

How compliant are developing countries with their TRIPS obligations?

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Abstract

This paper tracks the intellectual property rights implementation efforts of WTO member countries. Focusing on developing countries that acceded to the multilateral organization at its inception, 1st January 1995, the article points out the major differences between TRIPS and then existing international agreements on IPR. It then highlights how far along these members have implemented TRIPS provisions, and analyzes these efforts from regional and income perspectives. The research shows that European and a few Far East Asian countries in the sample collected have been good at meeting the deadlines for TRIPS implementations. Latin American, African and Caribbean countries are lagging behind in their obligations. Analysis at the income levels provide interesting evidence that even at low levels of income strong effort has been placed on meeting these international obligations. Results from this data collection study will be used to examine how the changes attributable to TRIPS impact economic activities in developing countries.

1 Introduction

Seventy-seven countries became members of the World Trade Organization (WTO) on the first January 1995, of which forty-odd countries were considered developing. As part of their membership commitments, these countries bound themselves to comply with the controversial *Trade-Related Aspects of Intellectual Property Rights* (TRIPS) agreement. TRIPS is one of the few multilateral agreements attempting to harmonize intellectual property rights (IPR) protection around the world. Unlike other international agreements, TRIPS defines the different categories of IPR, combines several elements of pre-existing IPR-related agreements and practices into one document, and enforce its provisions through the WTO's dispute settlement system. Furthermore members are expected to implement the entirety of TRIPS provisions, and are not allowed to pick and choose which IPR category would be suitable for their levels of economic development, as they have done in the past.¹ Thus the forty-odd developing countries, members of the then-newly minted WTO, began their process of implementing a protection regime for intangible goods and services, which has yet to be proven useful for economic development (Granstrand, 1999).

This research study focuses on the fifty-odd developing country members of the WTO, and examines how their IPR regimes have changed in line with the TRIPS obligations. I collect these information using national IPR-specific legislations (primary data), various IPR reports (secondary data), and in consultations with IPR experts wherever possible. In order to show how the local IPR landscape has changed for the countries studied, I compile information on the pre-TRIPS IPR regimes, and highlight the main differences between TRIPS' provisions and other similar agreements. The outcome of this data collection endeavor can be used for further studies, especially in analyzing how changes in IPR regimes impacts local economic activities.

All the developing countries studied had some form of IPR regime in place. Most of them were an antecedent leftover from colonial days that were adopted into the countries' new independent legislations. The three main IPR protection in most countries were copyrights,

¹Before TRIPS, countries were free to establish their own IPR system, and a majority of them tailored the system to suit their national interests and needs (Khan, 2002; Granstrand, 1999).

trademark and patents, and similarly at the international level the main IPR agreements were the Paris, Berne and Rome agreements which corresponds to the IPR types respectively. TRIPS obliged members to comply with Paris, Berne and Rome agreements and in addition, introduced three new categories for layout designs of integrated circuits, plant varieties protection, and undisclosed information.

Preliminary results from the data collection effort show that countries with high standards of economic development and emerging markets implement their TRIPS commitment relatively quickly. For some countries in the African and Latin American continents the TRIPS implementation progress is dictated by the regional trade agreements, respectively. Not surprisingly, countries in the middle- and low-income groups show a varied implementation development over time.

The rest of the paper is structured as follows. Section 2 supports the need for an IPR collection endeavor cross-country, in the manner proposed by this paper. Section 3 details the similarities and differences between TRIPS and other multilateral agreements per IPR categories. The penultimate section presents the methodologies used to collect the information and presents the results. Finally section 5 summarizes the paper, discusses the approach used in this study and makes recommendations for future studies.

2 Tracking local IPR protection

Efforts in collecting cross-country IPR protection systems began to better study how the legal protection system influences economic activities, in particular whether it is an appropriate incentive mechanism to promote innovative activities. Since then evidences have been compiled on how IPR, especially patents,² impacts R&D (Varsakelis, 2001; Mansfield, 1994), trade (Smith, 1999; Maskus and Penubarti, 1995; Ferrantino, 1993), FDI (Lee and Mansfield, 1996; Mansfield, 1994), and welfare (Falvey, Foster, and Greenaway, 2006; Thompson and Rushing, 1999; Deardoff, 1992; Rapp and Rozek, 1990), to name a few. And yet still, scholars are uncertain as to the importance and appropriateness of IPR protection in encour-

²Most IPR studies focused on patent protection because of availability of data and the controversial nature of this protection, which accords temporary marketing monopoly to the inventor.

aging innovation. It can be arguably ascertained that patent protection is likely to foster innovation in certain industries that faces high R&D costs, and where ease of imitation and low costs of final product manufacturing make it difficult for the original inventor to appropriate the benefits of her invention (Foray, 2004, chap.7). This has been the case for pharmaceutical and chemical dyes industries, where patent protection have been extremely important for innovation in the field (Mansfield, 1986). But for some other industries patenting is more of a strategic behavior (Cohen, Nelson, and et. al, 2000; Hall and Ziedonis, 2001). Thus, using an appropriate IPR index to study the impact of IPR scope and strength on local economic activities is crucial.

Attempts in quantifying the strength of IPR have been predominantly based on three types: legislation- and survey-based approaches, and combinations of the two. The legislation-based approach has been criticized for overestimating the level of protection accorded because it does not take into consideration the enforcement of those rights. On the other hand, the survey-based approach with its connectedness to the professionals are argued to be subjective, relying on the way the questions have been posed and possibly reflecting some “ideological tendencies” as mentioned by Kauffman, Kraay, and M. (2004). However, three factors render these indexes inappropriate for use in capturing developing countries’ implementation of TRIPS-compliant provisions: (i) focus on patent protection, (ii) time component and (ii) use of international conventions that are already included in the TRIPS agreement. Nevertheless, I include an overview of the indexes for better comparison of the methodology used and the one that I propose.

