in the vicinity. This leads to more establishments in the industry, more employment, and more production. Intuitively, there is a clear difference between a foreign automotive maker just assembling imported KD kits from the home country, and another foreign maker building the vehicle sourced from various local vendor or its own subsidiaries. Linkages and spillovers can be maximized with the presence of these measures. Thus, the hypothesis of this empirical study is as follows.

Hypothesis
LCR has positive effect on the growth of automotive industry in the host country.

We would look at the growth and development of in the automotive industry of each country and its relation to the enforcement status of LCR in that country.

3) Methodology and Data

(1) Basic Model

Our analytical framework starts from the general production function. (3.1) is a aggregate production function for the host country.

$$Y=AF(K, L) \qquad (3.1)$$

Y is the total output or value added, K is capital and L labor and A is total factor productivity. Usually, total factor productivity is described as a function of technology development and other general capability of the industry. My assumption here is that policy environment in the host country is crucial variables in this function, all the more when the host country is developing nation.

$$A=A(T, P) \tag{3.2}$$

where T is technology development over time, and P is vector of policies and institutional environment in the host country, such as trade regime including tariff and number of preferential trade agreements, level of transparency and business friendliness, and investment environment including performance requirements such as LCR.

From this analytical framework, the basic form of our model follows the standard base model for most cross-country growth studies. While the original model focused on the growth effect of FDI, this empirical study aims to analyze the policy effect on the development. Therefore, out model looks like this.

$$Y_{it}=\beta_0+\beta_1\mathbb{X}_{it}+\beta_2.\mathbb{P}_{it}+\varepsilon_{it} \tag{3.3}$$

$\mathbb{P}$ is a group of policy variables of the host country, and $\mathbb{X}$ is a group of macro-economic variables as our control variables. FDI was excluded from the equation because of its endogeneity with other explanatory variables. Y_{it} is the dependent variable which indicates the industrial development status in the country i's automotive industry at time t.

The development in the automotive industry can be measured in several ways. The most extensively used dependent variables are value added and output. Blomström and Sjöholm(1999), Takii(2001), Todo and Miyamoto(2002) used value added as dependent variable; Blalock and Gertler(2002, 2003) used output. Number of firms can be a dependent variable to measure the industry development as in Görg and Ströbl(2002). They used entry of indigenous firms as dependent variable and estimated the factors that affect the entry of indigenous firms using plant level data for the Irish manufacturing sector. Number of employee can be another indicator, but Qui and Tao(2001) suggested that production can be a good instrument for the industrial development because each unit of output requires certain amount of local employment, and bigger the scale of production, more solid is the industry infrastructure. Fotopoulos and Louri(2002) used domestic firm size as the dependent variable: as domestic industry develops, that is, the firm size becomes larger.

In this model, value created against the total production, number of firms, and number of domestic complete vehicle makers(OEM) were used as dependent variable. By domestic value rate, I try to measure the self-supporting capability of the industry, which is a good indicator of industry development.

Focusing more on the development rather than growth, qualitative measurement can be used as dependent variable: technology development, or productivity growth. First,

technology development is brought generally in two ways: technology transfer and technology diffusion. Technology transfer occurs mostly in joint ventures between transnational corporations and local companies, by licensing agreements or management, marketing, and technical service contracts. Technology diffusion is the delivery of technologies from foreign affiliates to local companies. These terms can be quantified such as number of patents applied for, or number of hours taken for a car to be manufactured. Generally, growth of an industry is achieved by factor accumulation and technology development. Growth by factor accumulation is quantitative growth, and can be measured by employment increases or capital formation. Output or value added also can be a proxy. Usually, productivity growth is used to demonstrate the latter type of growth. Most frequently used variables are unit labor productivity and total factor productivity(TFP). In this study, labor productivity was used. Dividing the total output by number of employee in the automotive sector, the productivity captures capital accumulation and technology development. In fact, in many empirical studies, TFP and labor productivity showed very similar results.[33]

$\mathbb{X}_{it}$ is the matrix of control variables, most of which are macroeconomic variables at the national level: the size of the economy is represented by (GDP), and the per capita GDP(CGDP) is used to reflect the average income level and it is also a barometer of the economic development stage of the country, and GDP growth rate(GR) is also added to capture the dynamics of the economy. In some equations, quadratic form of GDP per capita is added to see whether the industrial development is the quadratic function of host country's general economic development level: that is, to reflect the maturing industry problem in the developed countries. Many empirical studies have added variable related to investment, but in this study, it was purposely omitted due to its endogeneity with other regressors.

$\mathbb{P}_{it}$ is the matrix of policy variables: tariff rates(tariff), number of preferential trade agreements(PTA) such as FTA or Customs unions, degree of transparency indicated by the perceived corruption(CPI), enforcement of local content requirement(LCR). Tariff signifies the trade openness of the country, and by using the specific tariff rates on vehicles, the degree of protection in the automotive industry can be reflected in the model. Number of RTA is also related to the trade openness, but it is somewhat different tariff variable in that is linked to the market size issue. Level of transparency is of course can influence the industrial development. Whether the host country enforced local content

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[33] Prema-Chandra at el(2000) measured TFPG and LPG from production by majority owned US foreign affiliates in 44 countries. Although TFPG was lower and more dispersed than LPG, they were highly correlated(r=0.90). Besides, the regression results, by the same set of explanatory variables, was resilient to the choice between TFPG and LPG as dependent vriable.

requirements(LCR) on the foreign manufacturers, and whether the country has its own domestic brand(dOEM) would be added as our key variables, to see whether enforcing various government policies are more effective when the host country has its own maker.

LCR is a dummy variable denoted by 0 or 1(presence of LCR). It can be augmented to range of numbers, e.g. 0 to 5 according to the strictness of the requirement. However, it would be highly arbitrary and subjective, and may cause biased estimation. Therefore, it was simplified to binary level.

The growth studies are typically done in cross sectional data on an average value of variables during a certain time span to conduct the cross-country comparison and see the long term growth effect. However, nowadays panel approach is more popular in dealing with endogeneity issue of variables. Therefore, I used both approach in this study.

(2) Econometric Specification

i)   Simple Cross-Section and Pooled Regression

As noted before, the econometric study's result can be different according to the data structure: cross-sectional or panel. Therefore, in this empirical study, it would be needed to conduct the regression in various possible methods, using cross-sectional data, and panel data; with all countries sample or developing countries sample.

Many growth studies have run simple cross-country regression to check the long-term effects on growth. Here, we also start with this approach as our basic model. Islam(1995) also started with single cross-sectional regression, in order to see how much the results of panel data differ from those of cross-sectional regression.

$$Y_i = \beta_0 + \beta_1 \mathbf{X}_i + \varepsilon_i \qquad\qquad (3.4)$$

There is no time specification here, and i denotes countries. Y_i is the average of annual growth rate, and $\mathbf{X}_i$ is the economic variables at the average value. Policy variables are also averaged, except LCR. LCR takes value 1, if the country has enforced local content requirements at some time during the time span, and 0 otherwise.

Another method is pooled OLS regression. Since we use panel data set, there is now time specification, t. Still, we treat all the observations as independent ones. Here, the error term ε_i is composed of c_i and u_{it}. If there is no country-specific factor (c_i), but the purely random component (u_{it}), ε_i equals u_{it}, and we can use pooled OLS regression.

$$Y_{it} = \beta_0 + \beta_1 \mathbf{X}_{it} + c_i + u_{it} \qquad\qquad (3.5)$$

However, there remain a couple of problems using pooled OLS in the panel data. It does not consider country specific effects or the changes over time because all the observations are a single sample. Also, it is likely that the composite errors are serially correlated due to the presence of country-specific effects, c_i in each time period. In that case, the pooled OLS method fails to address the issue of unobserved heterogeneity and endogeneity.

ii)   Panel Approaches: Fixed and Random Effects

The panel data analysis has advantage over cross-sectional analysis in that it can estimate dynamic relationships among variables during the time span. Also, it allows you to tackle the issue of unobserved heterogeneity and associated endogeneity by controlling for unobservable variables that does not change over time.

To analyze our panel data, two techniques were used in this analysis: fixed effects and random effects. Fixed effects model explores the relationship between predictor and outcome variable within a country. Each country has its own individual characteristics that may or may not influence the predictor variable. Also, when using the FE model, we assume that something within the individual may impact or bias the predictor or outcome variables and we need to control for this. FE removes the effect of those time-invariant characteristics from the predictor variables so that we can assess the predictor's net effect. Also, the FE model assumes the time-invariant characteristics are unique to the country and should not be correlated with other countries. Gorg and Strobl(2002) suggests that fixed effects model is preferable for the estimation of the sector-specific effects to a random effects specification. The key insight is that if the unobserved variable does not change over time, then any changes in the dependent variable must be due to influences other than these fixed characteristics.

In the fixed effects model, the error term can be decomposed into a country specific effects(c_i) and random error component(u_{it}).

$$Y_{it} = \beta_0 + \beta_1 \mathbf{X}_{it} + c_i + u_{it} \qquad\qquad (3.6)$$

Here, β_1 does not change across panels, but the constant term, $(\beta_0 + c_i)$ changes. To estimate this equation, we do within transformation.

$$(Y_{it} - \overline{Y}_i) = \beta_1(\mathbf{X}_{it} - \overline{\mathbf{X}}_i) + (c_{it} - \overline{c}_i) \qquad\qquad (3.7)$$

Now, the error term u_{it} disappeared from the equation. If country effects are correlated with u_{it}, then fixed effects model is preferred. On the other hand, if country effects are not correlated with each explanatory variable in all time periods, random effect model is better to be used. In the random effect model, the constant term, $(\beta_0 + c_i)$ is considered as random variable. In using the RE model, first-order autocorrelation problem and correlation between explanatory variables and u_{it}, i.e. $\text{cov}(x_{it}, u_{it}) = 0$.

iii)   Dynamic Panel Data Approach: The First Differenced GMM

Still, endogeneity remains a concern for our analysis. There may be unobserved time variant effect that determines both the policies and the growth of automotive industry. To investigate the endogeneity, we need to identify an appropriate instrumental variable, but it is difficult to identify the IV for each potentially endogenous variable in country-level analysis. Therefore, here we used GMM techniques in the dynamic panel data analysis. Dynamic panel data approach is extensively used in the economic growth studies. The GMM techniques suggested by Arellano and Bond(1991) and Bond and Blundell(1998) allows us to use lagged values of lagged value of the dependent variable as instruments. Especially, the Arellano-Bond estimator was designed for small-T large N panels, like our panel data where large number of countries(42 countries) are observed for a relatively short period of time(12 years).

$$Y_{it} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 X_{it} + c_{i} + u_{it} \tag{3.8}$$

To eliminate the country specific effect, the first difference is taken.

$$\Delta Y_{it} = \beta_1 \Delta Y_{it-1} + \beta_2 \Delta X_{it} + \Delta u_{it} \tag{3.9}$$

The transformation solves the problem of omitted variable bias by eliminating c out of the equation. However, there still remains a potential endogeneity problem when the dependent variable and the new error term $[u_{it} - u_{it-1}]$ are correlated. If the control variables are endogenous, i.e. $E(X_{i,t}, u_{i,t}) \neq 0$, and $E(X_{i,t-1}, u_{i,t-1}) \neq 0$, then this means that $E(X_{i,t-1}, u_{i,t} - u_{i,t-1}) \neq 0$, so the lagged one period variable cannot be an instrument for $(X_{i,t} - X_{i,t-1})$. The lagged two period value would be a good instrument variable in this case. Here, $E(X_{i,t-2}, u_{i,t} - u_{i,t-1}) = 0$ and $E(X_{i,t-2}, X_{i,t} - X_{i,t-1}) \neq 0$.

On the other hand, if $X_{i,t}$ is weakly exogenous, where both $E(X_{i,t}, u_{i,t}) \neq 0$, and $E(X_{i,t-1}, u_{i,t-1}) = 0$, then $E(X_{i,t-1}, u_{i,t} - u_{i,t-1}) = 0$. In this case, one lagged variable can

be a valid instrument for $(X_{i,t} - X_{i,t-1})$.

To get the consistent estimator in the dynamic panel model, one can choose within estimation eliminating u_i or first differenced model, and instead use instrumental variable estimation to tackle the endogeneity problem. However, within transformation is not proper because the lagged value of dependent variable can be correlated with $\bar{e}_i$.

iv) Dynamic Panel Data Approach: The System GMM

Blundell and Bond(1998) maintained that estimators relying on lagged variables are weak instruments when the series are close to being 'random walk'. That is, $(X_{i,t-1} \text{ or } X_{i,t-2})$ is weakly correlated with $(X_{i,t} - X_{i,t-1})$. Then, this affects the asymptotic and small sample performance of the differenced estimator, leading to large variance of the coefficient and finite sample bias. This is particularly likely to be a problem when using the first differenced GMM with highly persistent series. In this case, system GMM is preferred. The system GMM estimator uses the levels equation to obtain a system of two equations, one differenced and one in levels. Thus the variables in levels in the second equation are instrumented with their own first differences, and this usually increases efficiency.

To check the consistency of the GMM estimators, we need to find out the validity of the instruments. To address this issue two specification test were conducted. The first is a Sargan test of over-identifying restrictions, which tests the overall validity of the instruments by analyzing the sample analogs of the moment conditions used. The second test examines the hypothesis that the error term is not serially correlated. In both First Differenced GMM and System GMM, we test whether the error term is second-order serially correlated, since the differenced error term is second order serially correlated by construction, even if the original error term is not.

(3) Data and Samples

There have been many empirical studies examining the effectiveness of policy or institution on the host country's development. However, most of them were viewed in one country when they are time-series analysis. There are some cross-country empirical studies with time series, but in that case it is usually done on the national economy level. There has not been many cross-country panel data analysis focused on a specific industry. It is mainly due to data availability problem. The FDI or development statistics are mostly easily obtained at a country level, but it is hard to get industry level data cross

country, especially when the industry specification breaks down to sector level, e.g. automotive industry, or chemical industry, etc. Many statistics offices offer aggregated industry data, such as manufacturing industry, service industry, and so on.[34] It is even more difficult to collect consistent data of cross-country industry data with times series.

The industry development data are represented in domestically added value ratio, labor productivity, number of enterprises, and number of domestic OEMs. These dataset was obtained from UNIDO(United Nations Industrial Development Organization). They offer industry statistics to ISIC 4 digit level. The data used here include ISIC 3410-Motor vehicle, 3420-Automobile bodies(coachwork), trailers and semi-trailers, and 3430-Parts and accessories for motor vehicles and their engines.

i) Value Added/Output

The measure of value added covers: (a) value of materials and supplies for production (including cost of all fuel and purchased electricity); and (b) cost of industrial services received (mainly payments for contract and commission work and repair and maintenance work). The measure of output covers only activities of an industrial nature. (a) the value of sale of all products of the establishment; (b) the net change between the beginning and the end of the reference period in the value of work in progress and stocks of goods to be shipped in the same condition as received; (c) the value of industrial work done or industrial services rendered to others; (d) the value of goods shipped; and (e) the value of fixed assets produced during the period by the unit for its own use.

ii) Labor Productivity

Labor productivity was computed dividing the total output by number of employees in the automotive industry. The output and number of employee were obtained in UNIDO dataset.

iii) Number of Enterprises

An "enterprise" is a legal entity possessing the right to conduct business in its own name; for example, to enter into contracts, own property, incur liability for debts, and establish

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[34] Many national statistics offices offer industry data with rough categorization, mostly one-digit level classification at best, based on ISIC industry classification: i.e. manufacturing industry, agricultural industry, service industry, etc.

bank accounts. Value added and outputs would be the most direct indicator of industrial growth.   However, weakness of these variables was the volatility.   Number of enterprises and employees was free of this problem.   They showed consistent upward trend in most of the countries.   Moreover, number of enterprises in the automotive industry can be an indicator of industrial growth.   Number of business entities in the industry is closely related to the size of the industry, and degree of attractiveness of the industry in the concerned country.

iv) Number of Domestically Owned OEMs

Data on local manufacturer was obtained in HIS Global Insight, the worldwide research institution specializing in some industries including automotive industry.   Manufacturers producing more than 100 unit of vehicles annually was counted.

Independent variables are basically the same as those used in Chapter II.   What is different from Chapter II is that, here per capita GDP is used instead of wage, and corporate income tax is omitted.   As for the LCR, same value was used in this analysis as in the empirical study in the Chapter II.   However, there is some modification to the variable in the panel data method.   Since differencing is generally used in the time-series analysis, the binary value of LCR is not suitable for the panel data method: fixed effects model and dynamic panel data method.   Therefore, this time LCR is denominated by the accumulated number of years that the LCR was in force.   That is, $\sum_1^t LCR_i$ is used in the panel data method.

The sample is a panel data of 42 countries which produces vehicles and regularly publish production data.   Approximately 50 countries have automotive industry, but not all of them provide with official data regarding the vehicle production.   The countries not producing vehicles were excluded from the sample, because it can lead to paradoxical results that countries without tight investment regulations have lower production or lower value added.   The time period of analysis is from 1995 to 2006.   The reason the period was limited to 2006 is because as of 2010, not many data pertaining to automotive industry is available from 2007.   Also, extending the period beyond 2006 might be meaningless because in most of the countries local content requirements expired before 2005.

<Table III-3> is the summary statistics that will be used in our study.   There was limitation in our sample size: mainly because of our inherent sample structure.   However, missing values in some years especially in the first four variables, which are our dependent variables, aggravated the sample size problem.

<Table III-4> Summary Statistics

	obs	mean	Std. dev.	Min value	Max value	Unit of Measure
VA	367	0.650	0.179	0.219	1.000	%
IProd	385	50498.25	37627.28	1608.514	178436.8	Billion $
Firms	378	1427.4	1937.81	1608.51	178436.8	#
dOEM	504	1.198	3.164	0	26	#
GDP	504	756.559	1703.765	12	13399	Billion $
Gcap	504	12419.32	12330.1	288.87	44822.96	US $
Growth	504	3.66	3.35	-13	12	%
LCR	504	0.34127	0.47460	0	1	1, 0
RTA	504	13.88	12.62	0	43	#
CPI	485	5.165	2.329	1	10	Index
Tariff[5]	442	37.22	54.49	0	300	%

The correlation matrix gives us the vague idea of what out regression result might be.   Contrary to our presumption, LCR showed negative correlation to almost all variables except domestically owned OEMs and tariff.   RTA had mixed results: it had negative relationship with GDP, i.e. economy size, and positive relationship with GDP per capita, i.e. income level.   This fact can be intuitively explained that small countries try to have more preferential trade relationship to boost the market size.   Tariff also had negative relationship with almost all variables.   It is interesting if trade barrier or investment measure is both detrimental to the economy and industry development.   Transparency, as expected showed positive relationship with economic variables.

<Table III-5> Correlation Matrix

	VA	Prod	Firms	dOEMs	GDP	Gcap	LCR	RTA	tariff	CPI
VA	1.000									
Prod*	0.447	1.000								
Firms*	0.476	0.332	1.000							
dOEM	0.458	0.041	0.297	1.000						
GDP*	0.948	0.422	0.476	0.371	1.000					
Gcap*	0.467	0.746	0.396	0.080	0.483	1.000				
LCR	-0.1948	-0.549	-0.366	0.039	-0.197	-0.578	1.000			
RTA	-0.1085	0.438	0.156	-0.200	-0.106	0.476	-0.402	1.000		
Tariff	-0.210	-0.417	-0.202	-0.068	-0.209	-0.495	0.395	-0.342	1.000	
CPI	0.237	0.603	0.126	-0.033	0.198	0.766	-0.558	0.472	-0.366	1.000

Note: * In the correlation, this variable is included as ln(variable)

4) Result of Regressions

(1) Cross-sectional Regression

Our basic benchmark model is a simple OLS based on the cross-sectional data. There is no time specification and all the economic variables are represented by the average annual growth rate. Policy variables are simply averaged over the time period. The binary variable, LCR is indicated as 1 if the country once had enforced local content requirements, and 0 if it never enforced the requirement. Thus, only long term growth effects of each variable are estimated. We used four different dependent variables to find out different implications in each regression. For independent variables, GDP, per capita GDP, number of RTAs, tariff rates on the passenger vehicle, CPI, and LCR was used.

<Table III-6> Cross sectional regression with simple OLS

	Dependent Variable			
	(1)Value Added(%) (n=40)	(2)Labor Productivity (n=42)	(3)Number of Enterprises (n=38)	(4)Number of Domestic OEM (n=42)
gdp	0.129* (0.103)	-0.473 (0.505)	0.149 (0.291)	-0.025 (0.032)
cap	0.242 (0.383)	-4.538 (9.076)	-0.796 (1.006)	-0.369 (0.531)
cap2	-0.042 (0.031)	0.457 (0.796)	0.096 (0.079)	0.021 (0.047)
tariff	-0.017 (0.012)	0.002 (0.283)	-0.002 (0.028)	0.004 (0.017)
RTA	-0.137** (0.051)	0.387 (1.339)	0.226 (0.140)	-0.067 (0.086)
CPI	0.661** (0.273)	-4.634 (6.913)	0.134 (0.671)	-0.196 (0.408)
LCR	0.142 (0.154)	-1.092 (3.879)	6.435* (3.184)	-3.250* (1.904)
R-Square	0.3139	0.0571	0.2715	0.1343

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level
Figures in the parentheses are standard errors.

Goodness of fit of these models was generally low, and there was hardly any significant estimator. The equation with value added and number of enterprises relatively showed high R-square. Coefficients of LCR in these equations were positive, but only that of equation (3) was significant. Overall, this cross-sectional regression model had little explanatory power. This may be due to the small sample, or some fallacy in our

assumptions. Also, it suggests that just cross-country analysis of growth effect is insignificant.

Now, we use the between effects model to compare with our cross-sectional model. Between effects model uses panel dataset, but it only looks into variation between panel entities, by averaging the variables within one group i.e. country.

$$\overline{Y}_i = \text{\ss}_0 + \text{\ss}_1 \overline{X} + u_i + \overline{e}_i \qquad\qquad (3.10)$$

$$\overline{Y}_i = \sum_{t=1}^{T} Y_{it}, \ \overline{X} = \sum_{t=1}^{T} X_{it}, \ \overline{e}_i = \sum_{t=1}^{T} e_{it}, \text{ thus average value within each group.}$$

In this way, equation (4.5) actually transformed panel data into cross-sectional data. $\text{\ss}_0$ and u_i are constant within panel, so they have the same value in this equation. $\text{\ss}_1$ refers to marginal effect between countries, and therefore the result of between effects model would be similar with our simple cross-sectional regression model.

<Table III-7> Between Effects Model

	Dependent variables			
	(1)Labor productivity	(2)Value Added(%)	(3)Number of Enterprises	(4)Number of Domestic OEM
Ln(gdp)	0.178** (0.082)	0.003 (0.022)	0.774*** (0.1713	1.225*** (0.356)
Ln(cap)	-0.244 (0.995)	0.302 (0.261)	1.293 (2.202	2.841 (4.522)
Ln(cap2)	0.032 (0.061)	-0.020 (0.016)	-0.077 (0.132)	-0.174 (0.272)
Growth	-0.043 (0.053)	-0.018 (0.014)	-0.032 (0.130)	0.976*** (0.321)
RTA	-0.006 (0.010)	0.002 (0.001)	0.039* (0.020)	-0.055 (0.046)
tariff	0.001 (0.002)	-0.000 (0.001)	0.002 (0.005)	-0.007 (0.008)
CPI	0.103 (0.073)	0.003 (0.019)	-0.121 (0.134)	0.085 (0.280)
LCR	0.125 (0.293)	0.131* (0.079)	-0.027 (0.062)	0.216 (1.231)
R-Square	0.6769	0.3606	0.5058	0.5195

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level
    Figures in the parentheses are standard errors.
    Here, R-square is between R-square.

Thus, to resolve the sample size issue first, we used Pooled OLS method. Here, we assume that there is no heteroskedasticity in the error term among panels. In other

words, σ_i^2 does not change over i and t. Then, the covariance matrix of error term(ϵ_{it}) would be like this.

$$\Omega_t = \begin{bmatrix} \sigma^2 & 0 & \cdots & 0 \\ 0 & \sigma^2 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & \sigma^2 \end{bmatrix}$$

This matrix signifies that there is no correlation between errors across groups of panel, and variance of error term should be all σ^2.

Four regressions showed somewhat different results. Some variables showed opposite signs in different equations. For example, coefficient for GDP was negative in Value Added equation(1), and level of transparency(CPI) had negative coefficient in equation (3). PTA showed opposite signs in equation (3) and (4). Overall, Equation (2) and (3) showed high goodness of fit, while there were the most significant variables in equation (4).

<Table III-8> Pooled OLS with no heteroskedasticity

Dependent Variable	(1)Value Added(%) (N=354)	(2)Labor Productivity (N=371)	(3)Number of Enterprises (N=360)	(4)Number of Domestic OEM (N=470)
ln(gdp)	-0.007 (0.008)	0.191*** (0.026)	0.732*** (0.050)	1.570*** (0.113)
ln(cap)	0.262** (0.111)	0.291 (0.361)	0.922 (0.622)	1.674 (1.359)
Ln(cap2)	-0.017*** (0.007)	0.008 (0.021)	-0.049 (0.038)	-0.170** (0.083)
Growth	-0.002 (0.003)	0.017* (0.009)	-0.003 (0.017)	0.155*** (0.039)
PTA	0.001 (0.001)	-0.001 (0.002)	0.017*** (0.005)	-0.027** (0.011)
tariff	-0.000 (0.000)	0.000 (0.001)	0.003** (0.001)	-0.006** (0.002)
CPI	0.003 (0.006)	0.052** (0.021)	-0.115*** (0.038)	0.289*** (0.089)
LCR	0.103*** (0.025)	0.250*** (0.079)	-0.015 (0.017)	0.501 (0.330)
R-square	0.2294	0.6643	0.5284	0.3893

Note: **: significant at 5% level, *: significance at 10% level
Figures in the parentheses are standard errors.

Among the economic variables, GDP was the most significant estimator. Industrial growth was quadratic function of income level. That is, the industrial development is accelerated to a certain level, but beyond which the development can be decelerated or in some cases, decline backwards. This is a meaningful result because it reflects the real world where automotive industry shows higher growth speed in the developing countries than developed countries where market size is bigger. LCR was significantly positive in three equations, and was significant in two of them. By imposing LCR, domestic share of the industry output increased as well as the labor productivity.

Now, we assume heteroskedasticity in the panel. In the new equation, covariance of error term, σ_i^2 in each panel was estimated. In this case, covariance matrix at the time t would be like: Here, we assume $var(\varepsilon_{it}) = \sigma_i^2$, at all t.

$$\Omega_t = \begin{bmatrix} \sigma_1^2 & 0 & \cdots & 0 \\ 0 & \sigma_2^2 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & \sigma_n^2 \end{bmatrix}$$

<Table III-9> GLS model with heteroskedasticity

Dependent Variable	(1)Value Added(%) (N=354)	(2)Labor Productivity (N=371)	(3)Number of Enterprises (N=360)	(4)Number of Domestic OEM (N=470)
ln(gdp)	-0.010* (0.006)	0.183*** (0.011)	0.742*** (0.025)	0.952*** (0.055)
ln(cap)	0.187** (0.086)	o.155 (0.225)	1.449*** (0.386)	0.487 (0.601)
Ln(cap2)	-0.013*** (0.005)	0.013 (0.013)	-0.085*** (0.022)	-0.065* (0.036)
Growth	0.001 (0.002)	0.016*** (0.005)	0.013 (0.012)	-0.003 (0.020)
RTA	0.002*** (0.000)	-0.002 (0.001)	0.004* (0.002)	-0.008* (0.005)
Tariff	-0.000*** (0.000)	-0.000 (0.000)	-0.000* (0.001)	-0.003** (0.001)
CPI	0.001 (0.002)	0.050*** (0.009)	-0.071*** (0.012)	0.120*** (0.037)
LCR	0.106*** (0.016)	0.143*** (0.050)	-0.142 (0.124)	0.072 (0.187)
LR test	Chi Sq = 228.86 Prob(Chi Sq)=0.000	Chi Sq = 431.64 Prob(Chi Sq)=0.000	Chi Sq = 563.12 Prob(Chi Sq)= 0.000	Chi Sq = -14889 Prob(Chi Sq)= 1.000

Note: ***: significant at 1% level, **: significant at 5% level, *: significance at 10% level
       Figures in the parentheses are standard errors.

Comparing with the <Table III-7>, we can find that the test result is similar; variables are related to dependent variable in the same direction; the standard errors are smaller, and therefore more variables became significant. The LR test results rejected the null hypothesis that error terms are homoskedastic except in equation (4). Thus, heteroskedasticity is confirmed in equation (1), (2), and (3). LCR again showed significantly positive coefficient in equations with VA and Labor productivity. The magnitude of coefficient decreased somewhat and the standard errors are in general smaller in this model, compared to the Pooled OLS model.

Here, we allowed the covariances are different across panels, but we assumed that they are invariant within panel. However, if the covariances within panel are different from simply being panel heteroskedastic, then the estimates will be inefficient and the reported standard errors will be incorrect. Therefore, we need to use panel approach to fix this problem.

(2) Panel Approach with Fixed Effects

In this section, we use full-blown panel approach. We run regressions using fixed effects model. As discussed earlier, the fixed effects model is used when we want to control for the omitted variables that differ between countries, which does not change over time. In doing so, we can capture the change of variables over time to estimate the effect of each variable on industrial development.

Fixed effects model has limitations in that it considers 'within variation,' but not 'between variations.' In other words, it can analyze each variables growth effect within a country over time, but cannot tell how their effect can be different across countries. On the other hand, random effects model considers both within variation and between variations. However, since we have analyzed between group effects in the cross sectional analysis previously, we just use fixed model here. Still, I will provide with Hausman test result to see which model fits better. It basically tests whether the unique errors(u_i) or individual effects are correlated with the regressors. The null hypothesis is that they are not. If we can reject the null hypothesis, then the random effects produces a biased estimator, and therefore fixed effects are preferred. According to the Hausman test result, we can reject the null hypothesis in all four equations, and therefore we accept that fixed effects model is preferred.

