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# Examining Intellectual Property Rights, Innovation and Technology Within the Caricom Single Market and Economy

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# Walden University

College of Social and Behavioral Sciences

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Abiola Inniss

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2017

Abstract

Examining Intellectual Property Rights, Innovation and Technology Within the

Caricom Single Market and Economy

by

Abiola Inniss

LLM, DeMontfort University, 2007

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy and Administration

Law and Public Policy

Walden University

November 2017

## Abstract

Caricom Single Market and Economy (CSME) firms operate under various laws and policies on intellectual property rights (IPRs), innovation and technology. International analyses and rankings rate the CSME countries' performance as poor in comparison with others at the same level of economic development. This results in negative impacts on the economic and social welfare of their communities. A paucity of data existed concerning the effects of policies on decisions by local firms to engage in innovation and technology activities. The purpose of this qualitative case study was to examine the effects of policies on IPRs, innovation, and technology on firms in select CSME countries. The questions addressed how IPRs policies affect the choices of innovation activities by firms, and what differences in IPRs policies in Guyana, Barbados, Trinidad and Tobago and Jamaica, influence the decisions by firms to invest in innovation and technologies. Landes and Posner's utilitarian exposition that IPRs should be based on the maximization of social welfare provided the theoretical framework for the study. Various policy papers, firm studies, study reports, and legislation from government and international agencies were analyzed using 4 levels of inductive coding. Findings included a lack of clear IPRs policies, high levels of innovation where policies were weakest, and a general reluctance by firms in the countries to invest in innovation and technology. Further study of the sociological and cultural aspects of IPRs policies, and how they affect innovation in CSME is recommended. This study can help effect social change in the CSME by informing policies that maximize social welfare through innovation and technology.

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## Chapter 1: Introduction to the Study

### **Background**

Economic and political issues in developing countries have been an aspect of international relations and law for several decades. The Declaration on the Establishment of a New International Economic Order of 1974 (NIEO) ushered in significant policy changes in the area of international intellectual property. Through the NIEO, developing countries sought greater transfer of technology from developed countries by reforms in the international intellectual property rights (IPRs) regimes (Chang, 2001). IPR regimes took on international and global perspectives more than ever before, and global policy and development also took IPRs into consideration (Adewopo, 2014). An important landmark in this global scheme was the creation of the World Intellectual Property Organization (WIPO) in 1973 as a specialized agency of the United Nations, which was created to administer treaties that arose from the global attempts to administer IPRs (WIPO, 2014). A global IP system emerged that comprised a set of national, regional, and multilateral legal instruments.

In the mid-1980s, there were some 18 international IP treaties that covered a range of areas such as trademarks, patents, geographical indicators, copyright, and industrial design, most of which were administered by WIPO (Deere, 2008). Developing countries were not involved in the development of the international IP treaties, and their concerns were only considered during the struggles that resulted in the New International Economic Order and a North–South standoff on the reforms of the international IP systems in the 1970s and 80s. In this period, the developed countries responded to the

push from developing countries by demanding stronger international IP protections. The United States, for example, responded to the threat of infringement to its agro-chemical, pharmaceutical, electronic, software, and entertainment industries by recruiting Japan and the European Union in support of its campaign to extend the scope of international IP protections (Drahos, 2002). This was in the interest of gaining maximum returns from increasing trade in goods that had intellectual property value. There were debates between development economists and legal experts about the relationship between IP and development. The proponents of IP rights posited that stronger IP protection would encourage foreign direct investments (FDI), as well as innovation and technology transfer (Deere, 2008). They contended that it would also encourage the growth of national cultural and creative industries, especially because there was the threat of a growing trade in counterfeit medicines and other goods; stronger IP protection could help to protect public health and safety (Deere, 2008).

Others argued that for stronger IP protection to work, the right conditions, tailored policies, laws, and a range of other mechanisms must be put in place (Park, 1997; Asongo, 2014). Rather than transferring technologies to developing countries from developed countries in a systematic way, stronger IPRs mainly result in the transfer of rents to multinational corporate entities in developed countries (Park, 2011). The IP rules enacted to protect innovations could slow the process of development and innovations by constraining the ability to copy and adapt technologies (Asongo, 2014). Developing countries as importers of technologies also sought to adopt the same strategies employed by developed countries when they were at similar stages of development, namely,

copying and reverse engineering of technologies that propelled them to their current levels of prosperity (Asongo, 2014).

### **Latin America and the Caribbean**

According to the historical background of Latin America and the Caribbean (LAC), the establishment of national IP laws started after independence from the Portuguese and Spanish early in the 19th century. Several developing countries in this region promulgated laws much earlier than others and even earlier than developed countries. Brazil became the fourth country after England, the United States, and France to adopt the industrial property law in 1809 (Deere, 2008). The British Empire standardized all of its laws across all of its colonies with some exceptions made for local ordinances. This included intellectual property laws.

The English-speaking Caribbean, prior to independence from its Colonial rulers, adhered to uniform intellectual property laws under the British system. In 1911 the United Kingdom enacted the Copyright Act of 1911 and extended the law to “His Majesty’s Dominion”(Drahos, 2000). Current intellectual property practices in the Caribbean are the purview of each individual country in its exercise of policies and laws as it sees fit (Inniss, 2012). There are no holistic approaches nor overarching regimen for intellectual property that govern the Caribbean Community and Common Market. There is also little information on the interplay of IPR innovation and technology within the

CSME, and how policies affect the choices of innovation activities by firms in these countries (Inniss, 2012).

The positive contribution of innovation and technology as drivers of economic growth in developing countries has been established in scholarship (Dinapoulos Elias, 2010). An understanding of the effect of IPRs, and the effect of policies on innovation and technology activities by firms in the selected CSME countries, are important to the creation of policy that can further economic growth and development using IPRs, innovation, and technology. The intention of this study was to contribute to the knowledge in this area. The dependent variables were the firms and the independent variables were the policies.

### **The Caribbean Community and Common Market-Caricom**

The Caribbean Community and Common Market (Caricom) was established after a period of 15 years during which the hope of a regional integration movement was fed through the establishment and failure of the British West Indies Federation from 1958 to 1962. Political leaders in the Caribbean redoubled efforts to strengthen ties between the islands and mainland (Guyana and Suriname) through developing and strengthening areas of cooperation that existed in the Federation. The Caribbean Free Trade Agreement (CARIFTA) became effective on May 1, 1968, with the participation of Antigua, Barbados, Trinidad, Tobago, and Guyana, and it was augmented later that year with the entry of Dominica, Grenada, St. Kitts/Nevis/Anguilla, Saint Lucia, and St. Vincent in July, and Jamaica and Montserrat on August 1, 1968. British Honduras (Belize) joined the group in May 1971. In October 1972 at a head of government conference, Caribbean

leaders made the decision to transform CARIFTA into a common market and to establish the Caribbean Community that would include the common market as a component.

In April 1973 at the Eighth Heads of Government Conference of CARIFTA held in Georgetown, Guyana, the decision to establish the Caribbean Community was made a reality with the consideration and signing of draft legal instruments and by 11 members of CARIFTA with the exception of Antigua and Montserrat. The Caribbean Community Treaty was signed on July 4 and became effective in August 1973; the four independent countries of Barbados, Jamaica, Trinidad, and Tobago and Guyana made provision in what became known as the Georgetown Accord for the other territories-Antigua, British Honduras, Dominica, Grenada, Saint Lucia, Montserrat, St. Kitts/Nevis/Anguilla, and St. Vincent that signed it to become full members of the community by May 1, 1974 (Caricom, 2015).

### **The Caricom Single Market and Economy**

Following the establishment of the CARIFTA and the strengthening of ties through the establishment of the Caribbean community and common market, some of the principal economies of the region implemented structural adjustment programs under the supervision of multilateral agencies, such as the International Monetary Fund that required programs of economic, financial, and trade liberalization that exceeded their commitments as expressed in the Treaty of Chaguaramas (Caricom, 2015). In 1989 at Grande Anse in Grenada, Caricom heads of government transformed the limited common market as it existed under the original treaty of Chaguaramas into a full-fledged single market and economy (Caricom, 2015).



A revised treaty of Chaguaramas in 2002 prescribed the removal of existing barriers to trade and to the establishment of a single market space in which goods, services, technology, capital, and skilled citizens should have freedom of movement. Market liberalization regulations were drafted to enable the market access in relation to capital flows and other economic and financial facilities that are preferential among the countries in the region (Caricom, 2015).

### **Problem Statement**

There have been increasing global pressures on Caribbean governments to comply with international regulatory regimen for IPRs. This is due to World Trade Organization (2012) requirements that signatory countries must also become Trade Related Aspects of Intellectual Property Rights (TRIPS) compliant (WIPO, 2014). There is also added impetus from the movement of the world economy that is now based on the creation and use of Internet-based technologies and the digitization of information. Additionally, there is international clamor for strengthened protection for IPRs for the intangibles that fall within this category (Yu, 2009).

Stronger IPRs will have positive effects on international trade by allowing firms within developing countries to compete effectively in foreign markets (Braga & Fink, 1997). Also, the harmonization of IPR regimen can reduce the costs associated with international trade (Fink, Primo, & Braga, 2004). Research and innovation, coupled with strong IPRs in some countries, have led to significant developments (Greenaway, 1997).

Conversely, there is argument against the strengthening of IPRs within developing countries (Arundel, 2001; Foray, 2009). Countries that have weak IPR

protections gain greater benefit in the lower priced products and technologies, such as the reproduction of DVDs and CDs; the production of and access to generic drugs, such as the ones used to treat HIV; and chronic diseases, such as high blood pressure and diabetes. This can be seen in the current economic conditions, and such countries benefit from enhanced consumer welfare (Adewopo, 2014). There are often large commercial enterprises set up to facilitate activities related to the reproduction of goods protected by IPRs in developed nations. However, it is important to note the access to medicines and other technologies that assist in raising the standard of living in these societies (Adewopo, 2014).

Because many of these countries are consumers of imported goods, strengthened IPRs will allow foreign firms to have much economic power within them, allowing them to increase prices, curtail exports, and manipulate the markets at will (Arundel, 2001). Park (2012) found that increased IPRs, particularly patents, in developing countries did not influence research and development activities in developed nations because developing nations occupied a small section of the world market share. Although there is literature on the north-south divide in intellectual property, there is little or no discussion of the economic and policy factors that affect the establishment of IPR regimen for countries within the CSME (Inniss, 2012).

The Global Innovations Index is a measuring system created by the WIPO, INSEAD business school, and Cornell University to produce an annual time series dataset from which analyses about the levels of innovation in countries can be measured with their economic development and innovation output. The countries in the dataset

selected for this study were the four largest economies within the CSME, and they can provide information for the conduction of the study. The Global Innovations Index (WIPO, INSEAD, Cornell University, 2015) analysis and rankings as at 2015 revealed that the middle- and high-income CSME countries, when ranked within their respective categories of countries at the same level of economic development worldwide, performed below par. The countries rated were Guyana, Barbados, Trinidad, Tobago, and Jamaica.

In this study, I used a qualitative case study to explore the role of IPRs in these economies within the CSME to see whether IPRs are used as a means of promoting developments in innovation and technology. Second, I looked at the decisions made by firms involved in innovation activities and the development of technologies to find out whether the differences in IPRs policies in these countries influenced the decisions by firms to invest in innovation and technologies. During data analysis, I uncovered answers to questions such as whether policies matter in the choice of innovation activities and identified them using the iterative process of the content analysis methodology detailed in Chapter 3 of this study.

### **Nature of the Study**

The case study, as a research method, allows the researcher to explore individuals and organizations (Baxter, 2008) in simple or complex relationships, programs, or communities and supports the deconstruction and reconstruction of various kind of phenomena. This approach ensures that an issue may be explored from a variety of lenses that will allow multiple facets to be understood (Yin, 2009). According to Yin (2009), a case study should be used in the following instances: (a) the focus of the study is to

answer how and why questions, (b) the researcher cannot manipulate the behavior of the persons involved in the study, (c) it is necessary to cover contextual conditions because the researcher thinks that they are relevant to the phenomenon under study, and (d) the boundaries between the phenomenon and the study are unclear.

In this study, I used the qualitative case study because it afforded me an in-depth look at an area that has not been previously investigated and allowed for exploration of the issue through multiple facets. Researchers who have looked at the relationship between IPR policies, research and development, and innovation have used this methodology.

### **Purpose of the Study**

The purpose of the study was to understand how IPR policies influence the choices of innovation activities by firms, across the select countries: Jamaica, Trinidad and Tobago, Barbados, and Guyana within the context of the Caricom Single Market and Economy. The study was used to find out whether the differences in IPRs policies in these countries influence the decisions by firms to invest in innovation and technologies.

### **Theoretical Framework**

One theory in the field of intellectual property is based on the utilitarian principle that property rights should be shaped by the maximization of social welfare, as presented by Landes and Posner (1989). The utilitarian theory was first developed by Bentham (Harvard, 1780) and expanded by Landes and Posner (1989). According to the utilitarian theory, lawmakers need to balance the power held in exclusive rights by persons who could help to stimulate the creation of inventions and works of art against the tendency of

such rights to curtail public enjoyment of those works (Landes & Posner, 1989). Creators of works could be discouraged from producing them by persons who copy and market them at cheaper prices without threat of negative consequences. This could create reluctance by talented innovators to produce anything of value because they would be discouraged by the lack of suitable reward and protection of their efforts (Dinapoulos, 2010).

This argument is present in the debate about the North-South (developed-developing countries) divide and the transfer of technologies that is discussed in Chapter 2. This economic inefficacy could be avoided by allocating rights to make copies of their works to creators, as well as rights to exclusive economic benefits for a limited period. In this way, the creators of works would be able to charge consumers prices that are more in keeping with the perceived value of the item (Chin, 1988). Lands and Posner (1989) further contended that all other alternative ways in which creators can recoup financial gain are wasteful of social resources. The utilitarian rationale has been used to shape doctrines within the field of intellectual property (Landes & Posner, 1989).

