8-2012

Essays on Attractiveness of Multinational Corporations

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ESSAYS ON ATTRACTIVENESS OF MULTINATIONAL CORPORATIONS

A Dissertation
Presented to
The Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy
Policy Studies,

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August 2012

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ABSTRACT

This dissertation analyzes selected policies designed to attract foreign direct investment (FDI) as a means of economic growth. The focus is on multinational corporations (MNCs) because most foreign direct investment is done by MNCs. The dissertation first shows the effects that the presence of MNCs has on economic growth before examining tradeoffs between direct costs *(i.e.,* transportation and production costs) and policy factors in attracting MNC FDI.

Essays 1, "Multinational Corporations and Their Effect on Gross Domestic Product" and 2, "Competing for Innovation: The Economics of Knowledge Acquisition" examine how FDI in combination with socioeconomic, economic, and policy factors affect the growth of gross domestic product (GDP). The collective results suggest that policies of regionalization drive GDP growth and influence FDI location. Nations that are corporate homes of the largest and most internationalized MNCs benefit from policies of regionalization as they aid the global expansion of their corporations. Importantly, these two essays provide empirical evidence of the value transfer of MNC internationalization back home and of the importance MNC concentration at the national level. The presence of MNC networks provide knowledge and aid in the innovative capacity of both developed and developing countries. Both essays find that GDP growth driven by MNC activity has been stronger in the developing world since 2000. The two essays contribute to the globalization literature by providing empirical evidence of the increasing importance of emerging markets in the new economy, the role of MNCs in that increasing importance, the political and diplomatic implication of these related

developments, and the policies nations currently employ to stay competitive in a turbulent environment.

Essay 3, *"Fleeing Regulation: Pollution Havens in Textile Manufacturing"* provides an example of the importance of regulatory policy by examining the effect of a policy change on FDI flows in the context of the garment sector. The results indicate that the removal of the quota system in the international trade of garments increased FDI in nations with permissive environmental policies, which in turn, has contributed significantly to leading to toxins and pollutants in local ecosystems.

The dissertation provides empirical evidence that under globalization nations compete for FDI through policy. The extant literature argues that globalization is a product of two sets of factors: (1) reductions in 'spatial friction' (*i.e.*, decreasing transportation, information, and organization-of- production costs), and (2) reductions in trade barriers, both in terms of border restrictions and in terms of domestic policies affecting foreign and domestic direct investment. The major contribution of the dissertation is in providing empirical evidence that under globalization nations compete for FDI by creating attractive regulatory environments for MNCs. There are social costs to be born in the competition for FDI and this dissertation shows that the nations that are corporate homes to the world's largest MNCs are often better positioned to absorb costs associated with knowledge sourcing as well as export pollution costs to their more lenient trading partners.

DEDICATION

This dissertation is dedicated to the following people:

- My parents Ivanka and Gueorgui Anguelov for encouraging me to pursue an academic career and for their support and guidance throughout the writing process
- In memory of my grandmother Lazarina Jaleva who called me "professor" since I was a little boy and lived her last days proud that I was working towards becoming one
- In memory of my grandfather Nikola Jalev who was the reason everyone in our family pursued careers in higher education.
- In memory of my uncle Iskar Shumanov who brought me to America at 15 and encouraged me to make education the focus of my life. His passion for democracy, freedom, and political engagement, helped change a nation.
- My host parents Brenda and Steve Swearingen who welcomed me into their home in 1993 as an exchange student and proceeded to treat me as a son from that point on. Without their unconditional love and support the completion of this manuscript would have been impossible.
- To the rest of the Swearingens, especially Gene and Mary, for their support and encouragement to complete the internship at the U.S. Council on Competitiveness which shaped the idea behind this manuscript
- Professor Patrick Yanez at the Fashion Institute of Technology for being a mentor since my undergraduate studies at FIT. His guidance in the research of Essay 3 was invaluable.

ACKNOWLEDGMENTS

I would like to thank all of those people who helped make this dissertation possible.

First, I would like to thank my advisors, Dr. Bill Ward and Dr. Aleda Roth, for their guidance, encouragement, and support. I would also like to thank my committee members Dr. Joseph Stewart Jr., Dr. Jeffrey Fine, and Dr. Holley Ulbrich for their helpful insights, comments, and suggestions. I am grateful for their commitment to my dissertation and their faith in its worth.

Additionally, I would like to thank Dr. Billy Bridges for his ongoing statistics tutoring, his willingness to sacrifice his time to help me, and his infectious passion for data analysis. His technical expertise and academic encouragement have been invaluable. I could not have done this without him.

A special acknowledgement goes to Dr. Jeffery Fine. His class was the first one I took at the Clemson MPA program in 2006 and since that time he has become an inspiration. I hope one day to be half the teacher he is. His ability to motivate his students to not just consume but produce knowledge is what I am trying to emulate as a new teacher. Dr. Fine makes a student feel important. Encouragement and support are balanced with brutal honesty about the quality of the product. His ability to hold one to the highest standard is delivered by engaging students in a relatable and at times informal ways, which makes his students feel like colleagues, not students. It is this approach to teaching and mentoring that kept me going through the rough times in the preparation of

this manuscript. Dr. Fine's passion for teaching policy analysis is infectious. I hope to be able to impart some semblance of that passion to my students.

Finally, thanks to the fellow graduate students in the MPA, Applied Economics and Statistics, Economics, and Policy Studies programs for their ideas and suggestions throughout this process. There are too many to name here but your intellectual curiosity, humor, problem solving ability, and most importantly, friendship, inspire me every day!

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CHAPTER ONE

INTRODUCTION

1.1 Purpose

This dissertation analyzes selected policies designed to attract foreign direct investment (FDI) as a means to generate economic growth. It is in a three-paper format and the overreaching theme is the impact of FDI by multinational corporations (MNCs) on national economies. The focus is on MNCs because they are the source of most FDI. The project fits within the body of literature on the changing nature of international trade and investment with a focus on affecting trade and investment (Atkinson, 2004; Baier & Bergstrand, 2007; Cortright, 2001; Hasan & Tucci, 2010; Kaplan, 2010; Mentzer, Myers & Stank, 2007; Porter, 1998, 2000; Weinstein, 2005; Wolf, 2004; Zakaria, 2008).

Essays 1 and 2 explore how FDI and MNCs affect the growth of gross domestic product (GDP). More specifically, essay 1 explores how MNC concentration at the country level affects the level of GDP. Evidence suggests that MNC concentration leads to GDP growth because of the FDI value MNCs gain from their international investments. Essay 2 examines the practice of investing overseas to acquire technologies and knowledge. Essay 2 results suggest that the corporate home nations of the world's largest MNCs are best positioned to capture innovation value from internationalization.

Essay 3 examines the effect of a policy change on FDI flows and offers an example of how a major policy change toward the liberalization altered the incentives

for MNC location. The example comes from the apparel industry and tracks how the removal of the quota system in the international trade of garments led to an increase in FDI in nations that allow pollution levels to rise.

The relationships among the three essays are graphically represented by Figure 1.1.

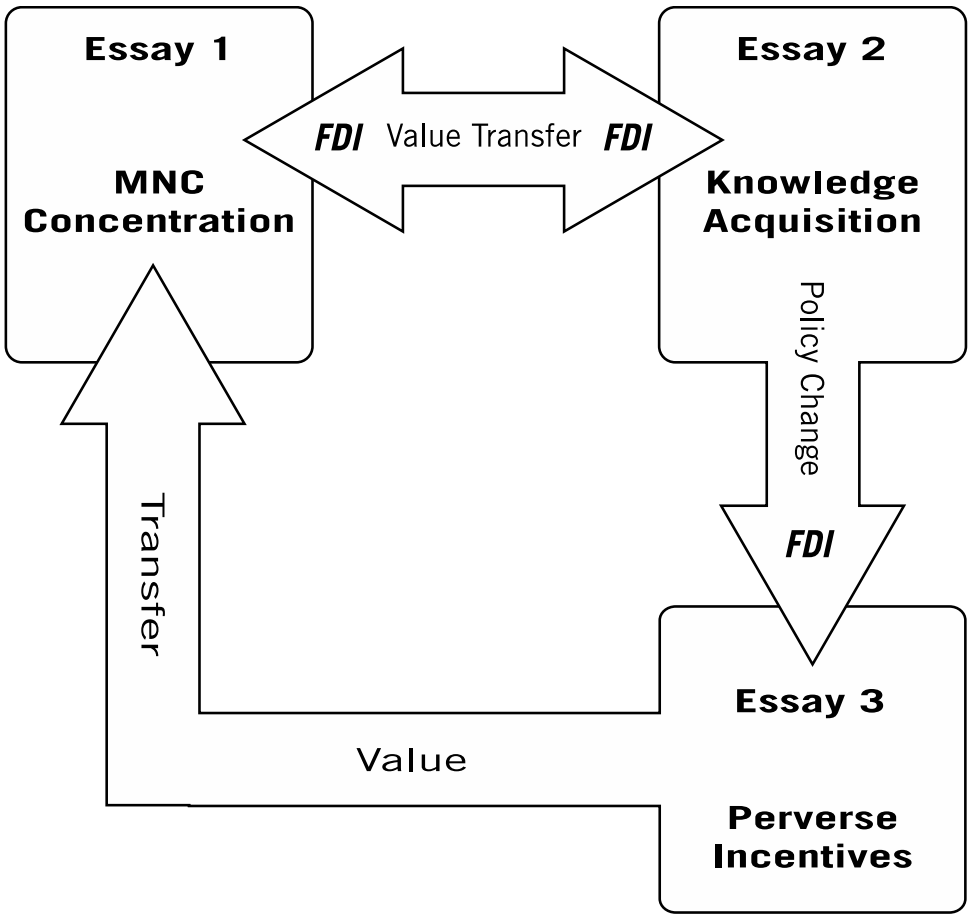

Figure 1.1: Graphical Representation of the Dissertation

1.2 Theoretical Background

Few would argue that globalization defines economic activity today. Globalization has emerged as a comprehensive term describing the process of global market integration of consumer preferences convergence (Townsend et al., 2009). As political barriers to international trade have diminished and costs of transportation and communication have fallen, the geographic scope of markets has expanded (Adams 2008; Ward, Bahattari & Huang, 1999). As market expansion has magnified, firms have transformed from national to multinational. This dissertation examines some of the policy issues in the spatial management of MNCs. The first is MNC ownership.

The debate around MNC ownership stems from discourse over the measures governments take to protect their firms from hostile merger and acquisitions (M&As) by foreign investors. Such support is not permitted under the World Trade Organization (WTO) antitrust rules (Zweifel, 2006). However, governments find ways to skirt WTO antitrust regulations. For example, since 2009 Japan Airlines (JAL) has been fighting hostile takeover attempts and has been able to ward them off with the help of its government. American Airlines (AA) has most aggressively been trying to buy the ailing JAL to gain access to the lucrative and growing inter-Asian rout market. Currently, JAL is the only airline that serves that market, which is the fastest growing in the world thanks to the increasing amount of domestic flights within China. AA has publicly accused the Japanese government of unfairly protecting JAL, but it has not been able to convince the US government to file a complaint with the WTO. The Japanese ministry of Land Infrastructure Transport and Tourism formed a task force to aid the

ailing airline, mostly by extending it government backed lines of credit in order for it to be able to fight off hostile takeover attempts by AA, Delta, and Air France[1]. The negotiations are still on going while JAL is in bankruptcy, with the decision-making process now steered toward minority share merger with American Airlines[2]. The Japanese government continues to extend lines of credit to JAL to keep it solvent, while its task force is restructuring the company.

When Belgian Inbev attempted to acquire American Anheuser-Busch, maker of Budweiser - "the all American lager," among the many antitrust questions surrounding the deal. According to a January 31, 2008 presentation by Erin Ennis from the US department of Commerce's US-China Business Council, it was important for US interests to keep Anheuser-Bush American. It was the firms growing operations in China that were helping it fight off the hostile takeover[3]. Eventually the takeover went through after antitrust queries by the US, UK, and Chinese governments[4.]

When American Hershey and Kraft were in a bidding war to acquire British Cadbury in a quest to access to Cadbury's leadership market position in Asia, there was a huge public outcry about the national ramifications of the deal and its impact on British pride and economics that even involved the prime minister Gordon Brown and his challenger Nick Clegg[5]. While running as one of the challengers in the reelection of

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[1] Chakravorty, Jui (2009-09-15). Air France-KLM in talks to invest in JAL-source. Reuters

[2] Sanchanta, Mariko and Yoshio Takahashi (2010-02-01). JAL to Decide on Partner Soon. The Wall Street Journal

[3] https://www.uschina.org/

[4] http://www.justice.gov/atr/cases/f239400/239441.htm

[5] http://news.bbc.co.uk/2/hi/uk_news/politics/8470776.stmt

Mr. Brown, Nick Clegg was critical of Mr. Brown's decision to use federal funds to help Cadbury fight the hostile takeover.

Although such examples elicit discussion in the media, many economists believe a multinational corporation's nationality is unimportant. "You want the jobs in the country, but it ultimately doesn't matter who owns the firms," says Nicholas Bloom, a Stanford University economist, who studies MNCs. Robert B. Reich, the Labor Secretary under President Bill Clinton, agrees: "Nationality matters almost not at all today." These quotes are from 2008 Business Week cover story[6]. The argument is this: most of the benefits accrue to the host rather than home nations, as MNCs tend to reinvest earnings into the local economy. This essay examines the validity of such claims by measuring the effect the largest firms in the world have on their home nations' gross domestic product.

A multinational corporation (MNC) can be viewed as a network of activities located in different countries (Kogut & Kulatilaka, 1994). Today MNCs not only sell in foreign markets but many also control foreign firms. For example, American General Motors (GM) owns 50.9% of GM Daewoo in Korea; German Daimler owns 85% of Mitsubishi Fuso in Japan and French Renault owns 70.1% of Renault Samsung in Korea. Renault also owns 44.4% of Nissan in Japan and Renault's CEO serves as Nissan's CEO. Such interconnectedness blurs national economic interests and challenges conventional economic classifications of imports, foreign assets, and exports.

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[6] Mandel, Michael. (2008-02-28). Multinationals: Are They Good for America. Businessweek http://www.businessweek.com/magazine/content/08_10/b4074041212646.htm

Firms can simultaneously export to a market and export from it. For example, GM that is the 100 % shareholder of Opel in Germany, Saab in Sweden, a partial shareholder of Daewoo in Korea and Suzuki in Japan. GM also has a joint venture in China and exports GM automobiles directly to all those countries (Ishikawa, Sugita & Zhao, 2008).

The growing ease with which firms operate internationally is a partially a result of trade liberalization policies (Dunning, 1996; 1998; Gorg & Greenaway, 2004). Liberalization policies have impacted all nations and define modern globalization (Barnett & Finnemore, 2004; Wolf, 2004; Zweifel, 2006). Since the creation of the General Agreement on Tariffs and Trade (GATT), the precursor of the World Trade Organization, policies of liberalization, privatization, and deregulation have shaped international trade (Zweifel, 2006). Global antitrust guidelines, in particular, have been strengthened with the creation of the WTO, which discourages governments from supporting MNCs by providing measures for filing antitrust claims under the trade distortion clause of the WTO (Barnett & Finnemore, 2004; Morici, 2000; Zweifel, 2008). The challenge is that antitrust policies vary from country to country, as do the ways in which governments support their firms. For example, unlike most Western nations, China does not allow outright acquisitions by foreign firms or nationals of Chinese businesses (Estrin et al., 2009; Midler, 2009). Mergers are allowed only in the form of joint venture partnerships where the majority of control lays with the Chinese partner. In most cases, Chinese government own the partners (Buckley, Wang & Clegg, 2007). The same is true for Russia, the former Soviet republics, and some East European nations (Dadak, 2004; Jeffries, 2004). Yet, firms from China and Russia are

allowed to acquire any other entity in most of the rest of the world, leading to unfair competitive positions. This policy asymmetry provides protection for their firm from foreign competitors at home, while it allows for free asset, technology, and knowledge acquisition abroad.

The US Department of Commerce and the US International Trade Commission are critical of such protectionist policies and are calling for a property right liberalization reform, particularly in China. [7] However, at this point their calls have no legal implications. According to WTO directives, WTO member nations are free to set their own foreign ownership laws. A call for change can have a legal standing only if a change of law occurs ex-post joining the WTO and is found to have trade distorting results (Barnett & Finnemore, 2004). Should the WTO find such a violation, the plaintiff nation gets retribution by being granted permission to impose retaliatory sanctions of its choice (Zweifel, 2006). This policy ends up resulting in further trade distortions, not only for the two disputing nations, but also for their major trading partners.

Morici (2000) called for the creation of an international body for antitrust regulation that would incorporate in a coherent way the major aspects of the three main antitrust legal systems – the American, the European, and the Japanese. Morici shows that the three have significant differences in the way governments support their own MNCs; he calls for a new supranational legislation to be created to address the difficulties of reconciling the three legal systems. To this day no such legislation has

[7] https://www.uschina.org/info/members-survey/foreign-investment-restrictions.html

been created. The WTO still adjudicates disputes on per case bases. This policy does not allow for precedents to be created. With the growth of international linkages in production, investment, and trade, disputes are becoming harder to resolve, take years in quasi-litigation, and end up not having an impact, even after adjudication.

As a response to trade liberalization, a more recent trend has been noted of increasing special protection policies, particularly in industrialized nations (Bagwell & Staiger, 1990). This phenomenon of macro liberalization and micro protectionism has been described as managed trade (Dixon & Moon, 1993). Managed trade theory claims that MNCs lobby their own governments for special protection, while at the same time putting pressure on the governments of their trading partners for free market access. Success in this process allows MNCs to establish their preferred platforms both in production and policy. Examples of favorable policy platforms are preferential tariffs, production subsidies, and exemption from regulatory compliance (Kogut, 1985; Ishikawa, Sugita & Zhao, 2008; Schofer & Hironaka, 2005). In some cases, large MNCs can engage in such prolific production and sales interplay that they can cartelize entire industries while extracting both economic and political rents (Kogut & Zander 1993).

It has long been noted that being large and multinational enables firms to establish preferred technical standards and protocols and create global brand equity (Kogut, 1985). Brands play a critical role in determining firm performance (Eisingerch & Rubera, 2010; Gammoh et al., 2010).

Global brands are the face with which firms portray an image to a diverse customer base (Townsend et al., 2009). Global brands enhance economies of scale and scope, especially in manufacturing and research and development activities (Strizhakova, Coulter and Price, 2009). For consumers, they create an imagined global identity, which has fueled the proliferation of a global consumer culture (Park & Rabolt, 2009; Strizhakova, Coulter and Price, 2009). The strategic actions of multinational corporations fuel the growth of global brands (Ozsomer & Altaras, 2008).

For MNCs, global growth is simultaneously tied to geographic and product diversification. Product diversification offers opportunities for achieving economies of scale and scope (Chang & Wang, 2007). Therefore, MNCs increasingly diversify production and holdings via foreign direct investment (FDI) and foreign portfolio management (FPI) (Blanton & Blanton, 2007; Lensink, 2006). FPI is a continuous process of acquisition and divestment, expansion and contraction, and overall restructuring of operations through reallocating assets in different countries by leveraging competitive capabilities (Oliveira, Roth & Ponte 2003).

The magnitude of such activities has grown significantly. Both the number and the transaction value amounts of MNC mergers and acquisitions (M&As) have increased rapidly around the world (Oliveira, Roth & Ponte, 2003). Where in the past most M&As were executed by MNCs located in the developed world, as early as the 1990s a change was noted of increasing number of cross-border acquisitions undertaken by firms from the developing world. Dunning (1998) defines the phenomenon as asset-seeking FDI

where MNCs based in the developing world strive to acquire both market share and technological know-how through their acquisitions of firms in the developed world.

The overall strategy has worked well and firms from emerging economies are growing in market power and importance. From 1996 to 2008, the number of developing country companies in the Fortune Global 500 increased by 525 percent.[8] Cross-border M&As can provide a network for knowledge transfers (Oliveira, Roth & Ponte, 2003). The result is a changing power balance, with economic and innovation growth shifting toward the developing world. For example, in 2001 57% of high-value initial public offerings (IPOs) occurred on the American stock exchanges. By 2005, only 16% did. During the same time, the volume of IPOs from Asian countries, with the exception of Japan, has doubled. Starting in 2007, China has contributed more to global growth than the United States (Zakaria, 2008).

Both developed and developing nation MNCs not only strategically position their own operations but also help guide supply chain partners to reposition themselves as well. Positioning strategies are crucial because long-term competitive advantage stems from positioning activities (Porter, 1996). Positioning strategy refers to branding. In domestic markets, the term is "brand positioning"; internationally, it is "brand proliferation" (Mentzer, Myer & Stank, 2007). Positioning activities attempt to modify the tangible characteristics and the intangible perceptions of a marketable offering in relation to the competition (Blankson & Stavros, 2007).

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[8] US Council on Competitiveness "Compete 2.0" report series, compete.org

As a result of global brand proliferation and diversification of assets, firms are engaged in continuous repositioning (Mentzer, Myer & Stank, 2007). MNCs use an array of strategies in positioning. Among them is what scholars have described as "soft power". Joseph Nye first developed the concept of soft power in Bound to Lead: The Changing Nature of American Power as "the ability to get others to want the outcomes that you want" through attraction rather than through coercion (Nye, 1990: 5). The soft power concept has been embraced by marketing scholars who apply it to the brand proliferation field of research (Miller & Thorr, 2003; Saladino, 2008; Townsend et al., 2009; Wand & Wang, 2008). Miller and Thorr (2003) argue that MNCs use policy and political venues to exercise soft power. The example these authors provide is the policies of the World Press Freedom Committee (WPFC) in India generating free TV content that was accompanied by large amounts of advertising. As a result, India went from having four brands of soap to several hundred – more than most industrialized nations.

1.3 Theoretical Gaps

Brand proliferation has developed into a comprehensive term that describes the whole process of international production in a strategic spatial management context. It draws on theories of macroeconomics, production management, and international marketing, while controlling for political factors. But each of those sets of theories are based on their own discipline-specific sets of assumptions, which leads to contradictions in an interdisciplinary format.

Macroeconomic theories attempt to explain trade between countries by focusing on the determinants of sectoral specialization (Hummels & Levinsohn, 1995). Those determinants are encompassed in the concept of comparative advantage - the idea that nations should specialize in what they do best and then trade with other nations. The Heckscher-Ohlin (H-O) theory of international trade states that differences in the pattern of specialization across countries are determined by differences in their factor endowments (Markusen et al., 1995). Factor endowments – labor, land, and capital – affect specialization in task (Adams, 2008). 'Old' Growth Theory explores the impact of variables such as land, capital investment, hours worked, and general work-force demographics on the growth of GDP and ends up with an unexplained growth residual. 'New' Growth Theory attributes that residual to changes in knowledge (Romer, 1990, 2007; Solow, 1997)

As early as the 1970s, scholars noticed that the slowdown in productivity growth in mature economies coincided with a dramatic increase in the residual that is attributed to knowledge (Hayes & Clark, 1985). Endogenous growth theory focuses on the role of that residual by including the change in knowledge in the production function analysis. This modification extends the traditional neo-classical production function by making the assumption that certain types of knowledge are endogenous components of production (Grossman & Helpman, 1991). Endogenous growth theory also makes the distinct assumption that at least one knowledge input into the function does not have diminishing returns to production (Romer, 1990). Such is the case often observed with investments in R&D and production, whereby synergies occur. Therefore, in

endogenous growth models the assumption of perfect competition is relaxed and some degree of monopoly power is assumed to exist.

Generally, monopoly power in these models comes from the holding of patents. Patents encourage research and development (R&D) by offering their inventors market rents to help recover the costs associated with R&D. Government subsidies for R&D are intended to promote projects with high social returns but too little private returns to be attractive to private investors. Low private returns may be caused by spillovers of ideas to competitors or by a low appropriability rate. A low appropriability rate means that innovators are not able to appropriate the entire consumer surplus associated with the good that they create (Jones, 2000).

In addition to generating rents extracted through patents, monopolistic, and in some cases oligopolistic market, structures are also defined by increasing product differentiation. Because of the creative destruction nature of innovative production, in the new economy an ever-increasing variety of goods is being brought into the market, while firms enter and exit it with a relative ease (Feenstra & Kee, 2008). Products are characterized by a high degree of differentiation and could be viewed as substitutes, but not as perfect substitutes (Dixit & Stiglitz, 1977). The Dixit-Stiglitz model focuses on commodities in a group that are good substitutes within a sector or an industry, but poor substitutes for other commodities in the economy. Dixit and Stiglitz (1977) demonstrate the importance of estimating cross-elasticities of utility in relation to production and observe the emergence of incentives for subsidization in sectors. Utility refers to the satisfaction customers receive from consuming a good or service and the satisfaction

from the consumption of compliment or contingent goods and services. Customers must choose among competing brands in their consumption bundles of goods and services; therefore, firms try to create brand loyalty, which lowers the willingness of consumers to switch from one brand to another. Brand loyalty lowers elasticity and ensures a certain amount of influence over the market. Firms that can create brand loyalty can raise their prices without losing sales, allowing for market rents.