In this approach, GDP Growth rate was added to the model to emphasize the impact of growth dynamics of national economies. Here, also there was inconsistent coefficient sign issue. As for the economic variables, equation (1) and (3), (2) and (4)

showed similar pattern; while for policy variables, equation (1) and (2), and (3) and (4) were rather similar.

Among policy variables, LCR was the most influential variable on the industrial growth. It was significant coefficient in all four equations. It had positive effect on labor productivity growth, entry of new firms both domestic and foreign. However, it should be noted that it had negative impact on the domestic value against the total production. LCR used to have positive impact on the domestic value ratio in the cross-sectional regressions so far. Next to LCR, RTA was the significant estimator. It was positively related to the industrial growth.

<Table III-10> Panel Approach with Fixed Effects Model

Dependent Variable	(1)Domestic Value Added(%) (n=354)	(2)Labor Productivity (n=371)	(3)Number of Enterprises (n=360)	(4)Number of Domestic OEM (n=470)
Ln(gdp)	1.034*** (0.285)	-2.108*** (0.588)	1.441 (0.958)	-4.309*** (1.641)
Ln(cap)	-0.445 (0.324)	3.332*** (0.665)	-0.314 (0.953)	12.158*** (1.851)
Ln(cap2)	-0.038*** (0.014)	-0.026 (0.031)	-0.069* (0.041)	-0.445*** (0.077)
Growth	0.004* (0.002)	0.015*** (0.005)	0.014** (0.006)	-0.032** (0.014)
tariff	0.000* (0.000)	0.000 (0.001)	0.001 (0.001)	-0.002* (0.001)
CPI	-0.011 (0.013)	-0.074*** (0.026)	0.011 (0.038)	0.104 (0.080)
PTA	0.001 (0.000)	0.005** (0.002)	0.012*** (0.003)	0.011* (0.006)
LCR	-0.022*** (0.005)	0.019* (0.011)	0.050*** (0.018)	0.082*** (0.028)
R-Square	0.1105	0.5682	0.2614	0.1668
Hausman Test	Chi-sq=24.33 Prob(Chi Sq)=0.0020	Chi-sq=17.86 Prob(Chi Sq)=0.0223	Chi-sq=34.77 Prob(Chi Sq)=0.0000	Chi-sq=17.74 Prob(Chi sq)=0.0132

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level
Figures in the parentheses are standard errors.

However, Fixed-effects will not work well with data for which within cluster variation is minimal or for slow changing over time. Therefore, it might not be suitable to investigate the impact of discrete variables such as policy effectiveness, because the policy does not easily change over time.

Also, it should not be overlooked that there is endogeneity problem in our model, especially those economic variables. GDP, as a proxy of market size, may affect the

growth of automotive industry, but the opposite direction is also possible. The industry growth can contribute to the GDP of the national economy. Similarly, Per capita GDP can be determinant of industrial growth, and industrial growth can raise the overall income level of the country. This is especially problematic, because the significance and share of automotive industry in the national economy is very large, first of all by its volume itself, and further its forward and backward linkage effect amplifies the effect. This is not confined to economic variables. High tariff would affect the speed and direction of industrial growth somehow, and at the same time, the level of tariff would be influenced by the growth stage of the industry. The causality may run in both directions. In this case, the regressors may be correlated with the error term.

(3) Dynamic Panel

To tackle this endogeneity problem, we now turn to dynamic panel model. In the dynamic panel data model, lagged dependent variable is used as explanatory variable.

$$Y_{it} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 \mathbf{X}_{it} + c_i + u_{it} \qquad\qquad (3.11)$$

To get the consistent estimation using equation (3.11), we can get within estimator by assuming u_{it} as fixed effects. In this case, however, there is a problem: the explanatory variable and error term are correlated, i.e., cov($Y_{it} - \overline{Y1}$, $e_{it} - \overline{e1}$) $\neq 0$. Therefore, within estimator cannot be a consistent estimator.

Another method is first differencing. If we first difference equation (3.11), $\Delta Y_{it-1} = Y_{i,t-1} - Y_{i,t-2}$, becomes the explanatory variable, and $\Delta e_{it} = e_{i,t-1} - e_{i,t-2}$, becomes the error term. Here, $cov(Y_{i,t-1}, e_{i,t-1}) \neq 0$ and therefore, first differenced estimator cannot be consistent estimator. Therefore, to tackle this we need instrumental variable, and use first differenced 2-stage least square method(FD2SLS): we use DV_{t-2} as the instrumental variable.

<Table III-11> is the regression result of FD2SLS method. Overall, the estimators are weak compared to the fixed effects model. The lagged dependent variable was not significant in this method. Only equation (3) had significant variables, growth and LCR. Both showed positive and significant estimator. In the rest of the equations LCR showed negative coefficient, though insignificant. From this result, it can be interpreted that LCR had positive impact on the firm entry in the domestic automotive industry. Also, it had bigger influence on the growth than the national economic growth.

<Table III-11> Dynamic Panel Approach: FD2SLS

	(1)Value Added (%)	(2)Labor Productivity	(3)Number of Enterprises	(4)Number of domestic OEM
	N=240	N=258	N=251	N=363
$\text{Ln}(DV_{i,\,t-1})$	1.142 (0.803)	-27.450 (249.383)	0.625 (1.848)	2.738 (2.111)
Ln(gdp)	0.034 (0.910)	-59.393 (491.955)	-4.481 (5.527)	2.830 (5.780)
lcap	0.022 (0.995)	85.550 (727.221)	2.598 (2.441)	-3.379 (7.337)
Lcap2	-0.003 (0.032)	-1.845 (17.076)	0.087 (0.191)	0.039 (0.214)
Growth	0.007 (0.004)	0.491 (4.359)	0.017* (0.009)	0.000 (0.017)
tariff	0.000 (0.000)	-0.001 (0.026)	0.000 (0.001)	0.005 (0.005)
RTA	0.001 (0.002)	-0.155 (1.459)	0.003 (0.004)	-0.002 (0.013)
CPI	-0.018 (0.031)	0.669 (6.658)	-0.020 (0.101)	-0.378 (0.285)
LCR	-0.011 (0.019)	-0.326 (3.518)	0.080** (0.041)	-0.101 (0.195)
R-Square	0.2201	0.2396	0.5171	0.7158

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level

Figures in the parentheses are standard errors.

This is in a great part due to the first differencing: we lost vast portion of our observations. This is especially problematic, because our sample has short span of time. Therefore, we use Arellano-Bond difference GMM estimator. We get better result using this method, with much more significant estimators. Equation (2) and (3) has the most significant variables. Among policy variables, RTA and LCR were the most relevant factor to the industry growth. LCR showed positive coefficient three equations except equation (1), and in two of them they were significant at 1% level. To conclude, LCR had positive impact on the productivity growth, and domestic firm entry. Besides, the size of coefficient increased from the fixed effects model.

To test the over-identifying restrictions issue, we do the Sargan test. The null hypothesis is over-identifying restrictions are valid. The higher the p-value is, the better. Here, Sargan test shows that we fail to reject the null hypothesis in the equation (3), that is, the instruments as a group are exogenous. On the other hand, the rest of the equation had over-identifying restrictions. Due to small number of countries in our sample, a large number of instruments caused Sargan test to be weak. Also, when there is heteroskedasticity, it is hard to rely on the Sargan test result, because the result can be due

to heteroskedasticity.   It would be better if we could use second or deeper lags to find good instruments, but it reduces the sample size.   Since there is not enough number of countries in our sample, it would not be proper.

<Table III-12> Dynamic Panel Approach: Arellano-Bond estimation

	(1)Value Added (%)	(2)Labor Productivity	(3)Number of Enterprises	(4)Number of domestic OEM
	N=274	N=292	N=284	N=396
$Ln(DV_{i,\ t-1})$	0.512*** (0.116)	0.107 (0.081)	0.396* (0.119)	0.927*** (0.033)
Ln(gdp)	0.068 (0.382)	-3.501*** (0.666)	-0.847*** (1.059)	-3.222 (2.033)
lcap	-0.034 (0.425)	3.864*** (0.724)	-0.114*** (1.039)	6.045** (2.199)
Lcap2	0.002 (0.018)	0.017 (0.033)	0.046* (0.034)	-0.157** (0.070)
Growth	0.006** (0.002)	0.012** (0.005)	0.013*** (0.005)	-0.006 (0.009)
tariff	0.000 (0.000)	0.001* (0.001)	-0.000 (0.001)	0.001 (0.001)
PTA	-0.001 (0.001)	0.006*** (0.002)	0.005* (0.003)	0.008 (0.006)
CPI	-0.006 (0.017)	-0.006 (0.032)	-0.020 (0.040)	-0.118 (0.074)
LCR	-0.006 (0.006)	0.047*** (0.012)	0.063*** (0.018)	0.050 (0.030)
AR(1) AR(2)	0.0622* 0.0455*	0.1910 0.1834	0.0774* 0.6460	0.2381 0.1358
Sargan	0.0041	0.0004	0.4383	0.0000

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level
        Figures in the parentheses are standard errors.

The test for AR(1) process in first differences usually rejects the null hypothesis: in this case, only equation (1) and (3) rejected the null hypothesis.   Therefore, there is autocorrelation in $\Delta e_{i,t}$, but there is autocorrelation in levels.   In the test for AR(2), since $\Delta e_{i,t} = e_{i,t} - e_{i,t-1}$ and $\Delta e_{i,t-1} = e_{i,t-1} - e_{i,t-2}$ both have $e_{i,t-1}$, it does not really matter even if it detects second order autocorrelation in levels.   However, what matters is that we have first order autocorrelation in the equation (2) and (4), which suggests that these models may not have been correctly specified.   Therefore, we need to try other method.

Sometimes, the lagged levels of the regressors are poor instruments for the first-differenced regressors.   Then we use the augmented version of GMM, the 'system GMM.' Below is the output table of system GMM. Test results are better with system GMM

method.　There is no first-order autocorrelation issue except equation (4), and second-order correlation is not found in all four equations.　As for over-identifying restrictions, however, this method is not free of bias.　Except equation (3) with number of enterprises, we reject the null hypothesis that the instruments are valid.　Thus, we can reject the assumption that our instruments are valid in the (1), (2), (4) equations.　However, as mentioned before, it is hard to figure out whether the rejection of null hypothesis is due to over-identifying problem or the heteroskedasticity problem.

Compared with the DIFF-GMM method, less variables are significant in this method.　Excluding equation (4) with autocorrelation issue, policy variables were generally insignificant estimators.　Coefficient on the lagged dependent variable and GDP growth generally increased in the system GMM.　However, for LCR variable, the opposite happened.　Not only the magnitude of the coefficient decreased a lot, but also the statistical significance reduced so that only LCR in the equation (4) is significant estimator, which we do not consider as valid model.

<Table III-13> Dynamic Panel Approach: System GMM

	(1)Value Added(%) (N=313)	(2)Labor Productivity (N=332)	(3)Number of Enterprises (N=323)	(4)Number of Domestic OEM (N=439)
$Ln(DV_{i,\,t-1})$	0.682*** (0.079)	0.621*** (0.067)	0.792*** (0.062)	1.010 *** (0.027)
Ln(gdp)	0.017 (0.028)	0.191*** (0.051)	0.340*** (0.096)	0.032 (0.159)
lcap	-0.057 (0.227)	-0.586 (0.550)	-0.896 (0.602)	1.958* (1.070)
Lcap2	-0.002 (0.013)	0.042 (0.0133	0.027 (0.035)	-0.127* (0.067)
Growth	0.007*** (0.002)	0.023*** (0.006)	0.019*** (0.006)	0.002 (0.008)
tariff	0.001* (0.000)	0.001 (0.001)	0.000 (0.001)	0.003** (0.001)
RTA	-0.000 (0.001)	-0.000 (0.002)	-0.000 (0.002)	0.014*** (0.005)
CPI	-0.014 (0.013	-0.048* (0.029)	0.027 (0.039)	-0.094 (0.072)
LCR	-0.004 (0.004)	0.006 (0.008)	0.009 (0.010)	0.031** (0.015)
AR(1) AR(2)	0.0307** 0.0586*	0.0004*** 0.1679	0.0042*** 0.4993	0.2465 0.2042
Sargan	0.0304	0.0000	0.0763	0.0000

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level
　　　Figures in the parentheses are standard errors.

So far, we have used various method of panel data analysis. To find out which method best estimates policy effect on industrial growth, we do the compared the results : Fixed effects model, 2SLS, and the two GMM method as in <Table III-14>. Among the four equations with different dependent variables, number of enterprises equation was selected because it was robust in all four methods. Some economic variables, though statistically significant, showed opposite signs with different regression models. Among them, GDP growth showed the most strong and consistent influence on the industrial development. Among the policy variables, LCR was the most relevant factor, all showing positive coefficient. The two variables' coefficients through the different regression method showed similar magnitude and consistent sign. Considering the goodness of fit of model and robustness, it seems that 2SLS and differenced GMM method is the most efficient model. Next to number of enterprises, labor productivity was affected by LCR the most, but in the 2SLS method alone, LCR exhibited negative coefficient, though insignificant. . Thus, it can be concluded that Diff-GMM method was overall the most efficient panel data analysis method.

<Table III-14> Comparison of Various Panel Data Method

DV=Number of Enterprises	FE (N=360)	2SLS (N=251)	DIFF-GMM (N=284)	SYS-GMM (N=323)
$Ln(DV_{i,\,t-1})$	-	0.625 (1.848)	0.396* (0.119)	0.792*** (0.062)
Ln(gdp)	1.441 (0.958)	-4.481 (5.527)	-0.847*** (1.059)	0.340*** (0.096)
lcap	-0.314 (0.953)	2.598 (2.441)	-0.114*** (1.039)	-0.896 (0.602)
Lcap2	-0.069* (0.041)	0.087 (0.191)	0.046* (0.034)	0.027 (0.035)
Growth	0.014** (0.006)	0.017* (0.009)	0.013*** (0.005)	0.019*** (0.006)
tariff	0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)
RTA	0.011 (0.038)	0.003 (0.004)	0.005* (0.003)	-0.000 (0.002)
CPI	0.012*** (0.003)	-0.020 (0.101)	-0.020 (0.040)	0.027 (0.039)
LCR	0.050*** (0.018)	0.080** (0.041)	0.063*** (0.018)	0.009 (0.010)
AR(1) AR(2)			0.0774* 0.6460	0.0042*** 0.4993
Sargan			0.4383	0.0763

Note: *: significant at 10% level, **: significant at 5% level, ***: significant at 1% level

Figures in the parentheses are standard errors.

3. Conclusions and Implications

1) Summary of Findings

So far, we have conducted empirical analysis on cross-country panel data, over the policy effectiveness of LCR on the automotive industry development.   We have adopted four different dependent variables as indices industrial growth and development.   VA was used to measure quantitative growth, and also sound development from the upper value chain.   Labor productivity was used to capture the technology and efficiency growth. Number of enterprises and domestic OEMs were also used to measure the quantitative growth, especially in the perspective of industry base.

In the simple OLS model examining the cross-country difference in the policy impact, LCR mostly showed positive coefficients, but only a few of them was statistically significant.   This was the same with between effects model.   The weak test result is supposed to be caused by the small sample problem.   Therefore, to fix the sample size issue, we used Pooled OLS and panel GLS method with full dataset.   In both of the regressions, we obtained consistently positive coefficient of LCR in the domestic value ratio and labor productivity equation.

By using fixed effects panel data method, the efficiency of regression method increased and we obtained significance coefficient for LCR in all four equations. However, LCR in equation (1) showed negative coefficient, this time, which has been exhibiting positive sign so far in the cross-sectional approach.   Lastly, in the dynamic panel approach, the negative sign of LCR in the VA equation continued, but it lost significance.   The rest three equations all exhibited positive coefficient, and most of them were significant.

Overall, cross-sectional approach was effective in distinguishing cross-country difference in the domestically produced value share, and labor productivity growth; while panel approach was more effective in finding the growth in the number of firms.   This distinction is supposedly found due to the characteristics of dependent variables. Domestic share of value added is a variable that cannot grow infinitely over time, but it has significance in that it demonstrates the industry's vertical structure and linkages between them.   Of course, it could grow over time, but 100% of domestically added value is neither a possible nor desirable state.   Generally, domestic value ratio close to 100% can be witnessed often in the less developed countries.[35]

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[35] See <Table 4> in the Appendix III.

Therefore, as for this variable, cross country difference can give more implications, based on the LCR's presence.　On the other hand, number of firms has significance not in the absolute value itself, but its growth over time.　Comparing the number of firms among countries hardly has any worth, but its growth signifies that the industry is expanding its base.　Labor productivity is somewhere in the middle of these two variables: it is meaningful index of cross-country comparison and also representing time-series growth.　Therefore, VA tend to be strong estimator of growth in the cross-country comparison, while number of firms and domestic OEMs are positively related to LCR in the time-series growth　In any aspect of industrial development, LCR showed overall positive effect.

Acknowledgement should be made about the shortcomings of the empirical study here.　The variable LCR was not really a elaborated indicator.　Here, the degree of intensity of the requirement was not reflected in the variable.　Also, in the cross-sectional regression, it would have produced more powerful estimators if we counted how long the LCR have been in place.　It would be better if we could capture the intensity into the variable, but in reality, it was very hard to quantify the strictness of the regulation, to make an objective variable.　Nevertheless, the actual enforcement issue and gap between the local content requirements the realized local content in the sector would still remains the data constraint in this kind of study.　For example, in countries where no LCR was imposed, the actual level of local content rate can be high.　Lastly, VA, the value added ratio, may signify the level of local content in quantitative terms, but it does not give information on how strategically and technologically important parts are sourced and produced locally.　Even though the numbers are similar in two countries, one country may be the manufacturing base of powertrains or transmissions while the other produces only low-tech parts.

2) Policy Implications

FDI may have uneven effect on the host country's industrial and economic development.　The determinants of effect turned out to be combination of many factors: general environment in the host country, the investment strategies of the MNCs, and the competitive relationship of the host country in the context of regional economy. Sometimes, countries with similar economic background showed different development path, and sometimes countries with hostile environment for foreign investors fared better. FDI into the host country does not itself guarantee the industrial development and economic growth.　It is necessary to promote the linkages between foreign investors and

domestic firms ensuring that the local firms are incorporated to the supply chain of the foreign investors and technology and know-how are diffused to the local industry.

Therefore, it is certain that the host government has some role to play in attracting high quality FDI, and amplifying the benefits from the FDI. In this context, LCR certainly played some role in transplanting and settling down the industry onto the ground of the host country generated by foreign capital investment. LCR can accelerate development and growth of automotive industry.

From the positive relationship between the domestically added value share and LCR, we can conclude that LCR can affect the shape of the industry, especially in the value chain system. From <Table 2> in the Appendix III, we can see that share of value added against the total output tend to be large in the countries where LCR was enforced. Also, from the positive results with labor productivity, it can be concluded that LCR can successfully enhance the development in intangible assets such as technology. FDI itself signifies injecting more inputs to the economy; thereby it leads to factors accumulation-led growth. On the other hand, the technology-driven growth is the spillover effect, which is positive externality from the FDI.

Therefore, local content requirements should be understood as a development related, industrial nurturing policy rather than a trade-related investment measure. This conclusion now leads us to the instrumental analysis of local content requirements in a legal perspective in Chapter IV.

Chapter IV. Regulation of TRIMs: WTO and Beyond

Local content requirements, the most common form of performance requirements, are frequent subject of controversy in the legal sphere as well as economic and business field. Actually, performance requirements are quite a material issue in the international economic law and will be more and more so in the future, as flow of FDI grows further globally. They are popular policy instruments for host governments in enhancing employment and industrial development as discussed in the previous chapters; but to the foreign investor, they are unwanted obstacle in performing free and efficient international business operation. Due to conflicting interests, they have been often disputed between the two parties, and they should be found in either way: for or against.

The controversy comes from the amphibious nature of the performance requirements as a trade-related investment measure. It is treated as investment measures and sometimes as trade measures as occasions demand. In the WTO, they are officially categorized as Trade-Related-Investment-Measures. That is, they fall under the overlapping area, but at the same time they are like a hybrid that belongs to no established classification. The ambiguous status of performance requirements has been the main cause of the controversy and conflicts concerning them. Secondly, they involve some ideological aspect, just as in the alternative question of free market or welfare state. Is liberalization of investment and trade more important mission than defending the sovereign rights of individual countries to pursue social and economic development? The second cause leaves us in an even more complicated perplexity. Actually, this is closely related to the issues and problems in shaping multilateral investment regulations, which we do not have yet.

Performance requirements are at the heart of all these complexity and controversy, and thus they works as a signal that reveals unfair and unjustified current legal regime and FDI and investment measures. The legality of performance requirements are still open to questions and debates. Its conclusive interpretation and construction in the future would bring about substantial implications and economic impact.

Thus, first part of Chapter IV will look into how performance requirements were regulated in the current regime, namely by the WTO; and in the next section, the limitations and side effects of the current system in regulating performance requirements, and also where these inadequacies come from will be analyzed. In the final part, it proposes the better forum to administer LCR, the multilateral investment treaty; how it can better address the policy concerns that WTO has been disregarding and falsely accusing.

1. Theory and Practice in the Current WTO Regime

Unlike international trade, international investment is not yet thoroughly incorporated into multilateral system of rules. There have been some attempts from early 20th century, before the establishment of GATT to no avail. Meanwhile, as an outcome of the UR negotiations, investment measures were dealt with in the domain of multilateral trade system, via TRIMs Agreement and GATS although with limitations. This was somewhat a reflection of the times since 1980s when world economies were getting more and more integrated and multinational companies were mushrooming. Also, it signifies that there was a sort of awakening shared by majority of countries that investment should be supervised in the multilateral setting as well as trade.

Provisions on investments were dispersed in GATS, TRIMs, and DSU, and moreover, they were limited to trade-related-investment-measures. Trade-related-investment-measures simply referred to performance requirements. The 'trade-relatedness' of performance requirements made it easily integrated into the rules of multilateral trade system. However, it also meant that these measures were interpreted through the glass of GATT although they are in fact investment measures. Above all, WTO's initial focus was to regulate trade-distorting measures rather than investment-distorting measures.

Until now, performance requirements are governed in the WTO as TRIMs. They are strictly prohibited by TRIMs Agreement, GATT, SCM Agreement, etc. As suggested above, it is the outcome of negotiating history and the philosophy of WTO, a form with a mission to expand free trade.

As briefly introduced in Chapter I, there have been several disputes in the WTO pertaining to these performance requirements. (See Table 1-1) Again, it is worth noticing that most of them are related to automotive industry. The background on why automotive industry is mainly associated with local content requirements has been explored in the previous chapters. <Table 4-1> shows details of these WTO disputes concerning performance requirements in the automotive industry. In most cases, complainant alleged the violations of the concerned measures with WTO obligations in the meaning of GATT 1994, GATS, SCM Agreement, and TRIMs Agreement. Most frequent complainants are European Communities, United States, and Japan, so-called 'Triad' in the automotive industry. They are home to the world's biggest automobile manufacturers and the most extensive foreign investors as well. That is, these kinds of disputes are practically initiated by investors. On the other hand, defendant countries are mostly developing countries.

<Table 4-1> WTO Disputes concerning performance requirements

Case Name	Complainant	Invoked Articles
Indonesia-Autos(1996) (WT/DS54, WT/DS55, WT/DS59, WT/DS64)	Japan European Communities United States	Articles I and III:2 of *GATT 1994* Article 5(c), 27.9, 28 of the *SCM Agreement* Articles 2.1 and 5.4 of *TRIMs Agreement*
Canada-Autos(1998) (WT/DS139, WT/DS142)	European Communities Japan	Article I, III, XXIV of *GATT 1994* Articles 2 of *TRIMs Agreement* Article 3.1(a), 3.1(b) of the *SCM Agreement* Article I:1, II:1, V and XVII of *GATS*
India-Autos(1998) (WT/DS146, WT/DS175)	United States European Communities	Article III:4, Article XI of the *GATT 1994* Articles 2.1 and 2.2 of *TRIMs Agreement*
Brazil-Autos(1997) (WT/DS51, WT/DS52, WT/DS65, WT/DS81)	European Communities United States Japan	Articles I:1, III:4, XI:1 of *GATT 1994* Article 2 of *TRIMs Agreement* Articles 3, 27.2 and 27.4 of the *SCM Agreement*
Philippines-Autos(2000) (WT/DS195/1)	United States	Articles III:4, III:5 and XI:1 of the GATT 1994 Article 3.1(b) of the SCM Agreement Article 2 of *TRIMs Agreement*
China-Auto Parts(2006) (WT/DS339, WT/DS340, WT/DS342)	European Communities United States Canada	Articles II and III of the *GATT 1994* Articles 2.1 and 2.2 of the *TRIMs Agreement* Article 2 of the *Rules of Origin Agreement* Article 3 of the *SCM Agreement*

Source: WTO website

Brazil-Autos case and Philippines-Autos case were supposedly settled and thus the panel was not established. Besides the two cases, every case was reviewed by the body of panel and was found in violation with the WTO obligations. India-autos and Canada-autos case went on to the Appellate Body, where most of the panel findings were upheld. The most recent case, the China-auto parts case, was concluded in 2009. It also went on to the Appellate Body and the most of the panel finding was upheld. It is slightly different from other cases in that the subject concerned in this case is confined to auto parts instead of autos.

These dispute cases provide with valuable literature for the interpretation and enforcement of performance requirements in the WTO. Therefore, in this section the above cases will be reviewed by each relevant provision in the WTO agreement. In doing so, it will stand out what are the issues and problems in the current regime, and how it relates to the realization of loopholes and limitations of the current system and furthermore, suggestions and guidelines for the multilateral investment regulations.

1) GATT 1994

Tariff and tax benefits were the most common form of local content rules disputed in the cases in <Table 4-1>. In this kind of local content requirements, preferential tariff treatment is provided for cars using more domestic parts and components. This is different from mandatory local content rule in that import is allowed regardless of the amount of local content in the product. There are basically two kinds of tariff discrimination: differentiated tariff rates according to the amount of local content, and the other is imposing different tariffs on products by shifting tariff classification based on the local content rates. Sometimes the preferential treatment expanded to domestic tax system, such as excise tax or corporate tax. Preferential domestic tax can have equivalent effect as tariff.

Among the six cases pertaining to the performance requirements, there was no case that did not allege violation of GATT 1994, and nearly all of them were in fact found to be inconsistent with GATT obligaitons. Article I:1, III:4, XI:1 are the most frequently invoked provisions. Canada-Autos case[36] and Indonesia-Autos[37] case were invoked under Article I:1; and Canada-Auto case, Indonesia-Auto case, and India-Auto case were addressed under Article III:4. There are also pre-WTO cases regarding host country's measure in foreign investment invoked under GATT: Canada-Foreign Investment Review Act(FIRA)[38] in 1984 and EC-Regulation on Imports of Parts and Components in 1990[39] were addressed under Article III:4.

Mandatory local content rates in percentage of value of the product, or deletion list can be categorized as quantitative restrictions, and therefore found in violation of Article XI:1 of GATT and also Illustrative List under Article 2 of TRIMs Agreement, and thus directly prohibited in the current WTO regime. They are also found violating Article III:4 of GATT 1994 because it discriminates foreign parts and components against domestic products.

In viewing the concerned requirements, foreign investor and host government have quite the opposite perspectives. First, host government does not recognize products manufactured by foreign investors in its territory as domestic products until they qualify for

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[36] Panel Report on Canada-Certain Measures Affecting the Automotive Industry(WT/DS139/R, WT/DS142/R), Appellate Body Report on Canada-Auto(WT/DS139/AB/R, WT/DS/142/AB/R)

[37] Panel Report on Indonesia-Certain Measures Affecting the Automotive Industry(WT/DS54/R, WT/DS55/R, WT/DS59/R, WT/DS64/R)

[38] Panel Report on Canada-Foreign Investment Review Act(BISD 30S/140)

[39] Panel Report on EC-Regulation on Imports of Parts and Components(BISD 37S/132)

some value added requirements, such as local content requirements.   Thus, the host government would provide due treatment for foreign products, mostly imposing tariff. When the product contains substantial amount of locally procured contents, then it is granted 'preferential' treatment against products from third country.   On the other hand, foreign investors see that their products should be accorded no less favorable treatment than the domestic products.   They regard their products not as foreign products and therefore not subject to border measures imposed on imported goods.

It would be interesting to see which perspective the WTO panel and appellate body reports take in finding the cases; how they categorize foreign investor's products in the host country: domestic or not.   Subsequent question derived from this observation is what are the criteria determining the nationality of products.   Interpretation of MFN and national treatment of course comes to the forefront in this matter.   Therefore, among all the provisions of GATT 1994, Article I and III are the most relevant and key provisions to be studied with particular attention.

(1) Article I:1 MFN Treatment

Basically, most favored nation clause in Article I:1 means that a contracting party shall extend foreign goods any preferential treatment given to any third country. Narrowly defined, the MFN treatment refers to equal treatment for all foreign goods, and the it refers to the equal treatment in the border measures, namely tariffs.   Thus, most of the disputes concerns claims about better treatment for products from certain origin.

There are two cases which invoked Article I:1 to allege violation of performance requirements..   The GATT regulates customs duties and internal taxes differently.[40] Internal taxes such as sales tax or consumption tax are covered under Article III, and ordinary customs duties are dealt with by Article I or II.   Here, GATT I:1 is applicable when it comes to preferential tariffs or tariff exemptions on imports based on its origin.

Such customs duty exemptions have been found inconsistent with GATT I:1 in Indonesia-autos case[41] and Canada-autos case.[42]   In Indonesia-autos case, it was found that *"sales tax exemption and customs duty exemptions* (awarded to Korean imports) *are inconsistent with GATT I:1 in that the concerned measures accords advantage to certain product", and they* were *"not accorded to all like products",* and *"advantage*

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[40] Para. 5.4 in the EEC –Regulation on Imports of Parts and Components(L/6657-37S/132)

[41] WT/DS54/R, WT/DS55/R, WT/DS59/R, WT/DS64/R

[42] WT/DS139/R, WT/DS142/R

was made conditional on criteria that is not related to the imported product itself."[43]

Canada-autos case was brought to the WTO by Japan and the EC, for its duty waiver to Big3 affiliated imports from the United States and Mexico under the Auto Pact[44] between the United States and Canada. The panel also found that the *"import duty exemption is inconsistent with GATT I:1 in that, Canada granted an advantage to some products for some members, not all members"*, and they were *"not accorded to like products from all members."*

In addressing the above two cases, the first questions would be; are products concerned in the case like products; and if so, under what criteria. However, in both cases, when examining Article I:1, the panel did not go through the scrupulous reasoning to verify whether the discriminated products were like products. Are they entirely foreign products? Were the preferential treatment given based on product's nationality or other criteria? The preferential treatment was not accorded to all Korean cars exported to Indonesia, but only for those which met the conditions. Also in the Canada's case, there were clear requirements to be applied by the favorable treatment. However, WTO just found that the favor granted to imports from Korea or Canada was not accorded to the imports from other origins immediately and unconditionally.