In the current study, the utilitarian theory, which proposes the maximization of social welfare, was instrumental in the examination of how IPRs policies affect choices made by firms on innovation activities that they choose to undertake. It was important in the analysis of whether policies actually take this balance of interests into consideration in the context of intellectual property, innovation, and technology, as well as within the framework of the CSME. In this research, innovation activities means the actual undertaking of research and development of technologies, while investment refers to

financial, technical, and human resource input. The unit of analysis in the study was the intellectual rights policies of the governments in the sample countries.

### **Research Question**

The research questions that were investigated were as follows:

How do IPR policies affect the choices of innovation activities by firms in the CSME countries of Jamaica, Trinidad and Tobago, Barbados, and Guyana?

The following sub-question was also explored:

What differences in IPRs policies in these countries (Jamaica, Trinidad and Tobago, Barbados, and Guyana) influence the decisions by firms to invest in innovation and technologies?

### **Definitions**

*Caribbean Single Market and Economy (Caricom Secretariat)*: Per Walden guidelines, include a definition of this term from a peer-reviewed source here. Cite author and year to show where you received this definition from.

*The Caribbean Community and Common Market (CARICOM)*: Per Walden guidelines, include a definition of this term from a peer-reviewed source here. Cite author and year to show where you received this definition from.

Trade-related aspects of intellectual property rights (TRIPS): Per Walden guidelines, include a definition of this term from a peer-reviewed source here. Cite author and year to show where you received this definition from.

*TRIPS plus*: Arrangements that go beyond the requirements of the TRIPS agreement (WIPO, 2014).

### **Assumptions**

I assumed that the Caricom Single Market and Economy will retain the membership of the select countries under review and that the TRIPS agreement will remain the influential regimen for IPR within the region.

### **Scope**

The study was conducted using data from the countries that are also signatories to the Caricom Single Market and Economy: Barbados, Guyana, Jamaica, and Trinidad and Tobago. These data were obtained from the CSME Secretariat and other sources.

### **Limitations**

The study was limited by the varying levels of information available from the countries under consideration. Though every attempt was made to access the most current data, this depended on the levels of documentation on firm level activities and government policies in relation to innovation and IPRs that existed on the sample countries.

### **Significance**

The construct of a Caribbean Intellectual Property is new because intellectual property was viewed as the individual concern of countries within a geographical area (Inniss, 2012). This did not properly frame the problems that arose from a piecemeal approach to this subject, especially because all of the members of the Caribbean Community-Caricom (Caricom, 2015) were signatories to different regimens that dealt with IPRs. Even with the establishment of the CSME in 1989 (Caricom, 2015), this issue has not been addressed in a holistic manner, and this leaves the region in a state of

discord in the face of international treaty negotiations that deal with intellectual property policy (Inniss,2012).

The World Trade Organization (WTO) requires that all Caribbean countries that are signatories to its agreement implement the 1994 TRIPS (WIPO, 2014) that mandates that these countries implement minimum standards of IPRs, whether or not their economic and policy positions accord with the principles. Most developing countries, including those within the CSME, have not implemented laws that meet the minimal standards of the TRIPs arrangement (Gurry, 2013).

The underlying policy issues that inform the reluctance of these countries to implement laws include the restricted access to medicines, food technologies, the exploitation of traditional knowledge and agricultural and scientific resources, as well as other technologies, much of which come from developed countries. The impact on Caribbean citizens who are denied access to medicines that have been restricted by international regimen such as TRIPS (through which patents and other forms of protection make access difficult) is likely to be damaging (Asongo,2014). Odagiri, Goto, and Sunami (2010) stated:

Patents, as commonly argued, may promote innovation and catch-up. They may also foster formal technology transfer. Yet they may prove to be barriers for developing countries in acquiring technologies through imitation and reverse-engineering. Therefore, the current move to harmonize the IPR system internationally, such as the TRIPS agreement, may have unexpected but grave consequences on developing countries. (p. 2)



These arrangements often require economic measures to counterbalance them, which are outside the reach of the economies of the countries in which they live (Asongo, 2014).

Caricom's lack of ability to negotiate conditions in the international sphere comes from the absence of a common positional framework, such as a legal and regulatory regime that will provide an ordered and unified approach to IPRs (Inniss, 2012). Further, the Global Innovations Index (2015) indicated that the Caribbean countries are still performing at a level below that of other economies in terms of the export of high technology goods and the production of creative goods.

In this project, I investigated how IPR policies affect the choices of innovation activities by firms and whether the differences in IPRs policies in these countries influence the decisions by firms to invest in innovation and technologies. This study can contribute to the body of knowledge in the area of intellectual property, innovation, and technology within the framework of the Caribbean Single Market and Economy (further discussion of this is undertaken in Chapter 3).

### **Implications for Social Change**

The reference to the term social change has been understood as describing changes over time in societal organizations and social structures. This includes changes in the supra-individual entities, such as markets and economies, power hierarchies, composition of populations, and social networks (Reitzle, 2005). The focus of this study was on understanding how IPR policies affect the choices of innovation activities by firms and whether the differences in IPRs policies in these countries influence the decisions by firms to invest in innovation and technologies. Innovation activities

contribute to social change both directly and indirectly because societies move forward when innovations take place (Sacramento,2009). This movement results from the need to adapt to, or adopt, implement and improve some processes and procedures in several spheres of living. There are also products that will be created, or that will necessitate getting accustomed to, that make social change unavoidable (Sacramento, 2009).

This study can make a significant contribution to the current knowledge on IPRs and innovations within the context of the CSME. The findings can also assist in informing policies that are formulated for the development of innovations and technology within the Caricom Single Market and Economy.

## Chapter 2: Literature Review

### **Introduction**

The literature on IPR covers a range of opinion on whether or not it is necessary to have such rights within countries and the international trade space. In this literature review, I focused on the aspects of economics and policy of intellectual property within developing nations. IPRs can be defined as entitlements or rights protected by law within countries that provide exclusive rights under the framework of patents, trademarks, copyrights, industrial designs, trade secrets, traditional knowledge (WIPO, 2014).

In this review, I outline the development of the subject area chronologically and focuses on the seminal works in the field. Several studies that date older than 5 years before the creation of this literature review remain authoritative in the area of international intellectual property and are cited in scholarly works internationally. One example of this is the work of Deere (2008) whose exposition on developing countries, TRIPS, and intellectual property spanned more than a decade of research that culminated in 2008 in a foundational text. There is reference to international regimens, such as the Paris Convention, the TRIPS of 1994, the Madrid Trademark System that comprises the Madrid Agreement Concerning the International Registration of Marks, and the Protocol relating to the Madrid Agreement (WIPO, 2014.), as well as other bilateral and multilateral agreements that govern the conduct of trade and intellectual property matters. The basis for IPRs is the promotion and protection of innovations through the recovery of some compensation for effort in research and development (R&D).

### **The Literature Search Strategy**

The literature search was carried out using a number of resources, such as journal websites, dissertations available from electronic sources, and reference lists from articles relevant to the topic, as well as a small number of seminal works in the form of books. The databases included AB/INFORM, Academic Search Premier, EBSCO, Mendeley Scholarly Paper search, and Google Scholar. Dissertations were researched as available through Walden University, and international dissertations available through ProQuest were also researched, along with journal websites. The search terms used were *international intellectual property, intellectual property in developing countries, economics and intellectual property, economics of intellectual property, Caribbean economies, developing countries and intellectual property, TRIPS agreement and developing countries, economics, intellectual property and developing countries*. A comprehensive search of hundreds of articles and other sources was carried out, and then a narrowing of the sources according to relevance was done. A chronological ordering of the literature was then done in order to trace the developments in the subject area from a short period before the 1994 TRIPS agreement to 2014.

### **The Focal Point**

Although there exists some form of IPRs protection in many countries, these are present in varying degrees and have different levels of importance within the economic and public policy structures of those countries. In looking at the situation from an economic perspective, economists argue that IPR protections represent a tradeoff between the costs of exclusivity and the benefits of innovation. Exclusivity can protect IP

owners from competition and sometimes grant monopolistic power, while property rights encourage the development of new technologies and innovation in many areas including music and the performing arts, all kinds of consumer and industrial products, and traditional knowledge of indigenous peoples.

Because of the need to balance the interests between exclusivity and creativity, many legal systems have placed limits on IPRs protection schemes in terms of scope and duration, so that when a patent expires, the information that it protected becomes accessible in the public domain. The issue of counterfeiting in developing countries is a concern for developed countries. The International Chamber of Commerce placed a figure of \$250 billion U. S. dollars in revenues lost to G20 countries (G20 Turkey, 2015) in 2009 and estimated that by 2015, this would increase to some \$360 billion U.S. dollars (Frontier Economics Ltd., 2011). G20 comprises 19 countries plus the European Union (G20 Turkey, 2015).

### **Theoretical Foundation**

The utilitarian principle that property rights should be shaped on the basis of maximization of social welfare, as presented by Lands and Posner (1989), has impacted the IPR debate. The utilitarian theory was first developed by Bentham (Harvard, 1780) and further expanded by Landes and Posner within the context of intellectual property. According to the utilitarian theory, lawmakers need to balance the power held in exclusive rights held by persons who could help to stimulate the creation of inventions and works of art against the tendency of such rights to curtail public enjoyment of those works. Lands and Posner argued that creators of works could be discouraged from

producing them by persons who copy and market them at cheaper prices with impunity. This could create reluctance by talented innovators to produce anything of value because of a lack of suitable reward and protection for their efforts (Dinapoulos, 2010).

This argument is present in the debate about the North-South (developed-developing countries) divide and the transfer of technologies, which is discussed in this literature review in both empirical and theoretical sections. Economic inefficacy could be avoided by allocating rights to make copies of their works to creators as well as rights to exclusive economic benefits for a limited period, thereby balancing the interests of both sides. In this way, the creators of works will be able to charge consumers prices that are more in keeping with the perceived value of the item (Chin, 1988).

Landes and Posner (1989) further contended that other ways in which creators can recoup financial gain are wasteful of social resources. The utilitarian rationale has been used to shape doctrines within the field of intellectual property (Landes & Posner, 1989). In this study, this theory framed the examination of how IPRs policies affect choices made by firms on innovation activities in which they may elect to engage based on the lack or presence of IPRs that might provide protections for their innovations.

The utilitarian theory is different from the competing theory of natural rights in intellectual property, which is separated into two arguments. The first argument is that of personality, and it is commonly associated with European copyright traditions that hold that a work should be protected because it is an expression of the author's personality (Fisher, 2001). The second is that of labor, in which there is a natural right to property where someone labors on resources that are not owned by anyone or which are held in

common with others (author, year). The natural rights theory is grounded in the work of Locke, whose theory of property contained themes of labor and self-ownership (Fisher, 2001). Locke argued that prior ownership of a person's body entitled him or her to the products produced by that body; by extension, ideas coming from a person carry the same right of ownership (Fisher, 2001). Locke posited that the appropriation of the results of a person's labor did not deprive others or make their positions worse and that there should be no spoilage because of it (nonwaste requirement; Fisher, 2001).

This Lockean natural rights approach does not support the argument for the balancing of resource in which the exclusive rights held by those who could stimulate inventions and creations of works of art and other products should be balanced with the right of the public to enjoy such works. The utilitarian theory is supportive of the arguments for the balancing of the proprietary interests with public access and allows for the investigation of the questions posed within the theoretical framework.

### **Conflicting Arguments**

Countries that have weak IPR protection gain greater benefit in the lower priced products and technologies, such as the reproduction of DVDs and CDs (Shah, Warsh, & Kesselheim, 2013). Software piracy benefits poor countries because it results in positive income redistribution effect (Asongo, 2014). The production of and access to low cost generic drugs, such as the ones used to treat HIV and chronic diseases like high blood pressure and diabetes, have been affected by the implementation of IPR regulations found in the WTO-TRIPS agreement. The WTO-Doha declaration on TRIPS and public health affirmed that governments had the right to prioritize public health over IPRs.

According to Gleeson and Friel (2013), agreements such as the recent Transpacific Partnership Agreement (TPP) can have negative consequences for developing countries because the balance of power in negotiations would rest with developed countries. Such countries benefit from enhanced consumer welfare; there are often large commercial enterprises that are set up to facilitate these activities. The important factor, however, is the access to medicines and other technologies that assist in raising the standard of living in these societies (Adewopo, 2014). These countries must weigh national exigencies against the possible loss of international interest in investing in technological areas and in the local production of indigenous technologies.

Proponents for less stringent IPRs in developing countries have argued that economic growth was achieved in countries such as China, India, Brazil, and other Asian countries that had traditionally weak IPR laws (Mazolleni & Povoia, 2010). There are other arguments that stronger IPRs will contribute to improved economic growth and welfare (Gurry, 2013), as well as opposing views that this will be detrimental to their growth and development (Adewopo, 2014).

### **The Sections**

The review is divided into two sections following the trend of the economic literature on the relationship that occurs between IPR protection and economic development: the theoretical and the empirical. The theoretical literature deals with the identification of the potential pathways through which developing countries' IPR protection schemes may impact their economic welfare. Economic welfare has been defined as the levels of prosperity and standards of living of individuals or groups of



people and also as the combination of net benefits to both consumers and industry (Samuelson, 2004). Moreover, researchers have sought to quantify the effects of IPR protection on different measures of economic performance, such as FDI, the growth of gross domestic product (GDP), total factor productivity (TFP), and international trade and innovation.

### **The Theoretical Literature**

In the theoretical literature, I explore costs and benefits of increasing IPR protection. I discuss that the result of increasing IPRS are often a decrease in revenues from the imitation of products coming from developed nations, as well as the increase in the cost of acquiring the protected original goods that originate from developed countries. Potential benefits could include increases in FDI, local innovation, foreign technology transfer, and R&D. Scholars have questioned whether the costs and benefits exist and the total effect of increased IPR protection on consumer welfare and economic growth.

Some researchers used a model of description of developed and developing countries that describes these two “worlds” as the North (developed) and the South (developing), and it is necessary to look at this concept that arose in the pre-TRIPS era, the period before the 1994 TRIPS agreement was signed. The idea of the innovative North and imitative South was popularized in the work of Chin and Grossman (1988) who claimed that there was tension between the North and the South in that while the North pursues technology and innovation, the South imitates and benefits from the Northern efforts without having to compensate them for it.