In a monopolistically competitive market, the consumer must collect and process information on a large number of different brands (Perloff, 2008). In many cases, the cost of gathering the necessary information exceeds the additional benefit of consuming the best brand, compared to a randomly selected brand. Consumers use information obtained from advertising, not only to assess the single brand advertised, but also to infer the possible existence of brands that they have not yet encountered. Advertising also helps customers gauge consumer satisfaction with brands similar to the advertised brand. This means that an individual firm's demand curve is downward sloping, in contrast to the firm in perfect competition, which has a perfectly elastic; *i.e.*, a flat, demand curve. These integrative processes of industrial differentiation through international brand management and the presence of economies of scale in geographically concentrated locales lead to the argument that global economic activity, in the context of industrial agglomeration, can best be studied by applying models of monopolistic competition (Dixit & Stiglitz, 1977; Fujita, Krugman & Venables, 1999; Krugman, 1979, 1980; Rosen, 1974).

Neo-classical economic theory states that monopolistic structures are inefficient in societal terms, but not for the owners of the monopolies. At their optimum output levels, monopolistically competitive firms charge a price that exceeds marginal costs. Monopolistically competitive firms maximize profits where marginal revenue equals marginal cost (MR = MC). Since their demand curve is downward sloping, firms charge a price that exceeds marginal cost. Consequently, at profit maximizing levels of production there is a net loss of both consumer and producer surplus compared to a perfectly competitive firm.[9] To reduce the loss, policies are in place to control monopolistic activity. Antitrust regulation aims to prevent trade distortion resulting from monopolistic structures. Such regulation is part of the World Trade Organization (WTO) adjudicative powers. Ironically, trade-distorting disputes tend to get resolved through imposing protectionist measures, which leads to further trade distortions (Morici, 2000).

Across disciplines, scholars agree that the current global market reality is so turbulent and dynamic that is poses serious challenges for globalization research that has both descriptive and prescriptive powers. The field is left in such confusion that according to Zakaria (2010) in the past decade, not one scholar was able to predict the rapid economic growth in emerging markets, the financial meltdown of 2008, the subsequent slowdown in western economies, and the surprising resilience and continued growth in the developing world.

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[9] See Perloff, pg. 445-448

1.4 Dissertation Contributions

The first essay is titled *"Multinational Corporations and Their Effect on Gross Domestic Product."* The research question is: What effect do the largest MNCs in the world have on the economies of their home nations? The question adds to the body of research on the incentives for governments to support and protect their own MNCs (Choi, 2004; Dunning, 1996, 2009; Grossman et al., 2006; Ishii, 2006).

A cross sectional time series analysis of 60 nations examines the combined effect of MNC nationality, FDI flows, trade balance, gross national income, unemployment rate, and population size on GDP, while controlling for development level and degree of regionalization. The results suggest that the nationality of MNC matters particularly, for nations that are part of large integrated trade blocs. The policy implications are that regionalization does provide benefits for the individual nations that are part of trade blocs. The body of evidence suggests that such integrative policies aid national competitiveness.

The second paper is titled *"Competing for Innovation: The Economics of Knowledge Acquisition."* It builds on the findings of Essay 1 that the nationality of MNCs matters to GDP. It further explores how FDI used by MNCs in merger and acquisitions can lead to amassing knowledge and innovation.[10] The research question is: What effect does the degree of internationalization of MNCs have on GDP? The 2008–2009 INSEAD Global Innovation Index is used to examine innovation's effect on

[10] For other studies of related issues see Contractor (2007), Dunning (1996, 1998), Love (2003) Markusen (1996), Plosila (2004), van Ark (2006).

economic growth (Dutta, 2010). A cross-sectional regression analysis for 60 nations stratified by MNC incorporation, establishes the connection between innovation and GDP. A second panel model for 1999 to 2008 explores that relationship with a focus on exports, imports, FDI, and marginal corporate tax rates. The combined relationship of these variables is weighed against each nation's purchasing power parity GDP (PPP GDP) as a proxy for economic growth. The findings suggest that the ability to buy foreign entities is more important for GDP growth than receiving FDI. The results suggest that regionalization, liberalization, and investing in public goods positively affect national GDP. Policies of industrial recruitment, lowering corporate tax rates, and maintaining a positive trade balance negatively affect GDP.

The third essay is titled *"Fleeing Regulation: Pollution Havens in Textile Manufacturing."* This paper examines how FDI flows are influenced by national environmental policies.[11] The research question is: What effect does pollution have on FDI flows in the economies most reliant on textiles? A cross sectional time series analysis of 32 nations for 1990 to 2008 examines how FDI responds to a major policy change — the removal of the quota system of international trade in garments and textiles (Gibbon, 2003; Miroux & Sauvant, 2005; Mikic et al., 2008). The findings suggest that trade liberalization changed the incentives for production location in textiles in favor of nations with relatively lax regulatory climates and large production capacities.

[11] The pollution haven hypothesis and related analyses are addressed by Acharyya (2009), Jorgenson (2006, 2007, 2009), Lee (2009), Pan et al., (2008), Smarzynska & Wei (2008).

The study tracks the changing market structure of the industry in the last two decades (Barns & Lea-Greenway, 2006; Birnbuam, 2005, 2008; Gereffi, 1999; Hutson et al., 2005; Kirshner, 2005) and finds that agglomeration and vertical integration in the garment retail sector have put strong capacity demands on production management in the textile sector (Bruce & Daly, 2004, 2006), intensify, and in turn, cost pressures that lead to perverse incentives in the site selection decision-making process.

This common theme in these three essays is FDI. UNCTAD defines FDI flows as the net yearly difference between assets and liabilities of an investor in foreign equity capital, reinvested earnings, and intra-company loans (UNCTAD, World Investment Report 2010, "Methodological Note"). In order for an asset to be considered FDI, it must be used to acquire a controlling stake in a foreign entity (Feng, 2008). What constitutes a controlling stake varies from industry to industry and from country to country because of differences in local structures of legal and property rights (Narula, 2009; Zhan, 2006). Furthermore, diversification makes it even harder to separate FDI from local assets. For example, China's Lenovo acquired US IBM's Personal Computing (PC) business in December 2004. The deal allowed Lenovo to continue to use the IBM brand, to keep IBM salespeople, and to retain the top IBM executive as CEO (Deng, 2007). Lenovo now takes advantage of IBM's powerful worldwide distribution and sales networks, and PC research centers in Raleigh, North Carolina. The research center is part of the research triangle that is set up as a private non-profit foundation, but is supported and funded by the US government (Rohe 2011). Rhoe (2011) argues that the growth of the research triangle has led to increasing public-private

initiatives and even more government support is expected for the industrial activities in the center. The result is that the US government ends up supporting the R&D activities of the Chinese government, as Lenovo like all Chinese MNCs is closely monitored and managed by the Chinese government. Scholars have noted that such outcomes have become common in the private sector.

Global network competition defines economic activity (Mentzer, Myer & Stank, 2007). Global network competition occurs when firms not only compete with other firms on position within a trading network, but also collaborate with trading partners. In some cases trading partners can be the firm's direct competitors, to secure favorable platforms for their global supply chains. Other scholars have referred to this phenomenon as "coopetition"– competing while cooperating (Bengtsson & Kock, 2000; Hayes et al., 2005; Luo, 2005; Porter & van Opstal, 2001).

Less focus is placed on coopetition in the public sector. Yet, much political and diplomatic discourse centers on national competitiveness. National leaders, economists, and human rights activists have raised questions about issues of fair competition among governments. This dissertation puts the focus on public sector coopetition by analyzing the economic results of selected government policies. The results are examined theoretically in an interdisciplinary format in order to explore the applicability of the main theoretical models in a rapidly changing economic and political reality.

CHAPTER TWO

DOES THE PRESENCE OF MULTINATIONAL CORPORATIONS AFFECT A COUNTRY'S GROSS DOMESTIC PRODUCT?

2.1 Introduction

This research examines how multinational corporations (MNCs) affect the economies of their home nations. The research question is: What effect do the largest MNCs in the world have on the gross domestic product (GDP) of their home nations? The question has implications for a country's trade and competitiveness policies. The dependent variable is gross domestic product (GDP). It has two official measures — official exchange rate GDP (OER GDP) and purchasing power parity GDP (PPP GDP). This study examines both in a comparative analysis in order to assess which metric best captures MNC activity.

Against both GDP measures, we regress the number of top ranked MNCs incorporated in a nation, foreign direct investment (FDI) inflows and outflows, exports, imports, population, and gross national income (GNI) per capita for a stratified random sample of 60 countries. The model includes a measure of MNC concentration per nation for both financial and non-financial MNCs. The hypothesis is that the more of the world's largest MNCs are incorporated in a nation, the higher that nations GDP. The cross sectional time series regression analyses used here show that to be true from 2005 to 2009.

2.2 Background in MNC Research

The term international no longer describes trading activity across borders. Rather, it denotes the traditional definition of two countries trading with one another based on comparative advantage in the production of finished goods. Trade today is global because the production function has been internationalized across borders (Feenstra, 1998; Hummels & Levinsohn, 1995; Hutson, et al, 2005; Gereffi, 1999).).

Some economists feel that foreign direct investment (FDI) is the core tool of international market penetration used by MNCs; and therefore it is the direct link between the changing nature of trade and MNC practices (Helpman, 1984, 2006; Lane & Milesi-Ferretti, 2007; Sun & Parikh, 2006). A vein of research argues that MNC market penetration and foreign capital dependence is detrimental to social and economic conditions, especially in lesser developed countries (LDCs) (Borensztein et al., 1998; Kellner, 2002; Kentor, 2001; Lundan, 2006; Rudra, 2002; Scruton, 2002; Wimberley & Bello, 1992). The majority of studies have focused on LDCs' dependence on MNC practices. Much of this research is based on two theories: World-System Theory and Dependency Theory. World-System Theory states that there is a global capitalist system that allows western (core) nations to exploit developing and less-developed (semi-periphery and periphery) nations by bringing them closer in or further out from the economic core (London & Smith, 1988). Dependency Theory states that dependence on foreign capital by underdeveloped nations causes decreased economic productivity and negative conditions in general (Kardulias, 1999; Robertson, 1992; Vernengo, 2004). Much of this literature has attempted to point out the negative consequences and

implications of such dependence. For example, Kentor (2001) finds foreign capital dependence to have a negative effect on domestic problems in developing nations by promoting income inequality, accelerating population growth, and slowing economic growth.

There are two measures of dependence: investment dependence— the penetration of a country by foreign capital, and debt dependence — the dependence of a government on foreign credit. Both are contingent on MNC activities because most direct economic penetration is accomplished through private investment by MNCs. In periphery and semi-periphery nations where MNCs directly control the process of production, investment dependence has an independent and simultaneous negative effect on economic growth. It distorts the economic structure of periphery nations per capita GDP (Chase-Dunn, 1975). Similar results are also found in cases of prominent developed nations, suggesting that MNC operations distort economic structures across the board (Bornschier & Chase-Dunn, 1985).

Links have been made between MNCs and dependence on foreign capital, MNC trade and inequality, MNCs and the general promotion of western values in non-western societies (Barbieri & Reuveny, 2005; Wu, 2006). The focus has been on the historically pervasive negative aspects of globalization and their ties to MNC interests. A key conclusion in this vein of research is that international dependence by poorer nations on developed nations can lead to unsatisfactory food consumption by individuals in poorer countries (Wimberley, 1992). In such cases of dependence a direct link can be established between MNCs, income inequality, and political violence (Robinson, 1989).

This point was supported recently by the Arab Spring uprisings, the onset of which analysts tied to food prices (Harrigan, 2011; Harrigan & Tilley, 2011; Johnston & Mazo, 2011).

There is a common argument between those studies and earlier works that criticizes globalization for promoting terrorism because of the openness of borders (Kellner, 2002) and the hatred fostered by the presence of western countries and ideologies in Islamic lands (Scruton, 2002). This focus on the negative effects of MNC activity is important from a trade policy perspective. Awareness of the negative effects of globalized trade can help devise policies that minimize those effects and strive to improve global equity.

However, research that exclusively focuses on the negative aspects of globalization does not give proper attention to globalization's many positive contributions. Work that points to the positive effects of global trade asserts that export of capital to less developed countries promotes growth by creating new industries, which leads to job creation and new capital formation (Firebaugh, 1992; Harris, 1993; Williamson, 1978). Firebaugh (1992) disputes the evidence from previous sociological studies that capital investment is harmful and claims instead that it is a necessary step in a global economic system. A positive relationship has been shown between foreign investment levels and increase in exports in developing nations (Williamson, 1978). There is even a suggestion that globalization itself was caused by economic growth that occurred after World War II, the long process of investment and trade liberalization in industrialized countries, and the impact of technological change (Harris, 1993).

The supporters and critics of globalization have laid the foundation for a third school of thought that is beginning to combine their findings and recommendations. Such research notes that foreign investment and foreign capital penetration by MNCs may have both positive and negative effects on the economic growth of countries of all sizes and levels of development (Jaffe, 1985; Kentor, 1998; Kentor & Boswell, 2003).

Analysis of the experience of both developed and developing nations after World War II lays the foundation for studying the relationship between export dependence and economic growth (Jaffe, 1985). Export dependence is defined as having large amounts of GDP in a country that is generated by exports. The main contribution of the focus on export dependence is the finding that while, there is a positive relationship between export dependence and economic growth, it is significantly reduced by foreign capital penetration because MNCs tend to gain control of export production and make it unavailable for domestic reinvestment (Harris, 1993; Jaffe, 1985; Kentor, 1998). This body of work indicates that there is a positive short-term relationship between FDI inflows and economic growth. However, Kentor (2001) claims that this positive relationship is replaced by a consistent long-term lagged negative relationship.

More recent studies offer a new conceptualization of foreign capital dependence. These studies use the term "foreign investment concentration", which refers to host country stocks that are held by another dominating investing country (Kentor & Boswell, 2003; Ishii, 2006). The main conclusion is that foreign capital penetration can be beneficial to a country's GDP but the benefits can be significantly reduced when that foreign investment is mostly from a single country instead of many. It is found to have a

significant long-term negative effect on economic growth. This effect is strongest within the first five years and subsequently decreases. This relationship is hypothesized to exist because high investment concentration limits state autonomy and keeps business elites from providing long-term improvements.

2.3 The New Reality — Changing Assumptions of Existing Theories

Latest research suggests that with the advent of the internet international trade has changed drastically (Bjornevatn & Eckel, 2006; Guillen, 2005; Love, 2003; Smyth & Smith, 2006). Several scholars have claimed that many of the earlier studies misinterpreted the data on the effects of multinational capital penetration and that it is dangerous to apply earlier recommendations to the present state of affairs without taking into account the changing nature of trade (Blanton & Blanton, 2007; Navaretti et al., 2007; Shafaeddin, 2005). The information technology boom of the late 20th century, combined with the creation of large unified markets like the North American Free Trade Area, The European Union and the emergence of Brazil, Russia, Indian and China, referred to as the BRIC nations, as large homogenous markets with rising purchasing power, has created a world of trade where MNCs employ multi-brand synergy strategies to engage in local market development.

The theories explored in recent literature on market development focus on the changing nature of trade and FDI from extraction of inputs by sector to multi-sector resource management (Angelescu & Squire, 2006; Barbieri & Reuveny, 2005; Blanton & Blanton, 2007: Shafaeddin, 2005). Prior to the change, sectors and products characterized most firms. Car manufacturers made cars, cheese manufacturers made

cheese. But today, through increased horizontal integration, firms tend to morph into highly diversified entities that make a myriad of products and own a variety of brands. For example, General Electric (GE) does not only make electronics and household appliances as it did in the 1970s. It also owns chemical companies, medical research and development start up firms, real estate and entertainment firms, banks, hotel chains, lumber yards, prepared foods and clothing firms and is probably in the process of expanding into more sectors as this sentence is being written.[12] GE's financial interests reach even further as it manages its financial assets in revenue generating fashion and could invest in other businesses without establishing production in their respective sectors.

In the past, FDI had been primarily involved with resource-based industries such as mining, oil, agriculture, and general commodity trade. The investment was focused, and often limited, to regions that possess natural resources, and was done with extraction of resources as a main goal (Blanton & Blanton, 2007; Sylwester, 2005). The sales took place in external markets that offered the highest profit margin. Firms investing overseas were not primarily concerned with sales in the countries of extraction. This pattern generated the data used in studies done by Jaffe (1985) and Kentor (1998, 2001) that led to a focus on the negative aspects of FDI as a tool of trade. The data sets employed reflected the extraction period that defined international trade before the information technology revolution of the last 20 years. Blanton and Blanton (2007) observe that the information systems innovation that rapidly accelerated in the mid and

[12] http://transnationale.org/companies/general_electric.php

late 1990s, has led firms to change the purpose of their foreign investments. From investing in extracting raw materials, MNCs have shifted their focus to developing complete external networks with strategic backward linkages to local production entities and forward linkages with local retailers (Hayes et al., 2005; Weinstein, 2005). This strategy allows them not only to manufacture externally, but also to outsource core competencies, which facilitates information management and makes it possible for firms to diversify across sectors (Shafaeddin, 2005). The sectors of importance are changing from primary commodities and products to fast-moving consumer goods, information technologies, and services. The growth if FDI in service industries alone has been impressive. In 1990, FDI stock in services was $950 billion worldwide. By 2002 it had reached $4 trillion with FDI inflows into services accounting for two-thirds of all FDI inflows in 2001–2002 (Helpman, 2006).

2.4 MNC Investments and Diversification Today

In the 1990s the dollar value of FDI inflows increased from $200 billion to $1.3 trillion. In the same period FDI inflows and outflows combined have grown at least twice as fast as trade (Choe, 2003). In 1980, FDI stock represented 5% of world GDP (Lall & Rajneesh, 2004). By 2000 that percentage had almost tripled to 14%. The share of developing countries in FDI inflows has been raised from 17.1% in 1988–90 to 21.4% in 1998–2000 (UNCTAD, 2000). Not only have the numbers grown, but also diversification across sectors has occurred. In 2000 ten of the 200 largest non-financial MNCs, as ranked by the United Nations Conference on Trade and Development (UNCTAD), were classified as diversified. The rest made products in well-defined

industrial sectors such as automotive, mining, chemicals, beverages, machinery and utilities. Seven of the diversified MNCs were from the developing world, six of them from China and Hong Kong, which suggests government control of their assests. The diversified firms from the developed world were Mitsubishi of Japan, Veba Group of Germany, and LVMH of France. By 2010 Mitsubishi was no longer simply classified as diversified, but fit into a new category – wholesale trade, together with two other Japanese firms. LVMH, now renamed Lvmh Moet-Hennessy Louis Vuitton, also falls into a new category titled "other consumer products". Veba Group is no longer on the list, and the top diversified firms from the developed world are Proctor and Gamble of the U.S. and Unilever, which is considered both Dutch and British.

In 1997 the only classification on the list that represented the service sector was telecommunications, with AT&T being its only MNC from the developed world, and two telecommunication firms from the developing world. By 2010 there were 10 telecommunication giants from the developed world, none of them American, and 11 telecommunication MNCs from the developing world. The service sector is also represented with another new classification – other consumer services. None of the top firms on the list are headquartered in the developed world. There are also two additional classifications that only appear on the list of MNCs from the developing world. They are "transportation and storage" with 4 firms that are all from China, and "other equipment and goods" with 9 MNCs that are all headquartered in Asia.[13]

[13] The data is available from UNCTAD.org/programmes/investment and enterprise/world investment report/largest TNCs

Although expanding, the classifications mainly note what sector represents the majority of holdings of an MNC, or in some cases, in what sector the MNC historically has had a large presence. For example Vivendi Universal is classified as a French telecommunications firm, but among its holdings is Canadian Seagram's entertainment division, as well as a joint ownership of NBC that it shares with General Electric. General Electric is classified under "electrical and electronic equipment", but its most profitable business is in finance: it owns GE Franchise Financial Corporation, GE Financial Assurance Holdings, GE Insurance, GE Small Business Finance Corporation, and GE Capital Retail Services — a leader in the commercial mortgage field. Such diversification offers MNCs market development capabilities by deployment of brand synergy strategies. Synergizing brands refers to their strategic market positioning so that they complement each other without competing across industries, price levels, and regions.

MNCs that own a large portfolio of brands engage not only in FDI, but also in FPI - Foreign Portfolio Investment (Blanton & Blanton, 2007; Lensink & Morrissey, 2006; Currie &Parikh, 2006). In addition to commodity, industry and infrastructure holdings, FPI has a financial capital component that affects fund liquidity. Financial MNCs and independent wealth funds are behind most venture capital activities with the ability to shift funding streams into ventures, regions and industrial sectors with speed and diversity. This ability intensifies FDI competition and leads to increased pressure for investment seekers to provide accommodating environments for management synergy and policy diffusion. Therefore, FPI has a political side to it. Gritsch (2005)

finds that states employ the economic means of globalization, which includes FPI, to attain international geo-political power.

Through FPI, MNCs are able to penetrate and develop new markets better than ever. The focus today is not primarily on extraction, as it was up until the information technology revolution, but on growth potential and future sales (Buckley et al., 2006). Management practices are geared toward future benefits and not just immediate gain through mark up in export sales (Parikh, 2006; Smyth & Smith, 2006). This branch of penetration is the result of a reality of oversaturated markets in developed countries where brands compete in an overcrowded market place for limited market share at ever increasing transaction costs. The owners of those brands look at emerging markets for future increases in sales volume in two important aspects: direct export sales, which is the traditional approach of exporting, and local manufacturing for sale in local markets (Aizenman, 2006). Direct export sales are still a valuable operation, but data suggest that increasingly MNCs use FDI to develop capital projects for manufacture in a host country, not for extraction or export, but for sale to the local consumer. China is a perfect example, where research shows that of all the production done in China by foreign companies, over 80% of the products are sold in China and not exported for sale outside the country (Drezner, 2006). Data also show how that change has impacted Chinese companies through increasing competition, leading not only to monetary gains for employees but also to the Central Communist Party taking a firm stand in policies that improve the working conditions and pension plans for Chinese workers (Bergsten et

al., 2007). This is an example of the power MNCs have to elicit policy change in their host nations.

Another positive example of this process is the noted increased interest in mutually beneficial labor relations (Barbieri & Reuveny, 2005). Economists and sociologists have observed a current and steady rise in wages in developing nations. The spike in wages is attributed to the economic interests of multinational employers. What in the past was referred to solely as "labor" is now viewed as "a consumer" (Basile et al., 2006; Grossman et al., 2006; Navaretti 2007 et al.). MNCs now have vested interests in the purchasing power of the countries they penetrate. They are now less concerned with keeping wages low in host nations to maintain low production costs, as they have been and as is the convenient argument for the critics of free trade. Today, MNCs have an interest in increasing wages because the wage increase is likely to be spent on the products and services that the MNC is selling in the country of operation. Large MNCs like the British/Dutch Unilever that own brands in consumer products, prepared foods and drinks, petro chemical products, entertainment, outer ware, electronics and financial services, can virtually supply new customers with anything. Their interest in increasing the purchasing power of their employees, although self serving, still increases the standard of living in emerging markets while providing employment and improving economic opportunities and security (Blanton & Blantaon, 2007; Choi & Davidson, 2004; Lane & Milesi-Ferretti, 2007; Wu, 2006).

Many scholars talk about the speed of change occurring in the global trading system in recent years, but few define recent and even fewer quantify the magnitude of

that change and its effect on productivity and economic growth. Zakaria (2008) shows that the largest overall growth in economic activity and wealth creation in human history occurred between 2002 and 2007, mainly in the developing world, and points out that not one economist was able to predict it. Furthermore, Zakaria points out how many economists predicted exactly the opposite to occur – a global economic slowdown, particularly severe in the developing world, as a result of the 9/11/2001 terrorist attacks. Since most economic analysis observes change over time to analyze growth and development trends, while trying to control for institutional capital to predict future outcome, it is not surprising that time-series analysis can lead to erroneous prognosis.

Studying the effect of total factor productivity on economic growth, Baier, Dwyer and Tamura (2006) show that analysis based on data from 1980 to 2000 would reach different conclusions from analysis of data from 1960 to 2000. Their prescription is to use even longer time series to allow for the variability across time to include many disruptive periods, in order to observe coping mechanisms and draw conclusions. Analysis of past states could provide misleading policy prescriptions, if the states examined are different from the present and likely to be even more different in nature than the desired future state the policy outcome is hoping to bring about. This could be why, as Zakaria asks, with all the information, modeling capabilities, and technology economists have, not one predicted the post 9/11 economic boom, the recession that followed it, or the ability of countries like China and Germany to rebound from it better than America. The question of time-series analysis in the context of representative time

periods is hard to answer when economic activity changes so fast in terms of sector growth.

Such change is important because it alters a nation's comparative advantage in trade. Neo-classical economic theory states that nations trade based on their comparative advantage. Comparative advantage is dependent on natural endowment, such as land, raw materials, and manpower, and on the ability of nations to accumulate and develop vital factors of production, such as technology, and capital. The combination of factors defines a nations total productivity factors (TFPs), and its comparative advantage (Markusen et al., 1995). With economic transformation and comparative advantage changes altering trade patterns across time, it would be helpful for researchers to identify the transformative periods and study their magnitude. The real challenge is measuring both the speed and nature of change during transformation. It is imperative for FDI scholars to not only focus on change in FDI dollar amounts, but changes in sector concentration.