Legislation-based patent index was pioneered by Gadbow and Richards (1988) and later followed by Rapp and Rozek (1990). This index notes whether a country’s IPR legislation is in conformity with the minimum standards of IPR proposed by the U.S. Chamber of Commerce Intellectual Property Task Force (1987), ranging from 0 (absence of IPR protection) to 5 (full compliance with the minimum standards of the US Chamber of Commerce). Rather than focusing on national legislations, Ferrantino (1993) built an index using membership in WIPO basic conventions as an input measure of IPR strength for 75 countries. Later, Ginarte and Park (1997) constructed the most widely used IPR-index to date which uses both national patent legislations and membership to international IPR conventions, which

covers large number of countries over the period 1960 – 1990 and allows for variations in cross-country patent laws (Maskus, 2000). The criteria used to measure the strength of a country’s patent regime were (i) membership in international treaties, (ii) extent of patent coverage, (iii) restrictions on patent rights, (iv) enforcement and (v) duration of the patent protection. Updating this widely used index, Park and Lippoldt (2007) constructed three indexes that incorporates elements of TRIPS by increasing the scope from patent-specific to include trademark and copyright legislations.³

Lee and Mansfield (1996) conducted the first survey-based IPR index, which asks 100 major U.S. multinational firms how a country’s IPR regime affected its investment strategy in the host country (i.e. transfer of technology to wholly owned subsidiaries, investment in joint ventures with local partners or licensing of technology). The responses for 14 developing countries were then averaged. Since then, there were several other surveys sent to assess the strength of the countries’ IPR protection such as by Seyoum (1996) and Ostergard (2000). These surveys were oftentimes over a specific time period, which makes it difficult to assess the dynamic impact of IPR protection. Ongoing surveys on the strength of IPR across different countries have been separately undertaken by the World Economic Forum (WEF) and the IMD. The WEF questionnaire is posed to market participants of both developing and developed countries on the strength of IPR protection in their respective countries. It asks the question, “[I]ntellectual property protection in your country is: (1=weak or non-existent, 7=equal to the world’s most stringent)” to professionals residing in those countries. The result of the survey is published in their annual Global Competitiveness Report. The IMD questionnaire, on the other hand, queries whether IPR “are adequately enforced” to senior business leaders in those respective countries, ranging from 1 to 10 with 10 being the highest achievable score.⁴

³However they fall short of being a TRIPS-focus index because of how they treat the IPR elements separately, the double-counting of memberships in international treaties and the concentration of in-books compliance only. The TRIPS agreement references both the Paris and Berne convention, basically incorporating main elements of those treaties into the TRIPS. Therefore, tracking a country’s membership of both the Paris and Berne convention in addition the TRIPS agreement is redundant.

⁴A simple Pearson pairwise correlation shows that the IMD and WEF survey results are strongly correlated.

The problems associated with the legislation- and survey-based indexes may be addressed by using the two approaches together. Kondo (1995), Sherwood (1997) and Smarzynska Javorcik (2004) were the first few. Kondo built his index based on a similar criteria used by Ginarte and Park (1997) and weighted each subcomponent of the patent regime using results from market practitioners' input on the enforcement level. Sherwood probably offers the most extensive coverage in determining the strength of nations' IPR regime by examining issues of copyright, patents, trademarks, trade secrets, life forms in addition to enforceability, administration, public commitment and international treaties signed of the IPR regime. However, only 18 developing countries were covered and the weights assigned to the components of IPR regime were based primarily on his personal knowledge and personal interviews with professionals from those countries. Smarzynska Javorcik (2004) built on the Ginarte and Park (1997) index but added the element of enforcement by accounting for countries that have been flagged by the United States' *Special 301* as countries that have weak IPR regimes. Lastly, there is the index created by Lesser (2002) which used secondary data to build a patent-specific, but TRIPS compliant, index. Lesser then used factor analysis to weight the important of each criterion and allocated the aggregate factor values to weigh each criterion in his construction of the IPR index, cross referencing them to responses from a survey sent to patent attorneys and licensing executives of agricultural and pharmaceutical firms in the United States and Europe.

The existing IPR indexes discussed in the preceding paragraphs are inadequate for the type of analysis that I would like to undertake in the near future. Mostly patent-specific, the indexes do not consider the other types of IPR categories that may influence economic behavior. For example, under TRIPS computer software are protected as literary works (under copyright) and not necessarily under patent while circuit boards as those produced by semiconductor companies such as Intel are covered by layout designs of integrated circuits. Thus, in focusing on patent strength, the existing IPR indexes would most likely be relevant for patent-specific industries such as pharmaceuticals and chemical products. Secondly, attempts in capturing TRIPS implementation efforts use membership to the WTO as a proxy. The countries studied in this paper are members of the WTO since the first January 1995, and yet most of them only begin to fully comply with the TRIPS provisions in the

year 2000 because of the transition periods afforded to the countries according to their economic development level. There are still several countries that have not complied with their obligations, despite having the implementation deadline of 2000 passed by. Jamaica is a prime example. And lastly on the time dimension. I track the implementation efforts of these developing countries from their accession to the WTO to today, thus giving me over a decade of implementation observations (i.e. 1995 – 2007). This time dimension is useful to firstly observe the overall implementation picture across regions and income levels, but to also allow the appropriate number of lags to examine how an institutional change in IPR strengths could influence any local activities.