Actually, findings under Article I were not directly related to performance requirements, but they reflect how the product is evaluated in terms of geography and value added. The WTO's view is limited so that it understands foreign products as homogeneous, with no possible variation or exceptions. In fact, there are numerous phases and status in terms of product nationality: some products are not entirely domestic while some products are not entirely foreign. In this highly globalized business world, the manufacturing process is widely disintegrated so that there are hardly any products which are produced as a whole in a single country. In that sense, the criteria to determine whether one product is domestic or foreign might not be where the final process took place, but where the major portion of value were added. If that is the case, preferential tariff on products with high percentage of local content are more than justified because those are closer to domestic product.

The second question concerns not the product but the relationship between countries. Some countries are bound by preferential trade agreements including FTAs. The issue of preferential trade agreements was also covered in the Canada-Autos case. In the panel procedure, Canada claimed that the concerned preferential treatment to auto imports from the United States and Mexico could be justified by the NAFTA agreement

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[43] To find more detailed facts related to this case, see Chapter IV. 3. 1) (2)

[44] To find more detailed facts about the Auto Pact, see Chapter IV. 3. 3) (1)

and Article XXIV of GATT. However, it did not make the case because the i) duty exemption was provided to third countries not parties to the free trade area, and ii) the treatment was not accorded to all manufacturers operating in the free trade area. Thus, the Auto Pact was found in violation of GATT I:1, and was terminated since February 18, 2001. EC originally claimed that Canada and Mexico was not free trade area at the time of concerned measure, and that Auto Pact lacks the legal validity authority to be addressed under Article XXIV.

Therefore, strictly speaking, the panel reports did not give findings on the legitimacy of the performance requirements, but they just pointed out that there was discrimination pursuant to the origin of the imports.

Thus, so far there have been no case where performance requirements in the investment measure were examined under Article I:1. Also it seems hardly likely that the MFN principal applicability can be raised in any later case. The MFN principle is only meaningful when it deals with foreign products. 'The most favored nation treatment' means the most preferential treatment accorded to products from any countries except domestic products. Therefore, if the portion of regional value content(RVC) of a certain product is so large against the total value that the product can be regarded as domestic product as in the concept of Rules of Origin[45], the concerned product can be under more preferential treatment exceeding the MFN treatment. That is, these products can be immune from the MFN principle test.

Nevertheless, there are dozens of countries who signs preliminary agreements that liberalize trade on certain products before the principal FTA agreement is concluded, generally under the name of Early Harvest Programs, although most of the products in the list are usually automotive parts and components.

(2) Article Ⅲ National Treatment

Article III is the most frequently addressed provision in the performance requirements related cases: in fact, every case were examined under Article III. Sales tax and customs duty benefits in conjunction with local content ratio requirements were found inconsistent with GATT Article III:4, in Indonesia-autos case, India-autos case[46], and Canada-autos case.

In Indonesia-autos case, the sales tax and luxury tax exemption based on local

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[45] The relationship between local content requirements and rules of origin will be covered in more detail later in section 2.

[46] Panel Report on India-Autos(WT/DS146/R, WT/DS175/R)

content rates were found in violation of Article III, because the discrimination was simply based on its origin or lack of sufficient local content. The panels opinionated that *"…in our view, such an origin-based distinction in respect of internal taxes suffices in itself to violate Article III:2…"* In India-autos case, the measure at issue was the indigenization requirement and trade balancing requirement and was brought to the WTO.[47] Regarding the trade balancing condition, the panel noted that *"additional burden not incurred upon the purchase of a like domestic product obviously affect the competitive conditions of the imported products."* In Canada-autos case, the CVA requirements were deemed to *"modify the conditions of competition between domestic and imported products,"* and *"thereby resulting in less favorable treatment to imported products."*

Article III bears the most importance in addressing the issue of performance requirements throughout the current system governing FDI. The principle of non-discrimination is a core and quintessence of not only WTO obligations and but also the general international economic law. In fact, in the TRIMs Agreement the exact provision of Article III of GATT is borrowed.

Most of the legal findings above mentioned invited the notion of origin of the products, in examining the validity of the concerned measure within the meaning of Article III. Here, if the measure at issue is border measure, it is not proper to be reviewed under Article III. However, in these cases, the border measures and internal measures are both addressed without clear distinction under Article III.

Relevant case regarding this argument is the China-Autos case. This case is a little different from the previous cases; here, the key issue was whether the measure at issue was border measure or internal measure. Chinese customs authority were levying tariff for complete vehicle for some parts instead of parts tariff, if they were regarded as having the character of complete vehicle. Complainants claimed that their products were taxed in excess of the like domestic products, while China argued that it was border measure, and thus they do not fall within the scope of Article III. If it were acknowledged that the parts concerned, used in the production of those cars with foreign brands, are considered as imported parts, China could claim that it can levy tariff which is not imposed on domestic parts. About the level of tariff issue, China could have imposed tariff rates higher than parts tariff on those core parts with the character of complete vehicle, under new tariff lines e.g. CKD. The panel upheld complainants' arguments and found that the Chinese customs measure was in violation with the national treatment principle. However, it does not clearly show how it reached the conclusion that the measures are not border measures.

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[47] To find more detailed facts related to this case, see Chapter IV. 3. 3) (2)

Generally, when disputing a certain measure under Article III, the prerequisite for the application of Article III is the likeness of the products which are alleged to be treated discriminatorily. In Indonesia-autos case, India-autos case, and Canada-autos case, which provoked Article III, 'likeness' of parts procured from local suppliers and imported parts from mostly the investor's home country were examined.

There is the issue of interpretation of 'llikeness' in the the non-discrimination principle. Diebold(2010) claimed that the applicable standards of non-discrimination is highly fragmented in the different sphere of economic activities as above mentioned. He argued that there are at least four kinds of application standards of non-discrimination principle: objective standard, economic standard, subjective standard, and combination of standards. He analyzed that the fragmentation is caused in the process of identifying relevant *tertium comparationis*[48].

Applying the objective standard or economic standard, it is more likely that domestic parts and imported parts, or domestic supplier and foreign supplier are viewed as 'like' because they are in the same sector[49] and in a competitive relationship as well. Therefore, when interpreting the concept of non-discrimination in an objective or economic point of view, preference for local procurement is likely to be found as violation of non-discrimination.

However, when applied by subjective standard, the result can be different. This standard has been developed by various adjudicating bodies in order to balance the weight between international obligations aimed at trade and investment liberalization, and domestic non-economic policy objectives such as environment and consumer protection, and economic development. Here regulatory purpose kicks in as the *tertium comparationis* as Diebold claimed. For example, if the measure is designed to protect the environment, then the products are compared on the basis of their environmental impact. PPM(Process and Production Method) and LCA(Life Cycle Assesment) principle reflect environmental protection purpose applied in the interpretation of the non-discrimination clause. Likewise, if the measure was drawn up for the purpose of industrial development, then the products can be differentiated as long as they have different effect on industry development. This kind of teleological interpretation is becoming more prevalent these days, especially in the European court. Are the vehicle mainly composed of parts produced locally and the vehicle produced with mostly imported parts similar products in

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[48] The quality of element which two 'situations' or 'objective' must have in common in order to conclude that they are 'alike' for the purpose of the comparison.

[49] NAFTA rules on investment protection adopted the economic interpretation of the 'like circumstances' concept as being in the 'same sector'.

terms of the industrial development effect of the host country? Then could not the differential tax treatment be justified as a legitimate policy instrument of the host government just as tariff is justified? Perhaps the question is not whether the foreign and domestic suppliers or investors are in like circumstances but whether the differential treatment occurs in 'like circumstances'.

(3) Article XI:1 Quantitative Restriction

Quantity restrictions with regard to local content can take the form of deletion programs or mandatory local content rates rule. These kind of LCR were often witnessed in the very early years of industrialization in the developing countries, from 1960s through 70s, and in some countries up to 80s. Quantitative limitations on imports are strictly prohibited under GATT XI:1, which provides as follows;

> *"No prohibition or restrictions other than duties, taxes, or other charges whether made effective through quotas, imports or export licenses or other measures shall be instituted or maintained by any Member on the importation of any product…"*

Three cases invoked Article XI: India-autos case, Brazil-autos case, and Philippines-autos case. However, the latter two cases were settled before the panel was established, and only India-autos case was reviewed by the panel. In this case, the indigenization requirement and trade balancing requirement were found to be violating Article XI:1, in that the indigenization requirement was import license based on local content level. The actual language of the panel finding was somewhat broad interpretation of this Article. It said, "any form of limitations imposed on, or in relation to importation constitutes a restriction on importation within the meaning of Art. XI". Also the trade balancing requirement was found in violation of this Article because it was restrictive condition placed on importation of the product and limit the amount of imports in relation to the export commitment; and thus acted as a restriction on the importation within the meaning of Article XI:1.

There seems to be no controversy on this ruling: if any kind of license is required to import certain parts or components or the foreign investor is obligated to export certain percent of locally produced products, it can be ruled as quantitative restriction and thus can be found in violation with GATT. However, preferential tariff or tax system based on the local content rate, the most common form of local content requirements, is not

relevant with quantitative restrictions.

2) SCM Agreement

The SCM Agreement has close relevance to performance requirements including LCR. First of all, Article 1.1 of SCM Agreement concerns foregone revenue that is "otherwise due", that is financial rewards in the shape of tax discount, and tax redemption which are government revenue foregone. Those preferential sales tax or tariff incentives in the Local Content Requirements are also "foregone revenues", and thus lie in the coverage of SCM Agreement. In fact, these measures function as subsidies to certain car makers or parts suppliers because manufactures employing larger quantity of local content get financial rewards in the shape of tax discount, tax redemption, or other financial benefits. This results in uneven competitive relationship between foreign investors since it constitutes *de facto* subsidy for the investor procuring inputs from local suppliers, and thus becomes the object of SCM Agreement.

SCM Agreement is widely mentioned in the performance requirements related cases. Many trade law scholars including Edwards and Lester(1997) have recognized that the fundamental concept of LCR is subsidy. Since the 'subsidy' in the meaning of SCM Agreement include general preferential treatment that can be converted to monetary value as well as cash infusion from the government, it can actually be applied to almost every measures regarding terms of trade. Indeed, every case except India-autos case invoked SCM Agreement to claim the case.

(1) Article 3.1(a) and 3.1(b): 'prohibited subsidy'

Article 3 addresses 'Prohibited subsidies'. Article 3.1(a) refers to export subsidy and 3.1(b) deals with subsidies contingent upon use of domestic over imported goods. Therefore, export contingency stated in Article 3.1(a) can be applied to export obligation or export performance requirements. Tariff/tax benefits based on local content rates can be examined under Article 3.1(b) which refers to subsidies contingent upon use of domestic over imported goods.

In Canada-autos case, the production to sales ratio requirements and CVA requirements were found as prohibited subsidy. The panel reviewed the ratio requirements under Article 3.1(a) and CVA requirements under Article 3.1(b). The duty exemption in conjunction with the ratio requirements was a prohibited subsidy contingent in law upon export performance within the meaning of Art. 3.1(a), because the amount of

the duty exemption earned by a domestic manufacturer was directly dependent upon the amount exported. Extending to subsidies that are contingent *in fac*" upon the use of domestic over imported goods, CVA requirements were also found as violation of SCM Agreement under Article 3.1(b).

China-Autos case briefly mentioned SCM Agreement. China argued that the measure was to prevent tariff circumvention for some parts, but the Panel upheld complainants' accusation that the measure worked as a subsidy for Chinese parts, because additional duties on imported parts were *in fact* favoring the use of domestic parts.

(2) Article 5(c): 'actionable subsidy'

Article 5 falls under the part of 'actionable subsidy'. While most of the performance requirements are reviewed under Article 3.1, Indonesia-autos case was the only occasion when Article 5 was provoked. In Indonesia-autos case, the panel found that the duty and sales tax exemptions under the 1996 National Car Program were "specific subsidies" which had caused serious prejudice through significant price undercutting under Article 6.3(c) to like imports of EC imports under Article 5(c). Unlike the Canada-autos case, Indonesian regulations did not require export performance in granting favorable treatment. In this regard, the 1996 National Car Program was reviewed under Article 5(c) instead of Article 3.1, and instead 'specificity' was the key issue. In this case, the 1996 measure did not specify a certain manufacturer, but since the favorable treatment was granted pursuant to the use of domestic parts over imported parts, the specificity was acknowledged.

3) GATS

GATS also address investment issues in its mode 3: supply of services, i.e. commercial presence, as stipulated in Article I:2(c).[50]   Therefore, there is a shared issue between the GATS and the prospective multilateral investment agreement.   However, it might possibly cause juridical conflicts in terms of legal principles, jurisdiction, and sometimes economic aspects.   The GATS define country of origin of services based on the different mode of supply.   In the first two modes of supply, the concerned service acquire the origin of services supplying country, i.e. host country in our language; whereas in commercial presence or presence of natural persons, the origin of service follows the origin of service supplier.   Therefore, the origin depends on the ownership or the equity structure of the service supplier.   If Hyundai's distributor in South Africa is subsidiary of Hyundai Motor Company in Korea, the origin of services provided by the distributor is Korea; but if it is the independent corporation, its origin would be South Africa.

(1) Article II:1 Most-favored-nation treatment

Canada-Auto case is the only WTO disputes case provoked under GATS. Complainants challenged Canadian government's import duty exemption scheme favored wholesale services and service suppliers of the United States, violating the MFN treatment of GATS.   Canada argued that the duty exemption was accorded to only goods, but not the services. In this part of case, Canada won in the Appellate Body Process, which reversed most of the panel finding.

There were a couple of important issues in this case.   First, it touched upon origin of the service supplier and vertical integration of automotive industry. Determining the origin of the supplier can be tricky sometimes especially when the ownership of the supplier is dispersed.   There are many joint venture firms and plants in FDI in the automotive industry.   In fact, Panel failed to determine the country of origin of CAMI, which was a 50:50 joint venture company between Suzuki and GM.   There are

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[50] *Article I. Scope and Definition*

2. For the purposes of this Agreement, trade in services is defined as the supply of a service:

(a) from the territory of one Member into the territory of any other Member;

(b) in the territory of one Member to the service consumer of any other Member;

(c) by a service supplier of one Member, through commercial presence in the territory of any other Member;

(d) by a service supplier of one Member, through presence of natural persons of a Member in the territory of any other Member.

numerous 50:50 JVs established in China. Vertical integration is another sensitive issue in the automotive industry.   The key issue is whether the distributor deals with brands only from its affiliates or it can carry multiple brands.   It has issue linkage with competition.

(2) Article XVII National Treatment

Article XVII of GATS provides National Treatment principle as follows:

1.   In the sectors inscribed in its Schedule, and subject to any conditions and qualifications set out therein, each Member shall accord to services and service suppliers of any other Member, in respect of all measures affecting the supply of services, treatment no less favourable than that it accords to its own *like* services and service suppliers.

2.   ……

3.   Formally identical or formally different treatment shall be considered to be less favourable if it modifies **the conditions of competition** in favour of services or service suppliers of the Member compared to like services or service suppliers of any other Member. (Emphasis added)

In essence, it looks analogous with its counterpart provision in GATT.   Here, as in GATT, no less favorable treatment is conditioned on 'likeness' and equal 'competitive relationship'.   Panel in the Canada-Autos case examined the discrimination effects by each mode of service supply.   Interestingly, the Panel found that the CVA requirements did not discriminate between Canadian service suppliers and foreign suppliers present in Canada, though it saw *de facto* discrimination between services provided by the suppliers of Canada and other countries.

However, there still is confusion in service supplier's origin issue.   In fact, it is not clearly stated in the language of the agreement, how to determine the rules of origin of services.   In the EC-Banana case, country of origin of the service supplier was determined based on multiple criteria: the ownership or control test and the substantive business operation test.   They would mostly lead to the same results, but sometimes they might bring about conflicting interpretation.   Therefore, clarifying the origin issue would be an important task to be tackled by WTO and GATS, or some new treaty governing investment matters.   It needs to be harmonized and elaborated.

4) TRIMs Agreement

TRIMs Agreement, as an integral part of the WTO agreements, prohibits trade related investment measures that are inconsistent with Article III of GATT, mostly performance requirements as stipulated in Article 2.1 and 2.2[51] and the Illustrative List in the Annex of the Agreement. This agreement most directly forbids performance requirements among the many WTO rules.

TRIMs including local content requirements were seen by MNCs as a constraints in doing business worldwide. US also were enthusiastic supporter for MNCs. Therefore, it played a vital role in concluding TRIMs Agreement at the Uruguay Round negotiation. However, US were not the advocate of MNCs from the beginning. As inward FDI increased in the United States by Japanese firms in the early 1990s, there were growing demands to ensure that foreign firms have sufficient local content and contributed to the United States economy and technology base, but these demands died down as the pace of inflows of investment slowed down, and the general recognition that Japanese investors had overpaid for their investments was spread.[52] If inward FDI kept increasing afterwards, the TRIMs agreement might have been different from what it is now.

Thus, TRIMs Agreement came into being. So far, it is the most newly built instrument treating the international investments. However, it is hardly an investment treaty in many aspects. It needs to be further scrutinized whether it is well balanced and legally reliable agreement in light of the negotiating history and stakes by different groups of countries.

(1) Establishing the Measure as Trade-Related-Investment-Measure

In examining performance requirements under this agreement, it should be first established that the concerned measures are investment measure. In the India-Auto case and Indonesia-Autos case, the panel first examined the existence of TRIMs, whether measures are investment measures. There was a debate on whether performance

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[51] *Article 2 National Treatment and Quantitative Restrictions*

*1. Without prejudice to other rights and obligations under GATT 1994, no Member shall apply any TRIM that is inconsistent with the provisions of **Article III or Article XI of GATT 1994***

2. An illustration of list of TRIMs that are inconsistent with the obligation of national treatment provided for in paragraph 4 of Article III of GATT 1994 and the obligation of general elimination of quantitative restrictions provided for in paragraph 1 of Article XI of GATT 1994 is contained in the Annex to this Agreement.(emphasis added)

[52] Lawrence(1997)

requirements were trade measure or investment measure in both cases. Both of the defendants claimed that the measures at issue were trade measure and not investment measures, and thus cannot be ruled in the context in the TRIMs Agreement. Thereon, panel found that the concerned measures were investment measures as follows.

> *"…We find that these measures are aimed at encouraging the development of a local manufacturing capability for complete motor vehicles, and parts and components in Indonesia. Inherent to this objective is that these measures necessarily have a significant impact on investment in these sectors. For this reason, we consider that these measures fall within any reasonable interpretation of the term "investment measures."[53]…"*

It is odd that these two countries both claimed that the LCR was trade measure, instead of investment measure. It can be presumed that the reason India made this claim is that these measures are clearly prohibited in the TRIMs Agreement, with hardly any room for extenuation. It was definitely losing game for them if the panel examined the measure under TRIMs Agreement, while they could give it a try to make their case under GATT or SCM Agreement.

These performance requirements, named as 'trade-related-investment-measure' can be indeed seen both as investment measure and trade measure. However, in essence, performance requirements are investment measures since they are imposed on foreign investors, and their impact on trade is incidental. The DSB first examines whether they are investment measures, and then move on to find their trade-relatedness. In Canada-autos case and China-auto parts case, , TRIMs agreement was provoked but unfortunately, the Panel exercised judicial economy and did not make finding on TRIMs Agreement because the measures already were found to be inconsistent with Article III:4 of GATT.

If the measure at issue proves to be both investment measure, and related to trade, it is whether the concerned measures are covered in the Illustrative List in the Annex, and at the same time, whether they are consistent with Article III of GATT. In Indonesia-autos case, the Panel found the 1993 Program to be in violation of Art. 2.1 of TRIMs Agreement because the measure was a "trade-related investment" measure; and the measure, as a local content requirement, fell within paragraph 1 of the Illustrative List of TRIMs in the Annex to the TRIMs Agreement, which sets out trade-related investment measures that are inconsistent with national treatment obligation under GATT Art. III:4.

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[53] Panel Report on Indonesia-Autos, WT/DS54/R, WT/DS55/R, WT/DS59/R, WT/DS64/R

(2) National Treatment and Quantitative Restrictions

Article 2.1 of TRIMs Agreement specifies National Treatment principle as in GATT 1994. Thus, TRIMs Agreement prohibits those measures by the host country that can discriminate foreign investor merely based on its nationality, and significantly changes competitive relationship between domestic products and products by the foreign investor. In other words, National Treatment principle is at the core of this short agreement.

However, it is noteworthy that there is no separate article laying down the Principle, as in GATT or GATS[54]. The scope and definition of National Treatment in TRIMs Agreement is vague to some extent. The scope of National Treatment in GATT is foreign goods in comparison with domestic goods, whereas it would have to be foreign investors and their products in comparison with domestic firms and their products in Investment Agreements. Based on common sense, since it is investment agreement, though it is trade-related, it should be dealing with investor as well as its products. However, when it clearly quoted provisions of GATT 1994, it would be improper to go beyond the established legal interpretation arbitrarily, and on the other hands, it is questionable if it is acceptable to just borrow the core principle from other agreement, and that from trade agreement instead of investment agreement. Of course, there can be opinion that TRIMs Agreement cannot be seen as investment agreement. However, then it is worth consideration whether TRIMs Agreement is a trade agreement.

Also, quantitative restrictions that mandate use of domestic products or exportation of the products produced by the foreign investors are prohibited again in TRIMs Agreement. As in the Article XI of GATT, this part of TRIMs Agreement can do without controversy.

(3) Illustrative List[55]

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[54] There is a separate article for National Treatment in GATS: Article XVII articulated that the concept of non-discrimination is applied to both the service and service provider.

[55] *Illustrative List in the Annex of TRIMs Agreement*

> *1 TRIMs that are inconsistent with the **obligation of national treatment provided for in paragraph 4 of Article III of GATT 1994** include those which are mandatory or enforceable under domestic law or under administrative rulings, or compliance with which is necessary to obtain an advantage, and which require:*
>
> > *(a) the purchase or use by an enterprise of products of domestic origin or from any domestic source, whether specified in terms of particular products, in terms of volume or value of products, or in terms of a proportion of volume or value of its local production; or*
> >
> > *(b) that an enterprise's purchases or use of imported products be limited to an amount related to the volume or value of local products that it exports.*
>
> *2. TRIMs that are inconsistent with the **obligation of general elimination of quantitative restrictions***

Illustrative List of TRIMs Agreement enumerates various performance requirements as prohibited. They are local content requirements, trade balancing requirements, foreign exchange balancing requirements, import restrictions, and domestic sales requirements. If the measure falls under one item of the list, it then be prohibited as unlawful measure. Due to the existence of this List, there is practically no chance of evading the WTO law with performance requirements under the current system.

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provided for in paragraph 1 of Article XI of GATT 1994 *include those which are mandatory or enforceable under domestic law or under administrative rulings, or compliance with which is necessary to obtain an advantage, and which restrict;*

> *(a) the importation by an enterprise of products used in or related to its local production, generally or to an amount related to the volume or value of local production that it exports;*

> *(b) the importation by an enterprise of products used in or related to its local production by restricting its access to foreign exchange to an amount related to the foreign exchange inflows attributable to the enterprise; or*

> (c) the exportation or sale for export by an enterprise of products whether specified in terms of particular products, in terms of volume or value of products, or in terms of a proportion of volume or value of its local production.(emphasis added)

2. Issues and Problems in the Current System

1) Questioning the Efficacy of the Current System

(1) Circumvention of Tariff by disguised FDI

One of the policy objectives of local content requirements in most countries is to deter circumvented trade by foreign companies. In fact, considerable number of vehicle manufacturer export KD kits under tariff lines imposed on parts and components to the market country and sell complete cars duty free after assembly process. This is called KD export strategy, substituting for CBU export strategy when penetrating a market with high tariff barriers. Also, this strategy is particularly effective when the target country's tariff structure is escalated. In many countries, automotive industry is subject to escalated tariff structure, where tariff moves higher as the goods are more processed with more value added: that is, lower tariff is imposed on parts and components and higher tariff is imposed on complete vehicles.[56] It is alleged that this structure is extensively used among developing countries because it helps raise the degree of protection.

However, it is often not so much for the protection purpose as it is widely believed when it comes to the local manufacturers' procurement cost. Usually, developing countries' parts industry is underdeveloped, and therefore local manufacturers depend largely on imported parts to build the complete vehicle. In this supply chain structure, high tariff on parts lead to high cost in manufacturing cars, leading to poor competitiveness of the local auto makers. Therefore, many developing countries set low tariff on parts and components whereas they keep tariff on complete cars very high.

In this background, it gives foreign manufacturers incentives to build assembly sites in the market by importing CKD kits from their home country at a much lower tariff. In other words, there are FDI in certain cases with a view to circumventing tariff. This happened most often in the Southeast Asian countries and also BRICs countries, where the tariff barrier is relatively high, and also escalated. In the initial stage of local production,

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[56] China, most ASEAN countries, EU, most Latin American countries have this kind of tariff structure. Exceptions are US, Korea and Australia which impose same tariff rates on complete cars and parts.

<Table > Tariff structure of automotive industry in various countries

	United States	EU	China	Korea	Malaysia	Brazil	Australia	India
Cars	2.5%	10%	25%	8%	30%	35%	10%	100%
Parts and components	2.5%	3~4.5%	10%	8%	25~30%	18~35%	10%	12.5%

the motivation was to circumvent the high tariff of these countries. If we look at the list of defendant countries in the WTO cases regarding the performance requirements, we can easily notice that they are mainly ASEAN or BRICs countries.[57] They are developing countries with their automotive industry at an early and growing stage, and of course with high tariff barriers as well as escalating tariff structure. China tried to prevent circumvented exports by foreign manufacturers by treating KD modules containing core parts such as powertrain and transmission with higher tariff, as was the subject of conflict in China-Autos case, but to no avail.

In fact, there is some disparity in situation between ASEAN and BRICs. In India and China, the domestic market size is large enough for the foreign investors to fulfill economies of scale. Therefore, auto makers can build production facility with large production capacity, and oftentimes they are accompanied by investments by their own subsidiaries or committed suppliers. In this way, these foreign manufacturers can form their own supplier networks along with the vehicle assembly line. However, in ASEAN countries, their market size is not so big enough to build large capacity plants with annual production capacity over 300,000 units. Usually, the plants operated in ASEAN region are with annual production capacity around 50,000 units, not exceeding 100,000 units at most. With this small to medium size operation, the investors cannot develop their own supplier network nor is it easy to procure from local suppliers due to quality problems, standard issue, and various others reasons.[58] Therefore, ASEAN countries are more easily exposed to circumventive imports by foreign auto makers and thus these countries tend to keep local content requirements. Even China and India are sensitive about the circumventive imports, and they used to enforce local content requirements.

However, the current system prohibiting local content requirements cannot prevent from these practices by foreign firms. These rules are designed to protect firms engaged in international business, but equal weights should be weighed on the prevention of circumventive or abusive activities by multinational corporations, and the system should not indulge in the transgression of the rules.[59]

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[57] Russia is still under the negotiation stage to join the WTO and thus not a member of WTO yet. Russia has all the common characteristics of developing countries trade barriers. The tariff is relatively high(25% for the complete passenger vehicles) and the tariff structure is escalated. Also, Russian government is regulating local procurement schedules for locally producing foreign manufacturers. See Appendix II. 4 for more detail.

[58] As explained in Chapter III, outsourcing is not a simple matter in the automotive industry due to its closed and integral architecture.

[59] There was a dispute regarding the alleged circumvention of duties by a foreign firms and the host country's attempt to block them by levying anti-circumvention duty, the EEC-regulations on parts and components case. At the time, the panel did not acknowledge EEC's arguments.

(2) Rules of Origin as a Substitute for Local Content Requirement

In fact, many countries are controlling the level local contents produced by foreign manufacturers in their territory, without violating the WTO obligations.   Ironically, many of them are developed countries.   It became possible by the proliferation of FTAs and the preferential Rules of Origin as a part of them.   This is not *de jure* performance requirements, but can act as *de facto* performance requirement.   It is largely utilized especially in countries belonging to a large economic bloc; the model example is the United States as a member of NAFTA.

For instance, since North America became the free trade area bound by NAFTA, global enterprises began making direct investments in this region in order to take advantage of the huge market.   These firms construct production facility in one of these countries and goods produced in these plants are exported duty-free to NAFTA area and sometimes to Latin American countries.   Many global vehicle manufacturers are operating production facility in the NAFTA region.   Initially, they target consumers in the host country only, but as they build-up the facilities to a larger scale, they begin to expand their coverage to the adjacent markets, mostly within the economic bloc.   In order for the host government to prevent circumvent trade, and for the foreign investors to benefit from the preferential tariff treatment, the foreign investors have the burden of proving the domestic origin of the products when they export their products to countries within the free trade area.

When exporting its cars from India to Thailand, Toyota can be treated with preferential tariff by Thailand, as long as the Thai authority acknowledges that the Toyota vehicle was made in India by fulfilling the percentage of Regional Value Added.   In other words, to be subject to the preferential tariff under the FTA, the manufacturer should prove that the concerned product was produced within the Indian Territory.   Here, Rules of Origin kicks in to determine whether the cars are indeed 'made in India'.   Since these days manufacturing process is decentralized globally, one cannot conclude the nationality of a product by looking at where the final process took place.   Among some criteria of determining the nationality of the product, the most commonly used criterion is the 'Regional Value Content' standard[60], i.e. percentage of local value.

Specific rules of origin are different from products to products, and as for the automotive products, the rules are usually tighter than other products.   Generally, the products have to meet the two criteria: changes in tariff classification criterion and regional value added criterion.