This study adds to such work as that done by Ghosh and Wang (2009), who use time series regression analysis for data on OECD countries for the years 1980 to 2003 to measure how FDI accelerates economic growth. Ghosh and Wang use their conclusions in a predictive way, arguing that FDI is likely to have a relatively low impact on future economic growth in OECD countries. That conclusion is surprising in light of the magnitude of change their data shows, such as the growth of FDI stock as percent of GDP in the countries they examine. But their analysis supports the conclusion because of the long time series employed. The time frame includes a very incremental and

steady FDI inflow period from 1980 to the mid 1990s followed by few years of accelerated growth. That variability in percent change suggests that some of the countries in the sample did go through transformative economic periods that altered their comparative trade advantages and consequently had an effect on their major trading partners.

Table 2.1 shows the first 8 out of the 25 nations observed by Ghosh and Wang (2009)

Table 2.1 FDI as percent of GDP by Ghosh and Wang (2009)

	1980	1985	1990	1995	2000	2004
Australia	7.9	14.4	23.7	28.0	28.7	39.8
Austria	3.9	5.2	6.7	8.2	15.7	21.4
Belgium	6.0	22.3	29.6	40.8	85.5	73.5
Canada	20.4	18.4	19.7	21.2	29.8	31.1
Denmark	6.1	6.0	6.9	13.2	46.5	40.7
Finland	1.0	2.5	3.7	6.5	20.2	30.1
France	3.9	6.7	7.0	12.2	19.6	26.2
Germany	4.0	5.3	6.5	6.6	14.3	12.7

The data show an average change in percent growth of 5588 with Belgium and Finland having the highest growth rates in FDI to GDP ratio. The growth rate captures the increasing importance of FDI over time, but it does not distinguish how its purpose has changed over the years. For example, Finland's FDI in 1980 was associated with mining and lumber operations. By 2004, although those sectors are still strong, the majority of FDI is associated with knowledge intensive production in telecommunication equipment and electronics components, many of them in renewable

energy manufacturing (Lavasseur, 2011; Leitao & Baptista, 2011). In 1980 Belgium's FDI was concentrated in three main manufacturing intensive sectors based on the past strength of its steel industry that started to decline in the 1970s. The three sectors of choice for foreign investors were automotive parts production and assembly, chemicals and industrial agriculture. By 2004 the largest growth in FDI shifted to service and financial sectors with banking, trading services, biotechnology and telecommunications in the lead (Keating et al., 2008). In 1980 Austria's government held over 30% ownership of its main industries, mainly in manufacturing intensive sectors in industrial machinery, paper and pulp, food, beverages and tobacco. The government pursued policies of full employment, making Austria an unattractive place to invest as foreign entities had limited property rights and faced inflexible labor laws. Today Austria's major FDI inflows are in trade services, professional, scientific and technical services, financial intermediary services, chemical, and petroleum and pharmaceuticals products.[14] Austrian inward FDI stock has grown from 3.9% of GDP in 1980 to 21.4% in 2004.

The research presented here further explores the cumulative effect of such changes in FDI activity today. This study employs a diverse sample of nations through a stratified random sampling approach. The approach is consistent with Ghosh and Wang's recommendations for future studies to examine whether their findings hold for countries that are not members of the Organization for Economic Cooperation and Development (OECD). Many time series studies in globalization tend to use OECD

[14] Information obtained from the database of Austria's Oesterreichische National Bank www.oenb.at

member nations, mainly because of data availability. However, OECD members themselves are outliers in the sense that their participation in the organization affects their trade policies. OECD membership requires a certain level of compliance. Compliance is voluntary but enforceable through WTO adjudication, for OECD members are also WTO members. Fewer studies examine a truly diverse sample of countries in terms of development, region, trade block and WTO membership.

This is the approach of choice here that helps accomplish two main goals. First, it helps build a sample that is representative of a world where few outliers influence the economic development of all. Second, it analyzes a time period that is homogenous in itself but has transformative characteristics. The selected years are 2005 to 2009 inclusively. Those five years are homogenous because there has not been a major technological breakthrough that could alter international trade and production, such as laying telephone and cable lines across the Atlantic Ocean in the early 1900s, or the commercialization of microprocessor technology in the 1990s. But these years are transformative because they capture the new role emerging markets play in today's global economy, both in the time of prosperity and during a recession.

2.5 The Age of China

The most recent period without major structural disruptions in the nature and purpose of global trade is ongoing. Some analysts have called it the age of China (Kaplan, 2010; Zakaria, 2008). The period starting point can be identified with China's admission into the WTO in December of 2001. The entrance of China changed the world dynamic and balance of trade because it altered investment incentives. The

largest country in the world became fully integrated into the legal global commercial system, agreeing to obey the rules of international trade adjudication. There is much debate today on how well China obeys WTO directives. Whether China is complying is beyond the scope of this study, but the fact remains that even with charges of non-compliance, structural changes within China had a spill-over effect on incentives for FDI location for several reasons.

The most important incentive is to reach 1.3 billion new customers with growing purchasing power who are eager to improve their standard of living by consuming products and services they had never enjoyed before (Zakaria, 2008). Second, in addition to accessing the already vast and continuously growing opportunities of China's market, MNCs investing in China improve their market access to Asia and other regions where establishing presence may be challenging, particularly for western firms (Midler, 2009). Third, the growth in China serves as the catalyst in the increasing importance of LDCs in international trade and relations, as China strategically pursues improving its own trade ties with them (Kaplan, 2010). For example, in 2009 when most nations were scaling back on investment as a result of the financial crisis, China was aggressively increasing its investments in Africa. At the Forum on China-Africa Cooperation on November 20, 2009 the Chinese prime minister, Wen Jiabao, announced that China would double the amount of low-interest loans to African nations to $10 billion in the upcoming three years, increase the number of scholarships, and reduce tariffs on products from the poorest nations (LaFraniere, 2009).

China's geo-political power has added an urgency component to investment incentives that impact transaction costs[15]. When in the past investors could wait strategically to penetrate a market based on the transaction costs of investing, today the explosive growth in developing regions makes it necessary to build market presence fast, even at high transaction costs. At the same time, firms from the developing world hurry to invest in developed nations for knowledge sourcing reasons. This tactic allows them access to advanced technologies at a relatively low transaction cost, which increases their competitiveness.

Transaction costs are different for firms from the developed and the developing world. Developing nation MNCs face higher degrees of uncertainty, more political risk, and cultural differences that affect business relations, all adding to the transaction costs of monitoring (Ruan & Ugur, 2006; Rudra, 2002). For example, Midler (2009) observes that with time, as the personal relationships between American importers and their Chinese partners improve, the quality of product deteriorates. This fact keeps on surprising American business people who expect exactly the opposite to occur because in western business culture, developing good personal relationships lowers monitoring costs (Jensen & Meckling, 1976; Williamson, 1981). In certain Asian cultures, including China, the process is reversed. In the initial stages of the business relationship Asian partners try hard to impress their clients, but with time they begin to look for ways of improving their profit margins by lowering operating costs (Midler, 2009). Such gaming processes are not new in trade, but have become much more magnified when

[15] For transaction cost discussion see Coase (1937), Williamson (1982, 1998)

China's average growth has been over 9% annually since 2002. This rapid growth has led to a much larger percent of business profits for those firms with presence there, becoming dependent on successful operations in China, which is contingent on understanding Chinese business culture. A globally competitive firm needs to be where marginal growth is strongest. Zakaria (2008) maintains that doing business with China today is no longer a choice but a necessity, implying shifting geo-political power structures and changing diplomatic power balances.

The unit of analysis in the present essay is a country in a given year, which helps translate the FDI flows of private entities into aggregate country gains in the form of GDP growth. That relationship is important for national competitiveness and trade policies. The model includes a measure of global market power of MNCs from the developed and developing world and examines how their total assets and internationalization of operations affect the national economies of their corporate headquarters. The study adds to the debate between the schools of thought embraced by sociologists such as Chase-Dunn (1975), Jaffe (1985), and Kentor (2001) who have admonished the negative effects of open trade and the development scholars, such as Blanton and Blanton (2007), Pearce (2006), and Lane et al. (2007) who notice the positive effects of opening markets and synergized market penetration by MNC through the use of FDI as a valuable tool in market development.

2.6 Data and Methods

This research employs a pooled time-series design that consists of a sample of 60 nations.

A stratified sampling approach is employed where country selection is based on whether or not a nation is a home base to one of the world's largest and most internationalized MNCs.

Ranking and general information on MNCs comes from the UNCTAD database Largest Transnational Corporations. MNCs are ranked based on a transnationality index (TNI), which is calculated as a ratio of foreign assets to total assets, foreign sales to total sales, and foreign employment to total employment. The data set breaks the MNCs down into three categories—Top 100 ranked non-financial MNCs from the whole world, Top 100 ranked non-financial MNCs from the developing world only, and top 50 ranked financial MNCs from the whole world. There is some overlap in MNCs listings between the three separate categorizations, therefore to eliminate double counting the data for the model of this study are taken manually. The count shows there are 34 countries that among them are corporate homes of the world's top 250 ranked MNCs. Out of them 30 are chosen randomly without replacement. Also 30 countries without a top ranked MNC incorporated within their borders are chosen randomly without replacement. The countries are further stratified by developed and developing. Four strata emerge: ***Developing countries without MNCs, Developing Countries with top-ranked MNCs, Developed countries without MNCs and Developed countries with top-ranked MNCs.***

The explanatory independent variables are:

(1) $\mathrm{NF}_{\mathrm{MNC}}$ − Number of top 200 ranked non-financial MNCs

(2) F_{MNC} – Number of top 50 ranked financial MNCs. They are defined as number of corporations based in a home economy that control and manage commercial ventures and operations outside their countries of origin (IMF.org).

The other independent variables are:

(3) $FDI_{INFLOWS}$ – FDI inflows measure how much foreign capital a nation receives in a calendar year

(4) $FDI_{OUTFLOWS}$ – FDI outflows measure how much a nation invests outside its borders in a calendar year[16]

(5) TB – Trade Balance (Exports – Imports) is an indicator of the amount of trade for a nation and shows whether a nation has a trade surplus or a deficit[17]

(6) UNEMP – Unemployment rate shows the percent of the labor force that is not involved in the production of a nation's GDP

(7) GNI – GNI per capita is an indicator of the average earning power of the population and therefore its purchasing power[18]

(8) POP – Population size is included to examine whether relatively large populations would be associated with relatively large GDPs[19]

(9) DC – Development Code is coded dichotomously with the value of 1 given to developed nations and 0 to developing nations

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[16] FDI inflows and outflows are measured in billions of current US dollars, *i.e.* not adjusted for inflation

[17] Measured in current US dollars

[18] Measured in thousands of current US dollars

[19] Recorded in thousands of people

(10) $\mathrm{GDP}_{\mathrm{OER/PPP}_{\mathrm{it-1}}}$ – a lagged dependent variable is added in both regressions to control for time effect issues

The model is as follows:

$$\mathbf{GDP_{OER/PPP} = \beta_1 FDI_{INFLOWS} + \beta_2 FDI_{OUTFLOWS} + \beta_3 NF_{MNC} + \beta_4 F_{MNC} + \beta_5 TB + \beta_6 UNEMP + \beta_7 GNI + \beta_8 POP + \beta_9 DC + \beta_{10} GDP_{OER/PPP_{it-1}} + e_{it}}$$

Where subscript "it" stands for individual observation at one time period.

Several sources are used to compile the data. Statistics on MNCs and their affiliates come from UNCTAD database "Largest Transnational Corporations".[20] Data on GNI per capita, and unemployment are drawn from the World Bank database World Development Indicators (WDI).[21] The data for GDP, imports, exports, and population size come from the CIA database "Country Statistics" in its publication "The World Fact Book".[22] The data on FDI inflows and outflows come from the UNCTAD data set "Country Fact Sheets".[23]

Two versions of the dependent variable GDP are examined:

1. Official Exchange Rate GDP (OER GDP) captures the market value of all final goods and services produced within a nation in a given year tied to that nations international currency value. Many economists prefer this measure of GDP because it

[20] http://www.unctad.org/Templates/Page.asp?intItemID=2443&lang=1
[21] http://data.worldbank.org/data-catalog/world-development-indicators
[22] https://www.cia.gov/library/publications/the-world-factbook/geos/af.html
[23] http://www.unctad.org/Templates/Page.asp?intItemID=2441&lang=1

measures the purchasing power a nation enjoys in the international market place via the currency value of the goods and services it trades internationally (CIA.gov). However, OER can be manipulated or artificially fixed depending on whether a nation lets its currency float. Furthermore, OER only measures the set of goods and services traded internationally, which for most countries is a pretty small set.[24] Therefore, OER GDP is not well suited to comparing domestic GDP over time because appreciation/depreciation from one year to the next will make the OER GDP value rise/fall regardless of whether home-currency-denominated GDP changed.

2. Purchasing Power Parity GDP (PPP GDP) is the measure most economists prefer when looking at per capita welfare and when comparing living conditions or use of resources across countries. However it is difficult to compute, as a US dollar value has to be assigned to all goods and services in the country regardless of whether these goods and services are traded internationally. For many developing countries, PPP-based GDP measures are multiples of the official exchange rate (OER) measure because such countries do not trade as much as developed countries (IMF.org). This fact is of particular interest for this study, since it ties the purchasing power of a nation to MNCs strategic market development practices.

The main hypothesis is the higher the number of MNCs, the higher GDP. It is of particular interest to see how both measures of GDP respond to the combination of independent variable. Based on the literature review it is reasonable to expect PPP GDP

[24] http://www.imf.org/external/pubs/ft/fandd/basics/gdp.htm

to be more affected by MNC incorporation since PPP GDP specifically measures internal economic activity.

2.7 Findings

Country data were collected using economic indicators from the World Bank and CIA Factbook Country profiles. Examples are attached as Appendix 1 and Appendix 2. Appendix 1 consists of 2005 values for all variables for the developed nations included in the study. Appendix 2 consists of 2005 values for the developing nations examined. The data were analyzed using cross-sectional time series regression analysis with STATA 10 software. Variance Inflation Factor (VIF) tests are performed to control for multicollinearity. No multicollinearity problems were found.

Table 2.2 shows the results of regressing OER GDP against the independent variables.

Table 2.2 Cross Sectional Time Series Regression Analysis, GDP OER

Variables	Coefficient	Standard Error	Significance
$\mathbf{FDI_{INFLOWS}}$ – FDI Inflows	0.48	0.43	NS
$\mathbf{FDI_{OUTFLOWS}}$ – FDI Outflows	-0.73	0.44	^
$\mathbf{NF_{MNC}}$ – Number Non-financial MNC	4660.56	1833.12	**
$\mathbf{F_{MNC}}$ – Number Financial MNCs	13344.50	9131.89	^
TB – Trade Balance (Exports-Imports)	0.13	0.18	NS
UNEMP – Unemployment	-186.24	161.68	NS
GNI – GNI Per Capita	1.01	0.35	**
POP – Population	0.15	0.11	NS
DC – Development Code	-53558.62	15104.47	***
$\mathbf{GDP_{OER_{it-1}}}$ – Lagged DV	1.05	0.01	***
Constant	6128.81	1250.89	NS
Prob. > F	<.0001		
R-squared	0.99		
Observations	239		

Dependent Variable: GDP OER – captures the market value of all final goods and services produced within a nation in a given year tied to that nation's international currency value. Level of significance on a two-tailed test denoted by the following symbols: NS – not significant, ^p<0.10, *p<0.05, **p<0.01, ***p<0.001.

The results show that OER GDP of a nation is statistically dependent on the number of MNCs incorporated in it. The relationship is positive indicating that as the number of MNCs in a nation increases OER GDP also increases. The relationship is stronger for non-financial MNCs. FDI inflows show no significance in this model, but

there is a weak relationship between OER GDP and FDI Outflows. The relationship is negative suggesting that nations that invested overseas had higher OER GDPs than those that did not.

The same model is run against PPP GDP. The results are presented in Table 2.3.

Table 2.3 Cross Sectional Time Series Regression Analysis, GDP PPP

Variables	Coefficient	Standard Error	Significance
$\mathbf{FDI_{INFLOWS}}$ – FDI Inflows	1.41	2.22	NS
$\mathbf{FDI_{OUTFLOWS}}$ – FDI Outflows	4.06	3.03	^
$\mathbf{NF_{MNC}}$ – Number Non-financial MNC	636523.47	29307.07	*
$\mathbf{F_{MNC}}$ – Number Financial MNCs	239552.60	138453.30	^
TB – Trade Balance (Exports-Imports)	-2.98	0.93	***
UNEMP – Unemployment	-1383.11	1293.77	NS
GNI – GNI Per Capita	-2.54	1.99	**
POP – Population	3.36	1.07	**
DC – Development Code	-103526.50	43550.76	*
$\mathbf{GDP_{OER_{it-1}}}$ – Lagged DV	0.29	0.17	^
Constant	6128.81	1250.89	NS
Prob. > F	<.0001		
R-squared	0.99		
Observations	239		

Dependent Variable: GDP PPP - estimates the market value of all final goods and services produced within a nation in a given year, whether they are traded internationally or not. GDP PPP is not tied to a nation's currency value and is especially useful in cases of nations that do not allow their currency to float. Level of significance on a two tailed test denoted by the following symbols: NS – not significant, ^p<0.10, *p<0.05, **p<0.01, ***p<0.001.

The strongest predictor of OER GDP change in this model is surprisingly Development Code. The relationship is negative, suggesting that the developing nations in the sample had significantly higher GDP growth from 2005 to 2009 than the

developed nations in the sample. This finding supports the arguments of changing power balances in international trade toward the developing world (Zakaria, 2008).

The results here also show that MNCs significantly affect PPP GDP. With PPP GDP as the dependent variable the model shows that non-financial MNCs positively contribute to the GDPs of their home nations and financial MNCs do as well, but not with the same magnitude. FDI Outflows also show a weak statistically significant relationship at the 0.1 level, but the direction is reversed. The relationship of GDI outflows to PPP GDP is positive. This fact suggests that investing overseas is relatively more important for PPP GDP growth than receiving foreign direct investment. This result, although counterintuitive, supports recent research claims that outward foreign investment is good for economic growth because the return on that investment is often substantial and has a positive impact on the economy of investing nations (Lall & Rajneesh, 2004; Loewendahl, 2001; Ruane & Ugur, 2006). Further research can examine this claim and relate it to the work on value extraction – the notion that foreign investors copy technology and knowhow from their expansions that benefit their home nations.

The biggest difference between the two models is in the effect of trade balance on GDP. With the OER measure, it appears that running a trade surplus or a trade deficit does not affect GDP. But with the PPP measure there is a statistically significant relationship that is negative. This fact suggests that nations running trade deficits had relatively higher GDPs than those that had a trade surplus. This finding challenges

conventional teachings that having a trade surplus leads to economic growth. Further research can investigate this finding and issues of sustainability over time.

Also different in this model is the relationship between PPP GDP and GNI per capita. Growth in GNI per capita shows a positive significant connection OER GDP but its relationship to PPP GDP is negative and statistically significant. The interpretation is that PPP GDP grew more from year to year in nations with relatively lower GNIs per capita, *i.e.*, relatively poorer countries. This fact also supports the claims that the economic growth in emerging markets was stronger than in the developed world. The result supports the arguments of authors like Zakaria (2008) and Kaplan (2010) that study the shifting power balance of global markets toward the developing world. The negative but statistically significant relationship between PPP GDP and Development Code also supports such arguments. It suggests that developing nations had stronger rates of growth than developed nations between 2005 and 2009.

2.8 Analysis

By analyzing both measures of GDP, this study offers an example of the importance of metrics. With the same independent variables the results show different relationships for GDP and FDI Outflows, Trade Balance, and GNI per capita. It is important to make the distinction in order to not make conflicting policy recommendations. The results of this study could help explain the different conclusions reached in previous studies about trade balance and FDI. Older studies and most studies that use OECD countries generally use OER GDP. Newer research uses PPP GDP. Universal calculations of PPP GDP have only recently become available. The

disagreement in the literature could stem from the data, particularly for those scholars that focus on developing nations because their PPP values are often multiples of their OER values. The opposite is true for developed countries that in tend to have higher OER than PPP values.

The findings of the regression analysis support claims in recent academic literature and the media that global trade is increasingly becoming dependent on MNCs and their investment practices. Just to examine how powerful that trend is we can look at the increase in US exports in the period from 2000 to 2006. The following data came from a study done by the US Department of Commerce.

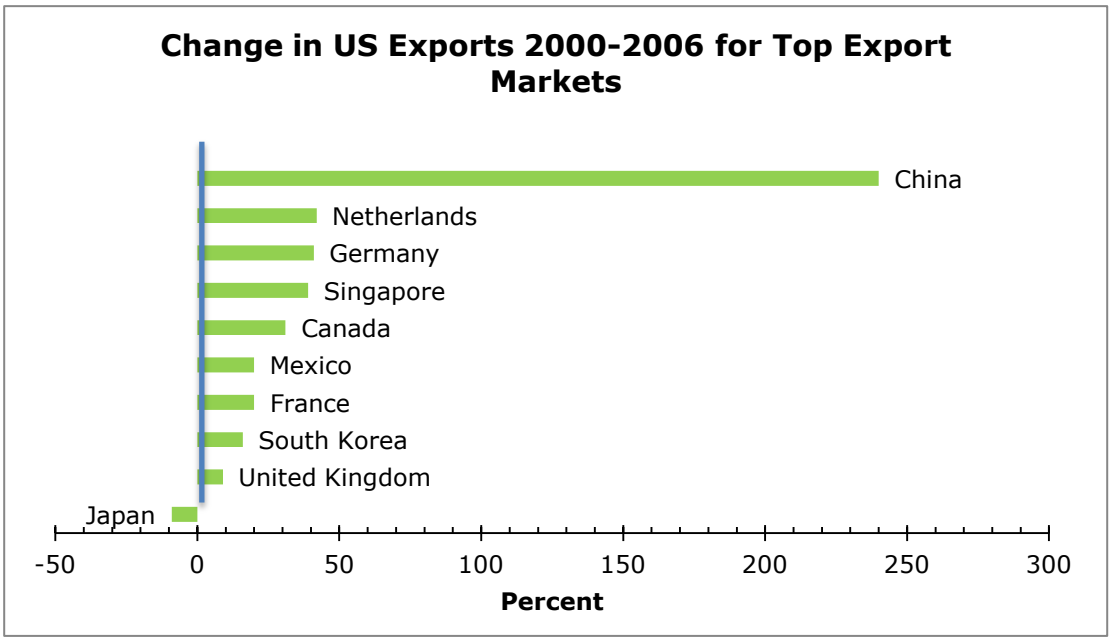

Figure 2.1: US Change in US Exports 2000–2006 for Top Export Markets

China holds the number one spot with 240% growth, second is The Netherlands, then Germany, Singapore, Canada, Mexico, France, South Korea, The United Kingdom

and Japan. China's economic boom is well noted and it is expected to see an increase in exports there, as it is the number one emerging market globally (Bergsten et al., 2007; Buckley et al., 2006; Drezner, 2006; Midler, 2009; Zakaria, 2008). However, increases of 42% in the Netherlands, 41% to Germany are a little less intuitive. The Netherlands is a well-developed European nation with only 16 million people. Why are 16 million people the number two market for exports for the world's leading economy, the US? One possible explanation could be connected to MNCs. The Netherlands is the home nation to 10 of the world's largest MNCs, among them Royal Dutch Shell and Unilever. Their recent market development expansion in China is associated with large industrial purchases for oil and energy operations, leading to a massive impact on US exports (www.iedconline.org). Germany is the home nation of 18 of the world's top 200 MNCs, among them BASF, Bayer, BMW and Deutsche Bank. These companies have also made the news lately for their increased investment and sales in the economies of the rapidly developing East Asia region (UNCTAD.org). These observations are congruent with the regression analysis of this study.

As MNC sales increase globally, their financial holdings closely influence their home nations' GDP. Taxes paid on overall earnings are filed in home nations (Ulbrich, 2003). This increases the financial power of home nations. Also, large financial transactions go through headquarters incorporated in home nations. When Royal Dutch Shell makes billion dollar purchases in industrial equipment, the letters of credit and payments are recorded as Dutch import purchases. This purchase has a direct effect on the size of Dutch imports, which influences GDP. Williamson (1978) and Wimberly

(1992) assert that in general GDP is most closely influenced by imports and exports and that exports in the form of surplus lead to economic growth. But the findings of this study show that on a yearly basis that is not exactly true. It is imports, measured here as deficit, that contribute the most to the rise of GDP as an immediate result of international trade.

2.9 Conclusion

The findings suggest that MNCs significantly influence the official exchange rate GDP and purchasing power parity GDP of their home nations. The results of PPP GDP as the dependent variable show support for the ideas of the changing power balance in the global market in favor of the developing world with the BRICS — China, Russia, India, Brazil and South Africa leading the trend. The data show that between 2005 and 2009 developing nations performed better and in particular, those developing nations that had top ranked MNCs incorporated within their borders, had significantly higher GDP growth rates than their developed counterparts.