3 IPR landscape change

TRIPS is touted to be the “most comprehensive multilateral agreement on intellectual property.”⁵ It extends intellectual property rights protection to intangible goods through seven categories: (i) copyrights and related rights, (ii) trademark; (iii) geographical indications; (iv) industrial designs, (v) layout designs of integrated circuits, (vi) patents, and (vii) undisclosed information, above and beyond the then-existing international IPR conventions. New IPR categories and subject matters are introduced on a most-favored nation (MFN) and national treatment basis. In addition, TRIPS is enforceable at the multilateral level unlike its predecessors (Watal, 2001; Gervais, 2003). However, TRIPS provides some flexibility in the implementation of its provisions for developing countries through implementation procedures and transition periods. Developing countries are given four years from the date of the general TRIPS enforcement, 1st January 1996, to comply with most of the TRIPS provisions. Least-developed countries (LDCs),⁶ because of their economic level, are given ten years from the general enforcement date to comply with their TRIPS obligations. After the Doha Ministerial Conference LDCs are given a further extension until 1st July 2013 ensure that their IPR regimes are in-line with their TRIPS obligations.

National IPR landscape prior to the TRIPS agreement seemed more flexible, with many

⁵And yet it seems to be the minimum standard of IPR acceptable for WTO member countries.

⁶The WTO follows the United Nation’s categorization of least-developed countries (LDCs).

countries implementing the IPR provisions when it was in their national interest. For example, Hong Kong, Singapore, South Korea and Taiwan adopted “soft” IPR regimes, enabling themselves to adopt, adapt and assimilate technologies from developed nations (Kumar, 2002). Others, such as those that came out of colonial rule, were more inclined to adopt the IPR system of their former colonial rulers than build a system suitable to their own. For example, South Africa, Kenya, Zambia, Namibia, Swaziland and Morocco had a few TRIPS compliant legislations before the WTO agreement was signed in 1995. However, enforcement of these IPR legislations were oftentimes weak because of limited resources and/or lack of political will. As a consequence there was a noticeable and significant relationship between the extent of IPR protection and level of economic development, whereby higher income countries provided more IPR protection than lower income countries (Evenson and Westphal, 1997).

Patent protection is an area of IPR where countries had room for maneuver, applying the rule as they saw fit for their country’s level of economic development or to meet specific industrial policy. India used to protect process and not product patenting of pharmaceutical products, thus creating a legal condition for local pharmaceutical companies to produce generic versions of branded drugs. Surveying the IPR regimes in a selected number of countries, a WIPO submitted document to the WTO show that only three of the 42 developing countries had patent protection for the duration of 20 years, notably South Africa, Zimbabwe and Nigeria (WIPO, 1988). In addition, exclusion of patent protection in areas such as life forms, pharmaceutical and agriculture chemical products, and computer programs were norm, as they depended on each country’s perception of patentability. In general, the TRIPS agreement has broadened the scope of protection conferred to patented inventions by: (i) protecting process *and* products; (ii) applying this to all technological fields; and (iii) setting a minimum duration of patent protection. However, strengthening patent protection is not the only change that TRIPS has imposed on developing countries. In the following paragraphs, I expound on the main differences between TRIPS and other international IPR conventions, elucidating on how the global IPR landscape changes under this Agreement.

The main multilateral IPR agreements and the practices in their implementation existing during the negotiation time period of the Uruguay Round shaped the language and rights of

members under the TRIPS agreement. These agreements were the Paris Convention (1883) governing industrial property and trademark, Berne (1886) and Rome Conventions (1961) on copyrights and related rights. A then-recent international agreement on integrated circuits, referred to as the Washington Treaty (1989), was also included in the TRIPS text.⁷ However the Washington Treaty is not in force as there aren't enough countries that have ratified it. These international agreements, or conventions, set the boundary of what can be protected and how they should be protected. TRIPS then took the scope and breath of protection outlined in these agreements, as well as the practices related to the implementation of these conventions and formalized the framework. Furthermore, the effective dispute settlement mechanism of the WTO ensures compliance with this agreement, unlike its predecessors.

3.1 Patents

Patent protection under the Paris Convention included both products and processes in all fields of technology but allows member countries to determine their own standards of protection in regards to duration of protection, patentable subject matters and exceptions to patent rights, as long as the principles of *national treatment*⁸ is applied. TRIPS however, while incorporating substantive elements of the Paris Convention, curtails the flexibility accorded in Paris by mandating that the duration of protection be set at 20 years from date of patent application filing, limiting instances in which suspension of the protection could be invoked, defined exceptions to subject matters excludable from patenting and rights of patentees are extended to include associated rights of offering for sale or importing.

In general, TRIPS' provision on patent protection is applicable to both product and process inventions for all technological fields but certain subject matters that are considered "public goods",⁹ biologically occurring products and processes of plants or animals, and any

⁷The United States wanted protection in this subject matter since it was a major producer of semiconductor products and services.

⁸National treatment principle obliges that member countries treat their nationals and foreigners, originating from any signatory member of the Paris Convention, equally.

⁹Inventions in areas such as scientific principles, mathematical formulae, and algorithm are usually considered non-patentable because governments have categorized them as "public goods" that must remain in the public domain. In addition, these basic science-like inventions tend to be non-commercialable as they as

methods for treatment of human or animals can be excluded from patentability. However, any non-biological or microbiological processes and microorganisms are to be protected under patents. Plant varieties is to be protected either via patent or an effective *sui generis* system. Additional five years of transition time is accorded to developing countries that have not provided patent product protection for an area of technology on the enforcement date of their TRIPS obligations, i.e. 1st January 2000.¹⁰ Specifically, developing countries that have not provided protection of pharmaceutical and/or agrochemical products prior to 1st January 1995 have to set up a *mailbox* system of patent application and provide exclusive marketing rights (EMR) from the 1st January 1996 (TRIPS Art. 70.8).¹¹ Failure to comply with this provision implies non-compliance with the agreement even when developing countries are accorded transition periods to phase in the TRIPS-compliant IPR regime (see WTO's *India-Mailbox* dispute).