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[60] Along with RVC standard, 'Change in tariff heading' standard is the most commonly used method in the automotive industry when determining the origin of the good.

There is an increasing tendency that local content rules are implemented through Rules of Origin rather than tariff differentiation or tax benefits.   It is a relatively recent phenomenon, since the proliferation of Free Trade Agreement.   It has also something to do with the global auto makers' global production strategy: basically they pursue localization, but not just in terms of sales market but also considering the relevant market in terms of segment.   For example, Toyota has built production facility manufacturing 300,000 units of small segment vehicles in India.   Vehicles produced there are principally for sales in India but not all of them.   Some of them are exported to neighboring countries like Thailand and Malaysia, or sometimes to Europe, or even to Brazil, where small size vehicles are dominant segment.   In this case, India is the manufacturing hub of small segment vehicles and it is also an export base of Toyota in the South Asia region.

Thus, Rules of Origin was devised as a technical regulation necessary in the field of international trade and transactions, but combined with the preferential trade agreements; it becomes economically significant item, so as to influence trade flows or investment decision.   Falvey and Reed(1998) recognized that ROO has trade-diverting effect; Krishna and Krueger(1995) found that ROO have export protection effect.   More recently, Cadot et al(2005) demonstrated that ROO can work as an export subsidy with an theoretical and empirical analysis of the Mexico's exports to the US under the NAFTA Rules of Origin.   They found out that in order to export goods from Mexico to the US duty-free, they are forced to buy US intermediate goods, and therefore the preferential tariff treatment on the condition of acquiescence to the ROO, in fact work as an export subsidy for the US intermediate goods industry.   Duttapupta and Panagariya(2002) proved that FTA becomes joint welfare diminishing after inclusion of ROO, in a theoretical model. What these economists tried to show that ROO is as a matter of fact trade protection measure, and therefore undermine the economic benefit of free trade arrangements. However, we need to note on the fact that the similarity between their arguments and what the WTO panel has made.   Like the Rules of Origin, LCRs have been oftentimes accused of the same charges: they distort or divert trade, protect domestic firms from foreign imports, work as a export subsidy, and provoked under GATT and the SCM Agreement.

One does not have to look up the academic articles in search for the theoretical evidence.   It is happening in the automotive industry everywhere in the world, in the United States, Europe, and Southeast Asian countries.   For example, if Toyota produces vehicles in Mexico and exports those to the US and Canada duty free, it has to procure most of the parts and components needed from local suppliers.   In NAFTA, the value-added necessary for the passenger vehicles to qualify as originated from NAFTA is 62.5%

in net cost method.[61]   Toyota has achieved so high level of local procurement as to make the TPS work almost as in Japan.   Hyundai and Kia also have strived to increase their local content rates since they built the plants in the US.[62]

Thus NAFTA value-added criterion to be eligible for the preferential tariff practically does function as local content rule.   If not, those foreign makers are to be subject to the MFN tariff, not the internal preferential tariff among NAFTA countries[63]. There is no trade bloc that does not have this kind of Rules of Origin.   In the European Union, for zero tariff treatment among the 27 member countries, the regional value should be above 60%.   In ASEAN and MERCOSUR, the RVC should be above 40% and 50%, respectively.   In short, foreign manufacturers have more incentive to match the necessary regional value according to the Rules of Origin especially when the host country has struck FTAs with many countries, or it is a member of a regional economic bloc, such as EU, NAFTA, or ASEAN.   Thus, the Preferential Rules of Origin is technically not a performance requirement, but it constitutes a *de facto* local content rule in effect.

\<Table IV-2\> Value Added Criteria in Some Countries under Rules of Origin in the Preferential Trade Agreements

Party	Details
US [1)	In NAFTA ROO, 62.5% of RVC is required in net cost method.
EU [2)	In various FTAs with other countries, EU set RVC at 60%
ASEAN [3)	40% in terms of transaction value
Brazil [4)	50% of the F.O.B

Source: 1) NAFTA Annex 401 Section B: Specific Rules of Origin

     1) European Community-Mexico FTA   Annex III Appendix 2

     2) ASEAN Rules of Origin for the CEPT(Common Effective Preferential Tariff)

     3) Mercosur Treaty of Asuncion, Annex III Rules of Origin Article 2

Note: 3) and 4) are general rules of origin, whereas 1) and 2) are specific rules of origin, applied to motor vehicle products only.

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[61] The Chapter III.2(1) and Annex III of the NAFTA Agreement stipulates that manufacturers producing in the United States can export vehicles free of import charge to Canada or Mexico, only when they meet the NAFTA Rules of Origin, which is 62.5% of regional value added in Net Cost Method.   This is way higher than other tariff items in the NAFTA as well.as those in other FTAs.   For example, they are 50% in net-cost method US-Australia FTA, 40% in build-down method in AFTA, and 35% in net-cost method in US-Korea FTA.and other tariff items in the NAFTA as well.

[62] There is a grace period for this rule.   For the first 5 years of local production, the US government acknowledges domestic origin for cars with 50% of local contents.

[63] Canada's external tariff for passenger vehicles is 6.1% and Mexico's external tariff is 50%, whereas internal tariff among the three members would be 0 %.

In other words, Value Added Criteria can effectively work to promote local procurement while not violating the WTO rules. The two measures are different in name, and in legal status, but their legality is exactly the opposite: one is prohibited local content requirements and the other is legitimate tool to prevent from tariff evasion or circumvented trade. It is interesting that one of the policy objectives of LCR is to deter circumvented export by foreign investors. Moreover, how they work to promote local content is almost identical. By qualifying for the certain level of local or regional content, the product could be subject by more preferential tax or tariff treatment. Therefore, host governments can achieve the same policy goal as good as the local content requirements, with the Rules of Origin. Hence, these preferential trade arrangements and Rules of Origin make prohibition of performance agreements in the TRIMs agreement incapacitate.

Other than the efficacy issue, there are a couple of more problems. First one is equity problem. Preferential Rules of Origin is an effective tool for countries which has struck many FTAs or belongs to a large regional bloc. However, for countries with few FTA networks, it does not work the same way. For example, manufacturers have more incentive to meet the regional value criteria in the United States or in Europe, while they are not that encouraged to do so in the less developed countries such as Uzbekistan or Egypt. Therefore, it induces more investment to the already developed countries or regional hub countries, whereas it does not contribute to the development of underdeveloped countries. That is, when approached from the Rules of Origin determination rather than performance requirements, its benefits accrue to certain countries as to deepen the disparities in industrialization among countries.

Second problem is that this kind of preferential rules of origin stirs up countries to engage in more regional trade arrangements such as FTA to gain leverage so as to be qualified as the export base in the region. The biggest demerit of preferential trade agreements is the distortion of trade and impairing the benefits of MFN principle. Already, there are too many FTAs in force, and even more FTAs are in progress, under negotiation or consideration. The proliferation of FTAs can act in such a way that it lessens the countries' commitment to multilateral liberalization. As globalization of manufacturing advances more widely and deeply, countries will be motivated to engage in more bilateral arrangements, ending up with one big messy spaghetti bowl.

Also, it is conflicting with many significant goals such as investment promotion, competition, and development since it is mainly serving trade promotion purpose. This will be discussed in the next section.

2) Conflicts with Other Policy Objectives

(1) Trade vs. Investment

The basic explanation why performance requirements are prohibited in the TRIMs Agreement is that it distorts trade.[64] Without performance requirements, there would have been more exports from the home country. The foreign investor makes overseas plant so that it avoids the vehicle tariff, and also exports its intermediate goods. However, the foreign investor could have produced its vehicles in the home country without having to sacrifice its volume of exports in the first place. This is like having the cake and eating it, in the part of foreign investor. The rationale of trade-distorting effect is in some sense absurd.

From a different point of view, performance requirements can serve to promote investment into the host country. As noted earlier, local content requirements can induce more investment in the upstream industry, i.e. parts and component industry. In this sense, trade and investment can be complementary, but sometimes directly substitutable with each other: the intermediate goods could be either imported from the home country or locally produced by the foreign suppliers which made FDI jointly with the foreign OEM. That is, by imposing such measure on the FDI, the foreign investor company should buy components from local source instead of sourcing from its home country mother company or affiliated suppliers.

Thus, in situations where trade and investment are substitutable, current system is favoring trade at the expense of investment. Also, it can be said that the rule favors foreign investor than the host country. Trade and investment are the two pillars of international economy. However, due to the substitutional relationship between trade and investment, it is very likely that one pillar is repressed in order to enhance the other. Most of the time, the repressed pillar is investment. In the development point of view, FDI contributes more directly and rapidly to the development of less developed countries.

If it is desirable to promote trade, why not promote investment? If more FDI flows into the developing country, it could help develop the country's manufacturing industry and further national economy.   Between the trade flow into the country and the investment flow, which would be more efficient in its development? There are three dimension of conflict: trade vs. investment, MNC vs. host government, developed country vs. developing country.

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[64] It is also alleged that TRIMs distort investment also, but in the WTO system, the investment distortion is not yet a topic of discussion.

However, more important questions rise from this point. FDI, by its nature, substitutes trade, and thus reduces trade volume: based on this visible data, it is prohibited in the WTO because allegedly it is distorting trade. Perhaps, we should rethink the matter from ground zero. Do performance requirements indeed distort trade? Performance requirements should be distinguished from ordinary trade barriers. Performance requirements are mostly aimed at investment promotion and industrial development. It should not taken for granted that trade should have priority over investment.

Certainly, in the current system of rules, a policy objective of investment promotion is hard to enforce. If TRIMs Agreement is the predecessor of multilateral investment agreement, then it should be regulating investment distorting measures, instead of trade distorting measures? If TRIMs Agreement bans trade distorting measures, it is another chapter of GATT.

(2) Investor Protection vs. Competition

Since the first Ministerial Conference in Singapore 1996, trade and investment was regarded closely associated with competition policy issue. Roughly, there are four types of anti-competitive business practices: horizontal restraints, vertical restraints, practices by one or more firms in abuse of a dominant position, and anti-competitive mergers and acquisitions. These firm behaviors are oftentimes practiced by foreign investors, and therefore investment instruments should be able to deal with competition issues.

Focusing on the automotive industry, the biggest competition issue is vertical integration. As discussed earlier, vertical integration is the peculiarity often witnessed in the integral industry, and automotive industry is the most typical integral industry. Therefore, when an auto manufacturer first invests in a foreign country, it usually starts from KD assembly. By doing so, it can effectively penetrate a foreign market while preserving the vertically integrated supply chain. In fact, in the WTO Working Group discussion on Trade and Investment, India pointed out that many MNCs were still procuring parts and components from their subsidiary or affiliated company. This is less desirable circumstance for the host countries because it does not lead to employments, development of industry, and further macroeconomic growth impact.

Also, the intra-firm trade within the MNCs enables many anti-competitive business practices. Transfer-pricing is common in the cross-border transactions among vertically integrated automotive firms. The parent company provides parts to its overseas subsidiary at high price to reduce the profit of the overseas subsidiary. Thus, profit increases for the parent company at home, while it saves tax it has to pay to the host

country government.   This definitely would not be a desired form of investment for the host country.

Therefore, for host countries attracting FDI in automotive industry, breaking these vertical restraints would be the main policy task.   India argued that local content requirements were the handy tool for this purpose.   Hence, local content requirements in the automotive industry are related to competition policy in two ways.   It could put foreign suppliers at a competitive disadvantage, but at the same time, for host country's suppliers, it could open an opportunity to compete with vertically integrated foreign suppliers, and thus guarantee level playing field.

M&A is another issue in the investment regulation, and they occur frequently in the automotive industry, as discussed earlier.   It is true that sometimes host country's reduction of regulatory barriers in investments results in the creation of monster foreign conglomerates by M&A that builds high barriers against entry of domestic firms. General public is more repulsive towards M&A of domestic firm by foreign company. To tackle these situations, host country should be entitled to control admission and operation of gigantic MNCs, especially in the less developed countries.

Hence, the question is how and where the balance should be sought, in the protection and consideration of both the host country and MNCs. The current regime, mainly controlled by GATT and TRIMs Agreement is more inclined to MNCs rather than the host country.

(3) Trade promotion vs. Development

Almost every motor vehicle producing country has been imposing performance requirements, such as local content requirements and trade balancing requirements, for some period at least.   In general, there are several reasons:

i)   to protect the parts upstream industry.
ii)   to influence the effective protection for the final goods producers.
iii)   to preserve foreign exchange(especially trade balancing requirements).
iv)   to create a spill-over effect for the upstream industry(i.e. backward linkage effect).
v)   to build a industry cluster in the territory.

The main objective of performance requirements imposed by host country, especially developing countries, is development of the domestic industry and building its own viability.   By imposing local content requirements, host country can attain two goals:

first, more market opportunity for the domestic firms, and second more investment inflow into the country. For example, in the automotive industry, local content requirements encourage car markers to procure parts and components from local suppliers; or to establish its own subsidiary or sometimes invite existing vendors to produce in the vicinity in the host country. In this way, local content requirements magnify the linkage effects of FDI.

In the WTO Working Group on Trade and Investment discussions, developing countries including India and Malaysia claimed that performance requirements such as technology transfer, export obligation, local content requirements were necessary for protecting infant industry and promotion of domestic export industry.[65] Development purpose can be pursued by technology transfer, which can constitute a separate performance requirement, but also can be effected through local content requirement.

A.   Flexibility for Development

Developing countries seek FDI to promote their economic development.   Direct investment generates domestic production, employment, and growth.   Therefore, it is very closely connected to development issue.   However, at the same time investment agreement, be it bilateral, regional, or multilateral, to a certain extent limit the policy options for governments in pursuing their development objectives.   For example, to magnify the development effect by the FDI, governments are tempted to rule employment of nationals, procurement from local vendors, and so on.   This could boost the growth of the host country rapidly, especially when the host country is at the infant stage of development.   Therefore, many existing investment agreements texts allow for flexibility for developing countries in various modes and provisions.

This flexibility can be pursued in different ways; by distinguishing between categories of countries, e.g. developing countries and developed countries; by providing provisions relating to stages and degrees of participation; or by limiting the substance of treaty obligations, e.g. granting exceptions or escape clause, or just giving transition period to assume obligations.

Article 5.2 and 5.3 of TRIMs Agreement are phasing provisions granting extra period of time so as to enable developing countries to get ready to assume fully and entirely their international obligations. These transitional arrangements do not create permanent rights, but acknowledge that developing countries may not always be in a

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[65] There were also dissenting opinions that performance requirements including local content requirements had little effect on industrial development.

position to act in the same manner as developed countries.   However, even for the least developed countries, the transition period is 7 years.   Now that 12 years passed since the launch of WTO, this provision is only effective for newly joining members.   That is, there is no flexibility remaining for developing countries as far as TRIMs Agreement is concerned.

B.   Respect for the National Policy Objective

Investment issues get into more national and sovereign area because it is happening in the national territory, whereas trade occurs across borders.   Therefore, it is perhaps naturally and politically correct to give more room for the member country's authority.   However, the TRIMs Agreement puts trade and investment no the equal footing, but perhaps from the viewpoint of trade.   Perhaps the current system, while excessively absorbed in finding the discriminatory treatment based upon nationality, may be overlooking and undervaluing the policy objective and its implications.

Also, there are some opinions alleging that the Agreement advocates the interests of multinational companies.   Therefore, if the new agreement does not bend ear to developing countries' voice and embrace development issues, it would not be able to vindicate itself from the reputation that it serves the interests of MNCs in the developed countries.

3)   Limitations as a Legal Instruments

(1) Narrow Scope

After many fruitless efforts to set up multilateral investment rules in various forums, starting from ITO, UN, to OECD, the investment agenda came to GATT. However, the WTO system, designed primarily to deal with trade in goods, and secondarily trade in services, was not ready to deal with and regulate investment matters as a whole, and all the less in the multilateral setting.   As a matter of fact, at that time the WTO was not so ambitious as to establish comprehensive investment regulations dealing with investment matters from A to Z, but only touched upon issues that overlapped with trade in goods and services.

Therefore, the current investment regulation in WTO, i.e. TRIMs Agreement, is very limited in scope of its coverage.   In other words, the agreement confined its jurisdiction to the impact of investment measures that distort trade in goods, and did not

deal with the investment *per se*, and left the rest of the whole other investment issues uncovered: liberalization of investment, protection of investment, dispute settlement, etc. In case of investment in service industry, it is relatively well covered by GATS.

Since the current investment regulations represented by TRIMs Agreement is not comprehensive in dealing with investment issues, it is hard to view the Agreement as a separate and independent investment agreement and, it does not suffice as a legal instrument when investment related disputes take place. Therefore under the current system, one has to draw on all other possible instruments which have even slight relevance to investment activities. That is why the current multilateral system of rules on international investment is often referred to as a 'patchwork', a derogatory remark criticize the gaps, overlaps and inconsistencies of WTO rules on investment.[66] Moreover, since it is linked to trade in goods issue, it has to depend on GATT and other agreements to make the case legally applicable. This will be discussed in the next section.

(2) GATT dependency and Redundancy

Hence, it came up with TRIMs Agreement, which was limited and incomplete in terms of coverage and formality, and many disputes involving investment activities still had resort to GATT and SCM Agreement. TRIMs Agreement is linked to GATT 1994 in terms of its application, as stipulated in the Article 2.1 and 2.2(Footnote 10) and the Illustrative List(Footnote 11). As explained before, the core of TRIMs agreement is i) national treatment for the foreign investor and their expatriate products, and ii) no quantitative restrictions on these products. TRIMs agreement borrowed the principles and obligations from GATT. In case of GATS, though many of its definitions and principles came from GATT, it has separate provisions to elucidate them, whereas TRIMs agreement just quotes some articles in GATT. Being as it is now, TRIMs agreement looks like a sort of sub-agreement to the GATT.

The GATT dependency is clearly stated in the panel report of Indonesia-Autos case. Panels noted autonomous legal existence of TRIMs Agreement, but they concluded that it was linked to GATT 1994 in terms of application, in that the Illustrative List was extended from Article 2.1 and 2.2, and to establish violation, the concerned TRIMs should be inconsistent with Article III or Article XI. Thus, WTO panel also admitted that the TRIMs agreement was not in itself legally viable, but it should borrow some principles and rules from GATT[67].

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[66] Brewer(1998)

[67] Indonesia-autos case Panel Report(WT/)

From a different angle, by the same reason, TRIMs Agreement overlaps in great part with GATT and some part of the Agreement is not necessary at all, because existing obligations under the GATT 1994 were sufficient to illegalize performance requirements. The FIRA case[68], which concerned about local content requirements and export performance requirements was dispute before the WTO and thus without TRIMs Agreement. The Panel concluded that the local content requirements were inconsistent with the national treatment obligation of Article III:4 of GATT, and it did not need TRIMs Agreement.[69]

The redundancy can be aggravated when mixed with inconsistency and contradiction. GATT and TRIMs agreement are sometimes inconsistent with each other in certain provisions. Brewer(1998) pointed out that "the TRIMs agreement provides for the phased elimination of practices that were arguably already disallowed under the GATT" and claimed that the TRIMs agreement is retrogressive. Well, in the ordinary principles of law, special laws are prior to the general laws when they contradict to each other, and this can be applied to this case. However, this inconsistency is better to be resolved when the new multilateral rules are

(3) Trade-orientedness

The very fact that the various performance requirements including local content rules have been addressed under GATT provisions and TRIMS agreement based on GATT means that these are understood as trade rules. This fact has great importance and implications, and also leaves lots of rooms to be tackled.

At the core of the TRIMs Agreement and other provisions of GATT that apply to performance requirements is 'national treatment' principle and 'like product'. The concept of national treatment can be extended to investment as well as trade, although slightly different. In fact, the concept of 'like product' *per se* is very trade-oriented idea. In trade point of view, products that are made of local contents and those that are made of imported contents can be *like* in nature. However, in investment point of view, those two can be 'unlike'. Vehicles produced with locally procured parts and components and

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[68] This is an investment dispute between the United States and Canada. The Foreign Investment Review Act ("FIRA") (BISD 30S/140, 1984) of Canada required from foreign investors purchase of certain products from domestic sources(local content requirement) and the export of a certain amount of percentage of output(export performance requirement) as a condition for the approval of investment projects.

[69] However, the panel could not find violation in the export performance requirements under GATT. Brewer(1998) also pointed out that the list of illustrative list of TRIMs agreement does not include export performance requirements in particular, and thus the list is not exhaustive.

vehicles just assembled from imported CKD kits can be like products in the view of trade. However, they could bear totally different meanings and implications considering the impact they can bring to the host country: employment effect, backward linkage effect to the local suppliers, etc. In this context, Dimascio(2008) has claimed that nondiscrimination in trade treaties and investment treaties should be applied differently.

On the other hand, even in the forum of trade, things can be interpreted differently when a little more consideration is made to other policy objectives than trade liberalization. The good example would be 'environment' issue. There is a prevailing consensus that products made with environment-friendly process no more the 'like products' as the products made with process damaging environment. If the current system regards these two kinds of products as 'like products', it is understanding the case only in the convention of trade, and disregarding all the other policy objectives.

That is, local content requirements and other performance requirements, although they are investment measures with close relevance to trade, if seen under the frame of investment, the legal interpretation could be dissimilar. They are prohibitive measures in the framework of trade, but in the perspective of investment and national policy, they have their solid rationale and justification. As long as the investment regulation is drafted and implemented in the current system in the WTO, this trade-orientedness would not easily disappear even if the legal text is extended in scope and reinforced.

3. TRIMs in the Investment Treaties

1) Why should TRIMs be Regulated in the Investment Treaty?

MAI was discarded more than 10 years ago, but it is not because negotiators were entirely against the languages in it. It was rather a scapegoat in the history of globalization. General mood at that time in the international community regarding the foreign investment was somewhat different from now. Around the time when MAI was negotiated, there was a vague sentiment of fear or repulsion towards the MNCs, and developing countries were very careful about making commitment to the international obligations on investment liberalization. Earlier than that time, the object of fear was targeted at western empires, from the delusion of colonial era. Perhaps, it is about time to resume the negotiation of multilateral investment treaties when developed and developing countries can come to the negotiating table with equal footing and voice.

Researchers and experts in the field of economic law roughly reached a consensus on the necessity of international cooperation with regard to international investment. This also leads to the consensus on the establishment of a multilateral investment treaty. Many scholars and experts are positive about creating multilateral rules on FDI. Nieuwenhuys and Brus(2001) urged the birth of multilateral investment treaty to replace and supplement MAI, as an upgraded version. They mentioned the possible and appropriate forum for negotiations on the agreement. Sikkel(2001) went one step furtuer, to discuss how to establish a multilateral framework for investment. There is hardly any opinion denying the necessity or role of multilateral investment treaty or opposing the creation of one.

Since the desirability or necessity of investment treaty is not the topic of this dissertation, we assume the necessity of multilateral investment treaty. Rather, the topic of interest here is why we should address TRIMs in the investment treaty. This question can be answered in three stages. First, why TRIMs should be addressed in the investment framework, and secondly how it would be different from being in the trade setting, and finally what would be the efficacy and utility therefrom.

(1) Legal Relevance: Investment Aspect of Performance Requirements

Here, the matter at issue is to find the most relevant law that performance requirements can be addressed and regulated. More concretely, does performance requirements have to be regulated in the multilateral investment treaty or is it fine to be

handled with multilateral trade agreements.   The most simple and plain answer would be as follows: in order to match the source of law and the measure of concern.   In other words, performance requirements are investment measures, and therefore it should be covered in the investment regulation.

There is a fundamental nature of investment that is distinct from trade.   Trade and investment were long addressed jointly in the history of international treaties, because trade in goods was most of the time made by natural persons living abroad and selling goods in foreign nations. Therefore, trade was an activity where goods, investment, and aliens were involved.   Thus, the border between trade and investment was vague and perhaps meaningless.   Take the example of FDI in the automotive industry.   GM and Ford did not sell automobiles to European consumers by export from the United States. They established distributor company and production facilities in Europe. .   In today's definition, FDI was sometimes preceding trade.   In the meantime, early efforts to regulate trade in specific agreements made distinction between trade and FDI.[70]   So far, for about a century, as trade liberalization progresses, trade and investment were recognized separately, and were addressed in the separate jurisprudence.

Investment is a form of economic activity, closely linked to trade.   Yet, it is different from trade in many ways.   Investment is more directly connected and deeply involved with domestic economy and policy environment.   The recent convergence since the launch of WTO, of course with much more weight on trade, has resulted not from the two regimes having a common origin, but because most of the direct investment these days is accompanied by trade in goods, as the boundary between the two regimes has become fuzzy again.   The fuzziness has given birth of TRIMs Agreement, and posed investment at a lower position than trade.

As explained in the previous section, TRIMs agreement tackled performance requirements as a trade measure when it is an investment measure which is at most related to trade.   Maybe, prohibition on performance requirements in TRIMs agreement is clever movement of dealing with investment matters with trade rules, thereby making things easier for foreign investors.   The current situation has resulted largely because performance requirements were unduly covered in the trade-oriented framework.   If we go on dealing with investment matters with trade rules, we would go on taking on the adverse effect that we discussed in earlier section.   Therefore, by relocating it to the relevant source of law, they can be illuminated properly and justifiably.

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[70] DiMascio(2008)

(2) Interpretation of Non-discrimination Principle

Non-discrimination obligation is the key doctrine governing almost every international treaty on economic activities: trade in goods and services, and intellectual property rights. In the investment treaties as well, non-discrimination and the national treatment to the foreign investors would be the core and quintessential element. MAI also listed non-discriminatory and national treatment.

Non-discrimination treatment pertaining to investment is generally divided into pre-entry treatment and post-entry treatment, and as in the case of trade in goods, national treatment would be invoked in terms of post-entry treatment. It is to guarantee foreign investors no less favorable circumstance than the local enterprises in the actual operation after establishment. In other words, if a certain measure does not put a foreign investor in a disadvantageous position compared to the national investors, then it is treated non-discriminatorily.

As in the national treatment in GATT, 'likeness' would be the core and crucial concept in determining the relevancy of the treatment. There could be several ways of verifying likeness: i) goods or services, ii) the firm or investor, and iii) most broadly, the circumstances. Therefore, it should be clarified whether it is non-discrimination between domestic goods and goods imported by foreign investors as a result of trade, or non-discrimination among domestic firms and foreign investors which are provider of the goods at hand. In GATS, it is plainly expressed that the concept of non discrimination is applied to both: the service and the service provider. On the other hand, in TRIMs Agreement, it is not clearly stated, but just quoted as *'provisions of Article III of GATT 1994.'* Chances are that in TRIMs Agreement, it only meant national treatment among the goods, the final outcome of the investment activities.

The interpretation and actual application of the Investment Treaty could be very different based on which level of likeness is chosen in the treaty.[71] For example, in NAFTA, like circumstance is the standard in finding the matter of non-discrimination, and the concept of like circumstances contains a subject element.

Next issue is the interpretation of national treatment whether it is among like products, like firms, or like circumstances. Let's say it is on national treatment among goods just as in GATT, should vehicles produced by the foreign investor A with imported parts and vehicles produced by foreign investor B with large portion of domestic parts and components be treated equally? There could be another question. Is vehicle produced

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[71] However, there are some investment treaties which do not condition national treatment on the presence of likeness.

by foreign firm with extensive domestic supplier networks the same product as vehicle produced by domestic firm with all globally sourced parts and components? Looked in these two scenarios, it seems that it is not sufficient to questioning the likeness of the goods alone or the firms alone when dealing with investment matters. In other words, whether the foreign and domestic suppliers or investors are in like circumstances should be considered.

Perhaps in the investment treaties, the concept and implementation of national treatment could or should be different altogether from the GATT. We are too accustomed to the national treatment in the trade rules. When there is a certain measure applied differently to a foreign product or foreign producer, it is almost automatic that National Treatment principle is brought up to the table. However, there are some differences in the national treatment in the trade treaties and investment treaties.

In the investment treaties, the policy objective pursued by the local content requirements may be taken into consideration to define the circumstances in which the comparison of foreign and domestic production parts takes place. There are legal challenges to the regulatory purpose consideration in the interpretation of likeness. Those opponents argue that legitimate objective itself is not sufficient to be exempted from the breach of non-discrimination obligation. There also have to be some link between the measure and the legitimate objective purpose. Therefore, if the measures at issue are proved to be effective in pursuing the policy objective, it could gain more justification. In this case, if local content requirements are ascertained to be effective in accomplishing the industry development, then its lawful enforcement claim could gain more ground.

In this context, the WTO regime has primarily studied the influence and effect of performance requirements on trade. Intuitively, performance requirements, by promoting local production of intermediate goods, reduce imports from the parent country. Here, WTO and trade liberalists only took notice of the negative effect of performance requirement, while overlooking the effect on the host country's industrial development.

Robert Hudec's scholarly confession that "there has always been some concern that the national treatment] test would fail to prohibit some…distinctions that should be prohibited, and prohibit some…distinctions that should not be prohibited" suggests many things. Different treatment to products pursuant its percentage of domestic contents might not be distinctions that should be prohibited. With different application of national treatment, the legal finding on performance requirements can be different from what it is now in the TRIMs Agreement.

(3) To advocate the Public Interest and Development Concern

In the WTO process, private interest and maximizing the global economic welfare has been pursued. Consequently, public interest and equal development opportunity for developing and underdeveloped countries were relatively neglected. Doha Development Agenda was named as it is in order to attract attention from the developing world, but so far it is almost a failure. It is perhaps best to reorganize and reshuffle the ground

One might question how it is possible to make a treaty that is so different in principles and philosophy from WTO rules; arguing that they must share some fundamental principles and essence of global economic law, even though the contents dealt with in the treaties are different.

Therefore, we cannot expect international investment to be liberalized as much as international trade; just as we do not expect natural persons to be entitled to migrate anywhere as goods travel anywhere in the world. Generally, trade in goods occurs at the beginning of bilateral business exchange between two countries, and then it expands to capital, investments, corporate entity, and natural persons. So is the degree of openness. It is higher for the goods, and next comes investments and then natural persons.

Performance requirements are prohibited in the GATT and TRIMs agreement, and even in the MAI[72]. It does not mean that it should be also prohibited in every investment

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[72] In the TRIMs agreement, performance requirements were demonstrated in the Illustrative List, MAI provides complete provisions of performance requirements much more comprehensively elaborated. Other than the formality, MAI is different from the TRIMs agreement in that it adopts MFN principle as well as National Treatment. Following is the complete text of performance requirements in the MAI.