Further, the researchers found that the South chose to have low levels of IPRS because of the economic benefits of imitation that included contributions to their economic growth. Although this modeling may capture the differences in the incentives between the North and South for economic purposes, it does not address the incentives for the South to increase IPRs protections by the implementations of new IP schemes, public policy and local laws, and the potential benefits in the long term. This issue is considered necessary as part of a holistic discussion; but, it was not the focus of this study. I investigated firm behavior as it related to current intellectual property policies in select countries in the CSME. I explored how IPR policies affect the choices of innovation activities by firms and whether the differences in IPRs policies in these countries influence the decisions by firms to invest in innovation and technologies

Increasing IPR protection in the South may be a catalyst to increasing local innovation, R&D, and economic growth. Diwan and Rodrik (1991) examined the effects of tighter IPRs protection on economic welfare in both the global North and South. Diwan and Rodrik discovered that the countries in the global South that were large-scale consumers of technological innovations were only interested in dealing with IPR protections where the type of innovations that required such safeguards (IPR protections) were different from the ones being produced in the North. Diwan and Rodrik also referred to the North as the large-scale producers of innovations.

Diwan and Rodrik (1991) used a theoretical model of trade and technology that considered that, given their relative economic disadvantage vis a vis the global North, developing countries had incentives to use the resources of the North. Diwan and Rodrik

observed that there was a difference in demand for innovation between the two sides, and they gave the example of the preference of a cancer drug for use in the North while the South might prefer the development of drugs to combat tropical diseases, such as malaria. Diwan and Rodrik found that the greater the difference in the demand for the types of drugs, the higher the incentive for the protection of IPRs. Diwan and Rodrik concluded the correct level of IPRs protections should be implemented within developed and developing countries.

Diwan and Rodrik (1991) concluded that if the South were given greater weight in the calculation of welfare, the overall welfare could be brought to a maximum point by setting greater IPRs protection in the North and lighter ones in the South. Diwan and Rodrik stated that increasing welfare in developing countries was more important than doing so in developed countries. Diwan and Rodrik also claimed that reduction in the IPRs protection in both North and South could take place commensurate with the increasing market size in the South. Diwan and Rodrik used a Nash equilibrium to model how the North and South set their optimal levels of IPRs protection. A Nash equilibrium occurs when all of the strategies of all other market participants are held as a constant (Island, 2010). As the market size in the South increased, the scope of innovation would increase beyond the optimal level and the North would decrease its level of IPRs' protection. A firm cannot achieve a higher level of profit by changing its strategy unilaterally; the result is that in a Nash equilibrium, no participant wishes to change its strategy (Island, 2010).

Concurrently, Diwan and Rodrik (1991) theorized that the larger the Southern market, the greater the incentive to reject stronger IPRS. Diwan and Rodrik produced this counterintuitive theory that differed from Chin and Grossman (1998) because they assumed that the two regions had varying and different requirements and preferences. This difference in assumptions challenged the conclusions that developing countries experienced an increase in economic welfare by large-scale consumption of innovations from the North.

Yang and Maskus (2001) looked at the effects of IPRs protection in the South where there were incentivized by firms in the North in order to allow for innovation and licensing of state-of-the-art technologies in the South. This was done by providing higher rent shares and reducing licensing costs. More rigorous IPRs in the South could result in higher rates of innovation in the North, as well as higher rates of licensing in the South. Yang and Maskus focused on licensing as the means of acquiring technology in the South. Yang and Maskus considered licensing to be important in the following ways: imitation was difficult in some cases to the extent that it became unprofitable and in some technology importing countries, the government policies supported licensing rather than equity investment as the medium of technology transfer. The Northern firm would first choose the intensity or level of effort it would commit to the innovation, and if it was successful, would then decide on licensing. Yang and Maskus revealed that using this model, stronger IPRs protection in the South gave rise to higher rates of licensing in the South and to higher rates of innovation in the North.

When licensing costs decrease, there is greater economic benefit; therefore, more licensing and firms are encouraged to engage in the process. At a certain level of licensing costs, stronger IPRs protections in the South increase the share of licensing rents, encouraging the process. Yang and Maskus found that licensing required fewer resources from the firms in the North and allowed them to invest more in labor for innovation; the transferring of labor to the South allowed for more innovation investment in the North. Additionally, Yang and Maskus found that where stronger IPRs led to technology transfers, the wages in the South rose, and where there was less production, the wages fell. I stopped reviewing here due to time constraints. Please go through the rest of your chapter and look for the patterns I pointed out to you. I will now look at Chapter 3.

Another study by Glass and Saggi (2002), used an oligopoly model which looked at the relationship between increased IPR protection in the South, foreign direct investments and imitation. This paper developed a product cycle model in which imitation, innovation and foreign direct investment were all endogenous. The study found that stronger IPRs resulted in increased cost of production due to more stringent uniqueness requirements. While this allowed for increased protection for multinational firms from the North, it also provided increased protection for firms operating only in the North with the result that the strengthened protections did not alter the projected profits in either.

The researchers concluded that Stronger IPRs did not provide encouragement for foreign direct investment. They also argue that the South was forced to expend more

resources towards a given probability of imitation success where imitation was made costlier and where there was stronger IPR protection. This left fewer resources in terms of labor. This caused foreign direct investment to contract and reduced the demand for labor in the South, and an increase in production in the North, as this occurred there were fewer resources remaining for innovation creating contraction. Additionally, there was a disincentive for imitation which combined with the resource reduction effect worked together to make a significant dent in in foreign direct investment and innovation.

Further research by Lai and Qui (2003), took another look at the long-term effects of IPR protection. In the work, they assumed that both the North and South held the capability to innovate. From this modified model, the researchers concluded that increased IPR protections in the South created a negative welfare effect in the South and a positive one in the North. They also found that in deviation from Lai's first result the effect on global net welfare was positive. It is important to note that previous research papers by Lai (1998), Diwan and Rodnik (1991), Helpman (1993), and, Chin and Grossman (1990), all assumed that the South in general possessed no innovation capabilities.

Yet another study by Lai (Grossman & Lai, 2004), examined the impact of harmonization of intellectual property rights between the North and South and found that stronger IPRs were efficient amounting to welfare maximization, where certain conditions were operative. These conditions were that the countries with larger markets for innovation products and relatively strong human capital resources tended to be more effective in the harmonization. The researchers posited that national policy should be

derived from a country's characteristics and not from the thrust of a global harmonization policy. They concluded that harmonization held greater benefits for the North in that it handed them the balance of power while it caused corresponding damage in the South.

### **The Empirical Literature**

The empirical literature seeks to examine several important questions concerning IPR protection, as well as seemingly to validate and expand on the theoretical models. In an early study, Gould and Gruben (1996), looked at the relationship between IPRs and economic growth. In this study, the researchers used a benchmark growth model, which was a regression per capita GDP growth for 95 countries using a standard set of variables from 1960 which included GDP per capita because growth rates can depend on the beginning level of GDP, physical capital savings, and secondary school enrollment rates which were used as a proxy for human capital savings.

To gauge the strength of IPR protection a measure of patent protection developed by Rapp and Rosek (1990), was used. This measure scored countries on a range from 1 to 6, with 1 representing no IPR protection and 6 being IPR protections consistent with United States law. They noted a positive correlation with economic growth and when the measure of patent protection was added to their benchmark model, they also found a relationship that was positive but not significant. When the instrument variables were used to correct for possible measurement errors and endogeneity issues, the relationship became significant which meant that with an increase in IPR protections there was an increase in economic growth.

The researchers next looked at the correlation between IPR protection and the state of the trade regime of the country i.e. whether it was amenable to trade or not. Three measures of openness to trade were tested: (1) Black market exchange rate premiums, (2) Real exchange rate distortions, and, (3) A composite trade regime index. It was found that there was a negative but insignificant effect, and while this suggested that a differential effect did not exist for closed trade regimes, when they implemented controls for this factor (Closed economies interacting with IPRs) this increased the effect of IPRs protection on the growth of open trade regimes.

In a single specification in which the interaction between IPRs protection and a closed trade regime was significant, the findings suggested that IPR protections had much less effect in closed regimes as against open ones. This specification indicated that open trade regimes with a moderate level of IPRs protection would grow at an approximate rate of 1.4 percent more than a closed trade regime with a comparable level of protection.

A study by Lee and Mansfield (1996), examined the degree to which the perception of a country's patent protection regime by international firms influenced its investment strategies. The researchers posed two questions: (1) Did weak IPR protections lower a U.S firm's foreign direct investment in a foreign country? (2) Did weak IPRs protection increase the likelihood of U.S companies would only transfer older or less effective technologies? They surveyed 94 U.S companies on their perceptions of 14 developing countries and conducted an analysis of the data using two regression models. The results revealed that patent protection made it more likely that firms would increase investments in foreign countries. The specification of the second regression revealed that



IPRs affected the investments made by companies differentially in protecting newer or more effective technologies that were highly valued by the companies.

These results suggested that as countries increased their levels of IPR protections there would be a gradual movement of technologies from developed to developing countries, but the authors noted that creating stronger patent laws might not by itself result in greater foreign investments because this also depended on a country's cultural and legal framework being capable of creating the environment within which the laws would work, since a change in laws did not mean greater enforcement of laws. Lee and Mansfield (1996), noted that without stronger laws and greater enforcement, U.S companies were unlikely to change their perception of investment incentives in these countries.

Park and Ginarte (1997), conducted a study using an IPR index which they created for a panel of 60 countries between the years 1960-1990. They estimated a system of equations to identify the effects of IPRs and some other national characteristics on economic growth and at the same time estimated the effect of IPRs protection directly on which promote growth such as investment, research and development, and education. The researchers found that a broadened measure of market freedom which included such factors as property rights related to wealth, land and earnings, contributed positively to economic growth, while IPRs protection by itself did not do so. The study by Park and Ginarte (1997), was different from previous studies because they constructed their own quantitative index of IPRs protection in which they incorporated five measures related to national patent laws. These were: (1) the extent of coverage such as types of inventions,

(2) membership in international agreements (3) provisions for loss protection, (4) enforcement mechanisms, (5) duration of IPRs protection.

They also found that IPRs protection to be a significant determinant of research and development (R&D) capital accumulation and physical capital accumulation, after they controlled for general market freedom. They found that IPRs protection could affect growth by encouragement of both tangible and intangible capital accumulation.

Park and Ginarte (1997), split the sample by level of development and discovered that benefits of IPRs protection as related to investment only occurred in the top 30 economies and that the effect was not statistically significantly in less developed countries. They concluded that the reason for this was that R&D in developing countries was mostly imitative and not innovative and therefore not amenable to IPRs protection.

Park and Ginarte (1997), also highlighted some of the implications of their findings. They explained that IPRs protection became more important for the growth of developing countries because there was not significant benefit to having IPRs protection when those benefits only accrued to companies outside the countries. They also noted that there was interdependence of IPRs protection and R&D activities and that the expansion of the research base in developing countries afforded them the opportunities and incentives to develop IPRs protection benefitting both local and foreign companies.

Several previous studies such as that by Gould and Gruben (1996), used measures of IPR protection created by Rapp and Rosek (1990), which demonstrated less variability and arguably less ability to explain the findings. There were also other studies

which evaluated the connection between general property rights and economic growth such as Svensson (1998), Sachs-Werner (1995), and Tortensson (1994).

Thompson and Rushing (1999) examined the factors which influenced countries' level of patent protection and tested the effects of openness to free trade, political stability educational attainment and R&D infrastructure on the level of patent protection in the countries. They used the index created by Rapp and Rozek (1990). They estimated a system of three equations namely GDP growth rate, TFP-the ratio of total factor productivity-1990/1971, and patent protection. TFP is a measure of technological improvements in productivity and labor over time. This translates to a measure of the level of output for a given level of capital and labor.

The researchers found that greater patent protection and enforcement resulted in positive and significant growth of TFP. They found in determining the effects of patent protection on TFP, that there was both positive and significant effect for countries which had a GDP per capita greater than US\$4000.00 ( as per 1985), and that there was a negative and insignificant effect for countries with GDP per capita less than US \$4000.00. They also identified a positive correlation between likelihood of stronger IPRs protection and the degree of economic openness of a country, and countries which had no active research and development were not inclined to implement IPRs protection. The researchers used the per capita GDP for the hypothesis instead of a direct measurement of R&D activity and found that the result was statistically significant only for countries with a GDP per capita of US \$4000.00 and above. They concluded that low

income countries (those which did not have significant R&D infrastructure) were not likely to engage in IPRs protections.

They also concluded that there was no correlation between political instability and the likelihood of adopting increased patent protection. This was consistent with Gould and Gruben's findings (1996), that countries which had open trade policies had correspondingly higher levels of IPRs protections.

Finally, Thompson and Rushing rejected their own hypothesis from a previous study in 1996 in which they had found that political instability affected patent protection rights in a developing country. The US \$4000.00 unit of measurement of GDP per capita was however consistent with their previous study in which they had found that the effects of stronger IPRs protection began to show at the US\$3400.00 GDP per capita as of 1980.

In a very interesting and important paper, the researchers Braga and Fink (Braga & Fink, 2000), examined previous research conducted on the effects of IPRs protection on trade, technology licensing, international transfer of technology and FDI. They summarized the results from the following studies conducted on the relationship of IPRs protection with trade: Ferrantino (1993), Maskus and Penubarti (1995), Braga and Fink (1997), Fink and Braga (1999), suggested that IPRs protection add a positive influence on trade flows and Fink and Braga (1999) also found this positive nexus to be very weak when high technology products were considered. This confirmed a result obtained by Maskus and Penubarti (1995), which found that most patent – sensitive industries were largely unaffected by IPRs protections.