3.2 Undisclosed information¹²

Undisclosed information was not a category of IPR protection until the TRIPS agreement.¹³ At the national level, protection of undisclosed information, or trade secret, was under general civil law or by tort, contract and/or criminal laws. And at the international level, they are, thus failing the industrial applicability patentability requirement in most countries (Watal, 2001, p. 99).

¹⁰For LDCs this implementation period is extended to 1st January 2016 because of the Doha Ministerial Declaration.

¹¹Under the *mailbox* system, a mechanism is set up to allow for the filing of patent applications of pharmaceutical or agrochemical products. The patent application would be reviewed from the date on which patenting in the field of pharmaceutical and agrochemical products are allowed. Once an application is subject to the mailbox application and it has obtained marketing approval then that product will be granted EMR for five years, a right that is similar to patent protection (Watal, 2001).

¹²Also referred to as “trade secrets”, “confidential information” and the like in many national laws. The term “undisclosed information” was purposely chosen by negotiating parties of the Uruguay Round of negotiations so as to avoid referring to expressions of any legal system (Gervais, 2003, p. 274).

¹³During negotiations, developing countries did not recognize undisclosed information as an IPR category and were against its inclusion. They argued that extending protection to this subject matter would push their obligations beyond patent protection because of the limitless term of protection accorded to this category and the absence of disclosure tradeoff for protection, unlike patents (Watal, 2001, p.190).

reference to its protection was mandated by Art. 10*bis* of the Paris Convention particularly vis-à-vis unfair competition, whereby the information is safeguarded from misappropriation in an unauthorized manner. TRIPS alleviated the importance of undisclosed protection by setting it as an IPR category and extending it to include data submitted to governments for marketing approval, in regards to pharmaceutical and agricultural chemical products.¹⁴

There are two parts to protecting undisclosed information under the agreement: the general need to protect information that is secret and valuable, and the requirement to protect information that has been disclosed for marketing approval. It is defined as information which was generated from a specific investment, considered valuable, known to few people in the industry, and effort has been undertaken to maintain its secrecy. As for data submitted to governments for marketing approval, the data has to be undisclosed, the product tested to generate the data uses “new chemical entities”, and “considerable effort” has to be spent to produce the data. These information are protected for as long as they are not revealed by the owner or an independent third party.

The implementation of TRIPS Art. 39.2 on secret information is likely to be straightforward and harmonized across developing countries, as many have already provided protection for this category, but the differing interpretations and implementations of Art. 39.3 on data submitted to governments and their respective agencies could lead to varying treatments of protection of data submitted for marketing approval across WTO members. Firstly, it is unclear if protection under this IPR category requires “exclusive rights” protection. Exclusive rights protection of data submitted for marketing approval would imply that the “owner” of such information has the right to exclude third parties from using her data for a specific time period, thus completely excluding others from using her data completely. In this case, a third party seeking the approval of a generic drug would have to develop her own data rather than use the original test data of the particular chemical product submitted for marketing approval earlier. In other words, the common practice in developing countries of allowing for the sufficiency of establishing bioequivalence for generic drugs with the original test data

¹⁴Protection of data submitted for marketing approval of pharmaceutical or agricultural chemicals, while not new, was an attempt by the United States negotiators to curb the use of data collected by its pharmaceutical and chemical industries by generic producers and other competitors.

would no longer be acceptable for a specific time period. Secondly, the ordinary reading of Art. 39.3 could be interpreted as mandating protection only to “new chemical entity”, implying that new uses of existing chemical product would not be covered, which can be controversial for some other member countries, such as the United States (Correa, 2002).

3.3 Copyrights and related rights

Prior to TRIPS protection, copyright and related rights were governed by separate international agreements,¹⁵ with the highest protection afforded at the international level for copyright being the Berne Convention (Watal, 2001). The Convention mandates that all literary and artistic works that meet the originality and intellectual creation criteria should be protected automatically from the date of creation without subject to any formalities for the duration of the author’s lifespan plus 50 years. A separate duration of at least 25 years is extended to works of applied arts and industrial design, although members are allowed to determine the extent of application and conditions of this protection. Brazil, for example, protected computer programs as works of applied arts and thus applied the 25 year protection. More importantly, the Berne Convention allows for broader scope of exceptions to copyright protection and provides flexible implementation obligations to developing countries. A predominant exception practiced by many countries is the *fair use* doctrine where use of the copyrighted material is allowed in instances of private, not for profit and educational purposes, i.e. uses that generate positive spillover (Blair and Cotter, 2005). The appendix to the Berne Convention outlines special provisions applicable to developing countries. For example, translation of copyrighted materials into the national language is allowed if it meets the 3-step criteria for limited uses of exceptions to copyright.¹⁶

Related rights, also known as *neighbouring rights*, is mainly governed by the International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting

¹⁵At the national level the two affiliated categories of IPR were either protected under the general copyright heading or an additional legislation would have to be enacted to extend the protection to related rights, depending on the country’s legal tradition.

¹⁶The 3-step test used to establish if the instance to avail to copyright exception is: (i) granted in special cases only; (ii) not conflict with normal exploitation of work; and (iii) not unreasonably prejudice the legitimate interests of the author.

Organizations (Rome Convention). Rome Convention obliges protection of performers, producers of sound recordings and broadcasting organization for 20 years from the date of performance, broadcast or fixation without subject to any formalities. Protection includes the right to control the reproduction of their work. The Convention, however, did not offer any enforcement provision in case of infringement but most countries offered civil remedies.