III. Treatment of Investors and Investments

National Treatment and Most Favoured Nation Treatment

Performance Requirements

1. A contracting party shall not, in contrast with the establishment, acquisition, expansion, management, operation, maintenance, use, enjoyment, sale or other disposition of an investment in its territory of an investor of a Contracting Party or of a non-Contracting Party, impose, enforce or maintain any of the following requirements, or enforce any commitment or undertaking:

(a) To export a given level or percentage of goods or services;

(b) To achieve a given level or percentage of domestic content;

(c) To purchase, use or accord a preference to goods produced or services provided in its territory, or to purchase goods or services from persons in its territory.

(d) To relate in any way the volume or value of imports to the volume or value of exports or to the amount of foreign exchange inflows associated with such investment;

treaty.

As previously mentioned, there are thousands of researches on the development effect of the performance requirements, and mainly local content requirements. The empirical results of the studies are in produced in both ways. In some cases, they are very effective in host country development, and in some of them, they are not. However, it does not assure that irrelevancy or ineffectiveness of the measure on industrial development. Under certain circumstances, they are more effective in some cases, they fail to accomplish the goal for some other relevant variables, such as the level of education or quality of human resource of the host country, level of corruption, or the general infrastructure such as transportation and telecommunications. In fact, there has been much evidence shown in various empirical studies that performance requirements, especially local content requirements are not effective in the industry development of the host country, and sometimes there is evidence of negative impact in certain cases. These results of studies were well utilized as a theoretical and empirical support for the opponent of performance requirements.

In the process of lawmaking, economic efficiency and effectiveness could be an important factor of consideration, but it does not mean that it always has to be given the highest priority. The policy could succeed or not pursuant to the policy design, the country's unique circumstances, etc., but it does not necessarily legitimize the elimination of the possibility to enforce one. The host country has the discretion to choose whether to enforce local content requirement and the foreign investors can decide whether to enter

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(e) *To restrict sales of goods or services in its territory that such investment produces or provides by relating such sales to the volume or value of its exports or foreign exchange earnings;*

(f) *To transfer technology, a production process or other proprietary knowledge to a natural or legal person in its territory, except when the requirement*

-is imposed or the commitment or undertaking is enforced by a court, administrative tribunal or competition authority to remedy an alleged violation of competition laws, or

- concerns the transfer of intellectual property and is undertaken in a manner not inconsistent with the TRIPs Agreement;

(g) *to locate its headquarters for a specific region or the world market in the territory of that Contracting Party;*

(h) *to supply one or more of the goods that it produces or the services that it provides to a specific region or the world market exclusively from the territory of that Contracting Party;*

(i) *to achieve a given level or value of research and development in its territory;*

(j) *to hire a given level of nationals;*

(k) *to establish a joint venture with domestic participation;*

(k) *to achieve a minimum level of domestic equity participation other than nominal qualifying shares for directors or incorporators of corporations.*

the market and make investments. The host country cannot impose too strict level of local content requirements in order to induce FDI. The equilibrium level or local content requirement and amount of FDI will be determined by the same mechanism as supply-demand and exports-imports are determined under the classical economic theory.

The current system of investment regulations start from the conception that these rules liberalize investment in the host country and protect the foreign investor. That is, the investment regulation is devised to protect the multinational enterprises from the outset. The new legal system should give more consideration for the other party.

2) Legal Framework for the Prospective Investment Regulations

(1) Bilateral or Regional Approach

Existing international instruments on investment can be a starting point in drawing the MIT. There have been numerous investment treaties. There are 2,392 Bilateral Investment Treaties (BIT) already concluded, and around 500 multilateral conventions and instruments governing cross-border investment flows. [73] Roughly, investment treaties serve two main objectives: investment protection and investment liberalization.

Bilateral Investment Treaties have been enabling in character: their primary purpose was to protect investment. BITs focus on providing legal framework and reducing uncertainty for the foreign investors. The United States' BIT and European Bilateral Investment Protection Agreements (BIPA) devoted to protect foreign investment from host country regulations or nationalization. They did not have much effect on liberalizing the access to FDI. A number of empirical researches showed that the amount of FDI inflow was largely determined by factors other than investment agreements, and BITs overall played only a minor role.[74] Recently, BITs began addressing liberalization issue as well as protection issue, but it seems that BITs would remain as transitory pragmatic approach to deal with FDI.

The liberalization in investment is pursued in the Service chapter as a part of FTAs. They generally contain concrete components pertaining to market access and terms and conditions on investment. Thus, these investment treaties go beyond the traditional boundary of BITs, to include liberalization schedule as in the trade agreements. Recently negotiated Korea-US FTA text includes investment chapter, which is comprehensive bilateral investment agreement. It grants national treatment and MFN treatment to pre-entry stage as well as already established investment. It contains almost every component of investment agreement.

However, in the similar context, the regional trade agreements (e.g. FTA) often including investment chapters are also temporary expedient like BITs. Their different scopes of investment, different definitions and interpretations on the terms and principles by individual agreements, would only add up to the inefficiencies and obstacles in the global FDI environment. Since investment was omitted from the Doha Round Agenda

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[73]. UNCTAD, World Investment Report 2005-Transnational Corporations and the Internationalization of R&D(Geneva: United Nations Conference on Trade and Development, 2005)

[74] Nunnenkamp and Pant(2003)

through 'July 2004 package', regional initiatives emerged as a feasible tool for countries to pursue liberalization of investment and enhancing investment access to their trading partners. As in treaties on commodity trade, there are fundamental principles such as MFN and national treatment in investment treaties. Therefore, these investment agreements as an integral part of FTAs will be able to build foundations for the future multilateral investment agreement. Thus, as long as there are no multilateral rules on investment, these bilateral investment treaties can fill the gap.

(2) Multilateralization of the Investment Treaty

In the past when FDI was mostly in oil and mining industry, protection of the private right of foreign investors from the host government was the most important function of investment treaty. Therefore, bilateral agreement was sufficient for the MNCs to prevent host governments from appropriating their assets. However, as there is growing demand for investment liberalization, there also rose the call for comprehensive investment treaty serving both purposes, to protect and liberalize investment. In this context, investment treaty in multilateral setting was gaining necessity.

There is another rationale for multilateral investment treaty. In the case of trade in goods, MFN principle can be meaningful when it is enforced multilaterally. World welfare is maximized when countries treat their partners in equal terms, so that there are no trade distortions and diversions. Let alone the welfare talks, a multilateral framework is superior to the bilateral or plurilateral framework. Multilateral investment treaty replacing the complex mesh of numerous BITs and regional investment treaties would enhance transparency and reduce transaction costs as well as administrative costs. Using theoretical model, Che and Willman(2009) proved that coordination effect of multilateral investment treaty is most effective when majority of countries take part in the agreement whereas a treaty between the two countries would have little effect.[75]

There were also investment treaties in the multilateral setting from the early years, hand in hand with trade treaties, though today the two aspect of international economic activity has evolved to a very different state after a different course of development. The treaties on investment have been mostly non-binding, serving as guidelines or model law.[76]

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[75] In this article, they also proved that investment increases and welfare of both home country and host country increase by establishment of multilateral investment treaty.

[76] Notable examples of multilateral investment instruments are "United Nations General Assembly Resolution 1803(XVII): Permanent Sovereignty over Natural Resources" in 1962, "Resolution 51/191 and 52/87. United Nations Declaration Against Corruption and Bribery in International Commercial Transactions", "ILO Declaration on Fundamental Principles and Rights at Work".

So far, attempts to come up with a substantial and material outcome of multilateral treaty ended up as a failure.

The first attempt to build multilateral agreement on foreign investment was made in 1948, in Havana Charter to establish an International Trade Organization (ITO). In the earlier draft, the Investment chapter contained pretty much comprehensive elements of investment treaty: it provided extensive rights for investors including the obligation of host countries to extend national treatment and MFN treatment. However, this was opposed by many countries, and consequently, the Charter had to be shrunk to a very limited scope. The final draft did not incorporate any rules related to performance requirements and dispute settlement mechanism between governments and foreign investors. Anyway, the Charter was not ratified by the US Congress and this attempt turned out a failure.

Next attempt was done by OECD with 'Multilateral Agreement on Investment (MAI)'. As cross-border investments were becoming active and complicated, there again arose the need for international norms to regulate these activities. Existing investment rules have formed around multilateral fora such as OECD and WTO, and regional initiatives including NAFTA, EU, and APEC. However, the content of MAI was not sufficient to cover quantitative and qualitative changes in FDI since 1980s, and most of all, was not provided with dispute settlement mechanism, thus lacking efficacy as compelling tool. Also, there was allegation that MAI, with OECD behind it, was advocating MNCs and were in some sense devised to support their worldwide operation, and that the underlying principles and spirits were reflection of business consideration of these enterprises, and thus were indifferent to the concerns of LDCs. This kind of understanding made it hard to induce general support from member countries, developed and less developed alike, and it indeed failed.

Another attempt was being made within the WTO, after its launch in 1995. The mood at that time requesting for multilateral setting for investment continued, and it was recognized that TRIMs were not sufficient in addressing complex investment issues. In 1996 Singapore Ministerial Conference, it was agreed to set up working groups on investment, as one of the "Singapore Issues."[77] However, in 2004 most of the Singapore issues were dropped from the negotiation agenda of Doha Round, due to the harsh opposition from the developing countries group. Thus, this final attempt to create multilateral investment treaty also failed.

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[77] They are competition policy and transparency in government procurement, trade facilitation. However, the Working Group's mandate was mainly examining the relationship between trade and investment.

(3) New Multilateral Investment Treaty

The awareness and attempts to create multilateral investment treaty(MIT) has been there for decades.   Since the establishment of a Working Group on Trade and Investment (WGTI), discussions on the new Investment Treaty and plans to launch negotiations have been under way.   In the report of the Working Group on the Relationship between Trade and Investment(1998), a checklist[78] was annexed for further studies.   Included in the list are comprehensive subject regarding the relationship between trade and investment: their

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[78] The checklist is as follows.

i) implications of the relationship between trade and investment for development and economic growth, including:

- *economic parameters relating to macroeconomic stability, such as domestic savings, fiscal position and the balance of payments;*

- *industrialization, privatization, employment, income and wealth distribution, competitiveness, transfer of technology and managerial skills;*

- *domestic conditions of competition and market structures.*

ii) The economic relationship between trade and investment:

- *the degree of correlation between trade and investment flows;*

- *the determinants of the relationship between trade and investment;*

- *the impact of business strategies, practices and decision-making on trade and investment, including through case studies;*

- *the relationship between the mobility of capital and the mobility of labour;*

- *the impact of trade policies and measures on investment flows, including the effect of the growing number of bilateral and regional arrangements;*

- *the impact of investment policies and measures on trade;*

- *country experiences regarding national investment policies, including investment incentives and disincentives;*

- *the relationship between foreign investment and competition policy.*

iii) stocktaking and analysis of existing international instruments and activities regarding trade and investment:

- *existing WTO provisions;*

- *bilateral, regional, plurilateral and multilateral agreements and initiatives;*

- *implications for trade and investment flows of existing international instruments.*

iv) and on the basis of the work above:

- *identification of common features and differences, including overlaps and possible conflicts, as well as possible gaps in existing international instruments;*

- *advantages and disadvantages of entering into bilateral, regional and multilateral rules on investment, including from a development perspective;*

- *the rights and obligations of home and host countries and of investors and host countries;*

- *the relationship between existing and possible future international cooperation on investment policy and existing and possible future international cooperation on competition policy.*

impact on the economic growth and development, correlation between trade and investment flows, and appraisals on the current legal system thereon, etc.

Based on these studies and the experience from the trials and errors of the previous attempts and instruments, it is desired that the new multilateral investment agreement be equipped with the following properties: completeness, comprehensiveness, efficacy in enforcement, and development consideration.

First, it needs to be a whole, self-sufficient investment treaty integrated into one whole independent text, unlike TRIMs Agreement. It should not be subjective to GATT because GATT is just general agreements for trade literally. It should be able to stand alone, not like an annex to other instruments. This is important because it is necessary in terms of substance, but also symbolically suggesting that 'investment' has the equal gravity and significance to the international business and economy to 'trade'. Many experts in this field are emphasizing that the new multilateral investment agreements should be separate from the trade agreements and its framework and priorities should be distinct from those in the existing trade agreements. Some even claim that this instrument should be drafted in some other venue than the WTO.

Secondly, it should be comprehensive in that it regulates investment measures in all stages of investment, from pre-entry to operation; providing rules for both manufacturing firms and service providers; from definition to exceptions. The current WTO system is mainly handling the trade aspect of investment, which is only relevant at the operation stage. If the new multilateral investment treaty has a hole in the coverage, the source of law in dealing with investment matters will be again fragmented to various instruments.

Thirdly, it should be armed with proper and effective dispute settlement mechanism so that it can possess efficacy in enforcement, and bind countries. Especially, the agreement should contain State-to-State dispute settlement mechanism. In case of Investor-to-State Mechanism, the host country's domestic legal system would be sufficient, but the absence of State-to-State dispute settlement system cannot be readily replaced by equivalent system. Without the effective dispute settlement mechanism, it could still work as GATT worked before the launch of WTO.

Lastly, it is strongly desired that the new investment treaty has good reflection on development issue. Otherwise, the investment regime would be advocating the MNCs at the sacrifice of the policy interests of the individual countries. Then, the treaty would not be able to be negotiated at all. First of all, it should focus on inducing participation by developing countries to the negotiation, by assuring developing countries that the new regulation will reflect proper and due development consideration in its provisions. In

order to do so, the negotiating text would have to be substantially different from the MAI.[79]

The feasibility of multilateral investment treaty is another matter. In fact, there remain many obstacles to be hurdled. It would require great finesse of balance between conflicting interest and powers among different group of parties. Evidentially, it has been long since the international community agreed that we need a complete system to govern FDI, the process has not been materialized yet.

The bottom line scenario is the plurilateral agreement signed by some like-minded countries, something like the outcome of Tokyo Round negotiation. Even GATT had only 23 parties to start with in 1947. The Investment Treaty could be signed by a group of countries and the membership can be expanded when the remaining countries are ready to become the contracting party of the agreement. As the number of countries increases to the extent that it outnumbers the non-member countries, remaining countries will have more incentive to enter the group to be integrated in the multilateral system of investment. Another option is the regional program. This would be favored by regional integration groups, and may contribute to the regional economic development. Above all, by breaking down to regional level, it is much easier to negotiate than the multilateral treaty.

However, any non-multilateral approach is apt to damage the original intention and purpose of multilateral investment treaty, harmonizing the rules of investment regulation globally and reflecting the balanced interests of both developed and developing world. Therefore, coordinating the different position of developed and developing countries on the general principles and framework of the treaty, and establishing the firm logic on the economic benefit of multilateral investment liberalization would be the departure of the negotiation forum. Every contracting party should be assured that multilateral investment liberalization can bring benefits to their economies.[80]

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[79] In fact, proponents of multilateral investment treaty, mainly developed countries, suggest that the contents of the new treaty should be similar to what have been discussed in MAI negotiations.

[80] The simplest argument for investment liberalization is analogous to that of trade liberalization. That is, liberalization of international investment increases the global welfare. However, matters are not as simple as in trade. Can the same rationale be applied in the sphere of investment when trade agreements are aimed at liberalization and welfare maximization, whereas investment treaties are devised to protect investors and their investment? Young and Tavares(2004) made several points on this issue; they noted that asymmetry in the investment position and the invisibility and complexity of measuring FDI flows makes it difficult that benefits of liberalization are spread fairly and therefore it is hard to induce fair and balanced negotiation outcome.

3) Legal Status of TRIMs in the New Multilateral Investment Regulation

Then, how should be TRIMs regulated in the MIT?   Should it be prohibited as it is in TRIMs Agreement?   It would be determined by the negotiation outcome by the member countries.   Certainly, there will be parties that claim outright prohibition on performance requirements, mostly developed countries.   The United States have been insisted prohibition of performance requirements in the TRIMs Agreement in the Uruguay Round negotiations and in its BITs.   Most of the developed countries including EC and Japan were taking the similar position as the United States.   Developing countries generally were against the outright prohibition of performance requirements.   Their idea was to have performance requirements be actionable taking into account the economic effect of the measure.

In the new regulation, it is very likely that current outright prohibition is modified, accommodating the developing countries' position.   The legality of measure at issue would be determined by several methods: effect test would be one way to tell the consistency to the regulation.   The host country can claim that the measure was not aimed at protection.   The judicial process will investigate if there is clear protectionist purpose, and if the measure provides with less favorable treatment for the foreign investor, etc.   If it is clearly host government's intention to protect domestic industry, the measure may then be disencouraged. .   It is sort of indirectly restricting the business activity of the investor, but it is not giving the less favorable treatment as long as the foreign investor follows the requirements.

Far from giving less favorable treatment, many countries are offering government incentives to the foreign investors.   These incentives are not strictly regulated in the current regime.   Obviously, it is not fair to regulate financial contribution to domestic firms while it is allowed for the foreign firms.   Many scholars criticize the disparity in the legal status of performance requirements(as FDI disincentives) and FDI incentives. Moran(1999) suggested that developing countries might accept the prohibition of performance requirements on the condition that incentive for the foreign investors is also disallowed, when they negotiate for the future Multilateral Investment Treaty.

As explained in the first Chapter, the local content rules and TRIMs in the original meaning have mostly disappeared by mid-1990s.   The only remaining LCRs were mostly in the automotive industry.   In other words, most governments have phased out the local content requirements as the industry development got on the right track.   This evidentially demonstrates that the purpose of LCR was to promote industrial development, not to protect the domestic firms from the foreign imports.

The key legal element is whether the multilateral investment treaty should take the same element of Goods and Services Agreement. Does MFN principle in the investment treaty have the same gravity as in trade in goods and services? Should non-discrimination and national treatment obligation be the foremost principle? The legal status of TRIMs in the new investment treaty would very much depend on the interpretation of nondiscrimination principle. With the same definition and interpretation of the principle, it is highly likely that TRIMs will be again regulated as unlawful measure. Yet, nondiscrimination and national treatment obligation may not be the supreme order in the investment framework. It seems that the status of MFN principle in investment treaty is not as authoritative as in the trade agreements. Evidently, in some existing investment treaties such as NAFTA Article 1102 and numerous BITs, public policy justification is more widely accepted than in GATT, and thus can rebut presumption of discrimination even in "like circumstances". Is foreign investors procuring large portion of inputs from its home country a like investor as the national investor contributing more to the domestic economy by employment of human and physical resources? This is also closely related to the development issue, which will be discussed later more specifically.

Sauve(1997) suggested an idea of regulating TRIMs based on the traffic light red, amber, and green, as used in the GATT SCM Agreement. His argument was that TRIMs have the similar purpose and effect with subsidies. This view is supported by many trade law scholars including WTO panels. At least the idea of traffic light system could be useful in regulating TRIMs. According to various policy designs, some performance requirements could be strictly discriminatory and trade distorting, while some are less so, and some are not.

Sauve's approach has some elements common with the developing countries' position, that is, to have actionable TRIMs. However, Sauve's categorization requires second thoughts. He placed LCR in the red light category, along with most other TRIMs: export performance requirements, trade balancing requirements, manufacturing requirements and limitations. Sauve takes the same position with developed countries that LCR is immediately prohibited, while developing country's genuine intention was to give at least yellow light to the LCR and other performance requirements.

Besides, there can be a totally competitive approach: differentiating markets according to their attractiveness. One possible method is to prohibit only performance requirements that are announced after the investment decision. In this way, countries with attractive market can get some rents and still receive FDI from MNCs, while countries with less attractive market will try to attract foreign investments with more friendly business environments. This kind of rule can be welcomed by the developing countries.

4. Summary and Conclusion

Under the current WTO regime, performance requirements including local content requirements are prohibited under many trade obligations in GATT, GATS, SCM and TRIMs Agreement. By the principle of non-discrimination as it is interpreted in the goods agreement, performance requirements are condemned as discriminatory and trade-distorting measure. Thus, performance requirements which have been enforced in some developing countries were mostly ruled as violation of the WTO obligations. Now most of these countries eliminated those measures.

This seems like a fair and reasonable result from the perspective of free trade advocates, but not necessarily for some others with other views and frames. It might look too stringent for them to prohibit them altogether, even if there were little evidence that these were protectionist measure. By prohibiting local content requirements, it limited host country's policy discretion: to prevent tariff circumvention of foreign multinational companies, to foster and develop the local industry, and to prevent anti-competitive practices by MNCs, and to induce more investment from foreign firms. The current investment-related regulations are far from sufficiency.

While the rules and standards in the current system reflects the traditional economic theory of comparative advantage and free trade, host governments policy goals are based on strategic trade theory. Under the traditional trade regime, chances of unindustrialized countries to become industrialized are in fact very thin, because it is predetermined according to its comparative advantage. On the other hand, according to the strategic trade theory, those countries can be industrialized if they can have policy discretion such as local content requirements on the FDI in the strategic sectors, eventually to reach increasing returns to scale necessary to achieve competitiveness. That is, competitive advantage can be acquired through the right policy mix.

If the economic interpretation on the same policy can be different pursuant to different economic theories, making separate rules governing FDI and performance requirements can be an alternative. Nevertheless, making an Investment treaty does not itself guarantee the due consideration for the development concern. It should be emphasized from the beginning in the process of negotiation. Considering the fast growing economic power and status of developing countries during the last decade, it is expected that the new rules would better reflect interests of developing countries and the development issue than ever.

Thus, it examines the prospective for the investment regulations as an alternative to the existing TRIMs and GATT, which are currently governing the jurisprudence of

investment measures. Though performance requirements have disappeared from almost all countries even in the automotive industries now, there are chances that they can return as FDI floods into less developed countries. Take Russia's example. Russia has been imposing local content requirements. Recently, it has renewed the directive into tighter rules. The TRIMs have never died and it might be proliferating again. We need multilateral investment treaty anytime soon in order to regulate them. It brings the possibility that various indigenization policies and performance requirements can be legally acceptable in the multilateral investment treaty.

Setting rules for investment is supposed to be much more challenging work than setting rules for trade. There are many open questions to be answered, legal controversies to be resolved, and terms and scope to be defined. DiMascio(2008) well pointed out that investments necessitate and justify more extensive regulation because they cause the producer and the production process to cross the border, leaving a larger footprint, both positive and negative, than trade. Indeed, investment entails far more complex matters than trade and sales in foreign market. That is, the investment regulation text inevitably has to be more elaborated and relatively more weight should be placed on policy justification than trade regulations.

There is undying controversy of economic efficiency vs. sovereign rights and institution. There is the dilemmas posed by relationships between globalization, the nation State and its sovereign interests and there are constant debates over the relative merits and demerits of institutional and regulatory harmonization versus diversity at country level. [81] It has been popular topic of debate in terms of trade liberalization, but it is a much bigger and sensitive issue in the investment matter. Rules governing FDI have more overlaps and interference with domestic laws. This can be possibly extended to jurisdiction issue, which legal instruments should have control over the foreign investor's business entity, from what stage and in which matters. This potentially overlapping jurisdiction will be the core and most frequent cause conflicts and disputes in the new system.

After all, keeping the balance between the two confrontational values: liberalization and development, globalization and sovereign rights of states, interest of investor and host country, is the most crucial yet difficult task of the future negotiation.

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[81] Young and Tavares(2004) also noticed this problem.

Chapter V. Concluding Remarks

So far, we have examined various aspects of FDI in the automotive industry and the policies surrounding the FDI in both economic and legal perspectives. Growing FDI in the automotive industry and its inherent strategic importance in the national economy made it the major target of indigenization policy of host countries. Host governments try to maximize the economic utility from the FDI extended to its local industry development. Local content requirements are the most popular policy tool to enhance the linkage between the FDI and its local industry. However, LCR and other performance requirements are strictly prohibited in the WTO regulations, since it hinders the free flow of trade from foreign investor's perspective. This is purely trade-oriented approach. If the same measure were viewed from investment-oriented approach, the result might have been different.

To find out LCR's impact on the investment flow, empirical research was conducted on various FDI determinants with both economic and policy variables, in the automotive industry of more than 43 countries. From the results, it was concluded that market size and market-related factors were the most important determinants of FDI. However, there was no evidence that the local content requirements distorted the FDI flow into the country, and rather it had positive effect especially in Asian region. Further, LCR brought positive impact on the industry growth measured in various methods: volume of industry, percentage of value added, and productivity growth. LCR can promote linkages with domestic supplier industry and bring favorable externalities to the host country economy, which again accelerates spillover from the MNC to the local industry. Combined together, these two findings proved that local content requirements are not detrimental to FDI inflow and they rather boost industrial development. To conclude, current trade regime illegalizing these measures lack both economic and political persuasion.

Thus, the TRIMs Agreement governing the performance requirements including the local content requirements is put under controversy in terms of efficacy, harmony with other policy objectives, and integrity as legal instruments. This, in turn, leads to the proposition that investment measures including performance requirements are better to be addressed by investment regulations. Overall, this dissertation aims to give implications in building the new investment regulation system. After much deliberation on regulating the FDI in the multilateral investment treaties, the most outstanding conclusion is that much more attention has to be paid to the development concern of developing countries. It is inevitable in the newly formatted multilateral investment rules.

Recent emphasis on FDI and development has something to do with the changing map of global economic structure. From now on, the center of gravity will be shifted to less developed countries. Majority of the world investment capital are flowing into Asia and Latin America region.[82] Evidently, the growth of China and India are in much part owing to inward investment from the developed countries. In the time forward, developing countries would exert way more power and influence in the negotiation process of multilateral investment treaty, than in the 1940s when multilateral trade agreement was drafted. This means that the political economy underlying the future investment treaty can be vastly different from that of trade rules. Thus, future dynamics in the global economic order and the multilateral system on trade and investment will reflect these changes, and interpretation on local content requirements can be completely different from as it is now.

Also, pattern of globalization is changing due to the proliferation of FDI. In the domain of traditional trade economics, globalization was driven by trade liberalization, and theoretically free trade leads to complete specialization of industries. That is, a couple of countries would monopolize the production of a certain industry, supplying the rest of the world. It was predicted by many experts that only a handful of manufacturers would survive in the end in the automotive industry. Actually, this has been the case before FDI was increasing as it is now. The US, Japan, Germany, France, and Korea were producing most of the vehicles consumed in the world, and the degree of concentration was rising. This was the reality just ten years ago. Monopolistic capitalism, polarization, North-South problem, economic imperialism, etc were typical words associated with globalization. However, FDI has suddenly changed the direction of globalization backwards. It is again spreading the vehicle production map worldwide. Globalization by trade liberalization led to oligopolistic structure of industries and concentration, while globalization by FDI led to localization and dispersion.

Perhaps, we have been too absorbed in the trade regime, in pursuit of the free trade. It is not saying that free trade should not be desired. However, in the meantime we have marginalized the equally important way of commercial system, investment. It is not likely that one type of globalization would take over the other entirely. FDI will continue in the future at a higher speed, but anyway automotive industry needs scale economy. Perfect localization is impossible; there still would be trade. Nor is it possible to tell that one thing is better than the other. They are equally important twin pillars of global economy sharing the same goal of enhanced economic welfare. We have been

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[82] In 2008, among the total investment flow in the world, 23% went into Asia, 9% to Latin America, and 5% to Africa.

perverted blind to maximize trade flows even if it injures the policy objective of investment.   FDI will take the lead in the globalization for the time being, and we might need to change our perspective.

FDI can be better disciplined within the framework of investment rather than trade. However, it does not mean that the new rule can damage the established multilateral trade system and benefits from trade liberalization.   Thus, our future task would be to harmonize trade and investment in terms of regulations and policy design; would the two regimes be able to get along with each other and how the conflicts and disputes could be managed.   Another suggestion for future research extended from this dissertation is investigating the conditions in the host country that are most appropriate for the spillovers and favorable externalities.   In what circumstances, the favorable effect of LCR can be maximized and when adverse effects occur.   Similarly, LCR can be effective in some countries while in some countries it does not show clear contribution to the industry's development, but just reduces overall efficiency and welfare.   There would be no universal policy that can bring about equal amount of industry development in different countries with different circumstances.

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Appendix I History of FDI in the Global Automotive Industry

1. Early Years(from 1910s to mid 80s) in Europe

FDI first started in the early 20th century, by two American vehicle makers, GM and Ford. GM and Ford were very early in enacting globalization: they started their globalization strategy first in Europe. Also, in that period, tariff rate for vehicles in Europe was very high: apparently, the purpose of FDI was to seek markets.

Ford was one step ahead of GM in overseas production. In fact, Ford has been a world organization right from the beginning. Ford Motor Company in the United States were founded in 1903, whereas Ford Europe was launched in 1909 when the Branch company was set up to supervise European sales. Ford first established assembly plant in UK in 1911. For about twenty years, a branch company and assembly plant was inaugurated almost every two or three years, in many countries in Europe. In 1967 Ford incorporated them into 'Ford Europe'.

\<Table 1-1 \> History of Ford's Overseas Operations

Year	Details
1911	First overseas assembly plant in Manchester, England.
1919	Another assembly plant was founded in Copenhagen, Denmark.
1922	Ford Belgium and assembly plant established
1922	Assembly plant in Cadiz, Spain was built to serve Southern Europe.
1922	Assembly plant in Triesta, Northern Italy, aimed at Eastern Europe market.
1925	The first Germany Ford company and assembly plant was established.
1926	Assembly plant in Berlin
1931	Third assembly plant in Germany was built in Cologne.
1936	Romanian company was founded in 1931 and assembly began in 1936.
1938	Hungary company was founded and its assembly began in 1941.
1953	Ford built another Assembly plant in UK, in Southampton.
1962	Major new plant in Halewood, UK
1964	Second plant in Genk, Belgium.
1965	Plant in Lommel, Belgium was founded.
1970	Ford Germany's Saarlouis plant(Home of Focus)
1973	A new transmission plant in Bordeaux was built.
1976	A large car factory opened in Valencia, Spain(Home of Fiesta) Second Romanian plant was built in Craiova. Built Transit and Connect.