It is important to note that as any research, this study has its limitations and raises further questions. The statistical samples used come from public data sets that all have disclaimers warning of possible inaccuracies. Economic indicator data are difficult to gather and analyze, which could explain why so much past research has used data that is more than 20 years old. Recent economic data are harder to come by, mainly due to the fact that indicators take time to gather and analyze. However, things are changing rapidly and more and more databases have made strides toward offering the latest economic data for analysis. Research should continue to be conducted on the effects of

unemployment, per capita median income and MNC global investment and developing operations to examine whether the long term effects of these variables and their cycle changes will have more of an effect on the long term growth of GDP, and whether that would be a positive side of globalization.

CHAPTER THREE

COMPETING FOR INNOVATION: THE ECONOMICS OF KNOWLEDGE ACQUISITION

3.1 Introduction

This essay examines how the home nations of the world's largest multinational corporations (MNCs) benefit from the global investment strategies of those MNCs. The research question is: What effect does the global market power of MNCs have on their corporate home nations' gross domestic product (GDP)? This essay explores the proposition that the relationship between MNC presence and the level of GDP arises (at least in part) from FDI strategies that (consistent with New Growth Theory) lead to home-country knowledge acquisition.

The study analyzes a group of 60 nations stratified by MNC incorporation to explore the effects of being a home to top-ranked MNC. A cross-sectional analysis of 2008 economic indicators establishes the connection between the ability of MNCs to acquire exogenous knowledge and their home nations' GDP growth. A cross-sectional time series analysis from 1999 to 2009 further examines the relationship.

To measure levels of influence of MNCs, the model employed here includes the number of top ranked MNCs incorporated in a country based on global market presence and capitalization. It also includes the number of foreign MNC affiliates in a country and FDI inflows and outflows under the assumption that FDI is a vehicle for the transfer

of knowledge (Acemoglu et al., 2006; Lall, 2004; Loewendahl, 2001; Campos and Kinoshita, 2002; Ruane, 2006).

The 2008–2009 INSEAD Global Innovation Index is used to examine innovation's effect on economic growth. Other variables are measures of gross national income per capita, population size, exports, imports, corporate marginal tax rates, unemployment rate, and FDI inflows and outflows. The combined relationship of these control variables is weighed against each nation's purchasing power parity GDP (PPP GDP) as a proxy for economic growth.

The findings show that nations with economies driven by large global firms benefit from the successful global knowledge sourcing strategies of their enterprises. An important way of achieving that goal is through purchasing foreign MNCs. The results also show the importance of trade blocs, trade balance, and corporate marginal tax rates. The study provides supporting evidence for the proposition that free trade policies based on global market expansion help increase national innovation and economic growth.

3.2 Multinational Corporations In The New Economy

A multinational corporation can be viewed as a network of activities located in different countries. The value of this network derives from the ability to reduce market uncertainty through the coordination of subsidiaries that are geographically dispersed (Kogut & Kulatilaka, 1994). Today, foreign multinationals not only sell in local markets but also control local firms. For example, General Motors (GM) owns 50.9% of GM Daewoo in Korea, Daimler owns 85% of Mitsubishi Fuso in Japan, and Renault owns

70.1% of Renault Samsung in Korea. Renault also owns 44.4% of Nissan in Japan and Renault's CEO serves as Nissan's CEO (Ishikawa, Sugita & Zhao, 2008). Such corporate control leads to capturing supernormal profits as firms can simultaneously export to a market and export from it. General Motors (GM) that the 100 % shareholder of Opel in Germany and Saab in Sweden, a partial shareholder of Daewoo in Korea and Suzuki in Japan, and has a joint venture in China. But GM also exports automobiles directly those countries (Ishikawa, Sugita & Zhao, 2008).

The growing ease with which firms operate internationally is a result of trade liberalization policies (Dunning, 1998; Gorg & Greenaway, 2004). Market liberalization has lowered spatial costs, while the importance of knowledge-specific value added activity has encouraged international production to be undertaken within plants and firms under the same ownership. Policies of reducing impediments to trade, as well as the technological advances in communication, information processing, and transportation, are the main factors that have helped global enterprise to internalize production flows.

The importance of knowledge-specific intangible assets as components of total firm valuation has grown. For example, in the 1990s the market value of MNCs has been calculated at between 2.5 and 5 times the value of their tangible assets, compared to 1.5 times in 1982. By the late 1990s between one half and three fifths of capital and knowledge flows were internalized within MNCs (Dunning, 1998). Stewart (1997) estimates that the knowledge component of manufacturing goods has risen to 70% of total value in 1995 from 20% in 1950. Because the level of development and growth in

industrial sectors is different across nations, regional concentration of MNC activity by type has been observed (Markusen, 1996). Knowledge-intensive sectors often have unique location needs. The growing propensity for firms to engage in cross-border alliances has implications for the process through which knowledge and intangible assets are transferred across borders and for the location of value-added activities. These factors have led firms to own particular type of value-added activity within certain strategic geographic locations, with emerging markets growing in strategic importance (Dunning, 1996). As operational location in production has become both dispersed globally and concentrated by sector and region, spatial management has become an important aspect of management policy (Dunning, 1998; Global Manufacturing Competitiveness Index, 2012).

3.3 Technology, Knowledge-Sourcing, and FDI

Technology sourcing is a common practice that is characterized by three channels. The imitation channel, also referred to as the competition channel, emphasizes that the entrance of foreign firms intensifies competition in the domestic market, encouraging domestic firms to become more efficient by upgrading their technology base. The linkage channel stresses that foreign firms may transfer new technology to domestic firms through transactions with these firms. Finally, the training channel arises if the introduction of new technologies, or entry of foreign firms, encourages an upgrading of human capital (Lensink, 2006: 479).

These findings on technology sourcing relate to the work of Hijzen, Gorg and Manchin (2008) on mergers and acquisitions (M&As). They argue that cross-border

M&As are a way of accumulating factors of production, including technological know-how. Of particular importance in their study is the fact that they make a distinction between horizontal and vertical mergers. Horizontal M&As are defined as mergers between firms within the same industry. Non-horizontal M&As are defined as mergers between firms in different industries.

Cross-border M&As are typically considered to be a subset of FDI. However, the UNCTAD's World Investment Report series emphasize that there are differences between cross-border M&A and FDI. Traditionally, FDI activity has been explained by the "tariff-jumping" argument, positing that exporting and investing abroad are alternative modes for entering foreign markets, when direct exporting and trading costs increase. In that context, FDI refers to transactions between parent and affiliate companies. Cross-border M&As, however, also include investments that are financed via both domestic and international capital markets. It is not always possible to trace the country from which these funds originate. Moreover, FDI refers to net investments whereas M&As refer to gross transactions in the form of acquisitions and divestments (Hijzen, Gorg & Manchin, 2008).

The amount of international M&As has risen relative to domestic M&As. In the 1990s, the number of cross-border deals increased by 146% while the number of domestic deals increased by 116%. In terms of the value per merger, the importance of cross-border merger activity has increased relative to domestic M&A as well. In particular, the average value of cross-border deals has increased by 18% compared to 12% for domestic deals (Hijzen, Gorg & Manchin, 2008).

Location choice has also changed. Where historically most M&As have occurred in the developed world, today increasing amount of M&As involve MNCs from the developing world. In 2008 there were 73 M&A deals worth over $3.0 billion finalized globally (UNCTAD World Investment Report, 2009). Twenty of them involved an MNC from developing countries, including the Czech Republic, United Arab Emirates, Russia, South Africa, and Egypt. The growing number of large firms from the developing world has been impressive. From 1996 to 2008, the number of developing country companies in the Fortune Global 500 increased 525%.[25] Such growth is the result of the explosion of international production networks and the increasing flows of FDI into the developing world.

3.4 Endogenous Growth Theory and Monopolistic Competition

Endogenous growth theory focuses on the role of knowledge in the "productivity" residual (Hayes & Clark, 1985). It extends the traditional neo-classical production function by making the assumption that certain types of knowledge are endogenous components of production. Endogenous growth theory also makes the distinctive assumption that at least one knowledge input into the function does not have diminishing returns to production (Atkinson, 2004; Lin, 2011). The two production functions are illustrated below:

Neo-Classical Production Function: $\boldsymbol{Y(t) = A(t)*f(K,L)}$ where *Y*, is a measure of wealth, A is a measure of knowledge

[25] US Council on Competitiveness (2008). Compete 2.0 report series, compete.org

Endogenous Growth Production Function: $\boldsymbol{Y(t) = A(t)*f(K,L,h_1,h_2 \ldots h_n)}$ where *h* denote knowledge specific externalities within firms

Both the exogenous and the endogenous theories assume that there will always be certain types of exogenous codified knowledge in the economy that must be assumed as given. However, endogenous growth theory assumes that in any firm there is firm-specific and human-capital specific knowledge that is unique to that firm or those individuals holding the knowledge (Romer, 2007). Given that firm-specific knowledge inputs are endogenous, there will be knowledge spillovers among firms and human capital inputs. It is the potential for knowledge spillovers that creates an environment where marginal costs are decreasing and there are no diminishing returns to scale. Endogenous growth theory also assumes constant marginal product of capital at the aggregate level, or at least that the limit of the marginal product of capital does not tend towards zero (Romer, 1990). This does not imply that larger firms will be more productive than smaller ones, because at the firm level the marginal product of capital is still diminishing.

It is possible to construct endogenous growth models with perfect competition. However, in many endogenous growth models the assumption of perfect competition is relaxed and some degree of monopoly power is thought to exist. Generally monopoly power in these models comes from the holding of patents. Patents encourage R&D by allowing their inventors to earn market rents to help recover the costs associated with R&D. Government subsidies for R&D are intended to promote projects with high returns to society but private returns that are too low to be attractive to private investors

(Kleer, 2010). Private investors are not attracted to projects with low appropriability rate. A low appropriability rate means that innovators are not able to appropriate the entire consumer surplus associated with the good they create (Jones, 2000). Basic research is specifically affected by this problem (Kleer, 2010).

Local R&D capabilities are dependent on local absorptive capacity for foreign knowledge. MNCs play a pivotal role in shaping local R&D absorptive capacity through the transmission of technology across countries. In home and host nations, MNCs import technology produced elsewhere within their respective global branch networks. They also develop new technologies locally. Governments are sensitive to this process and generally attach greater importance to technology generation over technology transmission, in the hope that R&D activities undertaken within their respective national boundaries will create important positive externalities for local scientific and technological development. This expectation has resulted in a strong competition among countries to attract R&D-intensive FDI (Acemoglu et al., 2006; Athukorala & Kohpaiboon, 2010).

In addition to rents extracted through patents, monopolistic market structures are defined by increasing product differentiation. Because of the creative destruction nature of innovative production, in the new economy an ever-increasing variety of goods is being brought into the market, while firms enter and exit it with a relative ease (Feenstra & Kee, 2008). In a monopolistic market, products are characterized by a high degree of differentiation and could be viewed as substitutes, but not as perfect substitutes (Dixit & Stiglitz, 1977). The Dixit-Stiglitz model focuses on commodities in a group that are

good substitutes for each other within a sector or an industry, but poor substitutes for other commodities in the economy. The analysis examines inter- and intra-sector elasticities of substitution and finds that with complementary commodities, there is an incentive for a firm to produce all the commodities within a sector. The relationship is illustrated with two goods but the implication is that it would hold with more than two goods.

The Dixit-Stiglitz (1977) conclusions can be applied to describe the multi-brand management practices of MNCs. The product differences among the multiple product lines and brands that MNCs own, or at least the way they are perceived by customers, are an important competitiveness attribute, as firms use a great deal of non-price competition.[26] Such competition is based on product differentiation. Firms need to successfully convince buyers that the differentiation they offer will lead to greater levels of utility. They try to do it via advertising, usually incurring significant transaction costs, in order to build brand loyalty. Brand loyalty lowers elasticity and ensures a certain amount of influence over the market. Firms with loyal customers can raise their prices without losing sales. Dixit and Stiglitz (1977) demonstrate the importance of estimating cross-elasticities of demand utility in relation to production and observe the emergence of incentives for subsidization in sectors that are defined by economies of scale.

[26] The following discussion follows received theory in microeconomics that can be found in popular textbooks such as Perloff (2008).

For consumers, there are unique information-gathering and information-processing costs associated with selecting a brand in a monopolistically competitive environment. In a monopoly industry, the consumer is faced with a single brand, so information gathering is relatively inexpensive. In a perfectly competitive industry, the consumer is faced with many brands. However, because the brands are assumed to be virtually identical, information gathering is still relatively inexpensive. Faced with a monopolistically competitive industry, in other words, to select the best out of many brands, the consumer must collect and process information on a large number of different brands (Perloff, 2008). In many cases, the cost of gathering the necessary information can exceed the benefit of consuming the advertised brand, as compared to a randomly selected brand. Consumers use information obtained from advertising not only to assess the single brand advertised, but also to infer the possible existence of brands of which they are not well aware. Advertising also helps customers gauge consumer satisfaction with brands similar to the advertised brand. This means that an individual firm's demand curve is downward sloping, in contrast to perfect competition, which has a perfectly elastic, i.e. flat, demand curve at the individual firm level. This fact means that firms charge a price that exceeds marginal costs, so production is less than socially optimum. However, under globalization identifying marginal cost, *i.e.*, the cost of producing one additional unit is challenging.

Where creative destruction occurs in fluid team environments, firms have no clear way of identifying marginal product of labor per worker, particularly in knowledge-intensive and service sectors (Vogel, 2006). When teams share

responsibility for output, employers often have no clear and systematic way of assigning responsibility. Although some may try, the transaction cost of identifying the marginal product of labor of a portfolio manager, for example, would make the process prohibitively expensive. Transaction costs can also explain why market structures evolve from competitive to monopolistically competitive. It is because the transaction costs of regulation for such industrial structures exceed the benefits (Perloff, 2008). Governments would have to regulate all firms that sell heterogeneous products worldwide in a uniform manner. That is an impossible task in a global market because it would require not only enormous economic resources, but also a policy of decreasing individual national sovereignty. For these reasons, governments at large embrace policies that allow for a certain degree of monopoly power. Such policies, combined with the institutional characteristics of individual nations and their different comparative advantages, have contributed to a world that, like its products, is highly differentiated. Certain nations are global leaders in manufacturing and labor-intensive sectors. Others are leaders in capital-intensive sectors. Some of both groups are leaders when it comes to innovation.

The race to innovate and improve processes has given rise to attempts to quantify and measure innovation itself. There are several innovation indexes put forth by various universities, publications, and governmental and non-governmental organization. The Economist magazine, the Netherland's Groningen University, and INSEAD lead in developing comprehensive innovation indexes. This study contributes to that quest by testing an existing country innovation indexes. INSEAD's index fits best because of its

inclusivity. It ranks 130 nations, including underdeveloped African and Caribbean nations that are part of this study's country sample. The index assigns scores based on five input pillars and three output pillars. The input pillars are institutions and policies, human capacity, infrastructure, technological sophistication, business markets, and capital. The output pillars are knowledge, competitiveness and wealth. The pillars are comprised of factors that can be rated and ranked.[27]

This study uses the index in combination with economic indicators to examine how innovation influences investment and growth in the new economy.

3.5 Data and Methods

This research employs both a cross-sectional analysis and a cross-sectional time-series analysis to examine the influence of knowledge on GDP. The cross-section is for 2008 and the cross-sectional time-series is for 1999 to 2009, inclusively. The years are chosen to capture the most recent economic trends. Several major changes occurred in the first decade of this century. The indicators for 2008 and 2009 reflect the effects of the current global financial crises and the beginning effects of the recession that followed it. The data from 2003 to 2007 capture a period of global economic growth. 2001 and 2002 capture the mini recession that followed 9/11, and 1999 and 2000 capture the crest of economic growth of the 1990s –the decade that arguably ushered the United States into the new economy (Atkinson, 2004).

[27] http://www.globalinnovationindex.org/gii/main/home.cfm

A stratified random sample of 60 countries includes 30 nations that are home bases to at least one MNC present on the list of top 250 ranked MNCs given by the United Nations Conference on Trade and Development (UNCTAD), and 30 that are not. UNCTAD separates MNCs into three categories – (1) Top 100 ranked non-financial MNCs from the whole world, (2) Top 100 ranked non-financial MNCs from the developing world only, and (3) top 50 ranked financial MNCs from the whole world. Appendixes 3 and 4 include the list of countries and a few of the independent variables.

MNCs are ranked based on a transnationality index (TNI), which is calculated as a ratio of foreign assets to total assets, foreign sales to total sales, and foreign employment to total employment. Because total assets are used in the calculations, overall size defines the ranking. The result is that the most internationalized MNCs are also the world's largest, although some minor variability is noted.

The dependent variable is GDP measured at purchasing power parity (PPP GDP). PPP values estimate the worth of all final goods and services produced within a nation in a given year and assign them numbers that would approximate their value in current US dollars, adjusted for inflation. Most economists prefer this measure when looking at per-capita welfare and when comparing living conditions or use of resources across countries (Cheung, Lai & Bergman, 2004; Perron & Vogelsang, 1992; Rogoff, 1996). However, PPP GDP it is difficult to compute, as a US dollar value has to be assigned to all goods and services in the country regardless of whether these goods and services are traded internationally, or have an approximate US equivalent. It is hard to

estimate in American currency the value of an ox cart in India and the utility level its owner derives from the economic activity it provides.[28]

Purchasing power is defined by discretionary spending. Its growth in the developing world, in particular, has been impressive. For example, in India discretionary spending accounts for 52% of average household consumption; this is up from 39 % in the 1990s and is predicted to reach 70% by 2025 by McKinsey & Company. Entrepreneurs from garbage pickers to tailors to people who have taught themselves to fix appliances are those whose discretionary spending brackets are growing the fastest (Kaplan, 2010). PPP GDP values reflect the magnitude of such economic activity. They come from the CIA's database "Country Statistics" in its publication The World Fact Book.[29]

The main independent variables are:

(1) $\mathrm{NF}_{\mathrm{MNC}}$ − Number of top 200 ranked non-financial MNCs

(2) $\mathrm{F}_{\mathrm{MNC}}$ − Number of top 50 ranked financial MNCs.

The hypothesis is that the number of relatively well-internationalized financial and non-financial MNCs incorporated in a nation positively contributes to its GDP growth. Such a nation's economy would be relatively more internationalized as a result of its firms' global market share. The higher GDP growth is associated with the return on investment of MNCs' foreign assets.

The other independent variables are:

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[28] The definition and discussion points come from the CIA's World Fact Book online database

[29] https://www.cia.gov/library/publications/the-world-factbook/geos/af.html

(3) INSEAD – The INSEAD innovation index is a composite score of economic and institutional factors that ranks nations on a percent scale

(4) $FDI_{INFLOWS}$ – FDI inflows measure how much foreign capital a nation receives in a calendar year

(5) $FDI_{OUTFLOWS}$ – FDI outflows measure how much a nation invests outside its borders in a calendar year[30]

(6) T_{MNC} – Total number of MNCs per country shows how many firms in a country are significantly internationalized in their global operations

(7) P_{MNC} – MNC Purchases indicates the number of foreign MNCs a nation acquires in a year

(8) S_{MNC} – MNC Sales indicates the number of domestic firms that were acquired by foreign investors in a year

(9) TB – Trade Balance (Exports – Imports) is an indicator of the amount of trade for a nation and shows whether a nation has a trade surplus or a deficit[31]

(10) T_{RATE} – Highest marginal tax rate (HMTR) is included as a proxy for attracting FDI under the assumption that lower corporate taxes would indicate an attractive business environment. Its variability over time is of particular interest as policies of regional integration have been associated with tax harmonization.

(11) GNI – GNI per capita is an indicator of the average earning power of the population and therefore its purchasing power[32]

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[30] FDI inflows and outflows are measured in billions of current US dollars, *i.e.* not adjusted for inflation

[31] Measured in current US dollars

(12) UNEMP – Unemployment rate shows percent of the labor force that is not involved in the production of a nation's GDP

(13) POP – Population size is included to examine whether relatively large populations would be associated with relatively large GDPs[33]

(14) $GDP_{PPP_{it-1}}$ – a lagged dependent variable is added in the time series regression to control for time effect issues

(15) T_{BLOC} – Trade bloc is an ordinal variable, created for this study, which ranks regional common markets based on degree of global market integration. The values are calculated by combining three measures of trade bloc integration from the United Nations Statistics Division National Accounts Database.[34] They are degree of internal market liberalization, degree of internal political cooperation, and number of preferential trade agreements with other trade blocs. The database offers six main measures of market liberalization, two of political cooperation, and a discrete number for the amount of external preferential trade agreements. The market liberalization categories are: (1) a free trade area, (2) a customs union, (3) a single market, (4) a currency union, (5) visa-free travel, and (6) absence of physical borders. The political categories are: (1) a political union and (2) a defense pact.

The approach used in this study is to combine the scores for market liberalization and political cooperation with the number of external preferential trade agreements to create an ordinal scale. Thirty-three out of the 60 countries in the sample fall into 9 trade blocs that meet the criteria of market and political union. They are the North

[32] Measured in thousands of current US dollars

[33] Recorded in thousands of people

[34] http://unstats.un.org/unsd/snaama/selbasicFast.asp

American Free Trade Agreement (NAFTA) coded as 9; the European Union (EU), coded as 8; Mercado Comun del Sur (MERCOSUR) coded as 7; European Free Trade Association (EFTA) coded as 6; Association of Southeast Asian Nations (ASEAN) coded as 5; Common Market for Eastern and Southern Africa (COMESA) coded as 4; Southern African Development Community (SADC) coded as 3; East African Community (EAC) coded as 2; and the Organization of Eastern Caribbean States (OECS) coded as 1. Countries such as Russia and China in the sample that do not belong to any of the trade blocs that meet the criteria receive a code of 0.

Several sources are used to compile the data. Statistics on MNCs and their affiliates come from UNCTAD data base "Largest Transnational Corporations".[35] Data on HMRT, GNI per capita, and unemployment are drawn from the World Bank database World Development Indicators (WDI).36 The data for PPP GDP, imports, exports, and population size come from the CIA database "Country Statistics" in its publication "The World Fact Book".[37] The data on FDI inflows and outflows come from the UNCTAD data set "Country Fact Sheets".[38]

Two regression analyses are presented – a cross sectional ordinary least square (OLS) regression for 2008 and a cross sectional time series panel corrected regression for 1999 – 2009. The two models are as follows:

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[35] http://www.unctad.org/Templates/Page.asp?intItemID=2443&lang=1

[36] http://data.worldbank.org/data-catalog/world-development-indicators

[37] https://www.cia.gov/library/publications/the-world-factbook/geos/af.html

[38] http://www.unctad.org/Templates/Page.asp?intItemID=2441&lang=1

Model 1: $\mathbf{GDP_{ppp_{it}} = \beta_1 INSEAD + \beta_2 FDI_{OUTFLOWS} + \beta_3 NF_{MNC} + \beta_4 F_{MNC} + \beta_5 T_{MNC} + \beta_6 S_{MNC} + \beta_7 TB + \beta_8 UNEMP + \beta_9 GNI + \beta_{10} POP + \beta_{11} T_{BLOC} + \beta_{12} INSEAD * FDI_{OUTFLOWS} + e_{it}}$

Model 2: $\mathbf{GDP_{ppp_{it-1}} = \beta_1 FDI_{INFLOWS} + \beta_2 FDI_{OUTFLOWS} + \beta_3 T_{RATE} + \beta_4 NF_{MNC} + \beta_5 F_{MNC} + \beta_6 P_{MNC} + \beta_7 TB + \beta_8 UNEMP + \beta_9 GNI + \beta_{10} POP + \beta_{11} T_{BLOC} + \beta_{12} NF_{MNC} * P_{MNC} + \beta_{13} T_{BLOC} * GNI + \beta_{14} GDP_{ppp_{it-1}} + e_{it}}$

Where subscript "**it**" stands for individual observation at one time period.

Data are analyzed using STATA statistical software. Variance Inflation Factor (VIF) analysis is performed to test for multicollinearity. The results indicate that multicollinearity is an issue with exports and imports, therefore their difference is included as trade balance.

3.6 Findings and Analysis

A cross sectional approach allows for the inclusion of the variable "Total MNCs" – recording the number of all firms from a nation that meet the MNC criteria. Data for total MNCs by year is not available for the 1999–2009 cross-sectional time series. Its inclusion in a cross-section model provides important insight and offers ideas for future research.

The findings suggest that total MNCs positively and significantly affect PPP GDP. A negative significant relationship is observed between financial MNCs and PPP

GDP, suggesting that the home nations of the largest financial MNCs had relatively lower PPP GDPs that year. The result may reflect the global financial crisis.

A cross-section Ordinary-Least Square (OLS) regression analysis for 2008 is presented in Table 3.1.