The marginal addition and legal clarifications of TRIPS provisions on copyrights and related rights, as well as the compliance of many developing countries with the pre-existing international laws on this subject matter made this the least controversial IPR category of TRIPS. However, there were some oppositions from developing countries in regards to the obligations under rental rights (Art. 11) and related rights (Art. 14). Art. 11 of TRIPS introduces rental rights protection for computer programs and sound recordings, which most developing country negotiators considered as a Berne-plus obligation. Furthermore, Watal (2001, p. 234) states that Art. 14 of TRIPS on related rights creates new obligations that are higher than those mandated by Rome Convention for many developing countries but points out that this was not met with much resistance from several of them as they were already providing such protection.

3.4 Layout designs of integrated circuits

Protection of layout designs of integrated circuits is a new addition to IPR. The upsurge in United States' semiconductor companies and export to other countries gave rise to this protection. At the time of negotiations, the Washington Treaty/IPIC treaty governed its protection at the international level, however lack of ratification of this treaty rendered it not in force.¹⁷ TRIPS remedies this situation by enforcing it as part of the IPR package. In addition, TRIPS expanded the scope of protection to include protected designs and set the term of protection for a minimum of 8 years from filing date or date of first commercial exploitation.

Layout designs of integrated circuits protects the configuration of a circuit board, whereby

¹⁷Developing countries were actively participating in the negotiations of this treaty, and thus reflected many of its views. However, the United States and Japan did not sign onto the treaty as it was perceived as providing inadequate protection level (Gervais, 2003; Watal, 2001).

changes made to the board increases its functionality. These changes oftentimes require high degree of skills and large amount R&D, thus qualifying it for patent protection in some jurisdictions.

3.5 Industrial designs

Industrial designs protection has been protected under the Paris Convention and is included under TRIPS categories. Prior to TRIPS, countries were able to protect industrial designs with copyright laws, unfair competition or establishing *sui generis* legislation on the matter. Protection in this area is in regards to the aesthetic, and sometimes functional, aspects of any product that is industrially produced. It can be protected under copyright laws, obtaining concurrent and simultaneous protection. However unlike copyright, protection under industrial designs also safeguards from independent development of similar design.

TRIPS did not create additional obligations under industrial design protection. It merely reinforces the common practices and rules of Paris Convention, whereby the term of protection is for least 10 years.

3.6 Trademark and GI

Trademark and geographical indication (GI) protect consumers from being misinformed about the products that they are purchasing due to false advertisements or similar appearances. Trademark has been protected under Paris Convention but only extends to goods and not services. TRIPS marginally increased the protection level of trademark in both developed and developing countries (Watal, 2001), whereby trademark is clearly defined, treatment of well-known foreign marks are outlined, and limited protection is provided for services trademark.

GI was protected under Madrid and Lisbon Treaties in regards to appellations of origin. Prior to TRIPS, GI was provided by a few countries and there was diversity in the protection methods and standards. TRIPS included GI as one of the IPR categories but left implementation of this particular area to members, with a caveat that members will continue their negotiations in this matter to define its scope and depth of protection.

4 Methodology

There are eight parts to the TRIPS agreement detailing members' obligations, which upholds the basic tenets of the WTO (part I), highlights the minimum substantive protection in the different IPR categories (part II), outlines the various process procedures to be implemented or modified (parts III and IV), mandates publications of new or modified legislations and that disputes would be conducted under the WTO's Dispute Settlement Understanding (DSU) agreement (part V), sets the transitional arrangements for developing countries (part VI), and describes institutional arrangements and other final details of the agreement (part VII). All of these TRIPS provisions are equally binding but the main changes that TRIPS necessitates are contained in parts II and III, which refer to the substantive and procedural introduction and/or modification of members' IPR regimes.

4.1 Data collection

I choose to focus on the substantive aspect of TRIPS provisions for ease of data collection and to capture only institutional changes that would affect innovative activities.¹⁸ Procedural aspect of TRIPS is likely to affect the behaviors of IPR users in regards to time for filing or challenges to patent, trademark or copyright grants but it is less likely to affect the undertaking of innovative activities. However concentrating on collecting data on the substantive aspects of TRIPS proves to be a Herculean effort, as outlined in Table xxii in the appendix. Table xxii gives an overview of the obligations set by part II of the TRIPS agreement. The table notes the definition, the terms of protection, criteria for protection, rights conferred and the exceptions to each of the seven IPR categories. In general, compliance with part II of this agreement requires the implementation of all of these facets of the IPR types. I further simplify this data collection endeavor by concentrating solely on each IPR types' term of protection.

Data collection of each of the fifty-three developing member countries are based on careful examination of primary and secondary sources and in consultation with IPR experts,

¹⁸I define innovative activities as those that could potentially add to societal welfare, such as R&D.

wherever possible.¹⁹ Following Lesser (2002), I scour the WTO official documents which reviews members' efforts in implementing TRIPS provisions²⁰ and cross-referenced them with the documents produced by the WTO Secretariat on these members' overall trade policies. These documents, referred to as the TRIPS Review Mechanism and Trade Policy Review reports, are reliable sources to note the legislative changes undertaken or soon to be undertaken as they are based on members' own submissions and the WTO Secretariat's objective research. I note compliance of each IPR category based on whether the legislation reported meets the minimum term of protection mandated by TRIPS. When the minimum required term of protection is met, I note the name of the legislation mentioned and consult WIPO's Collection of Laws for Electronic Access (CLEA) database for the year that the legislation is implemented.²¹ I use the *implementation* instead of the *in force* dates of the legislation because this is when everyone is made aware of the new or modified legislation.²² Furthermore, for most countries the *implementation* and *in force* dates are within the same year except for low income and a few other countries. This finding will be further discussed in the following section.