A few research studies, in considering the relationship between IPRs protection and FDI, found that based on the data collected from surveys of US manufacturing companies inferred positive IPR protection and FDI connection. These studies included work by Mansfield (1994), Frischtak (1993), Lee and Mansfield (1996). They also discovered that more current regression analyses which were based on the research of Ferrantino (1993), and Fink (1997), revealed that there was no significant link between IPRs protection and FDI. They explained the results as that the use of the survey data overstates the influence on FDI which can be directly linked to IPRs protection and that the surveyed IPR protection index also indirectly includes the opinions of companies about perceptions and other factors which could influence FDI. They added that the presence of potential imitators was also a factor.

The relationship between IPRs protection and technology licensing was examined by Mansfield (1994) and Fink (1997), and there was an agreement in both studies that the link was positive but weak. Knowledge transfer and IPRs protection was noted by Braga and Fink as having only limited anecdotal evidence available on the subject and concluded that the usefulness of IPRS in the transfer of knowledge to developing countries was one with conflicting views. They opined that if knowledge could be excluded without legal protection and IPRs protection define the legal instruments on which the transfer of technologies is based, then IPRs protection may diminish any risk of losing proprietary knowledge after the knowledge has been transferred. This would benefit foreign title holders.

On economic growth and IPRs, Braga and Fink (2000), looked at the theoretical work of Helpman (1993), and noted that very little empirical work had been done in this area because there was difficulty in incorporating an endogenous and imperfectly constructed competitive market set up into a dynamic and general equilibrium model. This overview is extremely useful in encapsulating the position of empirical studies up to the year 2000.

A 2003 study by Kanwar and Evenson (2003), looked at the relationship between IPRs protection and the rate of technological change. This study ignored the relationship between IPRs and economic growth since the researchers opined that an insignificant relationship between the strength of protection and economic growth could be the result of innovation not being a strong economic factor. They cited literature that looked at the effect of technological change on economic growth and concurred with the general findings that a positive relationship existed between the two variables, and that this could be small or large depending upon the particular time and economy under examination.

In constructing the study, the researchers used a random effects model and time series data from 1981-1995 to estimate the relationship between technological change and IPRs protection. The model specified R&D investment which was measured as a portion of GDP, as a function of various IPR protection indices, change in per- capita GDP, gross domestic savings as a proportion of GDP, the Barro-Lee (2000), human capital variable, a black-market exchange rate premium dummy variable. The researchers, in fitting the model, revealed that there was evidence to support their claim that IPRs protection (which was proxied by an index of patent rights) had a strong

positive influence on technological change (proxied by research and development investment expenditure).

Chaudri, Goldberg, and Jia (2003), did a study estimating the effects of global patent protection on pharmaceutical products in India. They revealed that only a few studies had examined this relationship and concluded from their findings that increased IPRs protection had a negative impact on economic welfare in developing countries. They looked at the effects of patent enforcement for a particular kind of antibiotic in India and concluded that that IPRs enforcement had adverse effects on developing countries. Chaudri et al. cited a number of studies as support as follows: Challu (1991), Fink (2000), Maskus and Konan (1994), Nogues (1993), Subramanian (1995), and Wattai (2000).

In a study which focused on factors affecting foreign direct investment in the developing countries of Eastern Europe, Smyrzynska (2002), looked at factors affecting foreign direct investment and in particular, the company level decisions to invest in Eastern European countries after liberalization in 1989. The researcher used a survey conducted in 1995 which targeted more than 1000 companies worldwide and analyzed two binary decisions: (a) whether to engage in FDI in a selected country, and (b) whether to invest in a manufacturing project or a sole distribution project. The study tested whether two measures of IPRs protection influenced these decisions in any way, the first measure was similar to the IPR index created by Ginarte and Park (1997).

The second index focused on the enforcement of laws as opposed to the strength of existing statutory provisions, and trademark and copyright protections (as opposed to the Ginarte and Park measure in index 1, which dealt with patents). The researcher allowed for differential effects in those sectors which were considered sensitive to IPRs protection, such as electronics, pharmaceuticals, and chemicals.

Smyrzynska's study assessed firm level decisions and differed from previous ones which assessed aggregate FDI flows. She was able to capitalize on the opening up of Eastern Europe which was an advancement on earlier studies which did not control for changes in policy and investment over time in those countries that were relatively open during the entire period when the analysis was conducted. She noted that the theoretical relationship between FDIs and IPRs strength could be ambiguous since weak IPRs protection decreased the advantages for the foreign producer since the product could be subject to expropriation, though stronger IPRs did encourage licensing as an alternative to foreign direct investment. She also noted that there were mixed conclusions found in the literature preceding her study.

Ferrantino (1993), found a statistically significant relationship between US affiliate sales in a foreign country and the country's membership in any international IPRs Convention. This corresponded with findings by Maskus and Konan (1994), Lee and Mansfield (1996), Primo Braga and Fink (2000), and Smith (2001). These studies did find positive correlation between US affiliate sales and IPRs protection. The researcher also noted that there were other studies which found that IPRs protection could differ in importance across a range of industries and provided support for both hypotheses.



In the first instance, the researcher found that the strength of IPRs protection as measured using the Ginarte-Park index, positively affected the probability that a company operating in an IPR sensitive sector would engage in foreign direct investment, but that this did not affect other companies in other sectors. In addition, she found that there was some evidence that the second index of IPR enforcement used in the study affected the decisions across all sectors. Smyrzynska concluded that that companies were more likely to become involved in manufacturing related foreign direct investment activities as against focusing on distribution alone in circumstances where there was strong IPRs protection and that this effect carried across all sectors.

In another study, Schneider (2005), sought to test the impact of IPRs protection, international trade and foreign direct investment on innovation and economic growth. In the study innovation was measured as the number of United States patent applications made by residents of each of the countries considered. It also controlled for domestic factors such as the strength of IPRs protection.

The researcher noted that the index had several advantages over previous ones in that it varied substantially over time. the researcher made the comparison with indexes from previous studies such as Rapp and Rozek (1990), and Mansfield (1994), Concerning IPRs she found that increased protection had a positive effect on innovation across the entire sample, though there was a striking difference between developed and developing countries because IPRs protection had a zero or negative correlation with innovation in the developing country component of the sample.

A similar finding was made by Ginarte and Park (1997), in their study. There were mixed results from the regression which examined the relationship between IPRs protection and economic growth, even though IPRs protection seemed to have a positive effect on economic growth, a result which was consistent for most part with Gould and Gruben (1996), and which revealed similar implications to those identified by Ginarte and Park (1997).

The researcher concluded that research and development (R&D) in developing countries was significantly imitative as against innovative and therefore not heavily affected by IPRs protection. Schneider noted that the implementation of stronger IPRs in developing countries was more beneficial to foreign companies and more harmful to local ones, and that the policy implications were that developed countries benefit by supporting R&D in developing countries so that developing countries might over time have some incentive to implement stronger IPRs, which in turn would support benefits to both developed and developing countries.

Branstetter et al. (2006), examined the relationship between increased IPRS protection and the transfer of technology to developing countries by US multinational firms. They found that there was a positive and significant relationship between these two factors. In the study Branstetter et al utilized affiliate level data on US multinational companies and aggregate patent data in order to test whether legal reforms which strengthened IPRs increased the transfer of technologies to their multinational affiliates which operated in reforming countries during the 1980's -1990's. They discovered that the royalty payments for the use or sale of intangible assets made to parent companies,

and which reflected the value of the technology transfer, showed increases where patent regimes were strengthened.

This increase showed up as more than 30 percent for the subsample, tended to be concentrated among affiliates of companies which used US patents extensively before the reform in the countries took place. The result by itself, however, did not appear to be sufficient to demonstrate that increased IPRs protection enhanced the economic welfare or that it contributed positively to economic growth in developing countries since the study did not take into account local effects of companies which were displaced after the reforms took place.

In another study, Falvey et al, (2006), designed and conducted research to assess the effect of IPRs protection on economic growth. It is interesting that this study looked at the question from both theoretical and empirical perspectives, though greater emphasis was placed on the empirical aspect of the study. The researchers noted that in the theoretical perspective, the level of IPRs protection produced on ambiguous effect on economic growth and that stronger IPRs could have an adverse effect on local industries which relied on pirated technologies.

Conversely, they noted that risk taking and creativity could be promoted by greater levels of IPRs protection in developing economies and well as developed ones, and that the relationship between IPRs protection and factors which promote growth such as in bound foreign direct investment and trade was ambiguous. From the literature on previous studies, they noted that Gould and Gruben (1996), had found a positive correlation, though it was not statistically significant between IPR protection and

economic growth. They also noted Thompson and Rushing (1996), who found a positive non-linear relationship between IPRs protection and growth in countries with per-capita GDP above US\$ 3400. (in 1980), but there was no relationship for countries with less income. Kanwar and Evenson (2003), were also noted for a study in which they found a positive relationship between IPRs and research and development.

Falvey et al., (2006), tested these arguments empirically and relied on a panel of data of 79 countries between the years 1975-1989 and used the Ginarte-Park index as a measure for the IPRs strengths. They controlled for factors such as education, trade and inflation. The initial model found that IPRs protection had positive effect on economic growth, though this was more evident in high-income countries. This result was found to be consistent with the Thompson and Rushing (1996), findings among others. They also found that countries with very low income (US\$700.in 1995) showed positive relationship between IPRs protection and economic growth, while middle-income countries (US\$10000.) showed no relationship.

The researchers concluded that IPRs serve to encourage imports and inbound foreign direct investment by protecting the property of multinational companies in very low-income countries. These countries typically had very little or no local research and development schemes or innovations. In addition, few or no companies had the resources to imitate products from the North.

For middle-income countries, there were two countervailing factors, namely that the positive effect on trade and foreign direct investment could be balanced out by the negative effect on knowledge diffusion and the discouraging of imitators. The researchers

emphasized that they did not find that IPRs protection reduced growth in any of the groups of countries. They found that there was no consistent positive effect.

Ivus (2010), disclosed that strengthened patent rights seemed to attract higher levels of importation of high technology goods and capital inputs from technologically advanced OECD countries to emerging economies. The measurement was taken after 1994 in 18 countries which had undertaken significant policy change as a result of TRIPS. The study found that the increase amounted to over \$35 billion USD in annual trade for the period. It was also found that these increases were largely in quantity rather than in monopolistic price changes.

A study conducted by Park (2012), found that patent protections in the south produced a statistically insignificant effect on research and development for firms situated there. Park discovered that because developing countries constitute only a small share of the world market, variations in patent rights in these countries had only marginal effect on the research and development efforts in developed countries. On the other hand, developing countries were heavily dependent on the tangible outcomes of research and development efforts in developed countries.

A working paper by Maskus and Yang (2013), disclosed that patent reforms which include a measure of enforcement in economies which have under taken major IPRs reforms, has resulted in the minimum of a 20 % rise in manufacturing exports from those economies to the United States. It concluded that IPRs reforms would attract more technological transfers and expand export capabilities.

The World Intellectual Property Organization (WIPO, 2014), has noted that there is consensus among international economists that IPRs reforms seem to yield expansions in trade foreign direct investments and licensing. This was in cases where the measurement used was patent rights. The empirical evidence of this was found only in middle income and large developing countries. Up to the time of the report there were no positive or negative measurable impacts to be found in the poorest and smallest countries through econometric studies. The report suggested that IPRs play a minimal role at best in the poorest and smallest countries and that their ability to attract international technologies is more closely associated with factors such as policy coherence, the costs of doing business and proximity to markets.

Finally, the Global Innovations Index (WIPO, INSEAD, Cornell University, 2015), analysis and rankings as at 2015, revealed that the middle and high-income CSME countries when ranked within their respective categories of countries at the same level of economic development worldwide, have performed below par. The countries rated were Guyana, Barbados, Trinidad and Tobago, and Jamaica. The Global Innovations Index is a measuring system created by the World Intellectual Property Organization (WIPO), INSEAD business school, and Cornell University for the purpose of producing an annual time –series dataset from which analyses about the levels of innovation in countries can be measured with their economic development and innovation output. These findings add to the questions raised and arguments presented as to what effects greater or lesser IPRs have on developing countries in terms of rates of innovation and technological

development. In the current report, the Caricom specific information was of value in investigating those aforementioned issues.

### **Summary**

This literature review focused on the relevant economic research which examined the effect of IPRs and protection on developing countries. Economic well-being, economic growth, technological innovation and welfare, international trade and foreign direct investment were considered. Overall the literature revealed that dependent upon the circumstances and model assumptions, IPRs protections have positive results in some countries (Maskus & Yang, 2013), while in others the results are negative (Chaudhuri, 2003), and yet others ambiguous (Schneider, 2005).

Little of the current literature deals with the positive, negative or ambiguous effects of IPRs and protection in the context of the 15 countries that make up the Caribbean Community (Caricom) nor the CSME. This study adds to the body of knowledge and can provide the basis for further scientific enquiry.

## Chapter 3: Research Method

### **Qualitative Case Study**

The Global Innovations Index (WIPO, INSEAD, Cornell University, 2015) analysis and rankings revealed that the middle- and high-income CSME countries, when ranked within their respective categories of countries at the same level of economic development worldwide, performed below par. The countries rated were Guyana, Barbados, Trinidad and Tobago, and Jamaica. In this study, innovation activities means the actual undertaking of R&D of technologies ,while investment refers to financial ,technical and human resource input. The unit of analysis in the study was the intellectual rights policies of the governments in the sample countries.

### **Research Question**

The research questions investigated were as follows:

How do IPR policies affect the choices of innovation activities by firms in the CSME countries of Jamaica, Trinidad and Tobago, Barbados, and Guyana?

The sub-question was the following:

What differences in IPRs policies in these countries (Jamaica, Trinidad and Tobago, Barbados, and Guyana) influence the decisions by firms to invest in innovation and technologies?

### **The Method**

This study was designed using qualitative methods as recommended by Yin (2009). The factors for consideration in planning a case study are (a) the type of research



question being considered, (b) the extent of control the researcher possesses over the events, and (c) the level of focus on contemporary events (Yin, 2009).