Table 3.1 OLS Regression, 2008 on PPP GDP

Variables	Coefficient	Standard Error	Significance
INSEAD – INSEAD Index	142808.17	253776.40	NS
$\mathbf{FDI_{OUTFLOWS}}$ –FDI Outflows	10.19	5.38	^
$\mathbf{NF_{MNC}}$ – Number of Non-financial MNC	-30994.01	33587.79	NS
$\mathbf{F_{MNC}}$ – Number of Financial MNCs	-342118.60	144101.10	*
$\mathbf{T_{MNC}}$ – Total MNCs	178.05	72.28	*
$\mathbf{S_{MNC}}$ – MNC Sales	1979.14	1466.35	NS
TB – Trade Balance (Exports-Imports)	-0.81	1.41	NS
UNEMP – Unemployment	-5876.46	10969.53	NS
GNI – GNI Per Capita	-0.93	10.24	NS
POP – Population	3.84	0.55	***
$\mathbf{T_{BLOC}}$ – Trade Bloc	16617.11	31393.45	NS
$\mathbf{INSEAD} * \mathbf{FDI_{OUTFLOWS}}$ – (INSEAD)×(FDI Outflows)	16.34	4.37	***
Constant	-667291.90	-0.88	NS
Prob. > F	<.0001		
R-squared	0.91		
Observations	60.00		

Dependent Variable: GDP PPP - estimates the market value of all final goods and services produced within a nation in a given year, whether they are traded internationally or not. GDP PPP is not tied to a nation's currency value and is especially useful in cases of nations that do not allow their currencies to float. Level of significance on a two-tailed test denoted by the following symbols: NS – not significant, ^p<0.10, *p<0.05, **p<0.01, ***p<0.001.

A variance inflation factor test shows colliniarity between FDI inflows and outflows, suggesting that in 2008 one was a good predictor for the other. MNC sales

and purchases are also collinear. Therefore, FDI inflows and MNC purchases are left out of the model. This approach allows for including measures that denote investment coming into a nation in the form of MNC sales, as well as investment going out of a nation in the form of FDI outflows.

FDI outflows are significant at the 0.10 level, while MNC sales are not. Also significant are population and the interaction term of the INSEAD innovation index and FDI outflows. The relationship between population size and GDP is positive, suggesting that countries with large populations have larger GDPs. The interaction effect between the innovation index and FDI outflows suggests that the rate of positive change in GDP attributed to a country's innovation ranking is accelerated by the amount of its FDI outflows. This result is consistent with the knowledge-sourcing arguments of regional economic development scholars who posit that FDI is used as a way to acquire foreign technology and know-how (Atkinson, 2004; Cortright, 2001; Gorg & Greenway, 2004; Lensink, 2006). The interaction effect between FDI outflows and the INSEAD innovation index suggests that when both variables are included in a model the effect of one is hard to observe in the absence of the other. It would be useful to examine how that relationship effects GDP overtime, but unfortunately INSEAD does not provide innovation figures for years prior to 2007. The index was developed in 2007 and offers values for 2007–2008 combined and 2009–2010 combined. The data limitations make it unsuitable for inclusion in a time series analysis at this point. In the cross-sectional model for 2008 the index does not show statistical significance as a constituent term. However, the strong statistical significance of its interaction term with FDI outflows

suggests that investing in foreign nations accelerates the rate at which a country is able to stimulate its own innovative environment. INSEAD rates a country's innovative environment based on its institutions and policies. Therefore, there is a policy component related to the innovative capabilities of nations. That component is also suggested by the results in the cross-sectional time-series analysis of the positive relationship between GDP and relatively high marginal corporate tax rates.

Table 3.2 shows the results for the eleven-year cross-sectional time series.

Table 3.2 Cross Sectional Time Series Regression Analysis, 1999 – 2009, PPP GDP

Variables	Coefficient	Standard Error	Significance
$\mathbf{FDI_{INFLOWS}}$ − FDI Inflows	1.34	2.26	NS
$\mathbf{FDI_{OUTFLOWS}}$ − FDI Outflows	2.47	3.63	NS
$\mathbf{T_{RATE}}$ − Highest Marginal Tax Rate	5141.14	2585.67	*
$\mathbf{NF_{MNC}}$ − Number Non-financial MNC	22954.56	19761.92	NS
$\mathbf{F_{MNC}}$ − Number Financial MNCs	138028.20	59493.68	*
$\mathbf{P_{MNC}}$ − MNC Purchases	-1965.31	922.67	*
TB − Trade Balance (Exports-Imports)	-2.22	0.99	*
UNEMP − Unemployment	-1337.24	678.16	*
GNI − GNI Per Capita	9.79	5.89	^
POP − Population	2.49	0.79	**
$\mathbf{T_{BLOC}}$ − Trade Bloc	11494.75	8182.72	NS
$\mathbf{NF_{MNC} * P_{MNC}}$ − (Number of Non-financial MNC) ×(MNC Purchases)	139.65	54.69	**
$\mathbf{T_{BLOC} * GNI}$ − (Trade Bloc)×(GNI Per Capital)	-1.18	0.71	^
$\mathbf{GDP_{ppp_{it-1}}}$ − Lagged DV	0.46	0.04	***
Constant	-157011.20	66494.90	**
Prob. > F <.0001			
R-squared 0.81			
Observations 660.00			

Dependent Variable: GDP PPP - estimates the market value of all final goods and services produced within a nation in a given year, whether they are traded internationally or not. GDP PPP is not tied to a nation's currency value and is especially useful in cases of nations that do not allow their currency to float. Level of significance on a two-tailed test denoted by the following symbols: NS – not significant, ^p<0.10, *p<0.05, **p<0.01, ***p<0.001.

In this model, FDI inflows and outflows are not collinear and are both included. MNC sales and purchases are collinear and only MNC purchases are included in order to investigate a knowledge sourcing relationship across time.

From 1999 to 2009, FDI inflows and outflows do not show a relationship to GDP if one controls for MNC incorporation, MNC purchases, corporate tax rates, trade balance, population, and unemployment. Higher marginal tax rates are positively related to GDP. This result might suggest a connection between higher taxes and their use for the creation of public goods that lead to positive institution building. Institutions are part of the INSEAD innovation index input pillars. The rest of the input pillars are policies, human capacity, infrastructure, technological sophistication, and business markets and capital. The rationale is that their combined effects result in three output pillars — knowledge, competitiveness, and wealth, which define the innovative capabilities of nations (Dutta, 2008, 2010). The quality of institutions, policies, human capacities, and infrastructure are based on outcomes associated with the government provision of public goods and the positive externalities created by those public goods (Chubb, 1985; Shah, 1999; Weingast, 1995). Further research can explore how higher corporate tax rates in combination with a more complete set of public revenue sources influences both the amount and quality of public goods in different countries.

A statistically significant positive relationship exists between the number of 50 top-ranked financial MNCs incorporated in a nation and GDP, suggesting that over time the home nations of the most internationalized financial institutions benefit from their global investments. The level of internationalization of a national financial system can

lead to long-term economic gain, but can have short-term risk associated with it. In the cross-sectional analysis for 2008 the relationship between financial MNCs and GDP is statistically significant and negative, suggesting that the global financial crisis impacted the home nations of the leading financial MNCs more powerfully than other nations. Further research can examine their subsequent recovery.

The number of top-ranked non-financial MNCs does not contribute to GDP annual growth. However, there is an interaction effect between the number of top-ranked non-financial MNCs and MNC purchases. The relationship is positive and significant, suggesting that for the home nations of the most internationalized non-financial firms, GDP growth rates are accelerated by the additional purchases of foreign MNCs. For countries that are not corporate homes to the world's leading non-financial MNCs, additional MNC purchases lead to a decline in GDP over time.

The implication of this result is that the nationality of MNCs matters. The more top-ranked MNCs are incorporated in a country, the higher its GDP annual growth with respect to the acquisitions of foreign firms.

These results also shed light on the question of which countries best utilize the imitation channel of investing. The costs of exogenous knowledge acquisition are better borne by countries that are corporate homes to the world's largest firms. From 1999 to 2009, those nations have been able to increase their GDPs through increasing their acquisitions of foreign entities.

The panel data analysis also shows a strong negative relationship between trade surplus and GDP. Trade surplus is expressed here as the difference between exports and

imports, or net exports. The result suggests that, from 1999 to 2009, GDP in most countries grew as a result of increasing trade deficits. This finding is consistent with the concept of a "dark matter" developed by Hausemann and Sturzenegger (2005, 2006, 2007). Dark matter is the high rate of return in investment from overseas, in relation to domestic investment. Hausemann and Sturzenegger argue that for the United States, and few other developed countries that have high total factor productivity, the average rate of return on foreign investment is strong enough to merit running a deficit. Overall repatriated profits, dividends, and flow of interest from foreign financial assets are high enough to service national debt payments and provide a surplus large enough to result in a positive current account balance. The results here provide support for such arguments and show that the relationship is observed not only in developed economies similar to the US, but also in developing nations. One can deduce that, from 1999 to 2009, many nations were able to maintain positive current accounts while running trade deficits. Those nations that had larger trade deficits also observed higher rates of GDP growth. Hausemann and Sturzenegger argue that the global financial market has reached a new equilibrium where investors have changed how they view liabilities (Hausemann & Sturzenegger, 2006). As barriers to trade and investing become lower in a global market, net investor nations are motivated to integrate and improve trade relationships with their borrowers in order to better manage and protect their foreign assets.

Gross national income per capita is positively related to GDP annual growth. The relationship is significant at the 0.10 level. As GNIs per capita grow, so does GDP, suggesting that increasing per capita purchasing power in a country leads to an increase

in national economic growth. As per capita income increases, so does consumer spending, which leads to increasing demand on national production, which leads to an increase in economic output and GDP growth (Greenwald & Stiglitz, 1987). The finding is consistent with the demand-driven philosophy of Keynesian economics that policies of stimulating domestic demand lead to economic growth (Fazzari, Piero & Greenberg, 1998; Ljungqvist & Uhlig, 2000).

An interaction effect exists between GNI per capital and trade bloc integration. The relationship is negative and also significant at the 0.10 level. It suggests that the rate of GDP growth with respect to change in GNI per capita is stronger for countries that are not part of trade blocs or belong to lower-coded trade blocs in this study. For progressively higher-coded trade blocs the magnitude of the relationship diminishes, suggesting a higher resilience of GDP to GNI per capita fluctuation for relatively richer and more integrated common markets. The trade blocs here are coded in ascending order, resulting in relatively less integrated blocs receiving lower numbers. Trade blocs 1, 2, 3, 4 and 5 are comprised of African and Caribbean nations that experienced relatively high GNI growth rates during the period. Higher trade bloc numbers are comprised of nations that are generally richer and where GNI growth has not been as strong. In addition, 33 nations in the study do not belong to any of the trade blocs and are coded with a "0". Few nations joined or formed trade blocs in the latter years of the time series. There could be a connection here because nations in the sample like India, China, and Russia are not part of regional trade blocs but that in the past decade have experienced high GDP and GNI per capita growth.

Some African and Latin American countries, as well as all Eastern European nations, joined a trade bloc toward the end of the time series. It is unclear if joining a trade bloc accelerated their GNI growth rates, as they were strong prior to receiving membership. Further analysis with different time series and country samples can study how market integration is related to GNI and GDP.

Unemployment significantly affects GDP annual growth in a negative way. Rising unemployment slows down GDP growth. This result must be viewed with caution because of the dubious quality of unemployment measures. For developing countries, many of which in this sample are characterized by large subsistence agriculture sectors, unemployment numbers do not include the rural poor who live mostly off the land. Unemployment numbers show individuals who are seeking work that are employable in wage earning occupations. Unemployment figures can rise in developing nations as more people leave subsistence agriculture for urban wage employment. Prior to the move, those workers were not considered a part of the wage earning labor force. Often, when they become wage earners, such workers drop in and out of the labor pool relatively frequently, as they pursue better jobs (Bosh & Maloney, 2008). Such variation can result in yearly aggregate unemployment figures that for some countries of this study show a steady increase overtime.

In the beginning years of the time series, different data sources had different unemployment values. The World Bank database World Development Indicators had many missing values for most African and Caribbean nations. The CIA database Country Profiles offered such values, but with a disclaimer that they are based on

imperfect reporting and estimating. As a result, for certain nations there is little variability in the unemployment values during the early part of the time series, as multiple imputation was employed to handle missing values. After 2004, the data show higher degree of variability. One can hypothesize that as information and data management technologies have improved and been diffused in recent years, better measures have become available. In the case of unemployment, it is unclear if the relationship observed here is affected by an actual change in unemployment levels or just reflects better unemployment estimates, particularly in the very underdeveloped African nations that are part of the sample. Further research can examine different ways of measuring unemployment to better understand its impact on GDP.

In general, most nations in the sample saw their unemployment levels drop and their GDPs grow over the time period. The trend is particularly strong for European nations, most Latin American nations and the ASEAN pact nations. The connection is that those nations all belong to a major trade bloc. There may be a link between trade bloc integration and lower unemployment. Further research is needed to investigate such a relationship and its magnitude.

There is a positive significant relationship between population size and GDP. More populated nations have relatively higher GDPs. The data reveal a general population growth trend in most countries during the time series. The study includes many of the world's most populous nations, among them Brazil, Russia, India, China and South Africa, commonly referred to as the BRICS. They have experienced particularly strong GDP growth from 1999 to 2009. Recent research has noted that the

general increase in welfare in developing countries has led to lower mortality rates, lower infant mortality rates, and longer life spans (Wolf, 2004; Zakaria, 2008). There can be a relationship attributed to improved general wellbeing leading to overall increase in total productivity, but since the study does not control for population growth that results from living longer while working, as opposed to population growth associated with lower infant mortality, or increasing life spans of the elderly, it would be reasonable to refrain from making such a conclusion. Further research can explore the relationship between unemployment, population growth, and GDP.

3.7 Conclusion and Discussion

The results of this study suggest that in the past decade FDI inflows were not a defining factor of GDP growth for most nations, including the US. But FDI outflows, including acquiring foreign MNCs, is associated with economic growth for the US and other countries that are corporate homes of the world's largest MNCs.

For most countries GDPs decline as a result of foreign MNC purchases. However, for the home nations of the top-ranked MNCs, a marginal increase in yearly acquisitions of majority ownership stakes in foreign firms accelerates GDP growth. This result suggests that the costs of knowledge sourcing are not born equally by all countries. Countries with more top MNCs efficiently bear the costs and their GDPs grow, while countries whose firms are not among the world's leaders do not, and their GDPs decline. This result suggests that both the nationality and the internationalization rank of MNCs are important for economic growth. The ranking of MNCs is a useful

tool for quantifying global market leadership and its effect on national economic prosperity.

This study also finds a connection between the nationality of MNCs and the degree of MNC internationalization that leads to the creation of dark matter. Firms that invest heavily abroad and become leaders in the global market experience relatively high profits from their internationalization strategies. The profits are reflected in their home nations' current account schedules in direct inflows of cash, when MNC profits are repatriated and classified as net income from abroad (NIFA) in national accounting (Hausemann & Sturzenegger, 2005).

The results presented here demonstrate how strong that relationship is globally. Hausemann and Sturzenegger formed their theory on data from the US, trying to provide an answer in the dispute of whether a large trade deficit poses risks for the US. In the model employed here, trade deficits show positive statistical significance. This leads to the conclusion that in today's global market, the growth in national GDP is more heavily affected by the return on its foreign investments than by its trade surplus.

Future research on the role FDI plays in the new economy is important. Further efforts are needed in developing good metrics for innovation. The results suggest a link between the innovative capabilities of a nation and its institutions. Innovation is hard to gauge and is a subjective concept, but it is an important concept in the new economy and there is a need to develop better ways to measure it.

Another important venue for future research is the nationality of MNCs. As firms become more internationalized in their operations, more and more of them are

classified as MNCs. By 2009, the number of MNCs globally had grown to 82,000 (UNCTAD World Investment Report 2009 "Transnational Corporations, Agricultural Production and Development"). It may be beneficial to research how fast a nation's firms are transforming into MNCs, how fast MNCs move up the ranking of global market power, and what policies can be credited with fostering that transformation and growth.

CHAPTER FOUR

FLEEING REGULATION: POLLUTION HAVENS IN TEXTILE MANUFACTURING

4.1 Introduction

This essay investigates evidence of the pollution haven hypothesis in textile manufacturing. The pollution haven hypothesis states that a large proportion of foreign direct investment (FDI) in lesser-developed countries (LDCs) finances highly polluting and ecologically inefficient manufacturing processes and facilities that are outsourced from developed countries (Grimes & Kentor, 2003; Jorgenson, 2007; Lee, 2009; von Moltke, 1998). The paper examines whether environmental permissiveness is associated with high levels of FDI from MNCs in pollution-intensive industries.

The study tracks the changing market structure of the garment industry in the last two decades with a focus on FDI done by multinational corporations (MNCs). MNCs dominate the apparel industry as a whole (Gereffi, 1999). Within the industry, agglomeration and vertical integration in apparels have put strong capacity and cost pressures on textile manufacturers (Bruce & Daly, 2004, 2006). These trends have increased the importance of MNCs in textile manufacturing in particular, as the sector is the most capital-intensive link in the whole apparel industry (Barns & Lea-Greenway, 2006; Birnbuam 2005, 2008; Hutson et al., 2005; Kirshner, 2005). Today most textile production is done by MNCs from developed nations that manufacture in developing nations, stressing the importance of FDI in the industry (Miroux & Sauvant, 2005).

Using a cross sectional time series analysis of the 32 largest textile exporter nations for 1990 to 2008 this essay examines how investors responded to a major policy change, i.e. the removal of the quota system of international trade in garments and textiles (Gibbon, 2003; Miroux & Sauvant, 2005; Mikic et al., 2008). The findings suggest that a policy change of trade liberalization altered location incentives in favor of nations with relatively lax regulatory climates and large production capacities, offering support for the pollution haven hypothesis in the textile industry.

4.2 Industry Sustainability Concerns — The Pollution Haven Hypothesis

The textile industry has been under increased pressure to meet social and environmental norms in all international markets (Rosenthal, 2007). Critics of garment conglomerates have raised ethical questions about their business practices ranging from perpetuating global poverty by fighting against wage increases in developing nations to pursuing an unethical marketing strategy of promoting the overconsumption or cheap, readily disposable clothes (Diebacker, 2000; Nimon & Beghin, 1999; Rosenthal, 2007). The production and promotion of such clothes is a recent phenomenon referred to as "fast fashion" (Barn & Lea-Greenway, 2006; Birnbaum, 2005, 2008; Bruce & Daly, 2004, 2006). The growth of fast fashion is of global concern and social activists and academic scholars are beginning to address its environmental impact (Cline, 2012). Clothing is a large and worsening source of carbon emissions because of the way in which it is produced and cared for (Diebacker, 2000; Khan et al., 2009; Lee, 2009; Pan et al., 2008).

Manufacturing of apparel is so fragmented that neither manufacturers nor customers understand much about how and when in the apparel production process environmental degradation occurs (Rosenthal, 2007). Ecological damage can occur anywhere in the making process from the growing and harvesting of cotton to the manufacturing of synthetic fibers, to washing, caring for, and disposing of garments.

Most textile and apparel production is done by MNCs. Miroux & Sauvant (2005) assert that MNCs dominate global production and in the developing world their affiliates dominate the sector. As a result, developing countries have accounted for a rising share of the growth in textile and apparel exports so much so that by 2005 they produced half of all global textile exports and nearly three-quarters of global apparel exports (Andriamananajara et al., 2004; Miroux & Sauvant, 2005).

For certain countries it is textile production and not apparel that defines exports.[39] In Pakistan, one of the leading exporters of both textiles and apparels, textiles have grown to comprise over half of all merchandise exports. In India apparel exports account for 55% of all export earnings. However, only about 12% of those exports are in the form of ready-made garments so that 88% of exports classified under "apparel" are actually in the form of fabric (Chaturvedi & Nagpal, 2003). The other global leaders in textile exports are Nepal (16%), Macao (China) 12%, Turkey (11%) and India (11%) (Miroux & Sauvant, 2005: 4).

[39] Textile production refers to the making of fabric, while apparel refers to the production of finished garments. For a in depth discussion of the difference between the sectors see Kunz & Garner (2011).

Fifteen developing nations including China, India, Pakistan, Bangladesh, Egypt, and Turkey, account for 90% of global textile exports and 80% of global clothing exports (Adhikari & Yamamoto, 2007). Among them China has risen as the leader in the industry and is referred to as "the tailor of the world" (Mikic et al., 2008; Pan et al., 2008). Today, Chinese textile companies are the largest in the world, but still over 34% of Chinese textile and apparel exports come from Chinese enterprises financed by foreign investors (Miroux & Sauvant, 2005). In Indonesia, 95% of textile mills are foreign owned (Robinson, 2008). Such growth of foreign ownership has raised ethical and environmental concerns that textile MNCs are strategically locating in countries that are still developing environmental regulatory systems, such as Indonesia, China, India, Bangladesh, and Viet Nam, in order to exploit regulatory uncertainty (Greer et al., 2010; Khan et al., 2009).

International environmental impacts of industrialization are studied across disciplines. Most empirical evidence of industrial pollution from FDI has come from the field of sociology (Chase-Dunn, 1975; Grimes & Kentor, 2003; Jorgenson, 2003, 2007, 2009; Rice, 2007). The field has pioneered the concepts of ecostructural investment dependence, arguing that a large proportion of foreign investment in lesser-developed countries (LDCs) finances highly polluting and ecologically inefficient manufacturing processes and facilities that are outsourced from developed countries (Grimes & Kentor, 2003; Jorgenson, 2007; Lee, 2009; von Moltke, 1998). Across academic disciplines that charge is referred to as "the pollution haven hypothesis", "the race to the bottom phenomenon", or the "theory of ecologically unequal exchange" (Jorgenson, 2009;

Gray, 2006; Ibrahim, 2008; Lee, 2009; Pan, 2008; Rice, 2007; Roberts & Parks, 2007; Smarzynska & Wei, 2001; Tufekci et al., 2007; Wallerstein, 2005). The theory has increasingly generated interest since the early 1990s, but Elliot and Shimamoto (2008) argues that earlier studies have found little empirical support. Supporting evidence comes from fairly recent cross-national studies of green house gas (GHG) emissions and other forms of air and water pollution (Jorgenson, 2003, 2007, 2009; Kentor & Grimes, 2006, Shandra et al., 2008; Smarzynska & Wei, 2001; Wagner & Timmins, 2009).

The main contention is that the globalization of commodity production has enabled developed countries to partially externalize their environmental costs to domestic LDC environments and to the global environment (green house gases, for example) via relocation of pollution-intensive production to developing nations. Jorgenson (2009) suggests that there is an incentive system under which developed countries favor terms of trade with their developing nation partners based on greater access to natural resources and sink capacity. Sink capacity, or carbon sink capacity, refers to carbon sequestration or the process of transferring atmospheric CO_2 into the soil (Lal, 2004).

The incentives for environmental sourcing are intensified in heavily indebted countries because they are under pressure to pursue structural adjustment programs that promote export-oriented production (Easterly, 2005; McMichael, 2004; Shandra et al., 2008; Winters, 2010). Schofer and Hironaka (2005) find that many LDCs succumb to both internal and external pressures to lower environmental standards for export-

oriented production in order to stay competitive and be able to make structural adjustment loan payments to the International Monetary Fund (IMF).

Assessing global environmental and social problems, Gray (2006) makes the observation that rising pressures from consumer protection groups have forced Western companies to recognize the need for environmental and social stewardship in their production processes and investment strategies. As MNCs have started to become more powerful worldwide, it has been generally argued that they have a social responsibility to operate ethically. Corporate Social Responsibility (CSR) has become a global slogan (Carroll, 1999; Lee, 2008). Activists have called for more stringent rules and regulations to be issued and enforced (Matten & Moon, 2008; Porter & Kramer, 2006). Concepts like sustainability accounting and reporting (SEA) have been introduced. SEA is an accounting measure for shareholder value that includes sustainable development components (Diebacker, 2000; Gray, 2006; Schaltegger & Burritt, 2010). Large international buyers have also implemented their own codes of corporate ethics. A multitude of such codes has emerged, including model codes drafted by trade unions and non-governmental organizations, company codes, and government promoted codes (Burritt & Schaltegger, 2010; Gray, 2006; Schaltegger & Burritt, 2010).

In the apparel industry, codes of conduct are the subject of debate for they have different meanings for different people; for some, it is a way of avoiding binding regulation. For others, it is a means of addressing a regulatory gap, which is often temporary (Nimon & Beghin, 1999). It is also a way to stave off more demanding

regulation by encouraging soft laws. At the same time, many of these codes operate in isolation, which can create confusion[40].

Scholars who study environmental issues contingent to the garment industry have paid special attention to cotton. Cotton is one of the most significant crops, second only to food grains in terms of value and volume among agricultural products (Pan, 2008). It is one of the most important fibers, accounting for more than half of all fibers used in clothing and household furniture and totaling 38% of the world fiber market (Pan et al., 2008). In recent years there have been many sustainability issues raised with respect to the cotton industry (Dem et al., 2007; Gibbon, 2003; Guo et al., 2002; Li et al., 2005; Li, 2005).

4.3 Cotton Sustainability Issues

The sustainability concerns center around the carbon footprint of supplying American cotton to the leading global textile processing centers – China, India, Pakistan, and Viet Nam. The United States has strengthened its leadership as the leading exporter of raw cotton. More than 75 % of the cotton produced in America is exported and the United States accounts for almost 40 % of world cotton exports (Birnbaum, 2008). Prior to 2001, US cotton exports were generally in the range of 5 to 7 million bales per year. By 2005, US exports reached 18 million bales, as quoted by USDA (Abdelnour & Peterson, 2007). American export volumes further doubled between 2009 and 2010, rising to record highs due to strong demand mostly from China (Patton, 2010).