¹⁹There are forty-four developing countries members of the WTO that acceded to the organization on the 1st January 1995. I dropped Central African Republic, Myanmar and Zimbabwe because these countries are experiencing political unrest and thus are unstable. I then added Jamaica, Guatemala, Colombia, Egypt, Madagascar, Malawi, Nicaragua, Poland, and Turkey to add diversity to the sample. These countries acceded to the WTO over the course of 1995, and thus are able to use the transition period for implementation according to their income levels.

²⁰This includes the question and answer portion of the TRIPS Review Mechanism.

²¹There are two dates that corresponds to legislation - the *implementation* and *in force* date. The *implementation* date is usually the date wherein which the legislation is signed and approved, while the *in force* date refers to when the legislation comes into force.

²²I assume that all agents would make their decisions on all information available to them during that period. And thus, even if a legislation may not be in force, the important fact is that the agent expects the legislation to be in force within a specific time period and thus will base her future actions on the information she has today.

4.2 Creating the index

Copyright, trademark, geographical indication, industrial designs, patents, layout designs of integrated circuits and *undisclosed information* are the seven categories of IPR as defined by TRIPS. For each of the categories mentioned, I create dummy variables to reflect members' compliance with the respective terms of duration. I assign 1 to the category, and 0 otherwise, if the particular member studied and its corresponding legislation mandate the protection term in-line with TRIPS agreement. Given the additional demands imposed by TRIPS on the categories *patent, copyright* and *undisclosed information*, I create three subsections for patent and copyright and related rights and two subsections for the undisclosed information.

Under TRIPS Part II Section 5, patent protection is extended to product and process of all technologies and *sui generis* legislation for plant varieties if this subject matter is excluded from patenting is required. Art. 65.4 further states that if a member country did not provide for the product patent protection to areas of technology prior to the “general date of application of this Agreement for that Member”, then the member would have an additional period of five years to fully comply with the Section 5 of Part II. Members have generally applied this provision to pharmaceutical or agricultural chemical products.²³ Therefore these three specific provisions can be read under one heading, i.e. patents. Data collection of dates for implementation of the 20-year term of patent protection, extension to pharmaceutical and agricultural chemical products, and plant varieties *sui generis* legislation show discrepancies, underscoring the need to treat these separately under one category. In comparison to the 36 member countries who currently offer the 20-year patent protection term, 12 members have different date of implementation for pharmaceutical and agricultural chemical products, while for plant varieties there are 26 members.

Copyright and related rights category in TRIPS refers to the copyright law as protected under Berne Convention and related rights, which falls under Rome and Phonograms Conventions. Given that most countries were already complying with the main Berne Convention provisions, I note TRIPS compliance when the country meets the additional obligations im-

²³A further indication that the provision refers to pharmaceutical or agricultural chemical products are the additional requirements of Art. 70.8 and 70.9 to provide filing means for those inventions and exclusive marketing rights, among others.

posed by the Agreement. These additional obligations, were not specifically covered in Berne Convention, are the treatment of computer programs as literary works, inclusion of rental rights and related rights. Besides these add-ons being new to international IPR copyright protection, they are important to consider from economic standpoint. Firstly, considering computer program as literary work entails longer term of protection. Secondly, rental rights obligations on computer programs and cinematographic work are important in countries where rampant pirating of these works render the copyright protection useless (Watal, 2001). And lastly, protection of performers, producers of phonogram and broadcasting organizations rights ensure adequate legal protection for these entities. Therefore, I count these add-ons as my three subsections towards compliance under the copyright and related rights category. Six and seven countries of those that implemented the treatment of computer programs as literary works have different implementation dates of rental rights and related rights, respectively. This shows that these add-ons should be considered separately.

I also treat *undisclosed information* differently from the rest of the IPR categories. *Undisclosed information* is broken down into two subsections because of the protection afforded by TRIPS under this heading. It is defined by TRIPS as information kept secret plus data submitted to governments and their respective agencies for marketing approval. Information kept secret, oftentimes referred to as *trade secret*, has been protected by governments under contract law or even under common law as part of the unfair competition policy, prior to this agreement. However there has been differing approaches to the protection of data submitted to governments for marketing approval. In most of the developing countries studied, there has not been any expressed protection of data submitted for marketing approval. And for those countries that did provide for this particular protection, most national health authorities have allowed the use of this data to establish bioequivalence of a similar product. Nevertheless, the division of this category into two is because of the particular definition of undisclosed information. Furthermore, results of the data collection under this heading show that some 14 odd-countries out of 37 member countries that do provide TRIPS-compliant trade secret compliance did not implement data submitted for marketing approval protection until later. Thus necessitating the need to treat them as separate cases within this category.

Noting compliance of the remaining IPR categories, trademark, layout designs of inte-

grated circuits, industrial design and geographical indication are more straightforward than the earlier three categories. I consider these categories as TRIPS-compliant when the term of protection as listed by TRIPS is implemented in the national legislation.²⁴ Table 1 shows how the TRIPS index is calculated.

IPR Category		Total
Copyright and related rights		1
<i>Computer program</i>	$\frac{1}{3}$	
<i>Rental rights</i>	$\frac{1}{3}$	
<i>Related rights</i>	$\frac{1}{3}$	
Trademark		1
Geographical indications		1
Industrial designs		1
Patents		1
<i>Patents</i>	$\frac{1}{3}$	
<i>Pharmaceutical patents</i>	$\frac{1}{3}$	
<i>Plant varieties</i>	$\frac{1}{3}$	
Layout designs of integrated circuits		1
Undisclosed information		1
<i>Trade secrets</i>	$\frac{1}{2}$	
<i>Data submission</i>	$\frac{1}{2}$	
Total		7

Table 1: TRIPS index method

Table 1 summarizes how a country’s IPR legislations that comply with the TRIPS provisions sums towards its TRIPS-compliant index number. Each of the seven IPR categories enter the index unweighted, reflecting the equal importance of each provisions considered under international law and practice.²⁵ This index ranges from 0 to 7, from non-compliance

²⁴See Table xx (on TRIPS provisions) for more information on each provision.