Source: Various sources

GM first entered European market by undertaking a British auto maker in 1925. GM's Europe operations were expanded and reorganized around UK's Vauxhall and Germany's Opel in 1980s, taking the European Integration into account.   Though a bit behind than Ford, GM continued expanding overseas production in 1920s, constructing assembly lines in Latin America, Australia, and Japan, as well as Europe.   GM's Europe strategy can be distinguished from Ford's in that GM's European operation was conducted mainly through Opel, while Ford's operation was polycentric.   GM's main production facilities are concentrated in Germany and Spain whereas for Ford, Germany, Belgium, UK, Spain and Sweden are the main production locations.[83]

FDI in the Europe in this period was definitely market-seeking, to better reach the consumers in Europe.   Western Europe was the biggest market in the world.

<Table 1-2 > History of GM's Overseas Operations

Year	Details
1918	GM Canada is established through M&A.
1923	First European Assembly Plant in Copenhagen, Demnark.
1925	GM acquired Vauxhall Motors in UK. GM also established operations in Argentina, France and Germany.
1929	GM acquired controlling interest in Adam Opel AG of Germany.
1980	Announced plans to build five new plants in Europe, one in Austria and Northern Ireland and 3 in Spain.
1989	Acquired SAAB from Sweden.
2002	Opel's new plant started operation in Russelheim, Germany.

Source: GM website

2. 1960s~70s in Southeast Asia

Japanese manufacturer's history of overseas production in this region is very long. They entered ASEAN market in 1960s and have taken undisputed leadership for a couple of decades.   Until early 1990s, import of complete vehicles into this region was practically prohibited, either due to high tariffs or government restriction.   In this period, Japanese makers invested in ASEAN in partnership with local makers, and started KD production.

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[83] Later on, GM and Ford showed different styles of overseas expansion: Ford mostly established greenfield plants whereas GM undertook local manufactures.   Besides, Ford has been steady in expanding its overseas production by 1980, but GM was kind of dormant since 1931 when GM acquired Holden from Australia, until it announced further investment in Western Europe in 1980.   On the contrary, from 1980s towards the end of 1990s, GM was more active in FDI than Ford, establishing plants in Asian region.   Ford rather concentrated on M&As than direct investment during this period.

<Table 1-3> Production and KD units in ASEAN 4, by maker

	2000	2001	2002	2003	2004	2005
Toyota	205,003	207,374	266,523	357,773	438,276	644,527
Mitsubishi	359,662	393,444	435,886	352,988	395,011	433,253
Honda	62,603	64,886	95,950	148,748	157,339	167,875
Nissan	52,491	56,471	64,789	71,809	78,091	80,598
Suzuki	48,865	54,704	64,430	71,933	85,990	126,948
Total	733,025	780,454	929,227	1,005,214	1,162,364	1,457,893

Source: Marklines

Until now, Japanese manufacturers have the dominant market share and industry leadership in ASEAN. They are producing almost 80% of total production in ASEAN region. Japan had close relationship with the Southeast Asian economy, and moreover, it was less invested region by developed countries' manufactures. Hence, Japanese car makers intended to occupy preemptive position in ASEAN. Still, automotive industry needs a certain level of market size in terms of demand condition, and a certain level of production scale in terms of supply condition. Individual countries in ASEAN did not meet these conditions, and thus Japanese OEMs makers realized that cooperation between member countries and industry integration was necessary for the development of automotive industry in the region. As its first attempt, these makers proposed BBC(Brand to Brand Complementation) Scheme in 1988. By this Scheme, individual countries specialized in a certain parts and components production and supplied other countries with these. This integration effort got rid of overlapped investment and helped achieve economies of scale, and as its consequence cost reduction. BBC later evolved into AICO(ASEAN Industrial Cooperation) Scheme in 1996, covering the industry in general.

<Table 1-4> Foreign Maker's production in ASEAN

Country	Maker	1995	2000	2005	2009
Thailand	Toyota, Isuzu, Honda, Mitsubishi, Nissan, Ford, Mazda, GM	525,680	411,721	1,125,318	1,001,268
Indonesia	Toyota, Suzuki, Honda ,Daimler, Mitsubishi	386,234	296,223	485,386	502,489
Malaysia	Toyota, Honda, Nissan	103,118	70,278	230,560	174,517
Pakistan	Suzuki, Toyota, Honda	34,509	45,473	175,209	115,366
Philippines	Toyota, Honda, Mitsubishi	112,392	70,959	72,053	6,081

Source: Global Insight

3. 1980s to early 90s in North America

North America has been the number one region in the world until 2003, with sales volume around 20 million units a year. At an individual country level, the United States has been the biggest market, yielding to China the first place in 2009. Yet still, North America is the most important region for automotive manufacturers.

<Table 1-5> US Big 3 and affiliates light vehicle production in Canada and Mexico

Country	Maker	# of Plants	1995	2000	2005	2009
Canada	GM	5	1,071,833	1,053,391	1,030,571	346,805
	Ford	2	533,443	629,646	221,809	237,974
	Chrysler	2	538,097	705,764	679,714	310,625
	Total	9	2,143,373	2,388,801	1,932,094	895,404
Mexico	GM	4	198,819	440,938	433,826	350,167
	Ford	4	214,072	275,966	127,206	231,415
	Chrysler	2	205,561	401,193	344,437	144,445
	Total	10	618,452	1,118,097	905,469	726,027

Source: Global Insight

Of course, the 3 US makers are the biggest producer in this region including domestic market, but apart from the United States, the US makers are the most committed investor and producers in Canada and Mexico. As mentioned above, US makers were very early in overseas production because unlike other makers, especially Japanese. They have opted for overseas production over exports for their foreign sales strategy. Thus, in 1990s US makers showed relatively lower portion of exports but a high ratio of overseas production, compared with other makers. Also, it was triggered by the regional integration: North American Free Trade Agreement(NAFTA). Since NAFTA, automotive industry of North America has been restructured. GM has seven plants in Canada and Mexico, three in Canada and four in Mexico. Ford is currently operating four plants in Canada and Mexico, two in each.

Next to US makers, Japanese makers also invested a lot in this region, and mostly in the United States. The initial motivation of the FDI in this region was because the US government has been imposing trade pressure on Asian countries, especially Japan and Korea. Japanese makers began producing in the US in 1982, followed by the VER in 1981. They made a great success due to the oil shock. Americans were ever more sensitive to the gas price and fuel efficiency going through the oil shock period. Ever since, production increased every year, so that in 1985, it was only 300,000 units per year,

but the number doubled in three years and in 1995, it was over 2,000,000 units.   In 2005, the Japanese makers produced around 3.5 million units, which occupied 25% of total US production.   In 1993, Japanese makers' US production figure outnumbered their exports to the US market.   Now Japanese OEM's production amounts to almost 35% of total production in the North America. Japanese automakers now supply 63% of their total US sales from their North American plants, compared with less than 12% in 1986.

<Table 1-6> Japanese Big 3 and Affiliate production in North America

Maker	Country	# of Plants	1995	2000	2005	2009
Toyota	Canada	3	90,136	183,740	306,020	319,547
	Mexico	1	0	0	23,670	42,696
	US	9	638,037	919,253	1234,172	873,280
	Total	13	728,173	1102,993	1563,862	1235612
Honda	Canada	1	106,133	326,823	385,491	383,011
	Mexico	1	135	19,709	23,538	51,247
	US	4	581,225	698,287	939,868	987,176
	Total	6	687,493	1044,819	1348,897	1032039
Nissan	Mexico	2	106,794	295,407	349,179	358,322
	US	2	523,821	443,866	836,011	356,647
	Total	4	630,615	739,573	1185,190	714969

Source: Global Insight

4. Late 1990s to Early 2000s in the Eastern Europe

Since 1990s, there was some change in the FDI in Europe, along with the prospects of thaw in the cold war by the collapse of Soviet Union.   As the East European economy was integrated to the Western Europe, there was growing foreign investment in this region from the Western hemisphere.   The investor was not US makers but mostly Western European makers, making investments within Europe.   Since mid 1990s, European makers have been shifting their production to Central and Eastern Europe, to exploit the cheap labor cost, and geographical vicinity to Western Europe. Spain used to be the major FDI recipient by these makers before; now Poland, Czech, etc merged as the most favorable location for vehicle production for its infrastructure, endowment with skilled labor force, and adjacency to Western Europe market.   Most European makers have production facilities in Central and Eastern Europe.   This Eastward translocation was later followed by foreign makers, such as GM, Daewoo, Ford and Toyota.   This movement was accelerated by the EU's enlargement since 2004.

<Table 1-7> Historical View of European Makers' operation in Eastern Europe

Maker	Strategy	Model
VW	Acquired Skoda (1991) Czech: Skoda production base Slovakia: VW 4WD Poland: VW small commercial vehicle Hungary: Engine	Skoda Fabia (Saloon/HB/SW) Superb VW Polo/Golf/SLW
Renault	Full-scale manufacturing since 1998 Concentrated around Slovenia, Romania, Turkey Export Thalia from Turkey to Eastern Europe Brand divided into Renault and Dacia	Renault Clio/Thalia, Symbol/Kangoo Dacia X 90
PSA	Full-scale manufacturing since 1998 Brand divided into Peugeot and Citroen Czech: Joint venture with Toyota, supply base toward Western Europe	Peugeot 206-106, Citroen C3, Peugeot Partner, Citroen Berlingo
Fiat	Established FAP(Fiat Auto Poland) in 1992, and produced mid-to-low price small car for Western Europe	Palio/Weekend/Siena, Fiat Gingo

Source: Global Insight

<Figure 1-1> Overseas production ratio of European makers

Source: Global Insight

Generally, share of overseas production in the European makers is low compared to other global makers. Moreover, their production outside Europe is very limited. Except for Volkswagen and Fiat, most European makers are Eurocentric, at least in terms of production. The two French makers, PSA and Renault are very similar in that they their sales and production are concentrated in Western Europe and France. Among PSA's total production, 55% was built in Western Europe, and over one third was made in France. Majority of Renault plants are located in Europe, especially in Western Europe.

<Figure 1-2> European Makers' Production Portfolio and its development

Source: Global Insight

5. After mid-2000s: Competitive Global Expansion

From this time around, FDI by global makers were accelerated and made everywhere by almost every manufacturer. What can be distinguished from the FDI trend from the previous period is that the hottest FDI spot in this period were mostly developing countries: BRICs and East Europe.

1) China

Asia is the fastest growing region in terms of automobile production as well as sales, largely due to motorization in China and other developing countries. China is by far the most powerful absorber of FDI within Asia. VW, Hyundai, and GM are the Top 3 producers among foreign OEMs, and Japanese Big 3 are the next largest makers. Almost every global maker has entered China and began production. However, European maker's presence in general is yet weak at the moment. Only VW is leading significant business in China while presence of other three volume brands is weak. Currently Renault and Fiat has no sales in China let alone production. PSA runs one plant in Wuhan.

<Table 1-8> Top 10 Foreign OEMs in China

Maker	1995	2000	2005	2009
VW GROUP	199,726	331,529	481,577	1387,327
HYUNDAI	0	4,853	345,393	845,825
GM	0	30,024	358,425	772,501
TOYOTA	0	451	146,211	613,065
HONDA	0	32,228	268,218	602,455
NISSAN	0	0	172,999	535,657
FORD	0	5,526	79,268	266,496
PSA	10,733	53,900	141,661	262,889
SUZUKI	17,174	53,958	120,654	243,079
MAZDA	0	0	50,386	173,889

Source: Global Insight

2) India

India is another potential strong market next to China, and thus attracted FDI of many global manufacturers. Until 1990s, a handful of makers entered through joint-venture, but now most foreign OEMs operate independently through wholly owned subsidiaries thanks to the deregulation of automotive industry. Asian makers are the most

distinctive key players.　Maruti-Suzuki and Hyundai are the top two producers.　In fact, Suzuki is the by far the biggest foreign OEM. Hyundai is the second biggest maker.　India has substantial significance in Hyundai's global production roadmap.　It is attractive not only for its low wage, but it has one of the greatest potential for market growth.　India is now in the process of motorization, thus the demand is expected to rise rapidly for at least 10 years.　Currently, cars produced from Indian plant are for exports to Europe as well as domestic sales.　It is warned that when India-ASEAN FTA enters into force, cheap parts and components will be imported from Thailand, which can be detrimental to suppliers to Korean makers in India.

　　Besides these two makers, other foreign makers are not significant in terms of volume yet.　The total production units of Japanese Big 3, GM, Ford, and European makers combined is smaller than the production of Hyundai alone, the second biggest foreign maker.　European manufacturers are not doing very well in this market, and their production volume is insignificant.　VW, adopting the aggressive emerging market strategy, is now trying to build production capacity and expand sales in India, taking advantage of its partnership with Suzuki.

<Table 1-9> Top 10 Foreign OEMs in India

Maker	1995	2000	2005	2009
SUZUKI	270,801	361,296	555,335	903,986
HYUNDAI	0	84,578	250,917	558,558
GM	6,514	60,045	29,337	66,148
HONDA	0	10,705	38,580	60,740
NISSAN	0	0	0	56,742
TOYOTA	0	21,514	45,695	52,565
FORD	0	17,417	22,804	32,476
FIAT GROUP	0	12,015	0	23,653
VW GROUP	0	0	8,674	12,321
RENAULT	0	0	0	7,464

Source: Global Insight

　　India is becoming the manufacturing hub of compact cars by global manufacturers. As seen in the graph, compact cars(A segment) takes about half of the total production. Also, its production is growing very fast annually.　Leading models include Suzuki Alto, A-Star, GM's Spark and Beat, Hyundai's i10 and Santro, Nissan's Micra, Tata's Indica and Nano, etc.

<Figure 1-3> Production by Segment in India

Source: Global Insight(2010)

3) Central and Eastern Europe

Third stream of FDI was made in the Central and Eastern Europe. For this region, it is the second generation of foreign investment. The motivation of FDI by these newcomers is different from that of European makers. Western companies including GM and Ford mainly invested in this region for cheap resource, whereas Asian makers such as Toyota and Hyundai had mixed motivation: to reach the Western European market while sourcing relatively cheap labor.

<Table 1-10> FDI by non-European makers in Eastern Europe

Maker	Plant Location	Year
GM	Poland Gliwice, Warsaw Hungary Esztergom	- 2006
Ford	Poland(Tychy) Romania(Craiova)	2007 2008
Toyota	Czech Colin: TPCA(Toyota Peugeot-Citroen Automotive)	2005
Hyundai	Czech (Hyundai) Slovakia Zillina(Kia)	2006 2004

Source: Global Insight

Recently, Russia is emerging as another big region receiving FDI by foreign OEMs; especially since 2003, when its government released new automotive development policy. The vigorous FDI into Russia is mainly motivated by its market potential and the

high trade barriers: tariff and NTB.

4) South America

South American is also a popular region for FDI, especially Brazil. This is attractive market because it is growing but they have no local brand. Also, trade barrier in this region is very high.[84] Their automotive industry is heavily dependent upon foreign manufacturers. European and American manufacturers are the active producer in South America, and VW, Fiat, GM are the Big 3 in this region.

For Fiat, South America is one of the most important regions outside Europe. It has to do with the market segment structure of South America. Like Europe, small segments such as A and B segments are the most dominant segment in South America, where European makers are very competitive. Therefore, European makers have been strong presence in this region. Fiat's production volume has increasing since 90s, and now is the second biggest maker in Brazil, narrowing the gap with VW. Together, VW and Fiat are producing 56% of total vehicle passenger vehicle production in Brazil, which has been much lowered from 68.4% in 1995.

<Table 1-11> Production by foreign OEMs in South America(No. of units produced)

Country	# of Makers	# of Plants	1995	2000	2005	2009
Brazil	11	20	1,463,774	1,575,777	2,360,177	3,085,618
Argentina	9	10	285,435	338,103	319,755	507,209
Venezuela	7	7	96,901	89,432	156,500	111,697
Colombia	6	6	80,836	34,067	66,465	87,012
Ecuador	1	1	26,210	19,579	6,209	0
Chile	1	1	21,572	19,216	6,201	0
Total	35	45	1,982,710	2,091,372	2,965,969	3,867,351

Source: Global Insight

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[84] The tariff for CBU in Mexico is 50%, and 35% for MERCOSUR countries.

Appendix II. Performance Requirements in some Countries

1. Canada: Auto Pact[85]

Auto pact is a sectoral free trade arrangement, providing a duty-free trade zone between Canada and the US for finished vehicles and car parts. Eligible producers (the US Big 3) were allowed to import parts and vehicles duty free subject to local content requirements (50% Canadian/US content). Jaguar, Saab, and Volvo, were also eligible for this duty free treatment. Within the introduction of duty remission programmes, imports from outside the Auto-Pact area, mainly Japan, could qualify for rebates on exportation. Preferential tariff treatment under the Auto Pact and the remission programmes led to a sharp reduction in tariff incidence for foreign-owned car producers, with duty averages not exceeding 2 per cent at the time when the FTA and NAFTA entered into force. The eligibility condition for this Act was;

(i) The manufacturer must have produced in Canada, during the "base year"
(ii) Production to sales "ratio requirement"
(iii) Canadian value added requirements (the "CVA requirements")

The ratio requirement is a sort of quantitative restriction, limiting the volume of export to Canada by foreign makers. The designated minimum ratio was 75:100, but actually, most of the ratios had been close to 1:1 because it was difficult for the foreign makers to access Canadian vehicle market cross border due to high tariff at that time. The CVA requirement was a kind of local content requirement. To satisfy the CVA requirement, the manufacturer had to achieve the same level of value added that it has achieved during the base year(1963/1964) The CVA requirement included use of locally made parts, certain service performed in Canada, and labor and administrative cost.

The Canadian government adopted a policy of issuing special remission order(SRO) to new vehicle manufacturers that provided for duty remission on vehicles and other automotive goods imported from anywhere in the world if the manufacturers maintained a prescribed production-to-sales ratio and a CVA requirement. Canada issued many SROs and some Asian companies, including Toyota Motor Corp. and Honda Motor Co., began operating assembly plants in Canada, and requested their own SRO.

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[85] Full title of Auto Pact is *Agreement Concerning Automotive Products between Canada and the United States*.(Can.T.S. 1966, No. 14) The Auto Pact was signed on January 16, 1965 and entered into force on September 16, 1966. The Pact was terminated on February 18, 2001 as Canada implemente the WTO decision in Canada-Autos case(WT/DS139/R, WT/DS142/R, WT/DS139/AB/R, WT/DS142/AB/R).

2. Mexico

Local content requirements had existed in Mexico since 1960s. Auto Decree in 1962 stipulated that at least 60% of the 'direct cost' of each car should be of domestic production. However, in addition to the Auto Decree, NAFTA was also another relevant legislation regarding the local content. Appendix 300-A.2 of NAFTA established that Mexico could maintain the provisions of Auto Decree until January 1 of 2004. In 1994, the local content requirement of 36% under the Auto Decree was reduced to 34%, and this remained unchanged for a five-year period with an annual reduction of 1% to reach 29% in 2003. The requirement was eliminated in 2004.

<Table 2-1> Phasing out schedule of performance requirements as in NAFTA

year	National Value Added		Trade Balance
	vehicles	Auto parts	
1994	34 % for each of the first five years beginning January 1, 1994	20 %	80.0 %
1995			77.2 %
1996			74.4 %
1997			71.6 %
1998			68.9 %
1999	33 %	20 %	66.1 %
2000	32 %	20 %	63.3 %
2001	31 %	20 %	60.5 %
2002	30 %	20 %	57.7 %
2003	29 %	20 %	55.0 %

Source: UNCTAD

Trade balancing requirements first was introduced in 1976 when Mexico's balance of payments deteriorated due to the severe devaluation of the peso. It required each assembler to attain a trade balance within four years. Article 5 of the Auto Decree in 1989 stipulated that final assemblers must maintain a positive foreign exchange balance, which takes into account their exports of assembled vehicles as well as parts and components manufactured by them or purchased from Mexican suppliers. The total value of new vehicles that a final assembler may import is determined by dividing the foreign exchange surplus by a factor set in Decree.[86]

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[86] For 2002, this factor was 0.577, which means that for US$100 of foreign exchange surplus, US$ 173 worth of new vehicles may be imported

3. Brazil

Brazil's FDI policy started with Provisional Measure No. 1024 of 13 May 1995, and after revisions was established under Law No. 9449 of 14 March 1997. Benefits were given to manufacturers of motor vehicles and parts, in the form of a reduction in duties on their imports of certain products, conditional on compliance with certain requirements regarding the purchase or use o domestic products, and with trade balancing requirements and other criteria which may be imposed by the Ministry of Industry, Trade and Tourism. Tariff quota was opened for the importation of motor vehicles manufactured by certain foreign producers and originating in certain countries.

1) Tariff reduction

For parts, components and other inputs, a reduction of 70% in 1996, 55% in 1997, 40% in 1998 and 1999, with a minimum import duty of 2%. For finished vehicles, a reduction of 50% of the applied tariff or the MERCOSUR Common External Tariff, whichever lower, was announced and implemented until the end of 1999.

2) Local Content Requirement

In general, a minimum local-content requirement of 60%, reduced to 50% during the first three years for "newcomers" producing automotive products, except parts, and for one year for "newcomers" producing automotive products, except parts, and for one year for "newcomers" producing auto parts.

For capital goods there was a 1-to-1 minimum ratio between domestic products acquisition and imports until the end of 1997, when it was raised to a 1.5-to-1 proportion. For raw materials there was a 1-to-1 proportion between domestic products and imports.

3) Export-Performance Requirement

Until 1997, a 1-to-1 proportion between exports and imports of vehicles and auto pats. From July 1998 to June 1999, for each US$ exported, companies could import US$1.02 in vehicles and auto parts at reduced tariffs. From July 1999 until the end of 1999, the proportion was set at US$1 to US$ 1.03.

4. Russia

The full-fledged industrial policy started quite recently in Russia. It is not until late 1990s that Russian government introduced the industrial development concept in the automotive industry. The government tried to privatize the automotive industry, and gradually reduced tariff rates on passenger vehicles. In the mean time, Russian government announced Directive 135 in 1998, which outlines the guidelines for the foreign investor companies producing automobiles in Russia. In 2005, the Directive 135 was replaced by Directive 166, which provides more favorable environment for FDI in terms of production conditions including local content requirements.

Now that almost every major player in the global automotive industry is present in Russia, the government is concerned about establishing production base conforming to the European standards.

<Table 2-2> Industrial Policy Development of Russia

Category	Directive 135	Directive 166
Date of Enforcement	Feb. 1998	March 2005
Term of validity	7 years	8 years for greenfield 7 years for developed area
Customs duty on parts and components	0~14.5%	2~14.5%
Minimum Investment	$1.5 billion (In case of joint venture with local partner, $1,500 million)	None
Output Requirement	Yearly administration based on the volume of output	Above 25,000 units
Start of Production Requirement	full-scale production required within 36 months after signing agreement	Within 36 months in greenfield Within 18 months in developed area
Local Content Requirement	For 12 months, 15% For 24 months, 20% For 36 months, 30% For 48 months, 40% For 60 months, 50%	For 24 months, 10% For 42 months, 20% For 54 months, 30%

Source: KAMA

Russia is not yet a member of WTO as of 2010. Since China made accession to the WTO, Russia remains the biggest economy not yet incorporated to the world trading system. Accession of Russia to the WTO will render more stable and favorable environment for the foreign investors.

5. India

A. Import licensing

India was applying discretionary import licensing to 715 tariff line item, including cars imported in the form of completely and semi-knocked down ("CKD/SKD") kits. This import licensing scheme was abolished on April 2001.

B. Local-content schemes

Since 1995, Memoranda of Understanding (MOU)[87] have been required from car manufacturers seeking import licences for CKD/SKD kits on the restricted list. The authorities state that the terms and conditions of the MOU differ between companies: however, it was reported that such memoranda generally contain provisions to indigenize production. Once the MOU signing firm has reached an indigenization level of 70%, there will be no need for further import licenses from Director-general of Foreign Trade. Consequently as and when the firms achieve 70% indigenization they would go outside the ambit of the MOU automatically..

C. Trade balancing requirements

Subparagraph (iv) is on trade balancing requirements. There have been balancing requirements between the actual c.i.f. value of imports by automobile producers in India and exports of automobiles. That is, foreign investors should meet 1:1 ratio between their imports and exports, with the grace period of 2 years. Since June 1999, a new export-oriented Automotive Development Policy has been implemented to comply with WTO commitments and promote the component sectors. Tax incentives for local content have been phased out and no distinction is made in CKD or CBU.

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[87] *Public Notice No. 60 and the MOUs(Subparagraphs 3)*
  (i) Establishment of actual proportion facilities for manufacture of cars, and not for mere assembly.
  (ii) A minimum of foreign equity of US$50 million to be brought in by the foreign partner within the first three years of the start of operations, if the firm is a joint venture that involves majority foreign equity ownership.
  (iii)Indigenization (i.e. local content) of components up to a minimum level of 50% in the third year or earlier from the date of first import consignment of CKD/SKD kits/components, and 70% in the fifth year or earlier.[87]
  (iv)Broad trade balancing of foreign exchange over the entire period of the MOU, in terms of balancing between the actual CIF value of imports of CKD/SKD kits/components and the FOB value of exports of cars and auto components over the period. While a firm that signs an MOU has an export obligation equivalent to the total CIF value of the imports made by the firm over the period of the MOU, there is a two-year memorandum during which the firm does not need to fulfill that commitment. The period of export obligation therefore begins from the third year of commencement of production....

6. China

In April 2005, the central government put KD vehicle identification rules, namely 'Administrative Rules on Imported Auto Parts Constituting Complete Vehicle Characteristics' in force, tightening restrictions on imported content of locally assembled vehicles. KD regulations apply both to PV and CV, imposing complete vehicle tariff (25%) rate on those parts (10%) that do not meet the new requirements. According to the new KD rule, the product is regarded a complete vehicle if:

1) automobile is assembled from imported CKD or SKD kit.

2) body(including cab) and engine assembly are imported.

3) body(including cab) or engine is imported in addition to 3 or more imported system assemblies.

4) 5 or more system assemblies (transmission, driveshaft, non-driveshaft, frame, brake, steering system) are imported.

5) total price of imported parts amounts to or exceeds 60% of manufacturing price.

Also, Parts are regarded a complete vehicle if:

i. parts are imported as part of an assembly system.

ii. basic pats or sub-assemblies are imported and their number amounts to or exceeds the sanctioned number of parts. The same tariff rate applies to parts if they are regarded complete vehicles as to complete vehicles.

iii. if the total price of imported parts amounts to or exceeds 60% of manufacturing price, complete vehicle tariff rate is applied on such parts.

<Table 2-3> Regulations on Imported Parts (implemented on April 5, 2005)

Assembly Name			Key Parts and Components	Considered Import		Notes
				A-Type Parts	Other Parts	
Body (incl. Cab)	M-Type	A	Side Panel, Door, Engine Hood	2	5	If an M1-type sub-assembly contains masking and press parts, it is considered import sub-assembly
		B	Roof, Front-Wall Panel, Floor, Trunk Hood(0r Rear Door), Rear-Wall Panel, Fender	-		
	M2-Type	A	Roof, Side Panel	2	4	
		B	Engine Hood, Front-Wall Panel, Door, Rear-Wall Panel, Floor	-		
	M3-Type	A	Roof, Side Panel, Frame	2	4	
		B	Front-Wall Panel, Door, Rear-Wall Panel, Floor	-		
	N-Type	A	Roof, Door, Side Body	2	5	
		B		-		
Engine	Diesel Engine	A	Cylinder, Cylinder Had, High-Pressure Fuel Injection Pump	2	6	Items not include: radiators, fans, air

		B	Crankshaft, Turbo Charger, Camshaft, Connecting Rod, Starter, Generator, Diesel Injector	-		filters, silencers, fuel tanks, and clutches
	Gasoline Engine	A	Cylinder, Cylinder Head, EFI(incl. ECU, Throttle Valve, Injector, Sensor)	2	6	
		B	Crankshaft, Camshaft, Fuel Pump, Connecting Rod, Starter, Generator, Turbo Charger	-		
Transmission	MT	A	Case, Gear, Clutch	2	4	1. Items not included: Remote control system.
		B	Axle, Gearshift Module, Synchronizer, Transfer Case	-		
	AT	A	Case, Clutch, AT Control(ECU Module)	2	4	2. If the entire driveshaft's transfer case is assembled then the sanctioned number of parts are reduced to 3
		B	Transfer Case, Gear(or Friction Wheel, Steel Melt), Axle, Gearshift Module	-		
M1-Type Automobile	Driveshaft		Case, Axle Shaft(incl. Constant Velocity Joint), Steering Knuckle, Differential Gear, Swing Arm, Wheel Hub, Bearing, Wheel Reduction Gear, Suspension Spring, Shock Absorber	-	6	
Axle	Non-Driveshaft		Shaft(incl. trailing arm), Wheel Hub, Bearing, Suspension Spring, Shock Absorber	-	4	
M2, M3, and NType Automobiles	Driveshaft		Case, Differential Gar, Axle Shat, Drive Axle, Wheel Reduction Gear, Wheel Hub, Bearing, Shock Absorber, Suspension Spring	-	5	If the suspension system's front shaft includes a swing arm and steering knuckle then the sanctioned number o parts are increased to 6.
Axle	Non-Driveshaft		Steering Knuckle, Shock Absorber, Front Shaft, Suspension Spring, Wheel Hub, Bearing	-	4	
Frame			Longitudinal Member(Front Sub-Frame and Engine Support), Cross Member(or Rear Sub-Frame)	-	2	
Brake System			Master Cylinder(or Air Control Valve), Servo Booster, Front Brake, Rear Brake, ABS Valve Body, ECU	-	4	
Steering System	Power Steering		Steering Gear, Steering Control Valve, Steering Servo Pump, Steering Wheel, Steering Column and Joint	-	3	Items included: airbags
	Other Steering		Steering Gear, Steering Column and Joint, Steering Wheel	-	2	

Source: FOURIN China AUTO weekly(September 19, 2009)

7. Indonesia

In 1985's localization policy mandated that diesel engine for commercial vehicles were provided by local supplier, assembled locally. In addition, engine, transmission, accelerator, steering system, clutch system, brake, etc were deleted from licensing list. Later in 1987, tariff barrier system was introduced instead of import ban, and also deletion plan was turned into tariff system. In the ordinance announce on June 4, for vehicles produced in Indonesia, and using local contents above 60% were pronounced to be exempted from luxury tax. Luxury tax was for commercial vehicles and passenger vehicles were 20% and 35%, respectively.