[40] For more information on Codes of Conduct initiatives refer to Clean Clothes Campaign reference guide http://www.cleanclothes.org/codes/index.htm

According to the US Department of Agriculture as of October 2011, US exports of raw cotton have grown even more for China, India, Turkey, Mexico, Taiwan, Thailand, Indonesia, and South Korea.[41]

According to Pan et al. (2008) today more than 45% of China's cotton imports come from the US and that percent is expected to increase in order to sustain the growth of the Chinese textile industry. The Chinese government's official policy of managing the country's cotton processing needs is to increase imports. Because of limited agricultural capacity relatively to the size of China's human population, priority is given to growing food crops for China's growing food consumption rather than growing non-food crops such as cotton.

Several researchers have explored the problems of subsidizing cotton farming in America, and the issues those subsidies raise for free trade (Li, 2005; Pat et al., 2010; Yijun & He, 2004; Yijun & Zhang, 2006). The charge is that American cotton subsidies distort trade patterns and keep poor nations from increasing their cotton exports, contributing to poverty in the developing world (Abdelnour & Paterson, 2007; Sumner, 2003, 2007). Pan et al. (2008) argue that such trade distortions also creates environmental pressures in countries that are most negatively affected.

Some LDCs are heavily reliant on cotton production, and Borders and Burnett (2006) report that these have suffered losses because world cotton prices have been gradually decreasing since the mid 1990s. Although lower prices should result in lower production, the United States has doubled cotton production over this same period of

[41] http://www.fas.usda.gov/export-sales/cottfax.htm

time (Borders & Burnett, 2006: 1). Minot and Daniles (2005) argue that US cotton subsidies have greatly harmed West African growers by both obstructing access to the US market and artificially lowering world market prices. In 2001–2002, America's 25,000 cotton farmers received a $230 subsidy for every acre of cotton planted—a total of $3.9 billion. By comparison, wheat and maize subsidies are around $40 to $50 per acre. American cotton farmers receive up to 73% more than the world market price for their cotton crop. In 2002, Brazil, Australia, and the West & Central African (WCA) countries won a complaint with the World Trade Organization (WTO) against the US on this issue. According to Pat et al. (2010), the case could have positive environmental outcomes because higher average prices would allow for organically grown cotton to be more competitive on the world market.

Analyzing environmental impact of organic cotton production Dem et al. (2007) suggest that environmentalists embrace organic cotton because of its lower pesticide use. However, Eyhorn (2007) argues that organically grown cotton is much more water intensive than traditional farmed cotton and in developing nations populations must choose between using precious water for organic cotton farming or for daily human necessities (*e.g*. proper hygiene and hydration). Organic or not, farming is only one link in the long supply chains of cotton products. According to a 2007/2008 study on the growth of organic cotton farming globally, farm-level costs are a very small part of the total coast in the supply chain of garment manufacturing (Feriggno, 2009). Weaving cotton into fabric is the strongest value-adding link in the production chain and the most expensive component of garment production (Birnbaum, 2008). It is also the most

environmentally taxing (Li et al., 2005; Ibrahim et al., 2008; Khan et al., 2009; Pan et al., 2008). Its global carbon footprint of cotton weaving is exacerbated by the fact that over 80% of exported raw US cotton ends up returning to the US in the form of ready-made garments (Birnbaum, 2008). Such a platform is based on long supply chains of shipping and trucking cotton, apparel components, and finished garments around the world in which a representative cotton bale is grown in the United States, processed into fabric in India, sewn into garments in China, and then re-imported back to the United States for final sale.

4.4 Processing and Textile Manufacturing

Turning a bale of cotton into fabric is investment-intensive, energy-intensive, and environmentally taxing (Banuri, 1998; Diebacker, 2000; Greer et al., 2010; Guo et al., 2002; Ibrahim et al., 2008; Khan et al., 2009; Tufekci, 2007). Textile processing consists of three major industrial operations — spinning, weaving, and finishing. Spinning entails mostly dry processing and generates noise and dust pollution. Spinning is considered the least impacting stage when it comes to the environment, but it is still very harmful to workers. Pan et al. (2008) find that the average textile plant uses shuttle looms that cause noise levels as high as 100db, exceeding the highest safety limit of 85db.

The most serious environmental problems are associated with the wet finishing processes of fabric manufacturing (Chaturvedi, 2003). The main wet processes are bleaching, mercerizing, and dyeing, which produce liquid effluent with varying waste composition (Guo et al., 2002). Before weaving it, cotton needs to be bleached. Then it

is mercerized. Mercerizing is the process of dipping the bleached fibers into a sodium hydroxide bath then neutralizing them in an acid bath (Wakelyn, 2006: 74). While not all cotton needs to be mercerized, most of it is mercerized nevertheless because fabrics treated in this way respond better to dyeing and are used in the production of cotton/polyester blends.

Once cotton is mercerized, it is then woven into fabric, which is then dyed. During weaving starch is applied to the fabric to impart strength and stiffness, resulting in wastewaters that contain large amounts of industrial grade starch. After weaving, fabrics are dyed based on pattern specifications. Apart from starch, sodium hydroxide and chemical dyes are used during these fabric-finishing processes. The amount and variety of wetting agents, acids, alkalis, and dyes depends on the quality and desired refinement of the end product (Wakelyn, 2006). The higher the quality, and subsequently the price of the fabric, the more chemically intensive the manufacturing process tends to be.

The wet processes are the most significant components of production, demanding large quantities of water for the different steps in dyeing and finishing, as well as the use of quality petrochemical products. Often the methods employed are inefficient. Over 15% of the world's total production of dyes is lost during the dyeing of fabrics implying that much of the lost dye ends up as effluent (Ibrahim, 2008). On average 200 tons of water are used for every ton of textile produced (Greer et al., 2010). The used water is chemically laden and poses serious environmental threats. The chemical compounds, metals, and toxic substances must be discharged in a run-off

process. They travel from the waters around textile plants into the ground water systems of large regions, affecting the toxicity of entire ecosystems (Ibrahim et al., 2008).

Kant (2012) states that The World Bank identifies 72 toxic elements that are emitted during textile manufacturing but only 42 of these toxic elements can go through a partial purification process where their levels are minimized but not eliminated. The World Trade Organization (WTO) sets guidelines for discharge levels, but each country is free to establish its own regulatory structure, determine tolerable discharge levels, and implement oversight and enforcement measures (Chaturvedi & Nagpal, 2003). WTO water quality standards are classified into aggregate measures and maximum allowable concentrations of specific chemicals. The aggregate measures are pH value (which determines acidity or alkalinity of the effluent), temperature, biological oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS) or non-filterable residue, total dissolved solids (TDS), and color (Banuri, 1998).

At present, the majority of the textile mills in the major processing centers of the world, including modern, integrated facilities, do not have adequate arrangements to treat their effluents before discharging them into an external drain (Khan et al., 2009; Pan et al., 2008; Tufekci, 2007). Since in many cases the external sink is an irrigation canal, the untreated chemicals can affect the quality of drinking and irrigation water. Khan et al. (2009) provide evidence that water pollution from clusters of textile factories in Bangladesh has led to the displacement of whole traditional communities and the destruction of entire ecosystems. In China water discharge figures for 2003 show that pollutants in that industry were forth among the worst in content and volume of all

industrial effluents (Pan et al., 2008). Ground waters are also contaminated, as are open basins, with the effects spreading even into fisheries (Banuri, 1998; Tufekci, 2007).

The environmental requirements placed by the WTO, as a condition for membership do not seem to have an effect as factories generally do not comply with them (Tufekci, 2007; Chaturvedi & Nagpal, 2003; Khan et al., 2009; Pan et al., 2008). The factories consider investing in treatment technology to be a non-productive use of funds in an industry that struggles against strong cost pressures. According to Khan et al. (2009) treatment is regularly below standards and is rarely checked either by the factory, environmental department, or buyer. Pan et al. (2008) report that in China standards vary across regions because of centrally planned development policies, while many local governments allow companies to emit waste beyond legal limits.

As clothing sales are growing in both emerging and developed markets, activists are concerned with the increasing environmental and sustainability problems in the clothing production process. Growth in industrialization in the developing world has increased demand for cotton for both domestic consumption and export dependence. As research mentioned so far has shown, production regulation is inadequate and compliance incentives undefined. At the same time major changes at the retail level in marketing and promotion of apparel and related industries have resulted in increasing global demand. Among these changes is the advent and diffusion of "fast fashion" (Nimon & Beghin, 1999; Pan et al., 2008; Rosenthal, 2007). Fast fashion has led to a notable increase of sales volumes in both developed and developing nations, which has

resulted in higher demand for fabric and has put further price-cutting pressures on production (Mikich et al., 2008).

4.5 Fast Fashion

Consumers spend more than $1 trillion a year on clothing and textiles (Brinbaum, 2008). An estimated third of that consumption is in Western Europe, another third in North America, and about a quarter in Asia. In many places, cheap, readily disposable clothes have displaced hand-me-downs or more durable garments as the mainstay of dressing (Rosenthal, 2007). When sweaters and T-shirts cost less than a sandwich, stores like Walmart and Target compete to become leaders in the quick-growing fast fashion industry, selling cheap garments that can be used and discarded with ease. Consumers, especially teenagers, love the concept. It allows them to shift styles with speed and on a low budget (Bae & May-Plumlee, 2005; Barn & Lea-Greenway, 2006; Bruce & Daly, 2004, 2006).

Competitive price pressures have intensified in the largest import markets with the growth of fast fashion (Mikic et al., 2008). The retailers reshaping the industry include European conglomerates like Zara, H&M, and New Look that offer inexpensive merchandise that looks expensive (Rosenthal, 2007). They are growing globally following the branded marketing model of established conglomerates such as Nike, Reebok, and Liz Claiborne. At the manufacturing level, branded marketers rely on buyer-driven supply chains of out-contracting, in which they do not own any production facilities but outsource all components of production (Gereffi, 1999).

The economic power of retailers is growing because they are able to exert control over prices by pressuring the independent labels they carry by using their growing volume of private-label production as leverage (Miroux & Sauvant, 2005). They are known for renewing their product ranges with fashion-led styles.

Fast fashion is a process of reducing buying cycles and lead times. Sourcing and buying decisions are shaped by the speed with which a product of fast fashion innovation can be put on store shelves. Competition among producers has shifted from a process that is centered on price competitiveness (now a standard condition for simply being in business) to one based on fast response (Mikic et al., 2008). Technological innovation has improved productivity at the manufacturing level, especially in such value-added areas as printmaking, pattern work, and design (Birnbaum, 2005, 2008; Bruce & Daly, 2004, 2006).

A growing body of research (coupled with the author's professional experience as an operative in textile sourcing) paints a consistent picture of a rapidly changing pattern of competition in the fast fashion component of the market for clothing. Changes in consumer lifestyle have reshaped customer demand with an increasing emphasis on "newness". A combination of popular culture consumer inundation and technological advances has changed the nature of apparel advertising (Bruce & Daly, 2006). In marketing, research trend prediction has been impacted because the influence of fashion houses has diminished. Traditionally, trend prediction agencies analyzed historic patterns in design and style of the major fashion houses and consulted manufacturers on anticipating trend changes. But stylists have challenged the influence

of the prediction agencies. Stylists, while not designing, combine designs and provide customers with complete unique looks, which can lead to rapid and unanticipated trend changes.

Today stylists dictate trends based on happenings in lifestyle hot-spots, clubs, and fashion "flash points" (Barn & Lea-Greenway, 2006: 261). Through savvy use of information technology stylists rely on celebrities as the new trendsetters rather than fashion designers. They are basing their influence precisely on the fact that they are not fashion houses and major brand labels, but instead are young, hip, and progressive trendsetters. The message seems to have worked. Women's clothing sales in Britain alone, the birth place of fast fashion, rose by 21 % between 2001 and 2005 to about £24 billion ($47.6 billion) and it was spurred by lower prices in an industry of consolidating producers (Rosenthal, 2007). Lead times of production have shrunk from an average of 6 months in the late 1990s to less than 60 days (Birnbaum, 2008).

The garment industry operates within its own unique calendar. It has eight seasons — Fall I, Fall II, Holiday, Resort, Spring I, Spring II, Summer, and Transitional. The average garment manufacturer provides 81 models every six weeks. The process includes ancillary services, such as market research, design, contract and marketing of product, preproduction services such as sourcing of fabric and transporting of fabric and trim to the factory; cut, make and trim, packaging, shipping and receiving, duty clearance and permits, transportation to retail outlets, stocking, pricing and mark down (Birnmbaum, 2008). Before fast fashion the traditional buying cycle started one year before a season and buying decisions were based mostly on long-term forecasts from

historical sales prepared by trend prediction agencies. Leads for orders were placed six months prior to product launch (Bruce & Daly, 2006). But the average factory today competes on its ability to ship a finished product in as little as 30 days. That time frame is down from an average of 52 weeks less than 10 years ago (Birnbaum, 2008). The services offered are changing from simple commodity manufacturing to full service delivery, which incorporates design and branding (Bruce & Daly, 2004, 2006).

Branded retailers achieve fast turnaround by sourcing to new suppliers with different products, but also maintaining a relationship with existing suppliers that have the capabilities to respond to fast change. Their preferred suppliers need to be able to take larger repeat orders on a regular basis, while also having the capacity to accommodate frequent and often unforeseen change requirements based on trend shifts (Bae & May-Plumlee, 2005). Being able to accept large orders sporadically is not sufficient (Barns & Lea-Greenway, 2006). Fast turnaround is required in an integrated manner for a producer to meet such demands. A drastic reduction in the length of time is necessary in the conversion of fiber to fabric, fabric to garment, and the delivery of finished products to customers (Bae et al., 2005). Such response can only be achieved through efficient reorganization of entire supply chains (Miroux & Sauvant, 2005).

4.6 Supply Chains in Apparels

Buying has changed from an operational to a strategic process (Bruce & Daly, 2004). Large retailers have large volume requirements. Thus they only consider large suppliers, which leads to the increasing role of MNC FDI as conglomerates are looking to expand capacity (Miroux & Sauvant, 2005). Growth of capacity is dependent on the

ability to attract capital. Producers in developing nations have limited financial and know-how capabilities, therefore, an increase has been reported in the foreign ownership of both textile mills and garment manufacturing facilities, particularly those that employ more than1000 workers (Bruce & Daly, 2006).

Fast fashion specialists are able to promote the latest trends quickly by sourcing in developing nations closer to their home markets. The European market, which gave birth to fast fashion, has changed global sourcing patterns in favor of closer locales. Since the sector is dominated by small and medium-sized enterprises (SMEs), West European manufacturers have to rely on outsourcing for capacity. However, global sourcing, which worked in the 1990s, is no longer an efficient strategy because often retailers require garment replenishment mid season for particularly popular items (Bruce & Daly, 2006). EU retailers require that merchandise be presented "floor-ready" on hangers and with stickers attached — an activity that can only be undertaken by near-by suppliers (Bruce & Daly, 2006).

EU requirements for floor-ready supply is leading manufacturers to respond by switching production to Eastern Europe, Turkey, and India from far-away East Asia (Bruce & Daly, 2004). In 2002–2004, a total of 275 textile and apparel FDI projects were recorded by the United Nations Agency on Trade and Development (UNCTAD). Forty-five percent of them had a European MNC as the corporate parent. The production site of choice was still Asia with 38% of FDI inflows, but with Eastern Europe catching up as its share has grown to 29% of all FDI inflows. Latin America and the Caribbean received 13% and Africa 6% (Miroux & Sauvant, 2005).

The European Union is the largest importer of textiles and garments, but much production sourcing and investment is done internally, mostly in Eastern Europe. In 2004 eighteen new FDI textile and apparel plants were constructed in Bulgaria, which ranked third globally after the US and China in 2004 (Miroux & Sauvant, 2005). Historically, Bulgaria has not had a strong textile sector and the presence of the industry there is fairly recent.

East Asian producers are adjusting to the increased competition from East European and African nations. East Asian producers are able to compete on capacity because of three main factors. First, they are becoming more adept at moving from simple commodity manufacturing to incorporating design and branding, offering a full-service delivery (Bruce & Daly, 2004, 2006; Birnbaum, 2005, 2008; Hutson et al., 2005). Second, they benefit from their own growing markets and increasingly produce for local consumption, which creates an added incentive to grow in order to accommodate both export and domestic orders (Miroux & Sauvant, 2005). Third, they in turn aggressively invest in lesser-developed nations, mainly in Africa (Gibbon, 2003; Brautignam, 2008; Busse, 2010; Minot & Daniels, 2005; Miroux & Savant, 2005).

African presence enables East Asian MNCs to shorten supply chains and shrink response times for European and American clients, which is essential in fast fashion. Although only 6 % of all FDI in apparels goes to Africa, its growth rate, tied to East-Asian MNCs in particular, has been impressive (Brautignam, 2008; Busse, 2010; Gibbon, 2003). For example, Lesotho's industry is owned primarily by Chinese and South African firms. Madagascar's growth in exports can be traced to Mauritian

ownership. Qatari and Sri Lankan MNCs dominate Kenya's fairly new apparel sector (Miroux & Sauvant, 2005: 11). Of all FDI outflows in textiles and apparel between 2002 and 2004, thirty-five percent had an Asian corporate parent. For the past several decades that parent typically would have been Japanese, but in 2002–2004 Taiwan, Turkey, Korea, Malaysia, and China surpassed Japan in total number of projects. Scholars often overlook the fact that many of today's largest textile MNCs come from the South, particularly South East Asia (Miroux & Sauvant, 2005).

Proximity matters in every region of the world (Gereffi, 1999). Geography is important in location decisions to the extent that the quota system, or the Multi Fiber Agreement (MFA), and restricting preferential trade agreements of the 1990s, created networks of production in specific locations (Gereffi, 1999; Hutson et al., 2005). These networks have remained fairly stable even after the end of MFA in 2005 (Birnbaum, 2008). It is unclear, however, whether its legacy will endure.

4.7 FDI During the Quota Years: Restrictions on Location

Since 1960 production location in textiles had been constrained by a quota system (Miroux & Sauvant, 2005). Foreign investors had to locate in nations that had available quotas. Producers from countries with restricted quotas jumped borders and willingly or unwillingly helped in the industrialization process of the nations where they were able to locate (Gereffi, 1999). Korean firms set up shop in Bangladesh, the Caribbean and sub-Saharan Africa. Chinese companies expanded in Southeast Asia and Africa. Indian firms went to Nepal (Adhikari & Yamamoto, 2007). These decisions

were driven by the then-prevailing need to find countries that had quota-free access to the American market.

Before European integration, the US was the largest import market for garments (Birnbaum, 2008). Today the EU is the largest market, but since much sourcing is done internally, the US market remains larger by 11% as a destination for textile exporters (Miroux & Sauvant, 2005). When Mexico was given quota-free access to the American market via NAFTA, its textile and garment market share in the US increased from 2% to 10% — a 500% jump in less than 5 years (Birnbaum, 2005). In the 1990s, six countries from what would become the Central American Free Trade Agreement (CAFTA) increased their US market share from 6% to 15%. Even countries without any previous existing garment industries, such as Jordan and the beneficiaries of the African Growth and Opportunity Act (AGOA), showed rapid growth from the moment they were granted quota-free access to the American market (Birnbaum, 2005).

Quota even dictated garment design. Cotton fishing vests became popular because quota category 359 (*e.g.* the category referring to the particular garment, in this case cotton fishing vests) was readily available. Wool cardigans fell out of style because their quota category 434/435 was too expensive (Birnbaum, 2008). A market for quotas was developed and quota futures were traded on the Hong Kong stock exchange. The price of quotas was greatly influenced by trade restrictions won by Western textile producers through aggressive lobbying (Birnbaum, 2005).

In America textile firms and domestic garment manufacturers both lobby for protection from imports. They have battled each other for years. Textile firms are better

organized and had won protection from imported fabrics. This fact accelerated the decline of US textile manufacturing because domestic factories were and still are not allowed to benefit from the variety of fabrics available from foreign suppliers. As a result, during the quota years, countries like Jordan saw their garment industry grow — they had both a quota-free access to the US market and allowed fabric imports. The MFA that had protected US textile firms was terminated in January 2005 (Abdelnour, 2007), but preferential trade agreements (PTAs) remain in place.

Preferential agreement systems exist in many places. In the US, the system known as 807/9802, allows for production sharing with facilities located mainly in Mexico, Central America, and the Caribbean. In Europe, the phenomenon is referred to as "outward processing trade" (OPT) with partners in North Africa and Eastern Europe. In Asia, Hong Kong is the center with outward processing agreements tied most closely to mainland China (Gereffi, 1999).

The rationale for PTAs is that they make it possible to minimize production costs locally while developing a widening circle of exporters and intermediaries external to interregional supply chains. However, PTAs can have negative unintended consequences for competitiveness. When NAFTA and the EU created preferential trade blocs to promote a growing consolidation of supply chains within each region, China and India learned how to be more competitive by aggressively increasing consolidation and vertical integration (Gereffi, 1999).

When the quota system ended PTAs remained. A few countries that have both high productivity and low costs have benefited from the transition, particularly China,

India and Vietnam. Nations that are challenged as a result of its removal include OECD members and small country producers, largely because of capacity constraints (Mikic et al., 2008).

PTAs have hurt some countries because the removal of the MFA ended the incentives to source from those countries. PTAs required that a certain percent of the final product be made from the preferential partner's product, usually yarns or dies from the US and the EU, which are relatively expensive. Because PTAs demand that producers meet rules of origin requirements, costs have become too high for many LDC producers to remain competitive. Also, PTAs require preference-receiving countries to not use textiles or other inputs from competitors such as China. The result has been that such measures have offered protection to very few Western manufacturers. This captive market strategy has also posed a challenge of capacity. Since most Western exporters of textiles are small in capacity and inflexible in the variety of textiles offered, requiring LDCs to tie procurement to them also limits their flexibility in product breath. It also limits LDC producer capacity capabilities, regardless of willingness to expand. This problem is the biggest challenge for LDC nations that are part of US and EU PTAs, as they cannot compete with the capacity and flexibility of Chinese and Southeast Asian producers. The end of the quota system has also impacted nations like Morocco, Rumania, and Tunisia, where export volumes have dropped and the industry has started to shrink (Adhikari & Yamamoto, 2007).

When the quota system ended on January 1, 2005, it ushered in a new reality of free trade (Birnbaum, 2008). The removal of the system had been negotiated for years.

Its de facto phase-out was started in the early 2000s. Between 2002 and 2003, 325 of Mexico's 1,122 garment factories closed down and moved elsewhere, mostly to Asia, in anticipation of the end of the system. Many of these companies were owned by foreign investors (Ryder, 2003).

Given the above issues, the purpose of this study is to examine whether increased environmental costs were associated with such policy and supply chain decisions.

4.8 Data and Methods

This research employs a cross-sectional time series analysis of FDI of 32 nations from 1990 to 2008. The sample consists of the 32 nations most economically reliant on textile exports. The nations, ranked by Miroux and Sauvant (2005), account for over 90% of global textile exports. The sample was selected based on the assumption that a link can be made between FDI and the textile sector. Since FDI figures are reported in an aggregate format for the whole economy, disaggregating investment into different sectors across time is challenging. For economies most reliant on one overall sector, it is reasonable to assume that most FDI would be directed to that sector as it defines national comparative advantage. Therefore, in this study, the assumption is made that since the economy as a whole is heavily reliant on textiles, investment in the sector would comprise a significant part of all FDI.

The dependent variable is net FDI, which is defined by the World Bank as FDI in the reporting economy from foreign sources less net FDI by the reporting economy to the rest of the world. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. Data are in

current US dollars, which means they are not adjusted for inflation.[42] The World Bank's database World Development Indicators is the source of all data in this study. It is the most comprehensive database available that also offers environmental impact measures.

The main independent variables are:

(1) $\mathrm{H20}_{\mathrm{TEXTILE}}$ − Water pollution from the textile industry as percent of all biochemical oxygen demand (BOD) effluents. It measures industry shares of emissions of water pollutants from manufacturing activities as defined by two-digit divisions of the International Standard Industrial Classification (ISIC) code.

(2) $\mathrm{H20}_{\mathrm{CHEMICAL}}$ − Water pollution from the chemical industry as percent of all BOD effluents. This measure is of particular interest because of the chemically heavy processes involved in textile processing (Adhikari & Yamamoto, 2007; Kant, 2012; Schroeppel & Nakajima, 2002).

(3) CDD − Adjusted savings: carbon dioxide damage (current US$). Carbon dioxide damage is estimated to be $20 per ton of carbon times the number of tons of carbon emitted. It is included as an overall measure of environmental permissiveness that estimates the economic damage of pollution.

(4) $\mathrm{AG}_{\mathrm{IMPORTS}}$ − Agricultural raw materials imports as percent of merchandise imports. Agricultural raw material imports is included as a proxy variable to explore whether a link can be made between the import of cotton, which is included in the measure, and environmental sourcing.