For the purpose of this dissertation, an exploratory–explanatory case study was used. Levy (1988) established the single case study explanatory-exploratory method as useful when researching a subject in which the research questions were of both the “what and how” types. Levy investigated information technology in higher education. In the study, the explanatory aspect arose from the need to determine the extent to which patterns of acquisition and use established in other environments were also applicable in higher education situations. The use of the exploratory strategy was in the examination of economic aspects of information technologies. The investigation of innovation and technology within the context of intellectual property also allows for determination of the what and how questions as posed in planned study. According to Yin (2009), the how questions are explanatory in nature while the what questions tend to be more exploratory (Levy, 1988). In further explanation of the choice of design, Webb (2002) posited that the purpose of exploratory research is to uncover the boundaries of the environment within which the opportunities, problems, or situations to be examined might be found. It is also a method that can be used to uncover variables relevant to the research that might be found within the environment. In applying this method to my study, the main research question was investigated using the exploratory method.

The explanatory case study can provide an opportunity for the how and why questions to be answered because it allows the researcher to examine and explain the phenomena. These kinds of case studies should give an accurate description of the facts

of the case, consider alternative explanations where they exist, and arrive at conclusions that are congruent with the facts (Harder, 2010). This method is suited to an investigation of the main question. The combination of these two methods, known as exploratory-explanatory research, allowed for a comprehensive investigation of the questions and resulted in answers to both how and what aspects of the subject under investigation (Harder, 2010; Yin, 2009).

### **Sources of Data**

The research analysis comprised mainly of reviews of documents, legislation, archival records and database content, and studies from entities such as the Inter-American Development Bank, the World Bank, and WIPO. I was not required to engage in any face-to-face interviewing. Content analysis was used to analyze the data. Documents such as studies and reports conducted in related areas of innovation policy, commerce, intellectual property and intellectual property legislation, private sector assessment, and competitiveness from the Caricom secretariat, government ministries, and other international agencies such as WIPO, Inter-American Development Bank (IDB), Caribbean Development Bank (CDB), the Caribbean Centre for Competitiveness—University of the West Indies were reviewed. This list is non-exhaustive, and other documents were sourced from relevant organizations as necessary and in accordance with their relevance to the study. Request for permission to access materials was not necessary because all documents were open source. Documents from 2005-2016 were used because this allowed for a wide enough time frame from which sufficient information may be derived concerning the questions under investigation. I also took into account available

datasets and documents on firm-level activities for the units of analysis. Content analysis was conducted on the collected materials as a part of an empirical inquiry using the qualitative case study methodology.

Content analysis is a means or method of placing qualitative textual data into similar contextual categories or clusters in order to derive meaning from them. It involves the close reading of text and is interpretive in nature. In qualitative content analysis, credibility and trustworthiness are established through processes of iterative analyses, looking for confirmatory data by using methodological triangulation and using examples to support any conclusions arrived at (Julien, 2008).

Purposive sampling was used because it was necessary for me to select materials that were relevant to the case study (Oliver, 2006). According to Oliver (2006), purposive sampling provides the case study researcher with the means of determining data that are detailed and relevant to the research question. Oliver advised that there must be detailing of the criteria upon which the sampling decisions were made and that there is some danger in using this technique because of the potential bias that will affect the validity of the study. In order to eliminate this possibility, it is necessary to ensure that there is consistency between the epistemological basis and the aims of the research.

Because the sample size depended on the nature of the research question in purposive sampling, the size of the sample was not quantifiable in the beginning stages of the research but was part of an iterative process. I noted any distinguishing factors while checking to determine whether the units being used were not selected because they supported the developing narrative; this is known as deviant case or negative case

analysis (Schwandt, 2007). None of the data were confidential or anonymous so that there was no need for special protections. The data were collected and stored in computer databases and on cloud drives as well as on a backup hard drive. Institutional review board (IRB) approval was obtained from the Walden University Review Board for the conduct of this study. The IRB number was 01-06-17-0325855.

## **Data Analysis and Interpretation**

### **Content Analysis**

In conducting this study, I selected content analysis as the method of data analysis and interpretation because it is a method that systematically describes the meaning of the data and allows for the interpretation of that data (Schreier, 2014). It places qualitative textual data into similar contextual categories or clusters so that meaning can be extracted or derived from them, and the researcher must read the text closely in order to do so. Credibility and trustworthiness are established through the processes of iterative analyses, looking for confirmatory data by using methodological triangulation and using examples to support any conclusions arrived at (Julien, 2008).

The process of content analysis delineated by Schreier (2014) was comprised of the following steps:

1. Deciding on the research question
2. Selecting material
3. Building a coding frame
4. Segmentation
5. Trial coding

6. Evaluating and modifying the coding frame
7. Main analysis
8. Presenting and interpreting the findings.

The coding frame constitutes the core foundation of content analysis and comprises one main category and more than one subcategories, of which the main category comprises the material that is the focus of the investigation, while the subcategories contain information about what is said in relation to the material in the main category (Schreier, 2014). I followed this recommended method in the conduct of my research.

I used Dedoose software to assist in coding and analysis of the data that were used in this research. Dedoose is a modern, online-based researcher software system with both qualitative and mixed methods research analysis applications.

### **The Stages of Coding and Analysis**

In content analysis, a coding frame must be constructed as an essential part of the process and this is done in four stages (Schreier, 2014):

1. Selecting material
2. Structuring and generating categories
3. Defining categories
4. Revising and restructuring the frame.

Having set up the coding frame, the actual coding exercise can then begin.

In the literature, there are several stages of coding that must be engaged in qualitative studies (Miles, 2014). In the first cycle, it is recommended that evaluation

coding be used, which is a system that applies nonquantitative codes to qualitative data and assigns judgment about merit, worth, or significance of policy or programs. This type of coding is recommended as appropriate for policy, critical action, evaluation, and organizational studies (Miles, 2014).

In the second cycle, I used pattern coding. This method is described as generating explanatory or inferential codes that identify an emergent theme, configuration, or explanation (Miles, 2014) and was, therefore, relevant to the purpose of the study. Miles and Huberman (2014) also advised that researchers use jottings, which may also be considered to be analytical sticky notes that express the writer's reflections and commentary on issues that emerge during the fieldwork phase and data analysis. Miles and Huberman advised that jottings can strengthen the coding process by drawing attention to issues that need greater analysis. Analytic memoing is another tool that is recommended in assisting with the coding of data leading to analysis. It is described as a narrative that may be short or extended and that documents the researcher's reflections and thinking processes about the data (Miles, 2014). I used both of these tools in the conduct of this study.

The next phase in the analytical process is the generation of assertions and/or propositions and are described as summarizing and synthesizing a large amount of individual analytical observations (Miles, 2014). This was followed by drawing conclusions, creating, and revising the report that included implications for theory policy and action as appropriate. A final report was then generated.

### **Methodological Weaknesses**

An aspect of the content analysis method is the analytical insight possessed by the researcher and the ability of the researcher to focus on the question throughout the course of the research. It also requires the researcher to focus on selected aspects of meaning that are relevant to the research question (Schreier, 2014). Yin (2009) identified this area as warranting monitoring because the researcher may be led astray from the original topic in the process of discovery of new information. This weakness may be circumvented by the use of research protocol, the following of a chain of evidence, and the establishment of a case study database (Yin, 2009).

This study was limited by the varying levels of information available from the countries under consideration. Though every attempt was made to access the most current data, this depended on the levels of documentation that exist from the various territories. Addressing these limitations in the manner described ensured that the threats to the reliability that they pose did not become manifest.

### **Ethical Concerns**

The researcher must identify biases, values, and personal background in a reflexive manner so that these do not influence the research process and compromise the validity of the study (Creswell, 2008). Additionally, potential participants must be informed of their role in the study, and their consent must be acquired. They must also be advised of their right to discontinue participation at any time during an interview and provided with the results of the survey interview. Permission must be had from the relevant authorities for the use of data that are not in the public domain, giving truthful

information as to the purpose and use of the data sought (Committee on Science, Engineering and Public Policy, 2009). I used secondary data, all of which were available as open source data; therefore, it was not necessary to seek permissions. I took care to ensure that the data collected were garnered from reliable, recognized sources.

### **Social Impact**

This case study research can make a significant contribution to the knowledge base on intellectual property in developing countries because of its focus on the newly developing area of Caribbean intellectual property, which suffers from a dearth of information that policy makers can use to create conditions suitable for the growth and development of the region. It is also important because I examined the questions within the context of the Caribbean Single Market and Economy, and upon its conclusion, I proposed further study and approaches to policy that could have positive outcomes and add to the body of knowledge. The procedures and findings, as well as recommendations, are detailed in the following chapter.



## Chapter 4: Results

In this chapter, I present the results of the study based on a content analysis of the data. The results are laid out in a format of continuous text, as recommended by Schreier (2012). The data consisted of policy papers, firm studies, study reports, legislation, and government policy documents, all of which were available as open source documents from major international organizations and government sites as detailed in the previous chapter. A total of 320 documents were collected, sorted for relevancy, and analyzed.

### **Content Analysis**

In conducting this study, I used content analysis as the method of data analysis and interpretation because it allowed me to systematically describe the meaning of the data and to interpret the data (Schreier, 2014). I placed qualitative textual data into similar contextual categories or clusters to extract meaning from it by closely reading the text.

In conducting the content analysis as delineated by Schreier (2014), I took following preliminary steps: (a) decided on the research questions, (b) selected materials, (c) built a coding frame, (d) conducted segmentation, (e) conducted trial coding, and (f) evaluated and modified the coding frame. I conducted the main analysis and interpretation of the finding after these steps. The interpretation will be discussed in detail in Chapter 5. According to Julien (2008), credibility and trustworthiness of a study are established through processes of iterative analyses, using methodological triangulation to look for confirmatory data and using examples to support conclusions arrived at. I

followed this process in the conduct of this study. This is described in detail in the stages of coding and analysis of the data as described below.

The coding frame made up the core foundation of content analysis and comprised one main category and several subcategories. The main category contained the material that was the major focus of the study, while the subcategories contained information about what was said in relation to the material in the main category (Schreier, 2014).

### **The Stages of Coding and Analysis**

I used Dedoose software to assist in coding and analysis of the data. I built the coding frame inductively by creating categories and subcategories from the documents I reviewed. The software facilitated ease of use, and I loaded the documents directly into the software, then categorized them by name, date, and type of document. I used colors to demarcate the different countries and placed the documents relevant to the countries under particular colors. CSME-related documents were placed under green, Trinidad and Tobago was assigned red, Barbados blue, Jamaica yellow, and Guyana black. I then took the following steps:

For selecting the material, I used the method proposed by Mayring (2010) and began by paraphrasing relevant passages and editing them for unnecessary material. I followed up by taking similar paraphrases and creating a single paraphrase, after which I generated category names, such as competitiveness and intellectual property and cross sectoral impact. For this study, I examined a total of 320 documents which I then sorted for relevance and processed in relation to the main research question and the sub-question.

For structuring and generating categories, I used an inductive method to create categories and subcategories from the data that allowed me to examine the material in-depth. I found that subsumption was useful at this stage, (Mayring 2010). After examining individual passages for concepts, I determined whether a concept was new, and if so, it was turned into a category. This was not used for all concepts that were new, in particular, where closely related subcategories already existed this was not done, and, where the concept was not relevant to the research, the material was disregarded. I created relevant subcategories from the main categories as I progressed through the material.

For revising the coding frame, I revised the coding frame several times to eliminate overlapping of subcategories, as well as to ensure that the categories created were relevant to the concept being examined. In this case, I tried to ensure that the categories were relevant to the subject of the research questions.

In trial coding, I carried out a trial coding on part of the data by applying the categories to the data (Schreier, 2014). This was done three times. I adjusted the coding frame as necessary to get the most pertinent codes in examining the material.

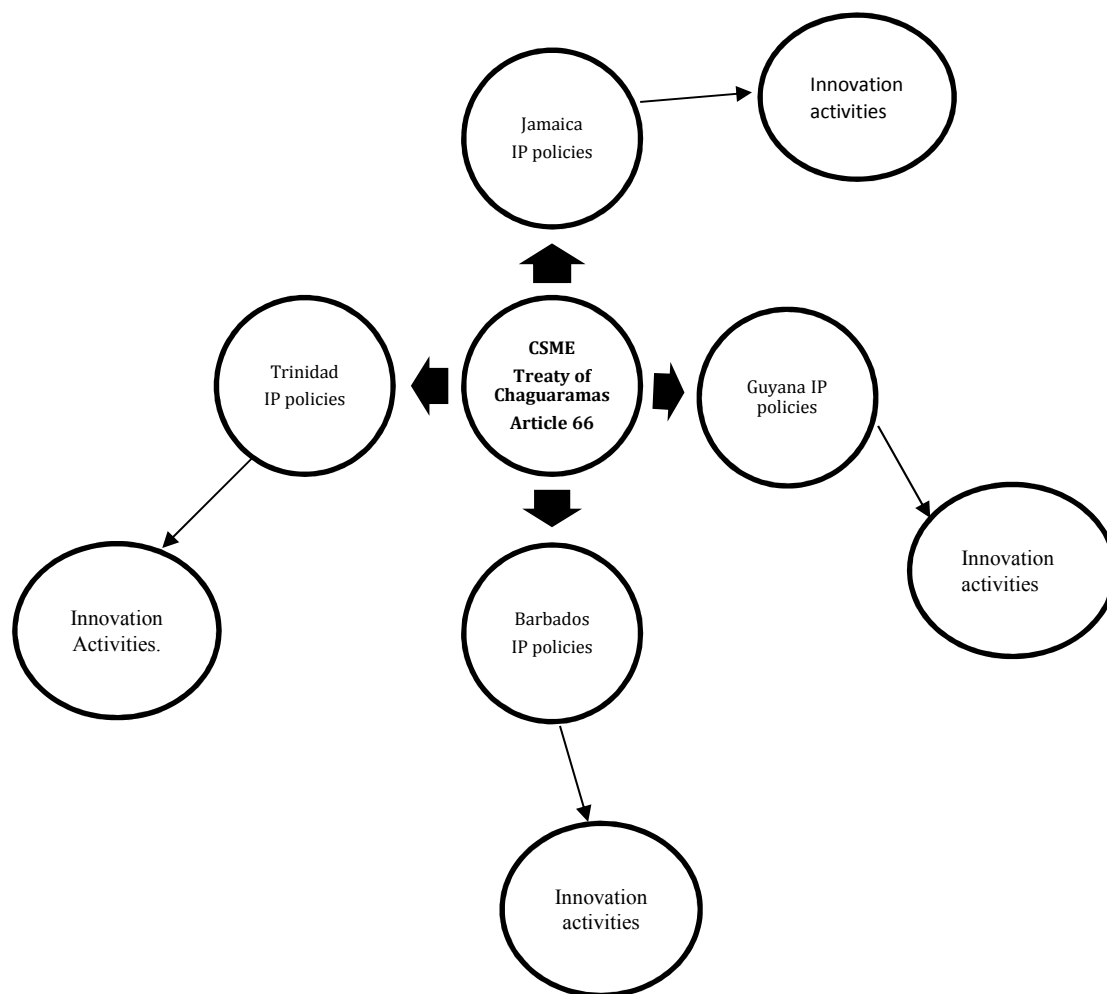
- (a) I engaged in first cycle coding using evaluation coding (Miles ,2014). This allowed me to sort policies for merit and relevancy to the questions.
- (b) I continued with pattern coding of the materials with the intention of generating explanatory codes from which emergent themes or explanations could be derived.
- (c) I then compiled the results of the study below in the order of research

question first and sub-question after.