²⁵Every part of this Agreement is technically equally binding. Thus, there is no hierarchy between enforcing either *Trademark* and *Undisclosed Information* rights. This is referred to as the principle of effective

to full TRIPS compliance. Full compliance, or an index total of 7, implies that the country has legally met TRIPS obligations, while 0 implies that the particular country has not yet undertaken any efforts to comply with the Agreement. It allows us to see how far these original WTO developing countries members have implemented their TRIPS obligations.

However, the index does not necessarily reflect the strength of the country's IPR regime. Each incremental increase of the index only reflects the country's implementation effort with any one of the seven IPR categories, in no particular order. Strength of these IPR provisions depend on the government's willingness to enforce the legislation, the judicial system and the ability of the IPR holders, as well as the challengers to IPR grant, to bring their case to court.²⁶ For the purpose of this paper, the index in its current form is adequate.

I discuss and analyze the results of this compilation of IPR legislations of the fifty-three countries in the following section.

5 Analysis of data collected

I examine and cross-check the IPR legislations, Trade Policy Reports and TRIPS Review Council documents of fifty-three countries to build the index necessary for this paper. The sample consists of countries from the European (7%), Asian (21%), African (32%) and Latin American and Caribbean (40%) continents with varying income levels. Most of the countries in the sample are classified as upper-middle (36%), lower-middle (34%) and low income countries, high income countries only account for 3%. There are seven LDCs among the countries studied, all from the African continent except for Bangladesh, in Asia. I subdivide the countries by region and income levels to get a comprehensive picture of the efforts undertaken. The result of the data collection effort below refer to the legislations in those countries that are in force. Approximately 12 countries have TRIPS-compliant legislations but I omit them from the information presented below because they do not reflect the legislations that are enforceable in the respective countries.

interpretation. (See Appellate Body Report, WTO (1999).

²⁶These may include, but are not limited to, opposition of patent grant procedures, legal fees, and the transparency of IPR system.

Data compiled using the method described earlier in Section 4, provide an interesting picture of how developing countries have been implementing their obligations under TRIPS agreement. Three trends appear from these countries' implementation activities. Firstly, almost all countries availed themselves to the transition periods afforded by the Agreement and in most cases have exceeded the time limit imposed by the transition period, excluding the LDCs.²⁷ Mexico, Romania, and South Africa of the developing countries and Côte d'Ivoire of the LDCs are the few that have implemented their TRIPS obligations before the deadline. The figures in the appendix show to this effect.

Secondly, implementation efforts of developing countries vary, and not necessarily because of their income levels. Figure 1 shows the evolution of TRIPS-compliant legislation implemented in these African countries from the years 1994 until 2007. The two dotted vertical lines in the figure mark the original deadlines for developing countries and LDCs, 2000 and 2006 respectively.²⁸ South Africa, Morocco and Côte d'Ivoire are the only African countries that have managed to fully become TRIPS-compliant by the year 2000 deadline, and they are from upper-, lower-middle and low incomes respectively. When examining the implementation efforts of low income countries in Figure 2, compliance does not appear to be completely affected by income level. Furthermore, comparing the efforts of low income countries and upper-middle income countries of Figures 2 and 3 show that the implementation efforts are similar, albeit with a particular caveat. 35% of low income countries are LDCs, which implies that these seven countries are able to postpone the implementation of their TRIPS obligations until 2013. An advantage that most upper-middle income countries have over low-income countries is that they are likely to have more TRIPS-compliant legislations already in place before the WTO agreement was signed and came into force.

And lastly, countries in regional trade agreements (RTAs) include IPR obligations tend to have their compliant legislations in place sooner than those who are not, as evidenced in Figure 4. The RTAs in question here are the Andean Community, European Communities, OAPI, and NAFTA.²⁹ This trend lends support to the argument that engagements in RTAs

²⁷The Doha Ministerial meeting in 2001 extended the deadline for TRIPS implementation of LDCs from 2006 to 2013, and 2016 for pharmaceutical and agricultural chemical product patenting.

²⁸The new deadline for LDCs is 2013, and 2016 for pharmaceutical and agriculture chemical products.

²⁹A list of the members in these RTAs can be found in the appendix.