[42] http://data.worldbank.org/indicator/BN.KLT.DINV.CD

The assumption is that as firms expand production their need for imported cotton increases.

The control variables are:

(5) WTO – WTO membership – a dichotomous variable tracking whether a country is a member of the WTO and also when it joined. Many of the nations in the study joined the WTO at different points during the examined time series. A 0 is assigned for the years a country is not a WTO member. A 1 is assigned for the years that it is a member. It is important to explore whether joining the WTO significantly increased FDI netflows.

(6) GNI – Gross national income (GNI) per capita

(7) $POP_{\$2}$ – Percent of the population living on less than $2 a day

(8) Region. The regions are Continental Europe – 1, Asia – 2, Southeast Asia – 3, Africa – 4, South America and the Caribbean – 5. The purpose is to see if there is a significant difference in FDI among regions not explained by other factors.

(9) $FDI_{NET\_INFLOWS_{it-1}}$ – a lagged dependent variable is added to control for time effect issues

Both variables 6 and 7 are included to explore whether relatively poorer nations receive more FDI under the assumption that wages would be relatively low. Reliable data on average wages was not available to fully explore labor sourcing.

The model is as follows:

$$\mathbf{FDI_{NET\_INFLOWS}} = \beta_1 \mathbf{H20_{TEXTILE}} + \beta_2 \mathbf{H20_{CHEMICAL}} + \beta_3 \mathbf{CDD} + \beta_4 \mathbf{AG_{IMPORTS}} + \beta_5 \mathbf{WTO} + \beta_6 \mathbf{GNI} + \beta_7 \mathbf{POP_{\$2}} + \beta_8 \mathbf{AFRICA} + \beta_9 \mathbf{EUROPE} + \beta_{10} \mathbf{ASIA} + \beta_{11} \mathbf{L\_AMERICA_{CARR}} + \beta_{12} \mathbf{FDI_{NET\_INFLOWS_{it-1}}} + \mathbf{e_{it}}$$

Where subscript "**it**" stands for individual observation at one time period.

The goal of the model is to explore FDI attractiveness based on environmental permissiveness without the ability to control for regulatory compliance. A reliable longitudinal measure of environmental compliance for the countries in this study in the years included was not available. Neither was an institutional environmental measure that showed a change in institutional structure from year to year. Therefore, an attempt to gauge change in environmental permissiveness is made by including aggregate measures of pollution emissions in different categories. The expectation is that if the change in those measures through the years is significant and positive, then the growth could be seen as a signal of regulatory weakness.

4.9 Findings and Analysis

The data are analyzed using STATA software. Where reasonable, multiple imputations were performed to deal with missing values. In instances where not enough data were available to impute, the individual countries were not included in the analysis. Appendix 5 shows the nations that are not included in the models, appendix 6 shows the nations that are, and appendix 7 shows all nations that were examined for available data.

A cross-sectional time series regression analysis is performed in three ways. The 1990s are examined as one set under the assumption that investment decisions would be impacted by the MFA agreement. The 2000s are examined separately under the assumption that the phased out and end of the agreement would have impacted FDI differently. The third analysis is performed for all years — 1991 to 2008 for an overall look at environmental factors' impact on FDI. The results suggest that in the 1990s FDI was not dependent on environmental factors or labor factors. The only variable that shows slight significance is agricultural raw material imports as % of all manufactured imports. It is significant at the 0.1 level and the relationship is negative suggesting that more FDI went to nations that had relatively low agricultural raw materials imported when compared to other manufactured imports. This finding is not surprising as general economic development is associated with import growth of relatively expensive capital goods and technologies. This fact can be related to capacity expansion of textile facilities, but since the model does not control for FDI per sector it is hard to make a direct link. The relationship does not show a link between cotton imports and FDI.

Table 4.1 shows the regression results for 1991 to 1999.

Table 4.1 Regression Analyses for 1991–1999, FDI Net Inflows

Variables	Coefficient	Standard Error	Significance
$\mathbf{H20_{TEXTILE}}$ – Water Pollution, Textile Industry	2.22	4.21	NS
$\mathbf{H20_{CHEMICAL}}$ – Water Pollution, Chemical Industry	15.75	11.37	NS
CDD – Carbon Dioxide Damage (×e-7)	2.47	4.39	NS
$\mathbf{AG_{IMPORTS}}$ – Agricultural Raw Material Imports	-121.03	64.64	^
WTO – WTO Membership	-96.81	169.36	NS
GNI – GNI Per Capita	0.80	0.77	NS
POP_$2 – People Living on under $2 Per Day	-4.70	4.88	NS
AFRICA – Africa	265.17	263.28	NS
EUROPE – Europe	-265.17	263.28	NS
ASIA – Asia	761.47	497.10	NS
$\mathbf{L\_AMERICA_{CARR}}$ – Latin America & Caribbean	-60.92	148.17	NS
$\mathbf{FDI_{NET\_INFLOWS_{it-1}}}$ – Lagged DV	0.85	0.26	***
Constant	52.10	462.12	NS
Prob. > F	<.0001		
R-squared	0.67		
Observations	118.00		

Dependent Variable: FDI net inflows - the overall balance of foreign assets to liabilities in a country measured in current US dollars. Level of significance on a two-tailed test denoted by the following: NS – not significant, ^p<0.10, *p<0.05, **p<0.01, ***p<0.001.

In the 2000s the results change. Two major policy shifts occur during that time. One is that China was admitted into the WTO in 2001 and locating production there became easier. The other major policy change is the agreement to remove the quota

system reached during the WTO's Doha Round in 2001 where the Doha Development Agenda (DDA) was put in place. The gradual removal of the MFA is part of the DDA and its specific dates at the time were not set, but negotiations on the subject commenced. Although the MFA did not end until January 2005 one can assume that location decisions would have been impacted prior, as building new technologically sophisticated facilities in developing nations takes time.

Table 4.2 Regression Analyses for 2000–2008, FDI Net Inflows

Variables	Coefficient	Standard Error	Significance
$\mathbf{H20_{TEXTILE}}$ – Water Pollution, Textile Industry	60.32	21.89	**
$\mathbf{H20_{CHEMICAL}}$ – Water Pollution, Chemical Industry	90.44	28.57	**
CDD – Carbon Dioxide Damage (×e-7)	2.64	7.88	***
$\mathbf{AG_{IMPORTS}}$ – Agricultural Raw Material Imports	-801.79	259.76	**
WTO – WTO Membership	-128.27	121.13	NS
GNI – GNI Per Capita	0.08	0.08	NS
POP_$2 – People Living on under $2 Per Day	-54.59	17.06	***
AFRICA – Africa	1212.49	474.74	**
EUROPE – Europe	128.23	601.84	NS
ASIA – Asia	5595.16	1706.49	***
$\mathbf{L\_AMERICA_{CARR}}$ – Latin America & Caribbean	-2025.96	818.15	NS
$\mathbf{FDI_{NET\_INFLOWS_{it-1}}}$ – Lagged DV	0.66	0.15	***
Constant	-52.03	621.00	NS
Prob. > F	<.0001		
R-squared	0.74		
Observations	110.00		

Dependent Variable: FDI net inflows - the overall balance of foreign assets to liabilities in a country measured in current US dollars. Level of significance on a two-tailed test denoted by the following symbols: NS – not significant, ^p<0.10, *p<0.05, **p<0.01, ***p<0.001.

From 2001 to 2008, the ability to pollute seems to be a factor for FDI attractiveness. The BOD water pollution levels from the textile and chemical industries are positively related to FDI and the relationship is statistically significant. Figure 4.1

shows the trend of rising BOD values for selected countries of the study as compared to the US and the EU. Water pollution in the US and Europe has been steadily decreasing while it has been increasing in their trading partners, particularly in those nations that are relatively close geographically.

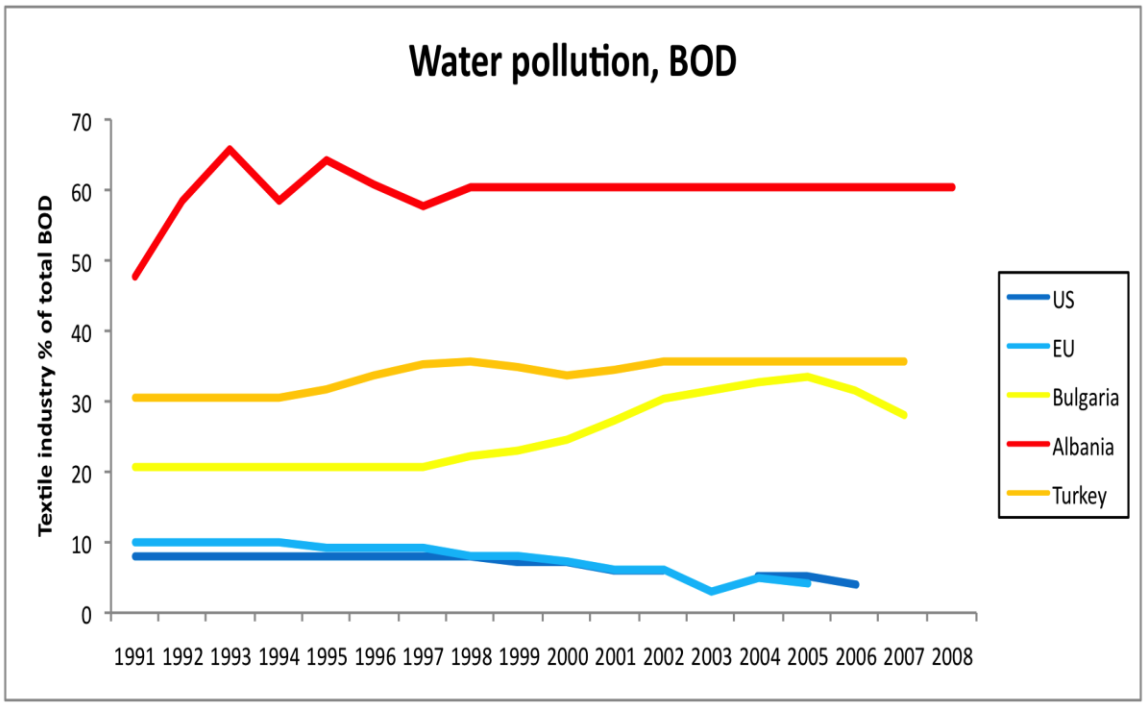

Figure 4.1: Percent of Water Pollution from Textile Production

The results of the study suggest that investors tend to value nations that are relatively close to the two largest import markets – the US and the EU. Figure 4.1 shows how water pollution from textile manufacturing in Albania, Bulgaria, and Turkey – the closest textile suppliers to the EU, has risen while BOD levels in the rest of Europe have steadily decreased. Figure 4.1 also shows that the US BOD values from textile pollution have also declined. It is unclear whether this fact is due to environmental regulation, or to a decline in textile manufacturing in America in the past two decades.

According to Miroux and Sauvant (2005) the US is still the leader in new textile plant construction, which suggest that the sector is still strong in America as compared to other nations that export textiles. However, it is unclear if current construction and growth is comparable to past levels. Further research could explore such questions.

The finding that both textile and chemical BOD values are significantly related to FDI inflows suggests a link between the two industries in terms of volume of textile output. This result may be related to the fact that textile production is chemically intensive (Ibrahim et al., 2008; Kant, 2012). With volumes and turnover capabilities dictating capacity, producers rely on fast access to chemical products. Therefore, access to the chemical products used in textile manufacturing would be important for choosing where to locate a new facility.

The results also show that during the quota system of trade, FDI does not seem to be influenced by environmental factors. Poverty and GNP per capita also did not matter. This finding is congruent with the work of Gereffi (1999) who finds a steady increase in market share of US MNCs during the 1990s within nations having relatively high wage rates.

Prior to the abolishment of the multi-fiber agreement in garments, quotas were so important that the choice of location was limited to where a producer could export to the US, regardless of costs associated with internalizing pollution or paying workers. But, the study results suggest that with the lifting of the restrictive MFA agreement, and the increasing choice of where to set up new facilities or expand existing operations, a trend began of investors choosing nations that allow pollution levels to rise.

The results here also show that carbon dioxide "damage" is significantly related to FDI. The relationship is positive suggesting that atmospheric emissions also matter and that permissiveness with regards to emissions tends to attract investors. The importance of relatively high levels of water and air pollution for foreign investors observed here supports the claim that nations can increase FDI if they allow pollution levels to rise. Figure 4.2 shows the trend change of carbon dioxide damage based on the dataset analyzed in this study for a select group of nations from the sample as compared to the US and the EU.

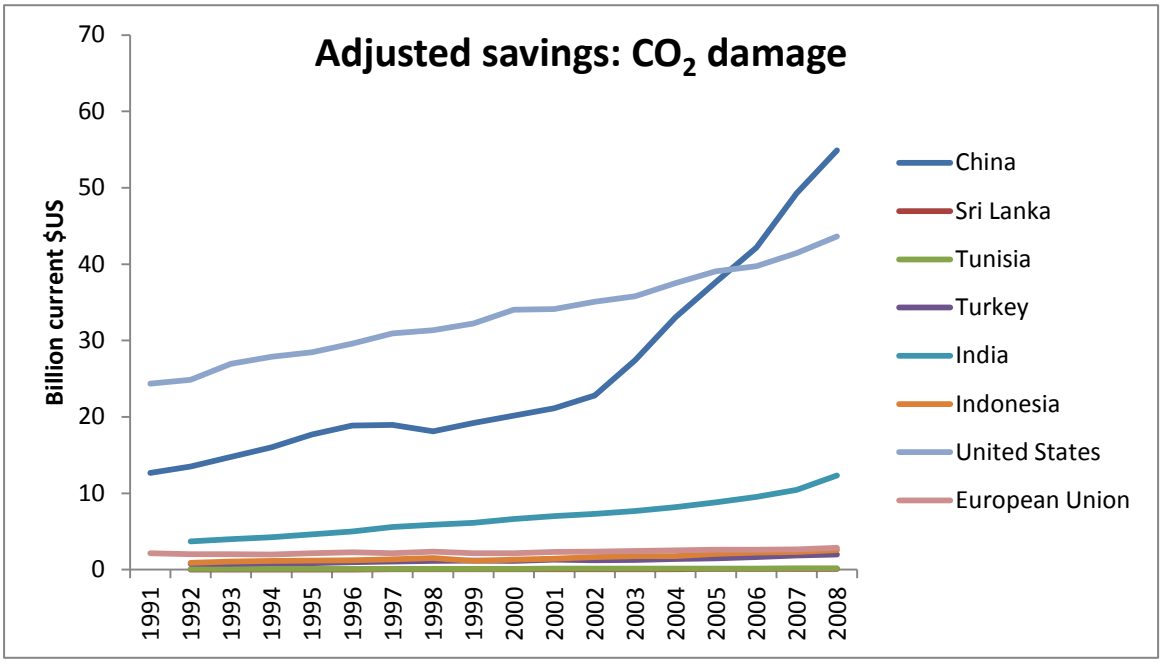

Figure 4.2: Carbon Dioxide Damage Measured in Current US Dollars

Emission output is highest for China and the US but the Chinese acceleration rate starting around 2002 (a year after China was admitted into the WTO) is the fastest. Meanwhile, European emissions are relatively flat. This fact could be related to

regulatory factors, with a much more permissive air polluting institutional environment in China, the US, and India. In 2005 the EU launched the European Union Emissions Trading System, the first carbon pricing system in the world. The EU has long been known as a pioneer in climate policy initiatives. It is unclear from the data of this study whether EU nations have been able to curb their pollution by exporting polluting enterprises overseas. Further case study based research could explore such issues.

The results of the regression analyses also show that agricultural raw imports as percent of all manufactured imports are statistically significant and negatively related to FDI. The same is true of the percent of the population living on less than $2 per day. From 2001 to 2008 FDI went to countries that imported relatively more manufactured goods than agricultural products and that had relatively fewer people living on less than $2 per day. This measure suggests that investors chose relatively wealthier LDCs that could afford to pay for increasing amount and variety of manufactured goods, and have established strong enough trade partnerships to achieve such an increase. Durable goods and industrial equipment are part of that classification, which can mean that investors value an institutional environment of industrialization where access to imported technologies matters. Such an environment provides a platform for expansion.

Between 2001 and 2008 African and Asian nations were relatively more attractive to FDI than European, South American, and Southeast Asian nations. This finding supports the hypothesis that regional presence matters for fast access to major markets when one controls for environmental permissiveness.

The results for all years, 1991 to 2008, suggest that the changes taking place in the 2000s were strong enough to impact the overall FDI location trends. Table 4.3 shows the regression results for 1991 to 2008. The same relationships are observed from 1991 to 2008 as in 2001 to 2008 at similar significance levels.

Table 4.3 Regression Analyses for 1991–2008, FDI Net Inflows

Variables	Coefficient	Standard Error	Significance
$\mathbf{H20_{TEXTILE}}$ – Water Pollution, Textile Industry	18.55	5.94	**
$\mathbf{H20_{CHEMICAL}}$ – Water Pollution, Chemical Industry	477.76	122.63	***
CDD – Carbon Dioxide Damage (×e-7)	15.30	3.96	***
$\mathbf{AG_{IMPORTS}}$ – Agricultural Raw Material Imports	-340.06	105.26	***
WTO – WTO Membership	-74.80	121.89	NS
GNI – GNI Per Capita	0.56	0.03	NS
POP_$2 – People Living on under $2 Per Day	-18.42	5.12	***
AFRICA – Africa	617.63	191.16	***
EUROPE – Europe	112.06	275.91	NS
ASIA – Asia	2291.17	624.53	***
$\mathbf{L\_AMERICA_{CARR}}$ – Latin America & Caribbean	-332.32	238.67	NS
$\mathbf{FDI_{NET\_INFLOWS_{it-1}}}$ – Lagged DV	0.72	0.06	***
Constant	-246.49	357.44	NS
Prob. > F	<.0001		
R-squared	0.75		
Observations	227.00		

Dependent Variable: FDI net inflows - the overall balance of foreign assets to liabilities in a country measured in current US dollars. Level of significance on a two-tailed test denoted by the following symbols: NS – not significant, ^p<0.10, *p<0.05, **p<0.01, ***p<0.001.

4.10 Conclusion

The results of this study support the pollution haven hypothesis in those nations most dependent on textile manufacturing. The relationships observed between FDI net flows and pollution measures show that when it comes to international location decisions, textile manufacturers choose countries where BOD water pollution from the textile and chemical industries is relatively high. The data suggest that as trade policies liberalize and restrictions on location are removed, investors choose to locate in nations that allow them to pollute.

There is further need for separating research on textiles and apparel rather than combining the two sectors as it has been done so far. Production patterns reflect national comparative advantage developing around such a distinction. Examples are provided by both China and India, where India specializes in exporting fabric, while China specializes in importing fabric, but exporting ready-made garments (Chaturvedi, 2003; Mikic et al., 2008; Miroux & Sauvant, 2005; Pan et al., 2008). India and China are also among the top five growers of cotton but their cotton processing industries are so large that they end up being net importers of cotton (Adbelnour, 2007). The US has been able to meet their demands and from 2001 to 2006 alone US exports of raw cotton have grown by over 400% (Abelnour, 2007).

Activists have raised ethical questions about the carbon footprint of a system in which the average cotton bale is grown in the United States, processed into fabric in India, sewn into garments in China, to be re-imported back to the United States for final sale (Gray, 2006; Rosenthal, 2007). The results of this study support such concerns.

Further research could focus on the ethical problems stemming from the promotion and diffusion of a system that is based on growth in demand brought about by the advent of fast fashion. The overall need for such research is to examine perverse incentives of policies based on subsidizing commodity exports but not penalizing re-imported products from those exports. At present in garments, not only are punitive policies not in place, but extra rewards exist for re-importing under the production sharing rule of the US import code.

As other studies, this research notes the limitations of available data. Of the 32 nations identified by Miroux and Sauvant (2005), the nations most often mentioned in the literature with evidence of environmental sourcing – China (Pan et al., 2008), India (Acharyya, 2009; Chaturvedi, 2003; Diebacker, 2000), and Pakistan (Banuri, 1998; Jorgenson, 2007) — are not included as these countries have not reported their values for BOD and water pollution effluents associated with textile and chemical processing to the World Bank in any of the years between 1991 and 2008. These and other countries originally selected, but for which data were also unavailable are listed in Appendix 5. Appendix 6 shows the countries that did make it into the model and provides a comparative look at the independent variable values in the first and last years of the time series.

Even without China, India, and Pakistan the results of this study suggest that in the other major textile exporting countries rising pollution levels lead to an increase in FDI. In many cases the investors in such nations are indeed from China, India and Pakistan, as well as from Turkey, Korea, and Malaysia, which are part of the sample

analyzed in this study (Brautignam, 2008; Busse, 2010; Gibbon, 2003; Miroux & Sauvant, 2005). Further research could examine the legal, ethical, and unfair competition issues that would stem from the growing market power of producers from countries with lax regulatory standards who not only pollute, but in turn invest in other nations that allow pollution to rise.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND FUTURE RESEARCH

5.1 Policy Implications

Chapters 2 and 3 in this dissertation offer evidence that the nationality of MNCs is important for GDP annual growth. This finding challenges the often-stated by economists notion that MNC ownership is unimportant. The policy implication is that it is justifiable for governments to support their MNCs. This finding also challenges the long-held position by the US government not to have an official industrial policy. The justification for the American position is that the wide-spread belief in the US that government should not favor industrial sectors and/or individual market players, which would include MNCs, because the unencumbered markets are the most efficient allocators of resources. In that view, an industrial policy would mean that the government would, in one way or another, "pick winners and losers" and in doing so would interfere with market efficiency. However, other nations, particularly in the developing world, do not subscribe to that philosophy.

The data analyzed here show that for most of the present decade FDI flows into developing countries have increased at the expense of developed countries. For example, at the end of 2008 FDI inflows into Africa had risen to a record value of $88 billion. FDI inflows into Asia grew by 17% to a record $298 billion, FDI into Latin America and the Caribbean grew by 13% to $144 billion, and FDI inflows to the former Eastern Bloc countries grew to a record $114 billion. Meanwhile, FDI into the

developed world dropped by more than 25% (UNCTAD.org). Those 2008 averages are important because they reflect the economic crisis of that year. The rapid global diffusion of the crisis affected all financial markets. The crisis constricted global capital liquidity by devaluing financial assets, lowering aggregate wealth, and impacting the ability of firms to invest (Tong & Wei, 2011). As expected, a drop in FDI inflows is observed by UNCTAD but only in the developed world. The strong growth in inward FDI into the developing world shows that global investors find value in allocating scarce financial resources there. Both Essay 1 and Essay 2 in this dissertation show that developing nations with high MNC concentration have benefited significantly in the past decade. Examples are the following averages from the end of fiscal 2008 – the worst period in capital liquidity during the financial crisis:

- Both developed and developing countries that had a top-ranked MNC incorporated within their borders also had more foreign affiliates than countries that did not, suggesting that countries where home firms grow to relatively large sizes attract FDI

- Developed countries that had a top ranked MNC incorporated within their borders had GDPs 5 times larger than developed countries that did not

- Developing countries that had a top ranked MNC incorporated within their borders had GDPs 12 times larger than those that did not

These numbers also point to a link between MNC ownership and the economic resilience of their home nations. They imply that during recessions countries that house large MNCs may be better capitalized, more resilient, and better positioned for recovery.

Therefore, the debate around policies of MNC government support is important even if it is difficult to resolve.

This dissertation makes an attempt at quantifying the benefits of MNC internationalization at the country level by developing a simple measure of MNC concentration per nation. The measure is developed in Chapter 2 and used in both Chapters 2 and 3. The data available only let us go so far. It would be useful to develop longitudinal measures of MNC brand management. Being able to study how firms acquire and divest entities across time, sectors, and regions would help policy makers understand the strategic expansion of MNCs. At this point private data firms such as Dun and Bradstreet Inc. (D&B) claim to be able to provide such data. However, the data are commercialized under the claim that it is proprietary information. D&B holds, what it claims to be, the largest data set on international merger and acquisitions named "Who Owns Whom". The dataset is infrequently cited in academic literature, but there is some mention of it. D&B representative Brian Atkins of Greenville, SC, provided a rough quote of $10,000 for a specific query on the acquisition and divestments of selected MNCs for the past 11 years. Such costs have made it prohibitively expensive to use the "Who Owns Whom" database in this research.

It is important to study and develop metrics of MNC concentration, diversification, and internationalization because they would help researchers gain insight into spatial management policies of MNCs. Understanding which sectors become attractive and when would aid policy makers gauge market cycles, innovation waves,

changes in consumer demand, and the complicated relationship between consumer demand and supply.

5.2 Suggestions for Future Research on MNCs and Trade Policies

The globalization literature examined in this dissertation argues that deregulation and liberalization policies promoted by the WTO have made it increasingly easy for MNCs to gain market access around the world. Future research could examine the relationship between market access and market power, as well as its impact on national competitiveness. Competitiveness policies are dynamic, reactive to market changes, and varied from country to country. This dissertation examines some aspects of how countries compete today. A major finding in Chapter 4 is that they compete through policy by adjusting their regulatory environments. Chapter 4 shows how market liberalization can have negative consequences because market liberalization, without a corresponding change in regulatory policy, can lead to the creation of perverse incentive for MNC location. The data analysis suggests that market liberalization crates incentives to minimize direct costs and increase social costs in FDI receiving nations. Chapter 4 also shows how the process is related to two major policies that define globalization today – trade liberalization and industrial recruitment.