### **Research Question**

How do IPR policies affect the choices of innovation activities by firms in the CSME countries of Jamaica, Trinidad and Tobago, Barbados, and Guyana?

I began the assessment by looking at the CSME-related documents to identify major policies in IP that had been promulgated by the regional body, Caricom, in relation to the single market and any others that had arisen as subsidiaries to such policies within the different countries. This was important in order to establish a contextual framework for the research questions and to map any connections between the IP regulations of the CSME sub-regional body (that derives authority from the Revised Treaty of Chaguaramas, 1973), and those of the individual countries being examined. I created a map that I used for that purpose and assigned categories that I examined using the following diagram:



*Figure 1.* Diagram of connecting issues.

### **Notes on the Data**

Various sources of data were used for this study, including country-level and firm-level studies conducted by the IDB, the World Bank, and other international agencies. Data on IPRs and their levels of registration for the sample countries were gathered from the WIPO index. In the country-level studies, researchers measured the competitiveness of select Caricom countries and used measurements such as macroeconomic stability, infrastructure, technological readiness, and innovation. These studies were based on data from the Global Competitiveness Index, which used the Global Competitiveness methodological framework. According to information provided, data were also used from the World Bank, the International Monetary Fund, and various United Nations Agencies. The Global Competitiveness Index was established in 2004 by the World Economic Forum, and, it uses a comprehensive methodological framework to assess the set of policies, institutions, and factors that determine national levels of productivity across 130 countries. Innovation is not defined by the Global Competitiveness Index as different from the ordinary, dictionary term.

The IDB commissioned firm-level studies comprised of private sector assessment studies of private sector development for 15 Caricom countries. These scholars examined areas such as logistics and infrastructure, the regional macroeconomic environment, institutional effectiveness, human capital, and innovation and competition conditions. Innovation was not defined differently from the established dictionary term for the purpose of these studies.

## **Findings**

The Revised Treaty of Chaguaramas (1973) is the founding document of the Caricom Single Market and Economy, and it sets out the requirements and aspirations for functioning of the Caricom Single Market and Economy.

### **Article 66 of the Treaty**

This question was examined in reference to Article 66 that deals with the obligations of member states in relation to IPR in sections (c) through (g) as follows:

(c) the identification and establishment, by the Member States of mechanisms to ensure: (i) the use of protected works for the enhanced benefit of the Member States; (ii) the preservation of indigenous Caribbean culture; and (iii) the legal protection of the expressions of folklore, other traditional knowledge and national heritage, particularly of indigenous populations in the Community; (d) increased dissemination and use of patent documentation as a source of technological information; (e) public education; (f) measures to prevent the abuse of intellectual property rights by rights-holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology; and (g) participation by the Member States in international regimes for the protection of intellectual property rights. (Caricom, nd)

I examined the records of patents and industrial design filings, firm- and country-level studies, and IPRs policies of the countries. The results are presented below.

## Trinidad and Tobago

I found that Trinidad and Tobago had enacted a suite of legislation on IPRs that corresponded to some degree with the aspirations of Article 66 of the Treaty of Chaguaramas as set out below.

Table 1

### *Trinidad and Tobago Intellectual Property Rights Legislation*

Legislation
Supreme Court of Judicature Act (Chapter 4:01)
Copyright (Amendment) Act No. 5 of 2008 (2008)
Copyright Act, Cap. 82:80 (2008)
Protection of New Plant Varieties Act, Cap. 82:75 (2007)
Industrial Designs Act, Cap. 82:77 (2007)
Layout-Designs (Topographies) of Integrated Circuits Act, Cap. 82:79 (2007)
Patents, Designs, Copyright and Trade Marks (Emergency) Act, Cap. 82:84 (2007)
Patents and Designs Act, Cap. 82:83 (2007)
Intellectual Property (Miscellaneous Amendments) Act of May 5, 2000 (2000)
Patents Act, 1996 (2000)
Trade Marks (Amendment) Act 1997 (Act N° 31 of 1997) (1997)
Trade Marks Act (1997)
Trade Marks (Amendment) Act 1996 (Act No. 25 of 1996) (1996)
Trade Marks (Amendment) Act 1994 (Act No. 17 of 1994) (1994)
Publications (Legal Deposit) Act, Cap. 82:74 (1985)



Trinidad and Tobago also established a dedicated Intellectual Property Office situated within the Ministry of Legal Affairs that is responsible for its oversight. Trinidad and Tobago also hold membership in the following international regimes for IPRs administered by WIPO. which may be considered to be aligned with Article 66 of the Treaty, section (g):

Table 2

*Intellectual Property Rights Treaties ratified by Trinidad and Tobago*

Treaties
WIPO Copyright Treaty (November 28, 2008)
WIPO Performances and Phonograms Treaty (November 28, 2008)
Trademark Law Treaty (April 16, 1998)
Strasbourg Agreement Concerning the International Patent Classification (December 20, 1996)
Brussels Convention Relating to the Distribution of Program-Carrying Signals Transmitted by Satellite (November 1, 1996)
Locarno Agreement Establishing an International Classification for Industrial Designs (March 20, 1996)
Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks (March 20, 1996)
Vienna Agreement Establishing an International Classification of the Figurative Elements of Marks (March 20, 1996)
Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (March 10, 1994)
Patent Cooperation Treaty (March 10, 1994)
Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms (October 1, 1988)
Berne Convention for the Protection of Literary and Artistic Works (August 16, 1988)
Convention Establishing the World Intellectual Property Organization (August 16, 1988)
Paris Convention for the Protection of Industrial Property (August 1, 1964).

I then examined the data for IPRs policies to discern whether these had any effect

on choices of innovation activities by firms in Trinidad and Tobago. The indicators used were the formal filings and grants of patents and industrial designs by persons (meaning corporate or individual) resident in the country. These data were made available by WIPO. I found that the government had created several policies for the protection of IPRs that had been concretized through legislation and public outreach. The Intellectual Property Office is a specialized organization through which IPRs policy advocacy is carried out. Trinidad and Tobago had a level of patent filings that was higher than that of Jamaica, Barbados, and Guyana for the period 1995-2015, although the number of patents being converted into actual products that were used in the communities was unclear. The actual figures can be found in Appendices A and B.

I found that among the IPRs commonly promoted there was a heavy bias towards cultural industries, such as music and the creative industries surrounding carnival, namely costumes and other creative designs. The data, however, indicated that Trinidad and Tobago remains heavily focused on the production of petroleum and the petroleum based industries, and that there is less emphasis on innovations in other areas of economic endeavor such as services and manufacturing. I found that the private sector was less willing to invest in innovations, and endogenous innovations were not often a part of the development processes in firms. Using content analysis, I discovered that Trinidad and Tobago IP outreach programs focused on awareness programs on intellectual property in tourism, the creative industries, building connections in climate change and intellectual property with the aim of encouraging innovations and generally promoting IPRs. There

was no clear indication of a nexus between intellectual property legislation, vigorous public policy and areas in which innovations in Trinidad and Tobago take place.

**Barbados** - The data revealed that Barbados had enacted intellectual property legislation dated between 1984-2006.

Table 3

*Barbados Intellectual Property Rights Legislation*

Legislation
Trade Marks (Amendment) Act, 2001 (Act No. 16 of 2001) (2001)
Copyright Act, 1998 (Cap. 300) (as revised up to 2006) (1998)
Registration of Business Names Act (Cap. 317, consolidated as of 1989) (1989)
Corporate Affairs and Intellectual Property Office, Cap. 21A (1988)
Industrial Designs Act, 1981, (CAP. 309A) (as last amended by Act 1988-6) (1988)
Protection of the Olympic Symbol Act, Cap. 315A (1985)
Intellectual Property Acts (Amendment) Act, 1984(Act No. 20 of June 22, 1984)
Patents Act, 2001 (Cap. 314) (as amended by Act No. 2 of 2006) (2006)
Trade Marks Act, Cap. 319 (2006)
Protection of New Plant Varieties Act, Cap. 267 (consolidated as of 2002) (2002)
Geographical Indications Act (Cap. 320, consolidated as of 2002) (2002)
Integrated Circuits Act, Cap. 320A (consolidated as of 2002) (2002)

These pieces of legislation could also be said to align with some of the aspirations of Article 66. There is also other legislation that are related to IPRs.

Barbados is also a member of the following international regimes for intellectual property rights administered by WIPO, which may also be aligned with Article 66 section (g):

Table 4

*International Treaties on Intellectual Property ratified by Barbados.*

Treaties
Nairobi Treaty on the Protection of the Olympic Symbol (February 28, 1986)
Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks (March 12, 1985)
Paris Convention for the Protection of Industrial Property (March 12, 1985)
Patent Cooperation Treaty (March 12, 1985)
Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (September 18, 1983)
Berne Convention for the Protection of Literary and Artistic Works (July 30, 1983)
Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms (July 29, 1983)
Convention Establishing the World Intellectual Property Organization (October 5, 1979)

In examining the data for policies on innovation, technology and intellectual property, I found that Barbados had a dedicated Corporate Affairs and Intellectual Property Office (CAIPO) which falls under the control of the Ministry of Industry, International Business, Commerce and Small Business Development. I found there was strong advocacy for the protection of intellectual property rights and that there was public

outreach and collaboration over the years with WIPO for the development of different aspects of IPRs and to encourage its use locally. The data revealed that the level of patent filings in Barbados was much lower than Trinidad and Tobago, and Jamaica but higher than Guyana with the data for 2015 showing that a total of 45 patents applications had been filed by individuals or firms indigenous to and resident in the country. For industrial designs, the statistics revealed that between 2001-2015, 83 had been filed but the number granted was not available (see appendices A and B). There was no indication that intellectual property advocacy in Barbados assisted in the development of innovation and technology, or that firms were making innovation choices in response to any policy stimulus or lack thereof. The country has a strong music industry and its copyright regimen is robust. The firm level studies indicated reluctance on the parts of the local firms to invest in technology and innovation, and the industries remain heavily reliant on tourism and other services, especially those that derive from the tourism industry. There is little innovation carried out in these sectors.

## **Jamaica**

In looking at Jamaica with regard to the CSME, and Article 66 of the Treaty of Chaguaramas, I found enacted legislation on intellectual property and IP treaties administered by WIPO.

Table 5

*Jamaica Intellectual Property Legislation.*

Legislation
The Copyright (Amendment) Act, 2015
The Protection of Geographical Indications Act No. 5 of 200)
The Jamaican Intellectual Property Office Act 2002
The Trade Marks Act, 1999
The Copyright (Amendment) Act, 1999
The Layout-Designs (Topographies) Act No. 30 of 1999
The Copyright Act No. 5 of 1993
The Merchandise Marks Act 1985
The Designs Act 1976
The Patents Act 1975
The Broadcasting and Radio Re-Diffusion Act, 1949

Jamaica is also a member of the treaties for Intellectual Property as administered by

WIPO set out below:

Table 6

*International Treaties on Intellectual Property ratified by Jamaica.*

Treaties
Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks (February 7, 2006)
Vienna Agreement Establishing an International Classification of the Figurative Elements of Marks (February 7, 2006)
WIPO Copyright Treaty (June 12, 2002)
WIPO Performances and Phonograms Treaty (June 12, 2002)
Brussels Convention Relating to the Distribution of Program-Carrying Signals Transmitted by Satellite (January 12, 2000)
Paris Convention for the Protection of Industrial Property (December 24, 1999)
Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (January 27, 1994)
Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms (January 11, 1994),
Berne Convention for the Protection of Literary and Artistic Works (January 1, 1994)
Nairobi Treaty on the Protection of the Olympic Symbol (March 17, 1984)
Convention Establishing WIPO (December 25, 1978)

I found that the legislation and treaties could be considered as aligned with the aspirations of Article 66 of the Treaty of Chaguaramas as discussed above at the beginning of the chapter, except for the 1949 Broadcasting and Radio Re-Diffusion Act, which was outdated in content and context. This Act was created at the end of World War



2 and predates the Treaty of Chaguaramas. In examining policy positions, I concluded that Jamaica has been consistent in efforts to modernize its IP regulations and outreach. There is a Government established Jamaica Office of Intellectual Property - JIPO, which carries a mandate in its own words “To contribute to national economic growth and development through the promotion, proper protection, administration and enforcement of Intellectual Property Rights”. In examining the data, I have tried to find out whether this has indeed occurred, in keeping with my own research question.