Indonesian government adopted deregulation package in 1993. Ban on importation of CBU was replaced by high tariffs and surcharges, local content requirement scheme was replaced by differential tax treatment in favor of locally produced vehicles. The 1993 deregulation package also included foreign capital's majority ownership, which allowed foreign firms to operate in Indonesia in the stable and predictable environment.

<Table 2-4> Imports duty based on local content rate

	Local Content Rate	Passenger Car	Light Commercial Vehicle	
1993	Less than 20%	100%	40%	
	20% to 30%	80%	30%	
	30% to 40%	60%	20%	
	40% to 60%	40%	0%	
	More than 60%	0%	0%	
	Local Content Rate	Sedans and Station Wagon	Pick-ups, Minibuses and Jeeps	Buses and Trucks
1995	Less than 20%	65%	25%	25%
	20% to 30%	50%	15%	15%
	30% to 40%	35%	10%	0%
	40% to 50%	20%	0%	0%
	50% to 60%	10%	0%	0%
	More than 60%	0%	0%	0%

Source: FOURIN, アジア自動車産業, 2006

Luxury tax was exempted by 20~35% for all passenger vehicles with displacement under 1,600cc and commercial vehicles under 5 ton which have localization rate over 60%

1) The 1996 National Car Program

As a follow-up measure of 1995 New Automotive Industrial Policy, Indonesian Government adopted National Car Program in 1996. This program provided for the attribution of National Car company status(so-called 'pioneer status') to Indonesian-owned car makers that produce cars in Indonesia in facilities 100% owned by national industrial companies, or Indonesian statutory companies with all shares belonging to Indonesian citizens, and use trade marks created by them, and owned by Indonesian technology, designs and engineering on the basis of national capacity, to be realized in phases.

To maintain pioneer status, the company's car must meet the following local content requirements: 20% at the end of the first year, 40% at the end of the second year, and 60% at the end of the third year. Under these conditions, National Cars are granted two kinds of benefits: full exemptions from sales tax on all sales, while purchasers of imported sedans or other domestic sedans with 60% or less local content pay up to 35% tax, and domestic sedans with local content greater than 60% are subject to 20%, and full exemption from import duties on parts and components.

As its joint partner to the National Car Program, KTM(Kia Timor Manufacturing) was established, with share ownership by Kia(30%), PT Timo Putra Nasional(TPN)(35%), and INDAUDA(35%). Kia Sepia was the model selected as National Car and it was planned to start production in 1998 in the plant near Jakarta with annual production capacity of 50,000 units to be expanded to 100,000 in 2000.

In June, as local manufacturing plant construction was delayed, Indonesian government modified the program that when cars are manufactured by Indonesian nationals, though built in foreign countries, they are treated equally as National Car. Under this decision, 1,000 Indonesian workers were sent to Korea, and 45,000 units of Timor (Sepia) were imported from Korea duty free as National Car. The National Car plant construction was commenced in the next year.

However, in 1998, the WTO Dispute Settlement Body concluded that the national vehicle concept was in violation of the WTO Agreement. Thus, Indonesian government introduced new automotive policy in 1999. The new policy removed CKD tariff incentives under previous localization rates.

8. Malaysia

1983 was the turning point for Malaysia's automotive industrial policy. In that year, the Government established Proton, the national car company, and since then Malaysia's industrial policy was directly related to the promotion of Proton. The PROTON project, which was a joint-venture with Mitsubishi Motors of Japan, began its production in 1985. As it has integrated manufacturing facilities promoting linkage and having national brand, it was given preferential duty rates.

Proton's KD production increases caused large trade deficit, and the Government released New Local Content Policy. Local content requirement was raised from 60% to 80%, and tariff was imposed on parts that Proton imported. In 1994, Perodua and DRB-Proton, the 2nd and 3rd National Car company were launched.

Later, the local content requirements were adjusted according to the engine displacement or weight, mandating up to 60% for small and medium size passenger vehicles(including MPV) up to 1850 cc. Under the local-content policy for the automotive sector, there were 30 items on the mandatory deletion list, which local automotive assemblers/manufacturers must source locally. Malaysia has received an extension of the phase-out period for local content requirements until December 2001. In requesting another two years extension until December 2003, Malaysia has agreed to abolish the local content rule and remove 11 products from the deletion list from 2002. The remaining 19 items were abolished at the end of 2003. However, there is still administrative guideline encouraging the local content usage.

<Table 2-5>Local content Rule of Malaysia(up to 2003)

	Vehicle types			Local content required
	PV	CV	MPV	
Engine displacement/ weight	Up to 1850cc	–	Up to 1850cc	60%
	Above 1851~2850cc	Up to 2500 GVW		45%
	2851cc	Above 2500GVW		Deletion program

Source: FOURIN, アジア自動車産業, 2006

9. Philippines

The Board of Investment(BOI) launched PCMP(Progressive Car Manufacturing Program) in 1973 to increase the domestic content from 15% in the first year, to 25% in the second year, and 35% in the third year, and progressively increasing thereafter.

<Table 2-6> Details of Motor Vehicle Development Program (MVDP)

Item		Detail
Car Development Program	MO 136 (Dec 1987)	For cars with engine displacement of 1201~2800cc, 40% of local content is required.
	MO 286 (March 1990)	For cars with engine displacement of 1200cc and below, 51% of local content is required.
	MO 68 (Dec 1992)	For cars with engine displacement of 1200~2800cc, foreign exchange is required as follows: - 50%(up to 1994) - 75%(1995~1997), - 100%(1998 onwards)
	MO 238 (Jul 1994)	Change the book value of CBU passenger vehicles importable from US$25,000 to US$20,000.
	MO 242 (Dec 1994)	Participation in CDP to ASEAN Industrial Joint Venture (AIJV) project proponents. Participants under the AIJV's scheme are required 100% foreign exchange for imports of CKD units for assembly.
Commercial Vehicle Development Program	MO 157 (Feb 1988)	1. For Asian Utility Vehicle(up to 3000 GVW) -local content(54.86%) and foreign exchange(25%) 2. For light Commercial vehicle (up to 3000 GVW) -local content(44.42%) and foreign exchange(25%) 3. For light trucks(3001 to 6000 GVW) -local content(21.90%) and foreign exchange(25%) 4. For cargo trucks or passenger buses, in accordance with vehicle WT, local content is required as follows: -6,001-9,000: 21.44% -9,001-12,000: 22.44% -12,001-15,000: 13.53% -15,001-18,000: 13.77% And 25% of foreign exchange is required from 1988 onwards.
Motorcycle Development Program	MO 160 (Feb 1988)	1. For two-wheeler vehicles, 54.95% of local content, and 25% of foreign exchange is required. 2. For three-wheeler vehicles, 46.64% of local content, and 25% of foreign exchange is required.
MO 346 (Feb 1996)		-liberalized new entry into auto assembly industry. -limit on the number of assembly model was abolished. -mid-to-large commercial vehicle import ban was released.
MO 473 (Apr 1998)		-newly entered auto makers were not allowed to import SKD for maximum 1 year. -high technology parts were required to procure locally.

Source: WTO, Notifications from countries (G/TRIMS/N/1/PHL/1)

10. Thailand

Under Factory Act(B.E. 2535) and Investment Promotion Act(B.E. 2520), passenger vehicle assembly plants were required to use specified local parts or were encouraged to use specified proportions in order to be eligible for Board of Investment rights and privileges. For passenger cars, not less than 54% of local parts is required; a compulsory parts list amounting to 60-70% local content applies for small trucks; trucks and buses must incorporate seven specified locally produced parts and reach at least 40-50% domestic content; and motorcycles must incorporate a local engine. The benefits include import duty and excise duty exemptions for assembly plants meeting the local-content requirements. If the local content is met, differential tariffs apply depending on whether the vehicle is imported completely knocked down (CKD) or completely built-up (CBU). Local Content Requirement was abolished before 2003.

<Table 2-7>Various Local Content Requirements in Thailand

	Application	Criteria	Effective Date	Reference
Mandatory Local Content	Passenger vehicles	No less than 54% of domestic auto parts must be used.	18 January 1994	Notification of Ministry of Industry No. 1
	Vans and other types of PV	Not more than; -40% of Chassis with engine, -45% of Chassis with engine and windshield, -50% of Chassis with engine and cap, are imported	25 December 1979	Notification of Ministry of Industry
	Small vans and trucks	- Local engines and parts are used at least 40% - seven local items are encouraged to use: radiator, silencer, exhaust pipes, battery, front-rear leaf, type and tube wheel, safety glass and front-rear drum brake	3 May 1991	Notification of Ministry of Industry
Local Content Ratio Required	Engines for automobiles	Year 1: 20% Year 2: 30% Year 3: 40% Year 4: 50% Year 5: 50% Year 6: 60% Year 7: 70%	12 January 1987	Announcement (Office of the Board Investment) No. P.1/2530 and Board Resolution
	Transmission Assembly	Year 1: 20% Year 2: 35% Year 3: 50% Year 4: 65% Year 5: 80%	21 January 1987	Board Resolution
Excise Tax	PV and Pick-	Not less than 60% of	2 march	Announcement

Exemption	up trucks with chassis and windshield	domestic parts and components must be used to any modification	1994	(the Excise Department)

Source: WTO, Notifications from countries (G/TRIMS/N/1/THA/1)

11. Vietnam

During the period 1987~1994, localization requirements were used in the appraisal and licensing of foreign investment projects concerning the production of automobiles, motorcycles, etc. In production and assembly of automobiles, companies have to submit a plan for components and spare parts production in Vietnam to receive an investment license. Five years from the starting date of production at the latest, the project has to use local parts and components for a value of no less than 5% of the car's ex-factory cost. The ratio then progressively increases so that in the 10th year, local content should be no less than 30% of the ex-factory cost. The below table shows the actual local content rates committed by foreign manufacturers.

<Table 2-8>Commitment on Localization made by makers(2003)

Makers	Local contents(%) in years from starts of production									
	1	2	3	4	5	6	7	8	9	10
Isuzu	-	-	-	-	-	-	-	-	-	30
Mercedes Benz	-	-	-	5	-	-	-	-	-	40
VIDAMCO	-	-	-	5	-	-	-	-	-	35
Suzuki	-	-	22.8	-	-	29.6	-	-	-	38.2
Ford	-	-	-	-	-	-	-	-	-	30
Toyota	-	-	-	-	-	-	-	-	-	30
Hino	-	-	-	-	10	-	-	-	-	30

Source: UNCTAD

The Vietnamese government tries to move from simple assembly to localized production of components and spare parts. According to the Prime Minister's decision ratified in December 2002, regular vehicles including commercial vehicles as well as passenger vehicles should have a local content of 60% or more by 2010. This target was reiterated in the Governments Master Plan for Development of Automobile Industry of October 2004. It required the local content of automobile engines to be at least 50% and that of gear boxes no less than 90%.

12. South Africa

Since the beginning of the assembly industry to serve the demand in the domestic market in 1920s, the vehicle market was protected by high tariffs. The high import tariff blocked the competition with imported vehicles, but there was high degree of competition among domestic assemblers. Cars were assembled locally from imported components mostly, and the local content level was around 20% at this period. This led to the necessity of local content rules for the local assembly industry. Starting in 1961, a series of local content requirements were introduced, and by the end of second Phase, manufacturers were required to have 52% local content, as measured by the weight of the local component. Assemblers not meeting the local content requirement were subject to prohibitively high tariff on the imported parts. The local content level required was gradually raised to 66%.

<Table 2-9>Industrial Policy Development of South Africa

Period	Policy details
Before 1960	No Local Content Requirement
1961~1969	Local Content Requirement introduced.
1970~1976	52% of local content was required in terms of weight
1977~1981	66% of local content for cars were required.
1982~1987	66% local content was extended to light commercial vehicles.
1988~1994	Local content requirement was reduced from 66% to 50%
1995	Motor Industry Development Program

Source: Black(2002)

From 1988, there was a change of policy direction: from import substitution to export promotion. Instead of enforcing tight local content requirements, export was promoted which eased foreign exchange difficulties. Thus, actual local content rate could be reduced. In this period, the local content requirements were lowered from 66% to 50%.

In 1995, the government introduced Motor Industry Development Program(MIDP). The main policy objective of this program was to i) reduce the tariffs on light vehicles and components, with tariffs being phased down even faster than required by WTO obligations, ii) removal of local content requirement, iii) duty-free import of components up to 27% of the wholesale value of the vehicle, and iv) duty rebate credits to be earned on exports of vehicles and components and used for duty-free import of vehicles and components.

Appendix III. Panel Data

<Table 3-1> FDI inflow in the motor vehicle industry(in US million $)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	392	774	1082	65	-313	253	-17	80	42	606		
Australia	0	0	0	0	0	0	0	0	0	0	0	0
Austria	0	0	0	-75.6	69.2	151.1	51	272.3	-6.7	11.1	-166.5	129.2
Belgium	0	0	0	0	0	0	0	659.6	-408.9	-592.6	0	-597.4
Brazil												
Canada	0	0	0	0	0	0	0	0	0	0	0	0
Chile												
China												
Colombia												
Czech Rep.	0	0	0	0	0	0	282.4	-73	887.9	-429.2	397.1	62.1
Ecuador												
Egypt												
Finland	0	0	0	0	0	0	0	0	73.4	-24.8	0	0
France	90.7	237.1	310.1	-31.1	563.6	272.7	1559.1	1765.1	695.8	771.5	1053.9	440.5
Germany	113	935.1	-946.8	-3441.3	-293	2327.8	578.5	-807.6	-1148.8	966.5	-1030.3	-461.9
Hungary	0	0	0	0	558.5	0	650.7	273.8	496.7	563.4	444.3	792.9
India												
Indonesia					5.41	66.33	141.88	69.40	28.27	173.49	70.45	
Italy	25.8	27.6	54.5	62.9	116.1	3635.6	159.4	1769.8	525.3	2066	-9.9	1886.5
Japan	0	0	0	0	0	0	0	0	0	0	0	0
Korea	55.9	285.6	362.5	181.5	136.8	919.4	-5.8	400.9	-38	261.2	746.3	177.7
Malaysia					0.06	2.84	58.68	0.47	9.20	31.03	0	
Mexico	0				2191.7	1612	1403.9	1249.9	1114.6	2466.9	2079.2	1419.9
Netherlands	402.3	641.7	178.4	23.3	98	45.1	193.4	-160.2	-267.7	-253.4	48.4	210.8
Pakistan												
Philippines					13.01	153.19	19.73	34.89	27.13	31.57	57.11	
Poland	58.8	341.7	193.2	465.6	279.9	279.8	55.1	387.5	766.5	937.5	391	601.2
Portugal	0	0	0	0	0	0	0	0	0	0	0	0
Russia												
Slovakia	0	0	0	0	0	-100.4	135.9	-161.6	-175	459.2	823	615.8
Slovenia												
South Africa												
Spain	528.4	512.2	809	565.8	-1253	0	0	0	0	0	0	-341.4
Sweden	0	0	0	0	0	1999.6	1073.1	-172.1	179.3	0	1065.5	650
Thailand					16.25	59.74	70.01	124.79	806.80	474.98	1644.69	
Turkey	0	0	0	0	0	0	0	28	140	35	74	63
Ukraine												
UK	-523.9	24.9	822.2	3951.2	5319.5	3999.3	-1293.3	-4323.4	-5317.6	-1205.5	-332.6	-483.9
USA	298	3697	1775	37182	6456	1028	7465	5805	-39	6083	3114	-2638
Uruguay												
Vietnam						28.69	84.36	116.91	91.95	185.42	391.43	
Total	16038.8	6702.9	3558.1	38884.3	14511.1	16308.6	11625.7	6913.7	-2493.9	12149.1	8613	2569.8

Source: OECD, ASEAN Secretariat

Note: ISIC (Rev. 3) 34 motor vehicle industry(341, 342, 343)

<Table 3-2> Number of Foreign OEMs

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	7	7	9	9	9	9	8	8	8	8	8	8
Australia	8	8	8	8	8	6	6	6	6	6	6	6
Austria	4	4	4	4	4	4	3	3	5	5	5	5
Belgium	2	2	3	3	3	3	3	3	3	3	3	3
Brazil	9	9	10	11	12	12	14	14	14	14	14	14
Canada	7	7	7	7	7	7	7	7	7	7	7	7
Chile	3	3	3	3	2	2	2	2	2	2	1	1
China	10	12	12	13	15	17	18	18	21	22	22	22
Colombia	5	5	5	5	6	6	6	6	6	6	6	6
Czech	1	1	2	2	2	1	1	1	1	1	3	3
Ecuador	8	8	5	5	5	5	4	4	4	3	2	2
Egypt	11	11	11	11	11	11	11	10	10	8	8	8
Finland	0	0	1	1	1	1	1	1	1	1	1	1
France	2	2	3	4	4	4	5	7	7	7	7	7
Germany	4	4	4	3	3	3	3	3	4	4	4	4
Hungary	3	3	3	4	3	2	2	2	3	3	4	4
India	4	6	6	9	9	10	10	11	11	11	11	11
Indonesia	15	15	15	15	14	14	14	13	13	13	13	12
Italy	2	2	2	2	4	4	4	4	5	5	5	5
Japan	3	3	3	3	3	3	3	3	3	3	3	3
Korea	0	0	0	0	0	0	0	0	0	0	0	0
Malaysia	15	14	15	13	14	14	15	14	14	14	14	14
Mexico	8	8	8	8	8	9	9	9	9	9	10	10
Netherlands	1	1	1	1	1	1	1	2	3	3	3	3
Pakistan	7	7	8	8	7	6	7	6	6	7	7	8
Philippines	13	13	12	12	12	13	13	13	13	13	13	13
Poland	9	9	10	9	9	8	7	4	4	4	5	5
Portugal	5	5	8	8	7	7	7	7	7	7	7	7
Romania	2	2	2	2	2	2	2	2	2	2	2	2
Russia	0	1	3	3	5	6	6	6	6	6	7	8
Slovakia	1	1	1	1	1	1	1	1	1	1	1	3
Slovenia	1	1	1	1	1	1	1	1	1	1	1	1
South Africa	12	12	12	12	12	12	11	11	11	11	11	11
Spain	10	10	10	10	10	10	10	10	11	11	11	11
Sweden	3	3	3	3	3	3	4	4	3	3	3	4
Thailand	15	15	14	12	12	15	15	16	16	14	14	14
Turkey	9	9	10	11	11	11	11	10	10	10	10	10
UK	0	9	1	1	2	2	2	2	5	5	5	5
Ukraine	10	11	11	11	12	12	13	12	10	11	11	11
USA	10	10	10	10	10	10	10	10	10	10	11	11
Uruguay	4	4	2	2	2	2	2	2	0	0	0	0
Vietnam	0	0	0	0	0	0	0	0	0	0	0	0

Source: Global Insight

<Table 3-3> Number of Domestically Owned OEMs

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	0	0	0	0	0	0	0	0	0	0	0	0
Australia	0	0	0	0	0	0	0	0	0	0	0	0
Austria	0	0	0	0	0	0	0	0	0	0	0	0
Belgium	0	0	0	0	0	0	0	0	0	0	0	0
Brazil	0	0	0	0	0	0	0	0	0	0	0	0
Canada	0	0	0	0	0	0	0	0	0	0	0	0
Chile	0	0	0	0	0	0	0	0	0	0	0	0
China	11	12	13	13	13	19	19	19	19	21	22	26
Colombia	0	0	0	0	0	0	0	0	0	0	0	0
Czech	0	0	0	0	0	0	0	0	0	0	0	0
Ecuador	0	0	0	0	0	0	0	0	0	0	0	0
Egypt	0	0	0	0	0	0	0	0	0	0	0	0
Finland	0	0	0	0	0	0	0	0	0	0	0	0
France	2	2	2	2	2	2	2	2	2	2	2	2
Germany	5	5	5	5	5	5	5	5	5	5	5	5
Hungary	0	0	0	0	0	0	0	0	0	0	0	0
India	3	3	3	3	3	3	3	3	3	3	3	3
Indonesia	0	0	0	0	0	0	0	0	0	0	0	0
Italy	1	1	1	1	1	1	1	1	1	1	1	1
Japan	8	8	8	8	8	8	8	8	8	8	8	8
Korea	5	5	5	5	5	4	4	3	2	2	1	1
Malaysia	2	2	2	2	2	2	2	2	2	2	2	2
Mexico	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	0	0	0	0	0	0	0	0	0	0	0	0
Pakistan	0	0	0	0	0	0	0	0	0	0	0	0
Philippines	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0	0
Portugal	0	0	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0	0	0
Russia	6	6	6	6	6	6	6	5	5	5	5	5
Slovakia	0	0	0	0	0	0	0	0	0	0	0	0
Slovenia	0	0	0	0	0	0	0	0	0	0	0	0
South Africa	0	0	0	0	0	0	0	0	0	0	0	0
Spain	0	0	0	0	0	0	0	0	0	0	0	0
Sweden	0	0	0	0	0	0	0	0	0	0	0	0
Thailand	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0
UK	0	0	0	0	0	0	0	0	0	0	0	0
Ukraine	0	0	0	0	0	0	0	0	0	0	0	0
USA	3	3	3	3	3	3	3	3	3	3	3	3
Uruguay	0	0	0	0	0	0	0	0	0	0	0	0
Vietnam	0	0	0	0	0	0	0	0	0	0	0	0

Source: Global Insight

<Table 3-4> Percentage of VA against the output in the automotive industry

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	55.2	52.2	63.4	60.3	47.0	54.4	54.0	48.1				
Australia		62.5	53.4	60.6	59.9	60.0	48.0	49.1	45.5	43.1	40.2	38.6
Austria	63.7		70.1	52.5	57.2	52.0	57.6	58.9	60.9	56.8	58.7	59.1
Belgium	78.1	75.7	72.9	75.9	74.3	72.7	70.6		66.9	62.0	62.6	70.0
Brazil		60.0	59.5	57.7	52.3	57.4	54.0	55.0	49.2	49.3	51.7	52.0
Canada	62.8	60.5	59.2	58.0	70.0	66.8	64.7	67.7	63.5			
Chile							59.7	66.6	51.1	65.7	73.4	66.9
China									64.5	58.9	56.2	57.2
Colombia						64.1	67.5	62.0	61.4	67.2	62.2	
Czech Rep.	60.2											41.2
Ecuador	85.2	87.3	88.1	87.6	83.1	79.8	84.3	81.1	77.1	68.2	74.2	
Egypt			92.0	84.1				38.4				
Finland	45.0	40.3	39.7	40.5	40.9	38.0	43.5	42.6	34.2	29.6	34.0	39.5
France		65.6	67.5	69.4	67.9	66.8	66.4	68.1	67.1	68.5	68.6	65.9
Germany				68.2	65.4	62.6	66.6	64.7	67.3	64.3	64.3	65.5
Hungary	63.7	62.3	62.2	63.9	68.2	63.6	56.4	58.8	57.4	57.0	49.7	52.5
India				47.8	50.2	44.3	43.8	45.9	51.5	55.1	64.0	
Indonesia				53.3	40.2	62.8	84.2		72.9	78.5	86.6	81.0
Italy	56.5	48.7	54.8	47.3	39.5	47.0	31.1	22.0	28.9	32.6	37.5	45.6
Japan	41.4	46.0	44.7	50.0	48.3	43.2	46.0	47.2	45.3	44.4	46.5	
Korea	59.3	58.4	65.9	61.8	63.4	63.0	67.0	64.3	64.1	59.5	57.6	55.9
Malaysia						61.2	69.9	67.7	68.6	71.1	59.8	67.4
Mexico	85.8	86.1	85.3	85.0	85.0	85.2	85.6	85.5	64.8	74.6	74.2	74.8
Netherlands	54.7	56.8	61.9	64.2	63.1	63.9	63.1	62.8	62.8	70.9	68.9	71.5
Pakistan												85.6
Philippines												
Poland		70.5	66.5	64.5	60.7	54.9	50.8	46.3	46.9	44.0	44.7	42.2
Portugal		64.3	65.8	63.4	65.3	60.7	60.5	53.5	45.3	39.0	40.1	
Russia							100.0	100.0	100.0	100.0	100.0	100.0
Slovakia	74.9	61.2										
Slovenia	70.7	62.1	56.6	64.5	57.3	53.7	47.4	38.9	33.7	34.9	37.5	35.0
South Africa		55.9		61.5								
Spain	63.1	63.0	61.7	62.6	58.5	58.3	53.8	53.1	54.2	53.0	52.5	55.7
Sweden	78.8	76.0	77.7	78.2	82.5	77.9	77.1	73.1	61.3	67.0	63.8	67.1
Thailand		74.5		97.4		98.4		99.5				59.8
Turkey	63.8	65.7	76.8	72.0	79.9	82.1	61.8		62.5	64.3	59.8	
Ukraine												
UK	59.4	65.7	60.5	55.9	53.7	48.5	53.3	49.0	51.0	56.4	51.5	
USA			60.4	57.7	59.2	55.1	55.2	59.7	62.1	61.9	61.4	60.8
Uruguay				100.0	100.0	100.0	100.0	100.0	100.0			
Viet Nam				45.7		72.4						

Source: computed from UNIDO INDSTAT
Note: the shaded area indicates the period when local content requirements were in place.

<Table 3-5> Historical change in the Tariff on passenger vehicles(HS 8703)

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	30	30	30	33	33	33	35	35	35	35	35	35
Australia	27.5	25	22.5	20	17.5	15	15	15	15	15	10	10
Austria	10	10	10	10	10	10	10	10	10	10	10	10
Belgium	10	10	10	10	10	10	10	10	10	10	10	10
Brazil	105	80	63	49	35	35	35	35	35	35	35	35
Canada	8	8	7.3	6.7	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Chile	11	11	11	11	10	9	8	7	6	6	6	6
China	100	100	100	100	100	100	61.9	50.7	43	37.6	30	25
Colombia	35	35	35	35	35	35	35	35	35	35	35	35
Czech	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	10	10	10
Ecuador	35	35	40	35	35	35	35	35	35	35	35	35
Egypt	135	135	135	135	135	135	135	135	135	135	135	135
Finland	10	10	10	10	10	10	10	10	10	10	10	10
France	10	10	10	10	10	10	10	10	10	10	10	10
Germany	10	10	10	10	10	10	10	10	10	10	10	10
Hungary	43	78	78	78	78	78	78	78	15	15	10	10
India	52	52	45	45	45	38.5	105	105	105	105	100	100
Indonesia	200	200	200	200	80	80	80	80	80	80	80	60
Italy	10	10	10	10	10	10	10	10	10	10	10	10
Japan	0	0	0	0	0	0	0	0	0	0	0	0
Korea	8	8	8	8	8	8	8	8	8	8	8	8
Malaysia	300	300	300	300	300	300	300	300	300	50	50	50
Mexico	30	30	30	20	30	30	30	30	30	30	50	50
Netherlands	10	10	10	10	10	10	10	10	10	10	10	10
Pakistan					225	250	250	250	200	150	75	75
Philippines	40	40	40	40	40	30	30	30	30	30	30	30
Poland	154	154	154	154	154	154	119	119	98	10	10	10
Portugal	10	10	10	10	10	10	10	10	10	10	10	10
Romania	30	30	30	30	30	30	30	30	30	30	30	30
Russia	70					30	20	20	25	25	25	25
Slovakia	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	10	10	10
Slovenia	27	27	27	27	27	27	27	27	27	10	10	10
South Africa	61	61	61	61		47	42.5	40	40	40	34	34
Spain	10	10	10	10	10	10	10	10	10	10	10	10
Sweden	10	10	10	10	10	10	10	10	10	10	10	10
Taiwan	50	50	50	50	50	50	50	60	60	60	60	60
Thailand	200	200	200	200	200	200	200	200	200	80	80	80
Turkey	33	33	30.7	28.4	24.3	21.5	10	10	10	10	10	10
UK	10	10	10	10	10	10	10	10	10	10	10	10
Ukraine											25	25
Uruguay				23	23	23	23	23	35	35	35	35
USA	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
venezuela	35	35	35	35	35	35	35	35	35	35	35	35
Vietnam					100	100	100	100	100	100	100	100

Source: WTO, national tariff authority

Note: highest tariff in HS 8703

<Table 3-6> Historical change in the Corporate Income Tax

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	30		33	33	35	35	35	35	35	35	35	35
Australia	36	36	36	36	36	34	30	30	30	30	30	30
Austria	34	34	34	34	34	34	34	34	34	34	25	25
Belgium	40.2	40.2	40.2	40.2	40.2	40.2	40.2	40.2	34	34	34	34
Brazil	25	25	25	25	33	37	34	34	34	34	34	34
Canada	42.9	42.9	42.9	42.9	42.9	42.6	40.5	38.1	36	34.4	36.1	34.1
Chile	35		15	15	15	15	15	16	16	16.5	17	17
China	33	33	33	33	33	33	33	33	33	33	33	33
Colombia	30		35	35	35	35	35	35	35	35	35	35
Czech	41	39	39	35	35	31	31	31	31	28	26	24
Ecuador	25	25	32	36.3	15	25	36.3	36.3	36.3	36.3	25	25
Egypt	40	40	40	40	40	40	40	40	40	40	40	40
Finland	25	28	28	28	28	29	29	29	29	29	26	26
France	36.7	36.7	41.7	41.7	40	37.8	36.4	35.4	35.4	35.4	35	34.4
Germany	55.1	55.9	56.8	56	52	52	38.9	38.9	40.2	38.9	38.9	38.9
Hungary	18	18	18	18	18	18	18	18	18	16	16	17.3
India	40		35	35	35	38.5	39.6	35.7	36.8	35.9	36.6	33.7
Indonesia	30	30	30	30	30	30	30	30	30	30	30	30
Italy	53.2	53.2	53.2	37	37	37	36	36	34	33	33	33
Japan	51.6	51.6	51.6	51.6	48	42	42	42	40.9	39.5	39.5	39.5
Korea	33	33	30.8	30.8	30.8	30.8	30.8	29.7	29.7	29.7	27.5	27.5
Malaysia	30	30	30	28	28	28	28	28	28	28	28	28
Mexico	34	34	34	34	35	35	35	35	34	33	30	29
Netherlands	35	35	35	35	35	35	35	34.5	34.5	34.5	31.5	29.6
Pakistan	46		30	30	35	45.2	34.7	35	35	35	35	35
Philippines	35	35	35	34	33	32	32	32	32	32	32	35
Poland	40	40	38	36	34	30	28	28	27	19	19	19
Portugal	39.6	39.6	37.4	37.4	37.4	35.2	35.2	33	33	27.5	27.5	27.5
Romania	38	38	38	38	38	38	25	25	25	25	16	16
Russia	35	35	35	35	35	35	35	24	24	24	24	24
Slovakia	40	40	40	40	40	29	29	25	25	19	19	19
Slovenia	39.2	38.1	37	37.8	38.2	37.5	37.7	38	38.2	38.3	38.6	38.3
South Africa	35					30	37.8	37.8	37.8	37.8	37.8	36.9
Spain	35	35	35	35	35	35	35	35	35	35	35	35
Sweden	28	28	28	28	28	28	28	28	28	28	28	28
Thailand	30	30	30	30	30	30	30	30	30	30	30	30
Turkey	44	44	44	44	33	33	33	33	30	33	30	30
UK	22					30	30	30	30	25	25	25
Ukraine	33	33	31	31	30	30	30	30	30	30	30	30
USA	39.6	39.5	39.5	39.4	39.4	39.3	39.3	39.3	39.3	39.3	39.3	39.3
Uruguay	30	30	30	30	30	30	30	30	35	30	30	30
Vietnam	25		35	35	35	32.5	32	32	32	28	28	28