Policies of industrial recruitment define competition for FDI. The general conclusion of the literature on FDI is that it is beneficial for countries to receive it. However, the findings in this dissertation suggest that there are significant costs associated with FDI competition. Some discussion has been noted in the literature on knowledge sourcing that the costs of concessions made to attract foreign investors may

be too high (Acharyya, 2009; Basile, Castellini & Zanfei, 2008; Blanton & Blanton, 2007; Choe, 2003; Choi & Davidson, 2004). Chapters 3 and 4 in this dissertation examine instances where this could be the case. Chapter 3 discusses the issue of knowledge sourcing – when foreign investors copy local technologies, which makes them more competitive against domestic firms over time. The data suggest that, maybe for this reason, FDI outflows are more important for GDP annual growth than inflows, which would suggest that the benefits of investing would largely accrue to the investor rather than the receiving nation. This concept has been described as value extraction (Ramos, 2009). Further research could examine the costs and benefits of industrial recruitment in relation to value extraction to help governments better gauge an optimum level of concession packages they offer to attract FDI.

It is important to note that the data offered here is of the last decade while much of the literature on FDI examines previous time periods. Other studies using fairly recent data also find little empirical evidence that FDI inflows are as important for economic prosperity as they have been in the past. Further research should examine the current relationship between FDI and other economic indicators to evaluate the costs and benefits of industrial recruitment policies. The benefits are not always clear, particularly if social costs are included.

Chapter 4 shows the negative consequences industrial recruitment can have on the social costs of environmental damage. The data and the literature examined in the essay track how under market liberalization policies the competition for FDI can increase social costs as MNCs may engage in environmental sourcing. Providing

empirical evidence for this phenomenon is important because of the export promoting policies supranational development bodies are embracing. Both the IMF and the World Bank champion export promoting policies that are evaluated by the amount of FDI a nation is able to attract and its impact on its exports. Under those policies, evidence has shown that in certain cases very impoverished developing nations lower their environmental standards to attract additional FDI to be able to make IMF and World Bank loan payments (Schofer & Hironaka 2005).

Some authors such as Morici (2000) and Zwifel (2006) call for the creation of more coherent and binding global governance structures. But answering this call poses challenges because it may impact national sovereignty. An example is the ongoing European Union financial situation where as a result of the financial crisis in some member states, the whole union is moving toward unified fiscal and monetary policies and away from having member states create their own. But the crisis has shown the political ramification of the process. Critics have argued that the democratic process has been impacted, national sovereignty has been compromised, and individual citizens have been removed from the decision making process (Auer, 2012; Mistral, 2010). Further research could examine the relationship between global governance and national governance in the context of policy. This dissertation shows that there are negative consequences of liberalization policies in the absence of reactive international regulatory structures that can respond to the changes those liberalization policies create. The creation and management of such global governance structures can be the focus of scholars who wish to take the subjects examined here further.

APPENDICES

Appendix 1: Essay 1, List of Developed Nations

Country	GDP (OER)	GDP (PPP)	FDI In-flows	FDI Out-flows	Non-fin MNCs	Fin MNCs	Exports	Imports	Un-employment	GNI pc	Population
Australia	700700	638731	-24246	-31137	1	1	86890	98100	5.1	29480	20090
Austria	304500	267053	10870	11145	0	0	102700	101200	4.4	37060	8185
Belgium	364700	324299	34379	32658	1	4	255700	235000	12.0	36340	10364
Canada	1115200	1111846	25692	27536	2	2	315600	256100	7.0	33100	32805
Finland	193200	161099	4750	4223	1	0	61040	45170	8.9	38480	5223
France	2110200	1811561	89949	114978	13	4	419	420	10.1	34940	60656
Germany	2781900	2498471	47439	75893	12	6	893300	716700	10.6	35110	82431
Hong Kong	117700	226766	33625	27916	25	0	286100	275900	6.7	28150	6899
Ireland	196400	3602894	-31689	14313	1	0	103800	60650	4.3	42030	4016
Israel	123400	164190	4818	2946	0	0	34410	36840	10.7	20250	6277
Italy	1723000	1694706	19975	41826	3	3	336400	329300	8.6	30550	58103
Japan	4505900	4009327	2775	45781	9	3	538800	401800	4.7	38950	127417
Kuwait	74700	44675	234	5124	0	0	27420	11120	2.2	30940	2336
Luxembourg	31000	27270	5980	9039	0	0	13400	16300	4.5	69220	0
Netherlands	594800	498703	47791	131816	5	5	293100	252700	6.0	39880	16407
Norway	283900	193660	5413	21966	2	0	76640	45960	4.3	62310	4593
Singapore	116800	124001	15460	11218	10	0	174000	155200	3.4	31890	4426
South Korea	787600	1099066	7055	4298	6	0	250600	214200	4.0	16900	48423
Spain	1123700	1026340	25020	41829	4	2	172500	222000	10.4	25450	40341
Sweden	354100	267247	9913	26211	1	1	121700	97970	5.6	42070	9002
Switzerland	365900	241265	-951	51116	4	3	130700	121100	3.4	56800	7489
UK	2192600	1825837	176006	80833	13	5	347200	439400	4.8	38800	60441
US	11170000	12332296	104773	15368	24	11	795000	1476000	5.5	38800	295734

Appendix 2: Essay 1, List of Developing Nations

Country	GDP (OER)	GDP (PPP)	FDI In-flows	FDI Out-flows	Non-fin MNCs	Fin MNCs	Exports	Imports	Un-employment	GNI pc	Population
Afghanistan	7200	32382	271	0	0	0	446	3759	40.00	280	29929
Argentina	183300	516958	15066	1311	0	0	33780	22060	14.80	4460	39538
Brazil	794100	1552542	18146	2517	3	0	95000	61000	11.50	3970	186113
Bulgaria	26600	71381	3916	310	0	0	9134	12230	12.70	3490	7450
Cameroon	17000	40744	225	-9	0	0	2445	1979	30.00	910	16380
Chad	5.5	14756	-99	0	0	0	365	501	60.00	440	9826
Chile	115300	186733	6984	2183	0	0	29200	22530	8.50	5930	15981
China	2228900	8091851	72406	12261	10	0	583100	553400	9.80	1740	1306314
Costa Rica	19400	44579	861	-43	0	0	6184	1736	6.60	4660	4016
Ecuador	36200	56.799	493	0	0	0	7560	7650	11.10	2920	13364
Egypt	98300	302803	5376	92	1	0	11000	19210	10.90	1200	77506
Estonia	13100	22239	2869	691	0	0	5701	7318	9.60	9760	1333
Fiji	2800	5364	157	10	0	0	609	835	7.60	3550	0.893
Grenada	500	440	70	0	0	0	46	208	12.50	5210	0.09
Hungary	109200	162289	7709	2179	0	0	54620	58680	5.90	10260	10007
India	785500	3602894	7622	2985	2	0	69180	89330	9.20	740	1080264
Libya	38800	65.675	1058	128	0	0	18650	7224	30.00	6290	5766
Malawi	2100	7507	52	1	0	0	503	521	58.00	210	12159
Malaysia	130110	289606	4604	2972	6	0	123500	99300	3.00	5210	23953
Maldives	800	2557	9	0	0	0	90	392	0.01	2610	0.349
Mexico	768400	1064899	22351	6474	7	0	182400	190800	3.20	8080	106203
Mongolia	1900	5230	185	0	0	0	853	1000	6.70	810	2792

Essay 1, List of Developing Nations (Continued)

Country	GDP (OER)	GDP (PPP)	FDI In-flows	FDI Out-flows	Non-fin MNCs	Fin MNCs	Exports	Imports	Un-employment	GNI pc	Population
Morocco	51700	138006	1653	75	0	0	9754	15630	12.10	1950	32726
Oman	24300	39599	1538	234	0	0	13140	6373	15.00	10470	3002
Peru	78400	164110	2579	-215	0	0	12300	9600	9.60	2660	27926
Philippines	98300	409445	1854	189	1	0	38630	37500	11.70	1260	87857
Poland	299200	512890	10293	3406	0	0	75980	81610	19.50	6240	38635
Russia	763700	1585470	12886	12767	0	0	162500	92910	8.30	4460	143420
Serbia	27100	43462	1573	22	0	0	3245	9538	30.00	3510	10829
Solomon Is.	300	800	19	0	0	0	74	67	24.00	890	0.538
South Africa	240200	532011	6647	930	10	0	41970	39420	26.20	4810	44344
Suriname	1300	2812	348	0	0	0	495	604	17.00	3310	0.438
Tanzania	12100	27006	494	0	0	0	1248	1972	40.00	350	36766
Turkey	363300	570748	10010	1062	0	0	69460	94500	9.30	6230	69661
Uganda	8700	48620	380	0	0	0	622	1306	35.00	300	27269
Venezuela	138900	153331	2589	1170	1	0	35840	14980	17.10	4950	25375
Vietnam	52400	255995	2021	65	0	0	23720	26310	1.90	620	83536

Appendix 3: Essay 2, List of Developed Nations

Country	GDP (PPP)	FDI In-flows	FDI Out-flows	Tax Rate	Non-Fin MNCs	Fin MNCs	MNC Pur-chases	MNC Sales	Exports	Imports	Un-em-ploy-ment	GNI	Popu lation	Trade Block
Australia	393900	2399	468	36	2	1	53	160	56000	61000	8.1	21060	18784	0
Austria	184500	2974	3301	34	0	0	58	81	62500	65800	7.0	26200	8139	2
Belgium	236000	0	0	40	1	3	104	87	145100	137100	12.0	25470	10182	2
Canada	688300	24744	17246	45	3	2	255	293	210700	202700	7.8	20870	31006	1
Finland	103600	4610	6615	28	0	0	92	57	43000	30700	12.0	25080	5158	2
France	1320000	46545	126854	40	13	4	340	291	289000	255000	11.5	24820	58978	2
Germany	1813000	50076	108689	52	11	6	525	305	510000	426000	10.6	26140	82087	2
Hong Kong	168100	24578	19369	16	8	0	54	64	188080	208630	5.5	25490	6847	0
Ireland	67100	18211	-6909	28	0	0	90	52	60900	43700	7.7	16490	3633	2
Israel	101900	3211	746	36	0	0	26	37	22100	26100	8.7	18620	5750	0
Italy	1181000	6911	6722	41	3	3	103	150	243000	202000	12.5	20990	56735	2
Japan	2903000	12742	22745	48	17	3	52	53	440	319	4.4	32360	126182	0
Kuwait	43700	72	23	55	0	0	4	1	14300	7800	1.8	15630	1991	0
Luxembourg	13900	0	0	37	0	1	6	18	7100	9400	3.0	43450	0.429	2
Netherlands	348600	41205	57610	35	5	5	253	158	160000	142000	4.1	26260	15808	2
Norway	109000	6790	5833	28	0	0	43	107	39800	37100	2.8	34870	4439	4
Singapore	91700	16578	8002	26	4	0	50	48	128000	133900	5.0	22960	3532	5
Spain	645600	18743	44382	35	0	2	100	144	111100	132100	20.0	15230	39168	2
Sweden	175000	60960	21928	28	3	1	215	131	85500	66600	6.3	29140	89111	2
Switzerland	191800	11719	33276	25	5	3	125	113	94400	95500	3.3	40020	7275	4
UK	1252000	87979	201451	31	11	5	614	587	271000	304000	7.5	24810	59113	2
US	8511100	283376	209391	40	27	11	1,327	964	663000	912000	4.5	32270	272640	1

Appendix 4: Essay 2, List of Developing Nations

Country	GDP (PPP)	FDI In-flows	FDI Out-flows	Tax Rate	Non-Fin MNCs	Fin MNCs	MNC Pur-chases	MNC Sales	Exports	Imports	Un-em-ploy-ment	GNI	Popula-tion	Trade Block
Afghanistan	20000	6	0	20	0	0	0	0	80	150	8.0	200	25824	0
Argentina	374000	23988	1730	35	2	0	12	94	26000	32000	12.0	7560	36738	3
Brazil	1035200	28578	1690	15	4	0	8	149	51000	57600	8.5	4130	171853	3
Bulgaria	33600	819	17	15	0	0	0	41	4500	4,600	12.6	1450	8195	0
Cameroon	29600	-15	-12	39	0	0	0	0	1600	1300	30.0	630	15456	0
Chad	7500	25	-2	40	0	0	0	1	220	252	60.0	200	7557	0
Chile	184600	8761	2556	15	4	0	-1	44	14900	17500	6.8	4920	14973	0
China	4420000	40319	1774	33	9	0	10	55	183800	147000	10.0	840	1246872	0
Costa Rica	24000	619	5	30	0	0	1	3	3900	4500	5.6	3470	3674	0
Ecuador	58700	648	2	25	0	0	-1	0	3400	2900	12.0	1490	12562	3
Egypt	188000	1065	38	20	0	0	3	14	5500	16700	10.0	1290	67274	0
Estonia	7800	303	84	24	0	0	-2	30	2600	3900	9.6	3890	1409	0
Fiji	5400	79	-30	35	0	0	1	1	655	838	6.0	2390	0.8	0
Grenada	340	42	0	30	0	0	0	0	22	167	20.1	3340	0.97	0
Hungary	74500	3312	250	18	2	0	8	55	20700	22900	10.8	4430	10186	0
India	1689000	2168	80	35	1	0	12	49	32170	41340	5.8	440	1094.6	0
Libya	38000	-128	226	30	0	0	1	0	6,800	4000	30.0	5530	4993	0
Malawi	8900	58	0	38	0	0	0	-1	405	475	58.0	170	10000	7
Malaysia	215400	3895	1422	28	2	0	5	54	74300	59300	2.8	3360	21376	5
Maldives	500	12	0	9	0	0	0	0	59	302	0.01	2050	0.3	0
Mexico	815300	13728	1901	35	3	0	17	37	117500	111500	2.6	4470	100294	1

Essay 2, List of Developing Nations (Continued)

Country	GDP (PPP)	FDI In-flows	FDI Out-flows	Tax Rate	Non-Fin MNCs	Fin MNCs	MNC Pur-chases	MNC Sales	Exports	Imports	Un-em-ploy-ment	GNI	Popula-tion	Trade Block
Mongolia	5800	30	0	25	0	0	1	0	317	472	4.5	420	2617	0
Oman	18600	39	3	12	0	0	0	0	7600	4000	15.0	6090	2447	0
Peru	111800	1940	128	30	0	0	1	6	6800	10,300	8.2	2100	26625	3
Philippines	270500	1247	133	33	1	0	4	31	25000	29000	9.6	1030	79346	5
Poland	263000	7270	31	34	0	0	6	84	27200	37500	10.0	4390	38609	0
Russia	593400	3309	2208	43	0	0	11	35	71800	58500	11.5	1760	146394	0
Serbia	25400	112	0	20	0	0	0	0	2300	3900	35.0	1740	11207	0
Solomon Is.	1150	-19	0	35	0	0	0	0	184	151	24.0	1200	0.455	0
South Africa	290600	1502	1580	42	2	0	71	40	28700	27200	30.0	3150	43426	7
South Korea	583700	9883	4198	31	6	0	0	92	133000	154000	7.9	9220	46885	0
Suriname	1480	-62	0	36	0	0	0	0	549	553	20.0	1610	0.431	0
Tanzania	22100	497	0	30	0	0	0	1	952	1460	40.0	260	31271	7
Turkey	425400	783	645	33	0	0	4	10	31000	47000	10.0	3360	65599	0
Uganda	22700	140	0	30	0	0	0	3	476	1400	35.0	280	22805	6
Venezuela	194500	2890	872	34	0	0	2	5	16900	12400	11.5	3550	23204	3
Vietnam	134800	1448	0	35	0	0	0	6	9400	11400	25.0	360	77311	5

Appendix 5: Essay 3, List of Non-reporting Nations

Country	Net FDI		H_2O Textile Industry		H_2O Chemical Pollution		Carbon Dioxide Damage		Agricultural Imports		People on > $2		GNI per capita	
	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008
Cape Verde	1199580	213833532	..	.	..	..	458073	2442717	2.39	1.69	40.22	40.22	1210	3510
Mauritius	6516611	325298218	..	..	..		7604016	28532671	2.70	2.61			4730	12780
Tunisia	122212258	2600674977	..	..	..	..	77396053	194547343	3.65	1.91	20.39	12.82	2920	7530
India	73537638	22807027034	..	..	..	..	3687287964	13350715404	3.12	1.57	81.71	75.59	910	3000
Pakistan	262151742	5389000000	..	..	..	..	341008037	1113155322	3.79	4.94	88.18	60.31	1260	2570
Belarus	..	2149200000	..	..	..	..	535498611	648504968	2.43	1.31	13.6	13.6	4810	12840
Macedonia	..	612032086	..	..	..	..	56322167	95289763	3.44	0.88	3.53	5.3	5330	10780
Haiti	11800000	29800000	0	..	0	..	4983837	13518009	..	..	72.15	72.15	1010	1140
China	3453000000	94320092014	..	..	..	..	12669884165	54876987807	6.16	3.56	78.58	36.27	890	6250
Hong Kong	..	3082975862	..	..	..	..	144384683	349203731	2.18	0.61			17950	46260
Lao PDR	6900000		..	..		..	1264282	12955610	..	..	84.82	76.85	710	2090
Macao	..	3494246375	..	..	..	..	5460233	26956234	3.57	0.29			17370	56760
Maldives	6500000	15427007	..	..	..	..	861178	6683740	2.10	3.16			1970	5370
Northern Mariana Islands	..		..	..	..	..	0	0	..	..				

Appendix 6: Essay 3, List of Reporting Nations

Country	Net FDI		H_2O Textile Industry		H_2O Chemical Pollution		Carbon Dioxide Damage		Agricultural Imports		People on > $2		GNI per capita	
	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008
Egypt	191000000	7574400000	31.1	31.1	13.9	13.9	393320000	1426884995	7.5	3.3	27.6	18.5	2370	5710
Lesotho	273587899	218041081	90.1	90.8	0.8	1.2	0	0	0.9	0.9	70.9	62.3	1080	1920
Madagascar	13681240	85444105	59.9	58.9	11.7	12.4	5368618	24286833	1.2	0.6	88.4	89.6	660	1030
Bangladesh	1390444	973108114	77.1	77.1	3.2	3.2	79649774	345626849	4.3	7.8	92.5	81.3	570	1600
Korea, Rep.	-308800000	-10594700000	25.0	9.3	9.6	12.1	1329218581	4003584061	6.8	..			8960	27080
Nepal	19160171	995124	38.7	38.7	5.8	5.8	4800607	25111290	5.6	4.6	88.1	77.6	550	1120
Albania	20000000	843676732	59.8	60.2	..	..	19843732	39752586	0.9	0.8	6.5	7.8	2020	8360
Bulgaria	55900000	8472194673	20.7	28.0	10.5	10.5	298443872	418912933	2.8	1.1	4.2	4.2	4650	13250
Czech Republic	564357920	8966891345	15.2	7.4	7.1	10.9	749901732	994212914	2.8	1.3	2.0	2.0	10520	24690
Estonia	80399561	875931162	23.6	8.8	6.7	8.4	135911735	154205511	2.7	2.0	2.8	2	6970	20360
Latvia	27291249	1092000000	19.9	12.6	5.6	5.6	72398599	63241868	1.0	1.5	2.0	2.0	7080	17930
Lithuania	30175187	1383367895	23.3	19.3	5.7	7.6	120352212	123310730	3.9	1.4	15.2	2.0	9080	18940
Turkey	783000000	15414000000	30.3	35.7	8.3	9.8	747941973	2061464341	3.8	2.2	9.8	8.2	2920	7530
Dominican Republic	145000000	2884700000	73.1	73.1	2.3	2.3	50644577	190686067	2.0	1.1	14.5	12.3	2730	8060
Cambodia	33000000	794691393	6.8	59.4	33.5	33.5	2308689	35903716	3.3	2.0	77.9	57.8	650	1960
Fiji	11927695	332673303	38.6	38.6	4.3	4.3	3371419	12133993	0.4	0.3			2400	4600
Indonesia	1482000000	3418723399	31.6	31.6	12.8	12.8	906746801	2798459963	4.7	3.0	56.9	60.0	1390	3740
Sri Lanka	43825645	690500000	43.6	43.6	9.0	8.9	20301806	103821018	2.2	1.1	49.5	39.7	1520	4400

Appendix 7: Essay 3, List of All Nations

Country	Net FDI		H_2O Textile Industry		H_2O Chemical Pollution		Carbon Dioxide Damage		Agricultural Imports		People on > $2		GNI per capita	
	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008
Cape Verde	1199580	213833532	..	..	..	..	458073	2442717	2.4	1.7	40.2	40.2	1210	3510
Egypt, Arab Rep.	191000000	7574400000	31.1	31.1	13.9	13.9	393320000	1426884995	7.5	3.3	27.6	18.5	2370	5710
Lesotho	273587899	218041081	90.1	90.7	0.8	1.2	0	0	0.9	0.9	70.9	62.3	1080	1920
Madagascar	13681240	85444105	59.9	58.9	11.7	12.4	5368618	24286833	1.2	0.6	88.4	89.6	660	1030
Mauritius	6516611	325298218	..	..	..		7604016	28532671	2.7	2.6			4730	12780
Tunisia	122212258	2600674976	..	..	..	..	77396053	194547342	3.7	1.9	20.4	12.8	2920	7530
Bangladesh	1390444	973108114	77.1	77.1	3.2	3.2	79649774	345626849	4.3	7.8	92.5	81.3	570	1600
India	73537638	22807027034	..	..	..	..	3687287964	13350715404	3.1	1.6	81.7	75.6	910	3000
Korea, Rep.	-308800000	-10594700000	25.0	9.3	9.6	12.1	1329218581	4003584061	6.7	..			8960	27080
Nepal	19160171	995124	38.7	38.7	5.8	5.8	4800607	25111290	5.6	4.6	88.1	77.6	550	1120
Pakistan	262151742	5389000000	..	..	..	..	341008037	1113155322	3.8	4.9	88.2	60.3	1260	2570
Albania	20000000	843676732	59.8	60.2	..	..	19843732	39752586	0.9	0.8	6.5	7.9	2020	8360
Belarus	..	2149200000	..	..	..	..	535498611	648504968	2.4	1.3	13.6	13.6	4810	12840
Bulgaria	55900000	8472194673	20.7	28.0	10.5	10.5	298443872	418912933	2.8	1.1	4.2	4.2	4650	13250
Czech Republic	564357920	8966891345	15.2	7.4	7.1	10.9	749901732	994212914	2.8	1.3	2.0	2.0	10520	24690
Estonia	80399561	875931162	23.6	8.8	6.7	8.4	135911735	154205511	2.7	2.0	2.8	2.0	6970	20360
Latvia	27291249	1092000000	19.9	12.6	5.6	5.6	72398599	63241868	1.0	1.5	2.0	2.0	7080	17930
Lithuania	30175187	1383367895	23.3	19.3	5.7	7.6	120352212	123310730	3.9	1.4	15.2	2.0	9080	18940
Macedonia, FYR	..	612032086	..	..	..	..	56322167	95289763	3.4	0.9	3.5	5.3	5330	10780

Essay 3, List of All Nations (Continued)

Country	Net FDI		H_2O Textile Industry		H_2O Chemical Pollution		Carbon Dioxide Damage		Agricultural Imports		People on > $2		GNI per capita	
	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008	1991	2008
Turkey	783000000	15414000000	30.3	35.7	8.3	9.8	747941973	2061464341	3.8	2.2	9.8	8.2	2920	7530
Dominican Republic	145000000	2884700000	73.1	73.1	2.3	2.3	50644577	190686067	2.0	1.1	14.5	12.3	2730	8060
Haiti	11800000	29800000	0.0	..	0.0	..	4983837	13518009	..	..	72.2	72.2	1010	1140
Cambodia	33000000	794691393	6.8	59.4	33.5	33.5	2308689	35903716	3.3	2.0	77.9	57.8	650	1960
China	3453000000	94320092014	..	..	..	..	12669884165	54876987807	6.2	3.6	78.6	36.3	890	6250
Fiji	11927695	332673303	38.6	38.6	4.3	4.3	3371419	12133993	0.4	0.3			2400	4600
Hong Kong	..	3082975862	..	..	..	..	144384683	349203731	2.2	0.6			17950	46260
Indonesia	1482000000	3418723399	31.6	31.6	12.8	12.8	906746801	2798459963	4.7	3.0	56.9	60.0	1390	3740
Lao PDR	6900000	..	..	..		..	1264282	12955610	..	..	84.8	76.9	710	2090
Macao	..	3494246375	..	..	..	..	5460233	26956234	3.6	0.3			17370	56760
Maldives	6500000	15427007	..	..	..	..	861178	6683740	2.1	3.2			1970	5370
Northern Mariana Islands	..	..	..	..	..	..	0	0	..	..				
Sri Lanka	43825645	690500000	43.6	43.6	9.0	9.0	20301806	103821018	2.2	1.1	49.5	39.7	1520	4400

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