The data revealed that while Jamaica maintains a robust presence in the promotion of IPRs, the main focus has been on collective rights management of the creative industries, particularly music, such as reggae and soca for which the country is world renowned. Between the years 2001 and 2015 there were 1,635 patents filed and a total of 789 industrial designs were also filed (see appendices A and B). The numbers wanted for both categories were unavailable. The studies revealed that there is reluctance on the part of Jamaican firms to invest in innovation and technology, and firm operatives do not find it a priority to do so. The major industries remain bauxite mining, agriculture, tourism and the services industry. I also found that while Jamaica has several tertiary institutions and a focus on science and technology through a dedicated Ministry of Commerce, Science and Technology, there was no conversion from the tertiary research to patents or industrial designs and real products. There was also no record of inventions that had no patents, or industrial designs that became publicly utilized. The conclusion is that from the available records, there have not been many real-world applications of the patents that were recorded, and that innovations in the productive sectors such as

manufacturing and industry, have remained at low levels. There is no indication from the data that policy has influenced the choices of innovations made by firms in Jamaica.

### **Guyana**

Guyana provided an interesting case because it seemed to diverge from the pattern of the other countries examined above. Guyana has the least number of IP legislation, five in total, and three multilateral treaties administered by WIPO. These are laid out below:

Table 7

*Guyana Intellectual Property Rights Legislation.*

Legislation
Geographical Indications Act 2005
Trademarks Act (Cap. 90:01) (as amended by Act No. 4 of 1972)
Patents and Designs Act (Cap. 90:03) (1973)
Merchandise Marks Act, 1888 (Cap. 90:04) (as amended by Act No. 4 of 1972)
Copyright Act 1956 (Cap. 74)

### **Treaties:**

Table 8

*International Intellectual Property Treaties ratified by Guyana.*

Treaties
Berne Convention for the Protection of Literary and Artistic Works (October 25, 1994)
Convention Establishing the World Intellectual Property Organization (October 25, 1994)
Paris Convention for the Protection of Industrial Property (October 25, 1994).

Most of the laws are outdated and provide minimal protections for rights holders. Guyana does not have a dedicated Intellectual Property Rights Office, and there is no public outreach on the subject. There is also no government ministry with responsibility for intellectual property. Registrations of patents and other IPRs is done at the Deeds Registry of the Supreme Court of Guyana. From the records, I found that there was some representation made by the public for stronger Copyright legislation, since the applicable law dates to 1956 before Guyana's independence from Britain in 1966, but that the successive governments have been hostile or reluctant to engage on the subject of modern intellectual property laws. The laws on intellectual property are minimally aligned with the aspirations of Article 66 of the Treaty of Chaguaramas simply because they exist at all. They do not for most part reflect the modern aspirations of the Treaty in range or applicability to the areas covered, such as traditional knowledge, folklore or patent protections that promote the economic welfare of the member states under the treaty.

The statistics for patents and industrial design show that no patents or industrial designs applications or grants were recorded for between the years 2001-2015.

These factors notwithstanding, the data revealed that Guyana has the highest level of firm innovation within Caricom (15 member states), and consequently within the group of four countries under examination for this study. In the studies reviewed for this project, the relationship between innovation and productive activity was examined at the firm level in several Caribbean countries, including the sample countries selected for this study. They also looked at how much financial investment was made by the firms on

innovation in terms of innovation and technology or the acquisition of machinery. It was found that more than 80% of firms did not invest in R&D or the acquisition of machinery unless absolutely necessary. It was found that manufacturers engaged in innovation activities at a higher level than the other industries (see table 9), and that small and medium sized businesses tended to engage in innovations that were used in their processes. In Guyana firms tended to invest in innovations that were endogenous and this kind of activity was encouraged by businesses across all sectors. Government policy on innovations and intellectual property is entirely absent from the decisions made by firms to innovate. The firms seem to make these decisions based on economic factors.

### **Summary**

In examining the research question, “How do intellectual property rights policies affect the choices of innovation activities by firms in the CSME countries of Jamaica, Trinidad and Tobago, Barbados and Guyana?” I looked at the four countries case by case as recommended by Schreier (2012). I found that each country had varying levels of IPRs legislation in terms of number and modernity, and that there were also varying levels of policy advocacy and areas of focus by governments. Within the context of the CSME, Barbados, Trinidad and Tobago, and Jamaica all had legislation that reflected the aspirations of Article 66 of the Treaty of Chaguaramas, while Guyana’s legislation were few and mostly outdated, and did not align with those aspirations. All the countries had signed onto international treaties for the regulation and protection of intellectual property rights administered by the World Intellectual Property Organization. Barbados, Jamaica, and Trinidad and Tobago had ratified a greater number of such agreements than Guyana,

and had dedicated offices and strong public outreach programs for IPRs. Guyana did not have a dedicated office for IPRs and no outreach programs were evident. There was in fact a marked reluctance by successive governments to deal with intellectual property found in the records. There is no evidence that this reluctance actually amounts to a policy of non-interference, as noted before further study needs to be done to determine the underlying factors in this occurrence. On innovations and technology, I found that Barbados, Trinidad and Tobago, and Jamaica did not produce a large amount of endogenous innovations (table 9), that firms were reluctant to invest in innovations, and that where there were higher education institutions (as in the case of Jamaica) with innovation activities, these did not translate to recorded patents or industrial designs, and did not become actual products used in the society.

The case of Guyana provided a different result because it recorded the highest levels of innovation in the Caricom region, and this group under examination for this study as determined by firm based analyses, but had no patents recorded with the international agencies. There were also no outreach policies and no government policies promoting the use of intellectual property rights for innovation or any other purpose.

### **Sub-Question**

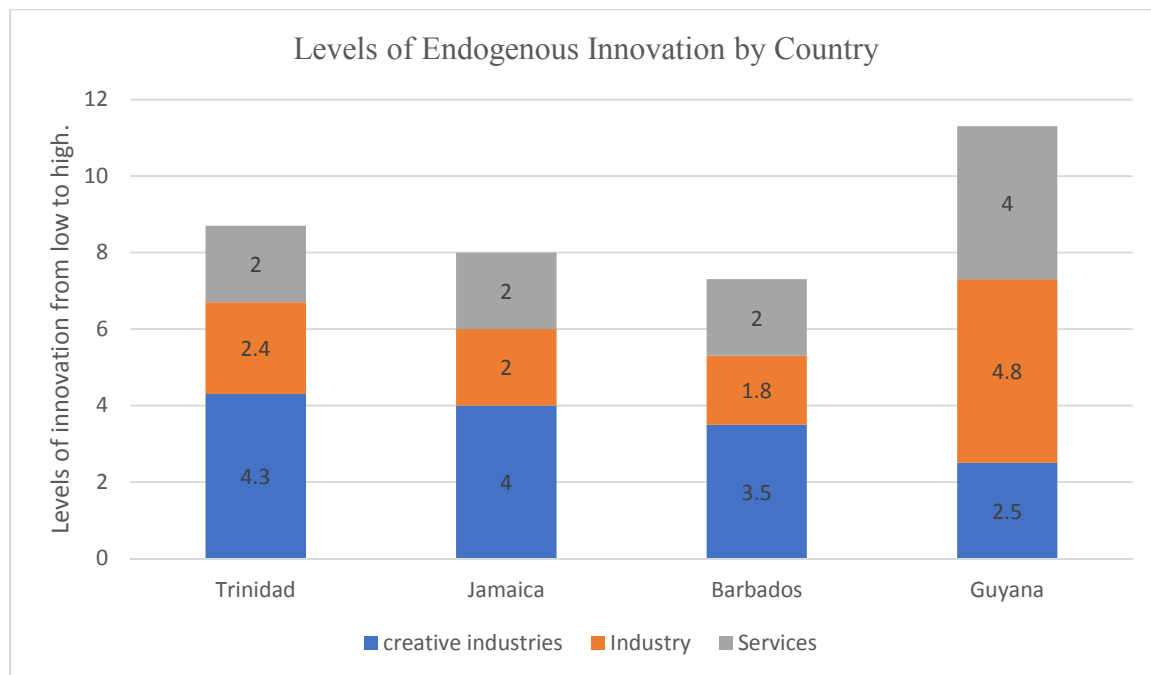
What differences in IPRs policies in these countries (Jamaica, Trinidad and Tobago, Barbados and Guyana) influence the decisions by firms to invest in innovation and technologies?

### **Findings**

I begin this section by presenting a summary of the finding on endogenous innovations for easy understanding of the discussion that follows.

Table 9

*Levels of Endogenous Innovation by Country. Author generated based on research data. Levels of innovation are ranked 0- 12, the data points are approximations on the scale of innovations.*



I examined this sub-question case by case and discovered the following:

**Barbados-** The government of Barbados established a dedicated office for intellectual property, the Corporate Affairs and Intellectual Property Office (CAIPO) which is supervised by the Ministry of Industry, International Business, Commerce and Small Business Development. The policies promoted by the government through this office and its outreach program generally promote the use of intellectual property mechanisms such as patents, copyright and trademarks to protect inventions and other works. The office facilitates the filing of applications and registrations for these rights, as well as hosts a database for searches of business names. There are robust outreach programs as well as the promotion of competitions in innovations for young people through international agencies. According to the records, the office has also collaborated with WIPO for the development of areas such as geographical indications. The data indicated that the economy of Barbados remains largely dependent on tourism and the construction industry associated with it, while emerging sectors include financial services, alcoholic beverages and some kinds of medicaments. The largest industries were the production of raw sugar, cement, medicaments, precious jewelry, repair of public transport vehicles, and its main source of revenue, tourism. The fastest growing industries were orthopedic appliances, footwear, non-electrical navigating devices, insecticides, unwrought aluminum, and aluminum structures all based on manufacturing with no research and innovation being employed.

The documents reviewed indicated that while there was a high level of internet technology usage with more than 50 % of all companies having a website, there was great reluctance of firms to invest in innovations. They revealed that businesses did not invest

in upgraded technologies unless it was absolutely necessary, and preferred to stick with methods that worked to keep the production lines moving.

The Government produced a draft Barbados Growth and Development strategy 2013-2020 in which it briefly describes a Value Capture for Intellectual Property plan that is intended to use intellectual property as a means of earning revenue for intangible assets. I did not find any concrete policies that focus on Intellectual Property Rights and innovation for the purpose of diversifying the economy away from the industries listed above, or that encouraged firms to invest in innovations that attracted intellectual property rights.

**Jamaica** - The government of Jamaica has a dedicated Office for Intellectual Property, the Jamaica Intellectual Property Office-JIPO. This office has been very active in promoting intellectual property rights as a means of creating and maintaining wealth though it does not host a searchable database for registered patents, copyrights, or industrial designs or trademarks. It has had close collaborations with WIPO on areas such as geographical indications and traditional knowledge, and is active in the promotion of copyright. The data reveals that more than any of the other forms of IPRs copyright industries such as music, particularly reggae and soca, and contributed the most to the economy of Jamaica with approximately 4.8 % of its GDP in 2012, and comprised 3% of its total employment.

The government of Jamaica produced the Vision 2030 Jamaica National Development Plan, implemented in 2009, which includes a policy for making Jamaica a technologically enabled society. This policy has been labeled one of the critical



outcomes. It includes the integration of science and technology into all areas of development and establishing a dynamic and responsive National Innovation System (NIS). The plan specifies that the government's policies in relation to intellectual property are:

- (1) To revise current IP laws on patents, geographical indicators regulations, and copyright,
- (2) To develop fully automated patents and trademarks registration systems,
- (3) To develop a geographical indications project.
- (4) Promote and use intellectual property as a tool for economic development to convey values, images and the reputation of Jamaica, including designs, music, trade- marks, geographical indications and certifications marks.

The government plans to develop the creative industries to attain an output of approximately 8% of Jamaica's GDP by 2030.

I found that there is a National policy on science and technology for the socio-economic development of Jamaica created in 2005, which addresses the development of innovations as an integral part of economic development. I found that Jamaica had created a National Commission on Science and Technology that was active in the promotion of innovations in socio -economic development with specific focus on tourism, music and information technologies. There were no policy analyses available which measured the outreach, effectiveness, or other outcomes of this policy as at April,2017. The data on Jamaican registration of patents and, industrial marks up to 2015 from international agencies, reveals no registrations were done. Firm level studies

conducted by the IDB up to 2014 also showed low levels of innovations across all sectors. I find that it is inconclusive whether the policy focus on intellectual property in Jamaica has influenced the choices of innovations by firms.

### **Guyana**

The data on Guyana was sparse. I found no overarching policy on IPRs and innovation and there was no reference to it in any policy documents related to the economy. The materials reviewed showed a National Competitiveness Strategy document that did not include science and technology innovations, nor any reference to intellectual property. From the data reported, Guyana produced the lowest level of patents and industrial designs applied for and issued of the four countries in this study (see appendices A and B). Firm level studies also reported Guyana as having the highest levels of innovation of all 15 countries of Caricom, and consequently of the four countries in this study which constitute the largest economies in that region. (see table 9). I find it conclusive that government intellectual property policies have not influenced firms' decisions to innovate because there are no policies. I have no evidence however, that the absence of policy equates to a policy of non-interference in intellectual property matters in Guyana by the government. From general information available, Guyana has had a high level of migration by educated and technically skilled personnel to developed countries spanning a number of decades. There is also no Intellectual Property Office, and registrations of IPRs are handed by the Office of the Registrar of the Supreme Court. There may also be other underlying factors which contribute to this state of affairs, and it

would defy genuine scholarship to attempt to classify this policy situation without further directed study of the issues surrounding intellectual property in this country.

### **Trinidad and Tobago**

The government of Trinidad and Tobago established an Intellectual Property Office which is supervised by the Ministry of the Attorney General and Legal Affairs. The office provides a hub for information on the registration of IPRs and hosts an online database for trademark searches. It states as part of its mandate to take a leading role in stimulating creativity in Trinidad and Tobago. I found that there was no overarching policy for innovation and technology but there are four strategy and policy papers which deal with innovation. These are Medium Term Policy Framework (MTPF), the National Performance Framework (NPF), the Enabling Competitive Business (ECB) Strategy, and the national ICT plan 'smartTT'. I found that the Medium -Term Policy Framework (MTPF) had an overall theme of 'innovation for lasting prosperity' and had a goal of increasing the expenditure of the country on innovation and technology to 1% of its GDP by 2012, as of February 2017, this has not been realized. This strategy acknowledged the need for the country to diversify its economy away from dependence on the oil and gas industry and identifies three areas for potential growth in this context. The creative sector takes the lead with music and carnival, film and television, followed by the ICT services industries, then renewable energy. Intellectual Property Rights were referred to in this policy paper in connection with collection rights management in creative industries, and it was noted that there was the potential for this to become a viable area for the development of innovation. The policy paper did state the intention to

establish an innovation system that provided the necessary support mechanisms for finance, intellectual property protections, linkages between, research and development (R&D) and commercialization. The firm level data from the Inter-American Development Bank (IDB) examined found that there was reluctance to invest in innovations across sectors, and this was also reflected in the statistics provided by international database curated by WIPO on the number of local patent and industrial designs registrations.