Source: OECD, national statistics office

<Table 3-7> Number of countries under Preferential Trade Agreements

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	3	4	5	5	5	5	5	5	5	5	10	12
Australia	2	2	3	2	2	2	2	2	3	3	5	5
Austria	19	20	21	22	22	26	26	27	29	39	41	43
Belgium	19	20	21	22	22	26	26	27	29	39	41	43
Brazil	3	4	5	5	5	5	5	5	5	5	10	12
Canada	2	2	4	4	4	4	4	5	5	5	5	5
Chile	3	7	8	8	9	9	9	10	25	41	41	42
China	0	0	0	0	0	0	0	0	0	2	12	13
Colombia	4	4	4	4	4	4	4	4	4	8	8	8
Czech	7	7	7	7	7	7	7	7	8	39	41	43
Ecuador	4	4	4	4	4	4	4	4	4	8	8	8
Egypt	0	0	0	0	0	0	0	0	0	25	25	25
Finland	19	20	21	22	22	26	26	27	29	39	41	43
France	19	20	21	22	22	26	26	27	29	39	41	43
Germany	19	20	21	22	22	26	26	27	29	39	41	43
Hungary	7	7	7	7	7	7	7	7	8	39	41	43
India	1	1	1	1	1	1	1	1	2	2	3	9
Indonesia	6	6	8	8	9	9	9	9	9	9	10	10
Italy	19	20	21	22	22	26	26	27	29	39	41	43
Japan	0	0	0	0	0	0	0	0	0	0	1	2
Korea	0	0	0	0	0	0	0	0	0	1	1	6
Malaysia	6	6	8	8	9	9	9	9	9	9	10	11
Mexico	6	6	6	8	8	22	25	25	25	36	37	42
Netherlands	19	20	21	22	22	26	26	27	29	39	41	43
Pakistan	0	0	0	0	0	0	0	0	0	0	1	1
Philippines	6	6	8	8	9	9	9	9	9	9	10	10
Poland	7	7	7	7	7	7	7	7	8	39	41	43
Portugal	19	20	21	22	22	26	26	27	29	39	41	43
Romania	7	7	7	7	7	7	7	7	8	8	8	8
Russia	11	11	11	11	11	11	11	11	11	11	11	11
Slovakia	7	7	7	7	7	7	7	7	8	39	41	43
Slovenia	7	7	7	7	7	7	7	7	8	39	41	43
South Africa	4	4	4	4	4	19	19	19	19	29	29	29
Spain	19	20	21	22	22	26	26	27	29	39	41	43
Sweden	19	20	21	22	22	26	26	27	29	39	41	43
Thailand	6	6	8	8	9	9	9	9	9	9	10	10
Turkey	4	19	20	20	20	21	21	23	24	37	39	40
UK	19	20	21	22	22	26	26	27	29	39	41	43
Ukraine	6	7	7	7	7	12	12	12	12	12	14	15
Uruguay	3	4	5	5	5	5	5	5	5	5	10	12
US	3	3	3	3	3	3	3	4	4	6	6	8
Vietnam	6	6	8	8	9	9	9	9	9	9	10	10

Source: WTO, KOTRA

<Table 3-8> Perceived Corruption Index

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	5.24	3.41	2.81	3	3	3.5	3.5	2.8	2.5	2.5	2.8	2.9
Australia	8.8	8.6	8.86	8.7	8.7	8.3	8.5	8.6	8.8	8.8	8.8	8.7
Austria	7.13	7.59	7.61	7.5	7.6	7.7	7.8	7.8	8	8.4	8.7	8.6
Belgium	6.85	6.84	5.25	5.4	5.3	6.1	6.6	7.1	7.6	7.5	7.4	7.3
Brazil	2.7	2.96	3.56	4	4.1	3.9	4	4	3.9	3.9	3.7	3.3
Canada	8.87	8.96	9.1	9.2	9.2	9.2	8.9	9	8.7	8.5	8.4	8.5
Chile	7.94	6.8	6.05	6.8	6.9	7.4	7.5	7.5	7.4	7.4	7.3	7.3
China	2.16	2.43	2.88	3.5	3.4	3.1	3.5	3.5	3.4	3.4	3.2	3.3
Colombia	3.44	2.73	2.23	2.2	2.9	3.2	3.8	3.6	3.7	3.8	4	3.9
Czech	5.37	5.37	5.2	4.8	4.6	4.3	3.9	3.7	3.9	4.2	4.3	4.8
Ecuador		3.19		2.3	2.4	2.6	2.3	2.2	2.2	2.4	2.5	2.3
Egypt		2.84		2.9	3.3	3.1	3.6	3.4	3.3	3.2	3.4	3.3
Finland	9.12	9.05	9.48	9.6	9.8	10	9.9	9.7	9.7	9.7	9.6	9.6
France	7	6.96	6.66	6.7	6.6	6.7	6.7	6.3	6.9	7.1	7.5	7.4
Germany	8.14	8.27	8.23	7.9	8	7.6	7.4	7.3	7.7	8.2	8.2	8
Hungary	4.12	4.86	5.18	5	5.2	5.2	5.3	4.9	4.8	4.8	5	5.2
India	2.78	2.63	2.75	2.9	2.9	2.8	2.7	2.7	2.8	2.8	2.9	3.3
Indonesia	1.94	2.65	2.72	2	1.7	1.7	1.9	1.9	1.9	2	2.2	2.4
Italy	2.99	3.42	5.03	4.6	4.7	4.6	5.5	5.2	5.3	4.8	5	4.9
Japan	6.72	7.05	6.57	5.8	6	6.4	7.1	7.1	7	6.9	7.3	7.6
Korea	4.29	5.02	4.29	4.2	3.8	4	4.2	4.5	4.3	4.5	5	5.1
Malaysia	5.28	5.32	5.01	5.3	5.1	4.8	5	4.9	5.2	5	5.1	5
Mexico	3.18	3.3	2.66	3.3	3.4	3.3	3.7	3.6	3.6	3.6	3.5	3.3
Netherlands	8.69	8.71	9.03	9	9	8.9	8.8	9	8.9	8.7	8.6	8.7
Pakistan	2.25	1	2.53	2.7	2.2		2.3	2.6	2.5	2.1	2.1	2.2
Philippines	2.77	2.69	3.05	3.3	3.6	2.8	2.9	2.6	2.5	2.6	2.5	2.5
Poland	5.57	5.57	5.08	4.6	4.2	4.1	4.1	4	3.6	3.5	3.4	3.7
Portugal	5.56	6.53	6.97	6.5	6.7	6.4	6.3	6.3	6.6	6.3	6.5	6.6
Romania			3.44	3	3.3	2.9	2.8	2.6	2.8	2.9	3	3.1
Russia		2.58	2.27	2.4	2.4	2.1	2.3	2.7	2.7	2.8	2.4	2.5
Slovakia				3.9	3.7	3.5	3.7	3.7	3.7	4	4.3	4.7
Slovenia					6	5.5	5.2	6	5.9	6	6.1	6.4
South Africa	5.62	5.68	4.95	5.2	5	5	4.8	4.8	4.4	4.6	4.5	4.6
Spain	4.35	4.31	5.9	6.1	6.6	7	7	7.1	6.9	7.1	7	6.8
Sweden	8.87	9.08	9.35	9.5	9.4	9.4	9	9.3	9.3	9.2	9.2	9.2
Thailand	2.79	3.33	3.06	3	3.2	3.2	3.2	3.2	3.3	3.6	3.8	3.6
Turkey	4.1	3.54	3.21	3.4	3.6	3.8	3.6	3.2	3.1	3.2	3.5	3.8
UK	8.57	8.44	8.22	8.7	8.6	8.7	8.3	8.7	8.7	8.6	8.6	8.6
Ukraine				2.8	2.6	1.5	2.1	2.4	2.3	2.2	2.6	2.8
United States	7.79	7.66	7.61	7.5	7.5	7.8	7.6	7.7	7.5	7.5	7.6	7.3
Uruguay			4.14	4.3	4.4	5.1	5.1	5.1	5.5	6.2	5.9	6.4
Vietnam			2.79	2.5	2.6	2.5	2.6	2.4	2.4	2.6	2.6	2.6

Source: Transparency International

<Table 3-9> Value added in Motor Vehicle Industry(ISIC 34) in million $

million $	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	878.5	965.1	1379.8	1150.6	496.2	662.3	558.3	307.5	n.a	n.a	n.a	n.a
Australia	n.a	2515.9	2036.5	2383.4	2560.7	2229.2	1380.4	129n.a	1441.0	1699.3	1582.4	1502.4
Austria	1269.8	2372.1	1260.8	1013.3	1216.9	993.1	1094.2	1238.0	1592.3	1949.5	2223.6	2279.5
Belgium	3445.0	3053.0	2383.5	2742.7	2442.8	2163.2	2067.1	n.a	2567.7	2488.8	2542.0	3226.7
Brazil	n.a	7538.5	8033.1	6877.7	3699.6	5547.3	4377.7	4463.2	4874.0	6259.7	8416.9	10621.1
Canada	8528.9	7912.6	8525.1	8115.8	16049.0	1466n.a	12459.6	14094.6	13322.2	n.a	n.a	n.a
Chile	n.a	n.a	n.a	n.a	n.a	n.a	45.5	71.5	41.6	89.0	138.7	97.0
China	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	17440.4	18848.3	19373.9	25869.9
Colombia	n.a	n.a	n.a	n.a	n.a	122.6	167.4	167.3	132.1	245.2	314.5	n.a
Czech Rep.	364.2	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	1891.0
Ecuador	35.2	24.1	46.8	71.6	21.3	16.2	53.3	53.3	37.0	24.3	44.2	n.a
Egypt	n.a	n.a	183.3	298.6	n.a	n.a	n.a	104.8	n.a	n.a	n.a	n.a
Estonia	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	0.9	1.3	2.7	3.2
Finland	160.8	143.4	135.4	148.9	145.9	119.5	136.6	141.0	126.3	116.8	153.0	181.9
France	n.a	11673.1	10795.0	12687.9	12675.4	10888.9	10382.2	11839.7	13608.8	16407.4	15772.9	13458.8
Germany	n.a	n.a	n.a	37926.2	35039.3	28005.3	34161.1	33523.6	46854.0	49056.7	48724.0	56070.8
Hungary	277.3	316.6	473.6	621.3	750.6	702.5	582.3	691.6	937.4	1132.5	1093.1	1464.7
India	n.a	n.a	n.a	729.2	1119.2	773.0	787.7	963.7	1645.9	2486.2	3914.9	n.a
Indonesia	n.a	n.a	n.a	109.3	221.4	988.7	1481.3	2185.6	1561.5	2509.6	3836.8	4100.1
Italy	4886.8	4516.1	5748.1	4232.0	3045.2	3412.7	1965.3	1276.7	2255.4	2893.7	3494.6	5301.7
Japan	47119.1	49807.4	42945.3	42679.8	45844.4	41377.1	40763.9	46734.9	48924.8	50705.7	56460.8	n.a
Malaysia	n.a	n.a	n.a	n.a	n.a	455.8	831.8	1086.3	1046.1	1059.7	589.9	861.0
Mexico	3969.8	5251.1	6030.7	6551.1	7494.1	9132.8	9238.9	8979.0	691n.a	6977.0	7821.7	8826.3
Netherlands	918.6	1001.7	996.7	1160.2	1165.4	1008.0	1013.8	1074.0	1321.9	1915.8	1835.6	2388.7

Pakistan	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	651.3
Philippines	n.a	630.3	675.1	272.3	487.6	n.a	292.1	n.a	441.9	n.a	391.6	n.a
Poland	834.4	891.1	793.4	888.2	859.8	713.2	930.8	682.7	947.9	1432.2	1708.9	1836.5
Portugal	n.a	699.0	66n.a	569.7	625.3	561.5	480.2	421.9	383.1	379.9	375.6	347.5
Korea	10065.2	10939.1	12319.1	5607.1	9321.8	11461.1	12659.3	13634.5	15215.5	15649.8	18026.2	20986.8
Romania	323.3	408.7	34n.a	280.3	235.3	260.1	356.4	488.1	100.4	142.3	n.a	n.a
Russia	n.a	n.a	n.a	n.a	n.a	n.a	2523.9	2659.4	2503.7	3396.6	3407.4	4577.9
Slovakia	96.0	65.5	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Slovenia	175.9	127.5	96.0	154.3	118.7	94.7	81.9	69.8	71.7	103.4	126.8	133.0
South Africa	n.a	1027.0	n.a	874.1	1659.4	1866.0	1932.5	1635.6	2346.4	2992.1	3275.5	3320.1
Spain	5192.8	5686.7	5327.6	5506.5	5017.2	4454.8	3649.3	3969.8	5421.7	5994.5	5679.6	6489.8
Sweden	3446.4	3324.2	3808.1	5076.6	5142.9	4553.9	3425.7	2836.1	3639.9	5026.1	4341.7	4770.5
Switzerland	n.a	n.a	275.6	273.8	298.2	286.0	290.4	288.7	351.2	n.a	n.a	n.a
Thailand	n.a	4105.8	n.a	1697.0	n.a	1224.7	n.a	3504.4	n.a	n.a	n.a	3407.9
Turkey	1281.6	1386.2	2016.9	1473.0	1482.6	2176.7	842.3	n.a	1983.7	2969.2	2447.8	4541.2
UK	7816.4	9703.7	9573.6	8577.3	7078.2	5295.3	6247.5	5547.0	6555.4	9105.1	766n.a	n.a
USA	n.a	n.a	86417.0	81386.0	96817.0	78723.0	69552.0	91035.0	97036.0	93363.0	89983.0	88977.1
Uruguay	n.a	n.a	n.a	43.8	26.0	25.0	23.2	23.8	15.9	n.a	n.a	n.a
Viet Nam	n.a	n.a	n.a	20.7	n.a	95.5	n.a	n.a	n.a	n.a	n.a	n.a

Source: UNIDO

<Table 3-10> Output in the Motor Vehicle Industry(ISIC 34) in million $

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina	1592.7	1847.4	2174.7	1908.0	1055.5	1216.6	1034.5	639.2	0.0	0.0	0.0	0.0
Australia	0.0	4025.5	3810.4	3930.1	4275.0	3713.4	2877.8	2627.8	3168.5	3945.9	3938.4	3887.4
Austria	1993.4	2372.1	1797.4	1928.5	2128.8	1908.0	1899.4	2103.0	2616.1	3435.1	3789.3	3855.2
Belgium	4409.1	4035.0	3271.6	3615.5	3289.0	2974.3	2928.1	0.0	3836.6	4013.2	4062.9	4606.7
Brazil	0.0	12571.0	13490.0	11925.3	7068.7	9659.9	8099.5	8107.6	9915.7	12695.3	16282.5	20408.1
Canada	13575.6	13086.0	14409.5	13988.2	22923.8	21945.2	19258.4	20830.0	20984.3	0.0	0.0	0.0
Chile	0.0	0.0	0.0	0.0	0.0	0.0	76.2	107.4	81.4	135.5	188.8	144.9
China	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27034.5	31992.2	34483.0	45219.1
Colombia	0.0	0.0	0.0	0.0	0.0	191.3	248.1	270.0	215.1	364.8	505.8	0.0
Czech Rep.	605.3	289.5	320.0	386.4	492.9	585.6	730.1	1039.3	1372.7	1862.2	2226.5	4585.8
Denmark	368.1	386.7	384.4	398.8	223.2	328.1	313.7	311.4	0.0	166.7	272.8	149.7
Ecuador	41.3	27.7	53.1	81.8	25.6	20.3	63.2	65.7	48.0	35.6	59.6	0.0
Egypt	0.0	0.0	199.2	355.0	0.0	0.0	0.0	272.9	0.0	0.0	0.0	0.0
Estonia	0.0	0.0	0.0	0.0	0.0	0.0	1.9	2.9	33.9	41.9	46.2	51.8
Finland	357.3	355.4	341.1	367.8	356.4	314.8	313.8	330.8	369.5	394.5	450.2	460.4
France	0.0	17788.8	15990.5	18270.0	18671.0	16300.6	15628.9	17382.9	20268.4	23942.8	22984.7	20412.7
Germany	0.0	0.0	0.0	55621.2	53573.0	44729.4	51300.2	51774.7	69588.0	76239.5	75802.8	85591.5
Hungary	435.2	508.4	761.3	972.6	1099.9	1104.5	1032.1	1175.6	1633.6	1988.0	2201.3	2792.2
India	0.0	0.0	0.0	1525.4	2227.9	1743.5	1798.2	2098.3	3193.3	4508.5	6112.9	0.0
Indonesia	0.0	0.0	0.0	205.0	550.7	1574.5	1758.4	2184.8	2143.2	3195.1	4428.9	5062.3
Italy	8650.7	9279.3	10484.5	8946.8	7710.4	7253.3	6315.4	5814.4	7795.7	8874.6	9313.5	11622.1
Japan	113842.7	108366.5	95998.9	85367.3	94989.8	95708.3	88522.1	98932.9	108010.7	114305.0	121495.6	0.0
Malaysia	0.0	0.0	0.0	0.0	0.0	744.6	1189.2	1605.0	1523.9	1490.8	986.2	1278.0
Mexico	4628.3	6098.4	7071.0	7706.5	8811.4	10717.2	10798.9	10503.2	10670.8	9350.2	10535.5	11803.6

Netherlands	1680.6	1763.7	1611.4	1806.0	1846.3	1577.2	1605.9	1711.1	2106.4	2703.0	2662.6	3340.9
Pakistan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	760.7
Philippines	0.0	630.3	675.1	272.3	487.6	0.0	292.1	0.0	441.9	0.0	391.6	0.0
Poland	834.4	1264.2	1193.8	1376.3	1415.6	1298.1	1833.9	1476.0	2019.3	3253.4	3819.5	4349.1
Portugal	0.0	1086.4	1003.6	898.9	957.2	924.4	793.3	789.2	846.3	974.7	937.7	347.5
Korea	16961.6	18717.1	18700.9	9072.8	14713.7	18192.5	18900.2	21189.5	23725.0	26293.1	31287.3	37540.2
Romania	323.3	408.7	340.0	280.3	235.3	260.1	356.4	488.1	340.1	435.2	292.5	419.0
Russia	0.0	0.0	0.0	0.0	0.0	0.0	2523.9	2659.4	2503.7	3396.6	3407.4	4577.9
Slovakia	128.2	107.0	37.9	40.0	34.5	42.0	50.2	75.1	114.7	214.9	224.7	227.9
Slovenia	248.7	205.4	169.6	239.4	207.0	176.5	172.8	179.5	212.9	296.5	338.2	380.1
South Africa	0.0	1836.1	0.0	1420.7	1659.4	1866.0	1932.5	1635.6	2346.4	2992.1	3275.5	3320.1
Spain	8229.9	9027.5	8632.1	8793.2	8574.8	7646.0	6781.4	7481.5	10008.7	11311.1	10810.8	11647.2
Sweden	4371.6	4373.4	4902.5	6491.4	6232.6	5849.1	4443.3	3877.7	5933.1	7503.2	6803.7	7109.4
Switzerland	0.0	0.0	275.6	273.8	298.2	286.0	290.4	288.7	351.2	0.0	0.0	0.0
Thailand	0.0	5511.4	0.0	1743.0	0.0	1244.8	0.0	3523.3	0.0	0.0	0.0	5697.8
Turkey	2007.6	2110.8	2626.2	2045.9	1856.4	2652.2	1362.8	0.0	3174.7	4620.6	4092.7	4541.2
UK	13166.2	14773.2	15832.7	15356.3	13187.8	10919.9	11715.9	11329.3	12846.3	16141.2	14874.6	0.0
Uruguay	0.0	0.0	0.0	43.8	26.0	25.0	23.2	23.8	15.9	0.0	0.0	0.0
Viet Nam	0.0	0.0	0.0	45.3	0.0	132.0	0.0	0.0	0.0	0.0	0.0	0.0
USA	0.0	0.0	143186.0	141091.0	163519.0	142851.0	125961.0	152548.0	156226.0	150777.0	146616.0	146456.5

Source: UNIDO

<Table 3-11> Number of Enterprises in the Motor Vehicle Industry

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Australia	1315	1537	1490	1442	1329	1440	1540	3822	3902	4229	3920	4200
Austria	201	218	235	225	206	193	228	237	263	271	267	279
Belgium	n.a	n.a	n.a	n.a	413	472	473	n.a	428	452	453	470
Brazil	n.a	2738	2650	2841	2924	2899	2861	3183	3299	3353	3355	3694
Canada	842	887	871	817	792	1035	1028	1051	1062	n.a	n.a	n.a
Chile	n.a	n.a	n.a	n.a	n.a	n.a	76	74	83	84	92	88
China	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	4357	6635	6583	7513
Colombia	n.a	n.a	n.a	n.a	n.a	154	160	163	172	182	190	n.a
Czech Rep.	453	287	342	687	288	341	385	573	513	577	473	474
Denmark	222	219	199	198	184	182	173	158	151	138	136	134
Ecuador	52	49	46	44	39	39	42	39	41	41	45	n.a
Egypt	n.a	n.a	44	57	n.a	n.a	n.a	71	n.a	n.a	n.a	n.a
Estonia	36	32	31	31	28	16	17	20	33	38	34	44
Finland	281	273	279	301	289	290	285	283	281	278	276	280
France	n.a	2217	2205	2184	2168	2153	2158	2150	2198	2179	2132	2110
Germany	1109	1072	1055	837	2308	2281	2336	2559	2284	2545	2486	2303
Hungary	n.a	n.a	n.a	175	194	202	401	396	410	414	408	407
India	n.a	n.a	n.a	2809	2810	2684	2736	2902	2757	3093	3069	n.a
Indonesia	n.a	n.a	n.a	232	244	246	216	256	247	249	262	336
Italy	1984	1937	2064	2263	2253	2369	2316	1945	1916	1974	2065	2041
Japan	10648	10126	9964	10437	9771	9798	9382	9149	n.a	n.a	n.a	n.a
Malaysia	n.a	n.a	n.a	n.a	n.a	299	272	296	332	302	304	401
Mexico	243	245	237	231	222	218	n.a	n.a	n.a	n.a	n.a	n.a
Netherlands	790	585	590	900	820	700	700	750	680	555	615	655

Pakistan	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	139
Philippines	n.a	246	249	245	141	n.a	114	n.a	117	n.a	126	n.a
Poland	1964	1119	1445	1710	1646	1145	1092	1070	1010	1393	1139	1217
Portugal	n.a	469	442	392	406	402	429	408	434	463	512	509
Korea	3070	3362	3083	2604	3011	3200	3456	3534	n.a	n.a	n.a	n.a
Romania	120	159	190	197	224	303	319	356	385	421	412	411
Russia	n.a	n.a	n.a	n.a	n.a	2108	1602	1498	3730	3849	4075	3585
Slovakia	30	34	33	36	19	25	34	35	39	49	54	92
Slovenia	76	79	71	76	90	84	82	77	79	87	94	104
South Africa	n.a	1175	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Spain	1569	1642	1648	1607	2006	2106	2123	2136	2102	2102	2137	2115
Sweden	542	564	644	662	664	690	718	754	885	907	933	961
Switzerland	n.a	n.a	196	183	170	172	176	137	n.a	n.a	n.a	n.a
Thailand	n.a	1095	n.a	862	n.a	938	n.a	1151	n.a	n.a	n.a	1336
Turkey	201	222	221	252	241	258	257	2026	3053	3376	4287	3993
Ukraine	n.a	n.a	n.a	n.a	n.a	491	465	481	512	502	526	347
UK	4109	2500	2726	2750	3308	2885	2948	2948	2962	3066	3162	n.a
Viet Nam	n.a	n.a	n.a	92	n.a	165	217	273	261	311	377	264
USA	n.a	n.a	n.a	7661	7583	7401	5998	6009	n.a	n.a	6112	6079

Source: UNIDO

<Table 3-12> Average Wage in the Automotive Industry

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Australia	8354.45	8562.85	7926.48	9291.28	9047.75	9899.45	9531.6	2949.06				
Austria		11622.64	10535.02	9362.17	11295.12	8246.21	6240.13					
Belgium	19629.39		23081.16	18718.27	19684.27	16439.53	17302.55	19069.87	23853.63	25632.63	24792.26	28238.27
Brazil	33335.41	30972.17	25511.04	25267.99	24865.11	21650.93	20495.55		25400.92	28748.83	28091.97	29573.54
Canada		8395.36	8409.76	8666.28	6142.96	6039.17	5146.43	3995.89	3885.27	4027.40	5154.97	6204.02
Chile	15972.92	15307.9	15115.3	14480.04	15054.78	14834.81	13789.99	14367.81	16192.09			
China							3891.95	3570.60	3021.96	3662.13	5054.05	5131.85
Colombia									1029.31	958.36	1021.55	1298.96
Czech Rep.						3498.109	3455.42	2768.59	2485.57	2823.08	3390.00	
Denmark												116274.10
Ecuador	2101.87	2063.97	1955.53	1879.39	1688.17	1260.066	1777.25	2616.31	2208.89	2460.44	2372.30	
Egypt			2579.67	2781.10				2033.40				
Estonia	13833.94	12044.21	10767.19	10525.89	10235.83	9219.414	10009.82	10793.11	11193.53	13135.94	13158.13	15434.80
Finland		21207.46	18951.11	18931.35	18885.90	15651.32	15533.11	18512.31	23299.46	27169.68	28113.51	29728.75
France	31306.42	31223.52	27186.55	30211.11	29887.79	25675.86	25294.43	27553.89	34254.58	38558.28	39370.94	43857.52
Germany	1573.22	1533.26	1630.30	1904.72	2008.80	1799.847	2339.49	3124.52	3624.13	4049.72	4132.71	3855.01
Hungary				836.65	961.12	1078.289	987.50	1024.27	1155.15	1109.57	1209.84	
India				311.56	635.39	701.2334	1268.55	736.30	1199.83	1035.25		1003.60
Indonesia	12160.69	13375.22	14657.07	12731.00	10649.57	10043.66	8550.17	8673.35	10131.34	12680.97	13113.17	14357.31
Italy	16466.65	14380.16	13316.3	13074.21	14779.84	15748.47	13925.41	13496.49	14464.05	15334.50	14506.88	
Japan	11897.42	13293.68	11630.87	7817.40	8160.48	10748.87	9883.43	10006.56	13216.22	14798.36	18231.65	713.81
Malaysia						2446.492	3296.23	3322.63	2875.14	3956.75	3526.98	
Mexico	4129.78	4431.65	5091.2	5135.46	5989.29	7095.637			3201.05			
Netherlands	21434.48	20053.7	16630.39	16436.77	16333.16	14151.59	13841.77	15283.2	18438.35	21514.26	23667.92	1515.43

Country												
Pakistan												
Philippines		3708.57	3663.36	2712.10	3972.84		3701.191		3598.45		3589.06	
Poland	3559.07							2420.31	2734.15	2824.32	3144.59	1154.291
Portugal		8766.09	7451.096	7433.40	6135.77	4841.905	5681.854	5794.47	6693.71	6617.26	6742.71	817175.20
Korea	1415.32	1466.68	1206.44	1572.84	1295.82	1359.037	1446.481	1673.90	1291.52	1299.34		
Romania					775.37	902.4816	1181.554	1640.04	1896.43	2484.16	2456.77	3101.05
Russia	1881.19	2084.63										
Slovakia	13431.3	8113.15	7173.20	8664.54	7344.18	5610.63	5400.23	5376.43	5906.63	6468.40	7462.54	6789.35
Slovenia	5976.34	5306.35	5719.06	5287.03	4983.67	4952.98	3884.32	3769.71	3271.43	4249.69	8179.09	5435.23
South Africa	15761.34	16447.28	13654.60	13692.61	13927.68	12517.31	11687.46	12520.77	14691.29	16489.62	17425.43	18163.48
Spain	23386.51	26298.07	23107.04	17104.96	21858.31	19362.09	17334.19	20304.48	21169.37	24078.95	25127.52	27225.54
Sweden		1714.38		3107.94		2989.66		2695.55				356.62
Switzerland	6000.82	5303.86	6020.46	6718.90	6972.40	7736.60	5417.34	7926.71	5625.04	6903.48	7129.02	13488.90
Thailand						371.35	438.84	548.22	847.35	1199.74	1436.32	1952.50
Turkey	17518.26	17502.58	18577.02	20863.56	22384.44	17676.06	15896.72	17901.69	18885.92	23266.39	24679.53	
Ukraine			17974.03	17588.88	19474.97	19417.59	19061.73	23252.18			25729.01	25850.75
UK				13481.36	12655.19	12425.12	11666.36	7279.50	5192.44			
Viet Nam				796.69		559.18						502.80
USA												

Source: UNIDO