I conclude that though the government of Trinidad and Tobago has exerted deliberate, directed effort in the creation of policies that promote IPRs in the creative industries, internet communication technology (ICT), and renewable energy, this has not translated to greater efforts by firms to innovate in these areas, nor in other sectors.

### **Summary**

In researching the sub-question “What differences in IPRs policies in these countries (Jamaica, Trinidad and Tobago, Barbados and Guyana) influence the decisions by firms to invest in innovation and technologies?”, I found that each of the countries under examination had some provisions for IPRS but that in some instances the policy focus was unclear or non-existent, as in the case of Guyana which had an absence of any policy measures on IPRs and could possibly be interpreted as having a non-interference policy as far as concerns IPRs. Guyana most notably recorded the highest level of innovation of the countries examined. Barbados had no express policies on IPRs and innovation that encouraged innovation, and diversification in its mainstay industries such as tourism and services arising from it. There were no real policies that encouraged

diversification away from these industries using innovation and intellectual property rights as a catalyst.

The case of Jamaica provided evidence of strong policy and institutional focus on the use of intellectual property and innovations, and as a means of developing the economy. There is still little evidence that these efforts have resulted in the development of innovations that have made a difference to the functioning of society, contributed, or demonstrated capacity to contribute to economic and social change in Jamaica.

Trinidad and Tobago was found to have robust institutions for the promotion of IPRs, but had no overarching national policy on innovation and technology. It had four identifiable policy documents which contained some intentions for innovations and technology development. The main thrust of the most relevant policy proposal as far as concerned innovations and IPRs was towards the cultural and creative industries such as carnival and the production of music, and internet communication technology. This policy so far has not translated into greater innovations by firms in the country as registered in firm level studies even though the country recorded the highest level of registered patents and industrial designs.

## Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to examine IPRs, innovation, and technology within the context of the Caricom Single Market and Economy. I looked at this subject with the goal of answering a main question: How do IPR policies affect the choices of innovation activities by firms in the CSME countries of Jamaica, Trinidad and Tobago, Barbados, and Guyana? and a sub-question, What differences in IPRs policies in these countries (Jamaica, Trinidad and Tobago, Barbados, and Guyana) influence the decisions by firms to invest in innovation and technologies?

The research was set out within the theoretical framework of Landes and Posner's (1989) utilitarian exposition on intellectual property rights, which asserts that IPRs should be based on the maximization of social welfare and that lawmakers need to balance the power held by persons who have exclusive rights and to stimulate inventions and works of art, with the tendency of those rights to curtail public enjoyment of those works. Landes and Posner's exposition was further expanded by other scholars who argued that the creators of works could be discouraged from producing them because of copying and reselling of these goods at cheaper prices without incurring any negative consequences (Dinapoulos, 2010). This theory, which proposed the maximization of social welfare, was instrumental in examining how IPRs policies affected the choices of innovation activities made by firms and what differences in policies in the sample countries influence the decisions made by firms to invest in innovation and technology.

In considering the maximization of social welfare, I found that the policies in the sample countries Barbados, Jamaica and, Trinidad, and Tobago for the protection of IPRs

and the promotion of innovation and technology took into consideration the need to diversify the economies and/or to promote economic growth for the benefit of society. The case of Guyana some questions that should be the object of further study. Successive governments avoided updating intellectual property laws and did not promulgate any policies with respect to IPRs, innovation, and technology; yet, Guyana registered the highest levels of innovation of the countries studied, and in firm-level studies by the Inter-American Development Bank, the country also outranked all 15 Caricom member states in endogenous innovation activities. The question arises as to whether the absence of IPRs policies in Guyana was more of a catalyst to endogenous innovation than where they existed, because the other countries (Barbados, Trinidad and Tobago, and Jamaica) registered lower levels of IPRs despite the presence of robust IPRs policies. In the case of Guyana, it is unclear whether there has been copying of innovations that curtail the creativity of those who produce them because of lack of adequate compensation. Because much of the research was based on firm-level studies, it may be the case that innovations are specific to internal processes and are not easily transferable across firms or sectors. This is an area that may be deserving of further study. The question of whether the maximization of social welfare has occurred where there are robust intellectual property policies and laws in which the interests of those who hold exclusive rights are balanced with those who desire and need access to them is still unanswered in the context of the CSME. This is insufficient evidence that IPRs have contributed to the development of innovations that have resulted in social change.

### **Discussing the Literature**

In the literature in Chapter 2 of this study, I detailed an empirical and a theoretical position on the effects of IP in developing countries as concerns IPR rights policies, R&D, and innovation. I selected the most pertinent examples for this part of the study. The studies chosen used the North-South (developed-developing country) paradigm. In both approaches, I found that there was argument for the implementation of stronger IPRs as a means of encouraging both FDI and the transfer of innovations and technologies as well as endogenous innovations, though it was articulated that this did not amount to the maximization of social welfare in the South. Stronger IPRs created an imbalance in the social welfare because, when implemented in the South within the context of North South paradigm, the North benefitted from increased protections while the transfer of technologies and other social benefits such as higher wages did not occur (Lai & Qiu, 2003). Lai and Qiu (2003) assumed that both North and South had the capacity to innovate and it found that higher IPRs in the South had negative welfare effect on the South and positive in the North.

Falvey et al. (2006) assessed the effect of IPRs on economic growth from both theoretical and empirical perspectives, though greater emphasis was placed on the empirical aspect of the study. Falvey et al. noted that, in the theoretical perspective, the level of IPRs protection produced an ambiguous effect on economic growth and that stronger IPRs could have an adverse effect on local industries that relied on pirated technologies. On the other hand, Falvey et al. noted that risk taking and creativity could be promoted by greater levels of IPRs protection in developing economies and developed



ones and that the relationship between IPRs protection and factors that promote growth, such as in bound FDI and trade, was ambiguous. Gould and Gruben (1996) found a positive correlation, though it was not statistically significant, between IPR protection and economic growth. Thompson and Rushing (1996) found a positive, nonlinear relationship between IPRs protection and growth in countries with per-capita GDP above US\$ 3400. (in 1980); but, there was no relationship for countries with less income. Kanwar and Evenson (2003) found a positive relationship between IPRs and R&D.

Park (2012) found that patent protections in the South produced a statistically insignificant effect on R&D for firms situated there. Park discovered that because developing countries constitute only a small share of the world market, variations in patent rights in these countries had only a marginal effect on the R&D efforts in developed countries. On the other hand, developing countries were dependent on the tangible outcomes of R&D efforts in developed countries. Patent protections in the South produced a statistically insignificant effect on R&D for firms situated there. Park discovered that because developing countries constitute only a small share of the world market, variations in patent rights in these countries had only a marginal effect on the R&D efforts in developed countries. On the other hand, developing countries were dependent on the tangible outcomes of R&D efforts in developed countries.

Of all these studies, Falvey et al.'s (2006) study that found that there was an ambiguous effect produced by IPRs on economic growth most likely corresponds to some degree with the current study undertaken on the effect of policies on IPRs, innovation, and technology within the Caricom Single Market and Economy. However, Falvey et

al.'s suggestion that stronger IPRs could result in negative growth in sectors that rely on pirated technology did not relate to my study.

In my study, I found that where there were no identifiable and robust policies on IPRs, innovation thrived, while it lagged in those countries where there were significant efforts to comply with the regional Revised Treaty of Chaguaramas and to enact modern IP laws and policies for innovation and technology. This suggests a weakness in the empirical approaches that have not taken into account the social and cultural circumstances of countries under consideration. This, along with the tendency to lump all countries into categories based on income (developed-developing) without consideration of the capacity, willingness, or tendency to innovate, resulted in inaccurate or incomplete assessments of the levels of innovation taking place at local levels that contribute to social change, with or without the awareness and usage of IPRs.

### **Limitations**

In conducting this study, I was initially limited by the available data from some of the sample countries. The data available from the WIPO, the foremost authority in this area, on the numbers of registered patents and industrial designs was unusually low for countries such as Trinidad and Tobago which has trained patent examiners and an entire institution which deals with the examination and registration of patents. WIPO later upgraded this data in March of 2017 after the completion of this study, and I re-examined the data accordingly. It would seem that there is some disconnection between the actual records in the countries, and those produced in the WIPO annual reports. However, the data from WIPO is the most reliable source for researchers worldwide since data is

collected by dedicated teams with vast financial resources, and passed through a stringent review process. My results were also based on firm level analyses that provided solid, up to date data, and allowed for the necessary rigorous analysis. In addition, the lack of available policy analyses of some IPRs and innovation policies in sample country Jamaica made in-depth, relevant comment on the implementation and success of outreach programs impossible.

### **Recommendations and Indications**

The results of this study reveal that there is need for further investigation into the sociological-cultural aspects of intellectual property policies, and the ways in which they affect innovation in the CSME countries. The results show that while three of the four sample countries implemented laws and created institutions, and some policies dedicated to the promotion of intellectual property and innovation, their levels of innovation across sectors were low, while the sample country that had no dedicated institutions, updated laws or visible policies for IPRs, recorded the highest levels of innovations in the group across sectors.

This is an interesting and startling discovery which is in contradistinction to the literature on the subject of IPRs as a catalyst for innovation and economic growth as demonstrated in other developing country blocs. This indicates that studies that are purely statistical, are inadequate in uncovering the underlying issues of low levels of innovation in Caricom countries and in particular, within the Single Market and Economy. The idea that more stringent policy and enforcement of laws will contribute to greater innovation in this region is by itself counterproductive where the way the society works is not taken

into consideration. Using an approach which balances the social and cultural factors with the use of intellectual property as part of the development of innovation, science and technology, may result in the maximization of welfare within the context of the CSME.

### **Implications for Social Change**

This study can contribute to the development of policy on the use of intellectual property rights within the context of developing innovation and technology in CSME countries. According to Dunn (1994), policy relevant knowledge assists in formulating and solving problems even as these problems are experienced by citizens and policymakers whom they impact. These considerations include rights and opportunities in democratic systems which have been abridged or not realized. This is one of the means through which this study can help to effect social change. The construct of a Caribbean Intellectual Property is a relatively new one because intellectual property was viewed as the individual concern of countries within the geographical area defined as the Caribbean, or more particularly the West Indies (Inniss,2012). This did not properly frame the problems which arose from piecemeal approaches to this subject, especially since all of the members of the Caribbean Community were signatories to different regimen for intellectual property rights. Even with the establishment of the CSME in 1989 (Caricom, 2015), this issue has not been addressed in a holistic manner, leaving the region in a state of discord as it faces international treaty negotiations which deal with intellectual property policy (Inniss,2012).

Additionally, countries within the CSME are under commitment to the Revised Treaty of Chaguaramas to implement laws that facilitate specific provisions under Article

66 for the protection of intellectual property rights, and allowance of trade and technology transfer. The results of this study can provide insight into how intellectual property rights affect the choices made by firms in their selection of innovation activities, and what effect government policies have on the choices made by firms. It also helps to augment the construct of a unique body of knowledge that has come to be known as Caribbean Intellectual Property, and reveals idiosyncrasies in the ways in which IPRs are viewed and treated. With further investigation, issues raised in this study (sociological and cultural), can act as a catalyst to new theory of the subject.

### **Conclusion**

This study provided valuable information on the questions of IPRs in select CSME countries, and exposed the need for further study of sociological and cultural factors that may affect the ways in which IPRs are perceived and treated with in the region. It is clear that there is yet little evidence that IPRs have contributed to the development of innovations, which have in turn effected social change. The maximization of social welfare can be taken into consideration in the creation of IPRs laws and policy, but governments must also have clear direction and policy positions on innovation and technology, in order to successfully balance the interests of rights-holders and users of intellectual property assets. In this study, there was no evidence that this had been achieved, even where there were vigorous efforts in the protection of IPRs. It is hoped that the dissemination of these results will facilitate further discourse among the academics in the region, and create a basis for policy considerations that are more reflective of the social, cultural and economic realities of the Caricom region.

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## Appendix A: Patent Filings for Sample Countries

Patents				
<b>Year</b>	<b>Barbados</b>	<b>Guyana</b>	<b>Jamaica</b>	<b>Trinidad and Tobago</b>
1995	0	0	61	87
1996	0	0	79	119
1997	0	0	70	171
1998	0	0	0	107
1999	68	0	0	120
2000	0	0	101	154
2001	85	0	76	239
2002	93	0	69	223
2003	123	0	50	231
2004	80	0	72	208
2005	76	0	69	206
2006	44	0	153	278
2007	112	0	163	319
2008	85	0	136	281
2009	79	0	127	0
2010	88	0	156	0
2011	71	0	113	0
2012	36	14	107	215
2013	42	16	119	174
2014	39	20	155	188
2015	45	0	70	168

This data was provided by the World Intellectual Property Organization

## Appendix B: Industrial Design Filings for the Sample Countries

Industrial Design			
<b>Year</b>	<b>Barbados</b>	<b>Jamaica</b>	<b>Trinidad and Tobago</b>
1995	0	11	5
1996	0	12	13
1997	10	22	16
1998	0	14	10
1999	7	0	0
2000	0	13	0
2001	5	7	0
2002	7	7	2
2003	15	8	10
2004	2	54	0
2005	11	31	0
2006	2	18	0
2007	4	36	0
2008	5	39	0
2009	4	53	0
2010	4	44	0
2011	7	64	0
2012	4	112	23
2013	5	175	24
2014	0	75	18
2015	4	66	17

This data was provided by the World Intellectual Property Organization