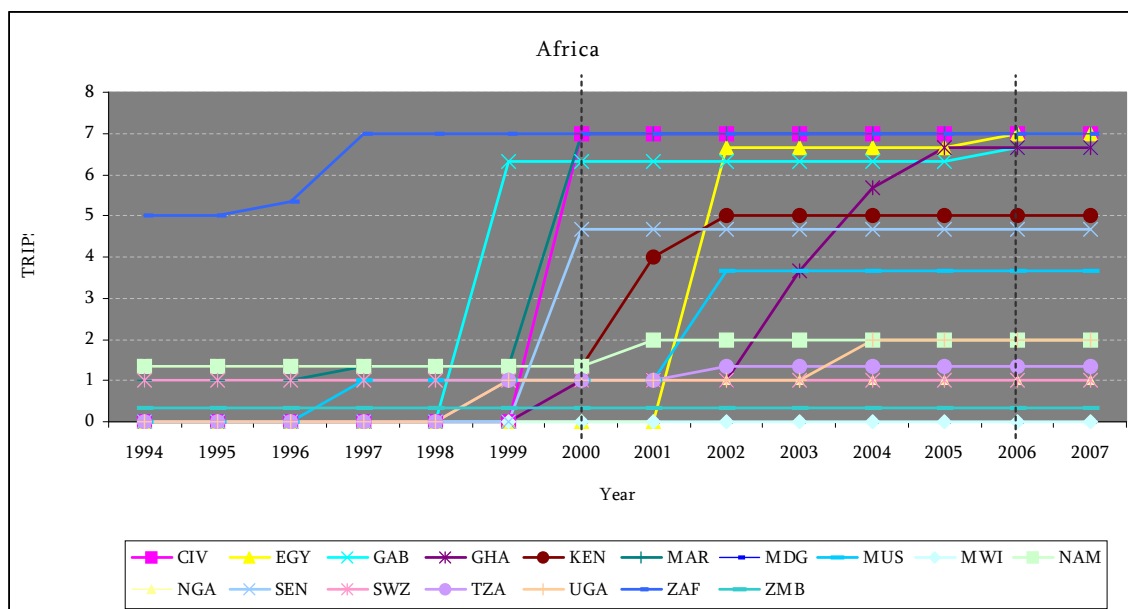


Figure 1: TRIPS compliance for African countries, 1994 – 2007

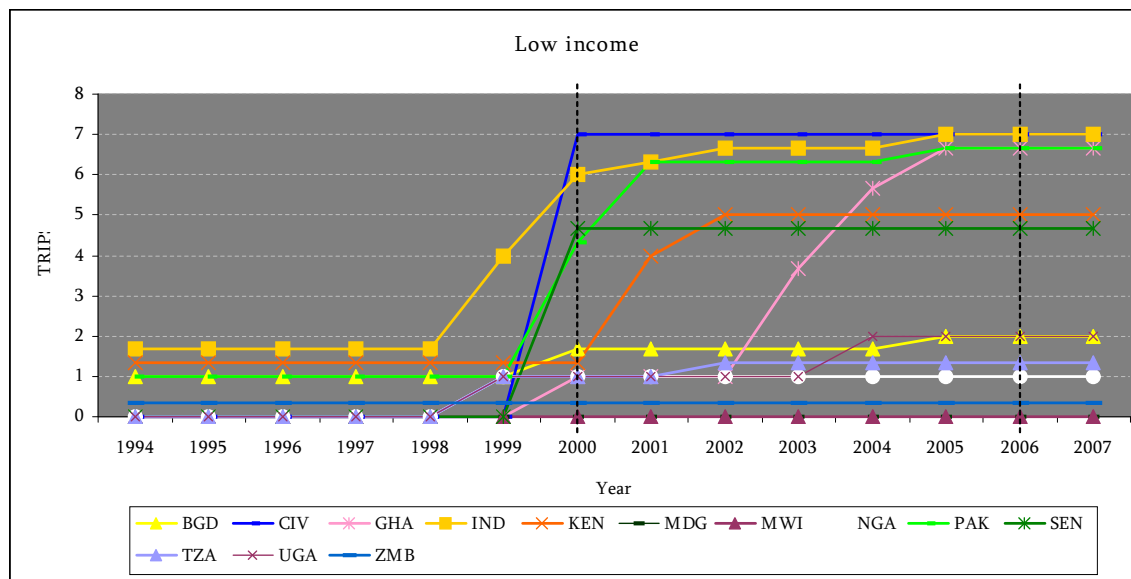


Figure 2: Figure 2: TRIPS compliance for low income countries, 1994 – 2007

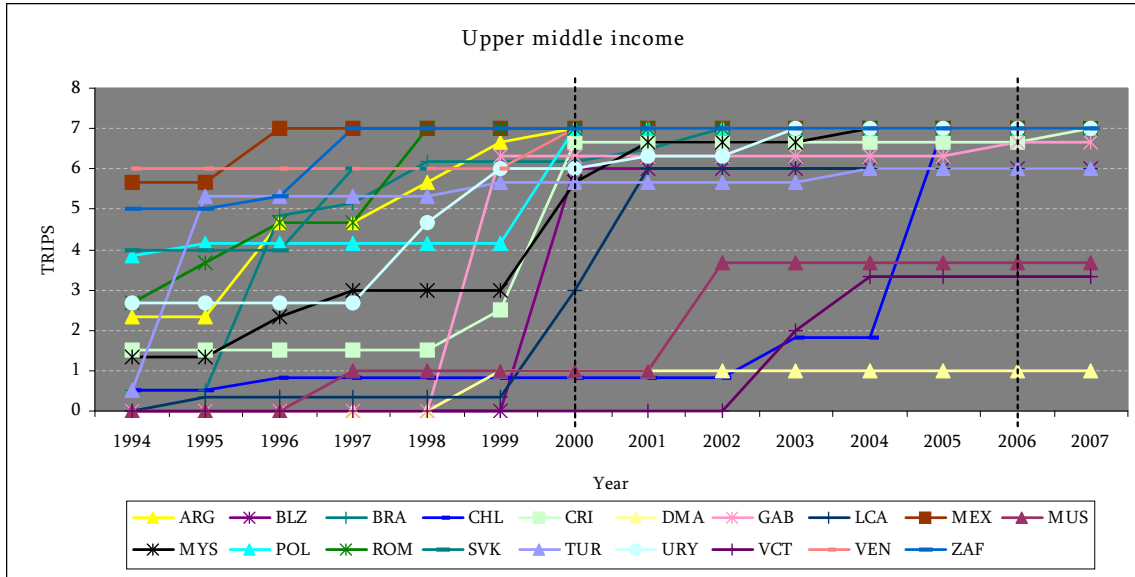


Figure 3: TRIPS compliance for upper-middle income countries, 1994–2007

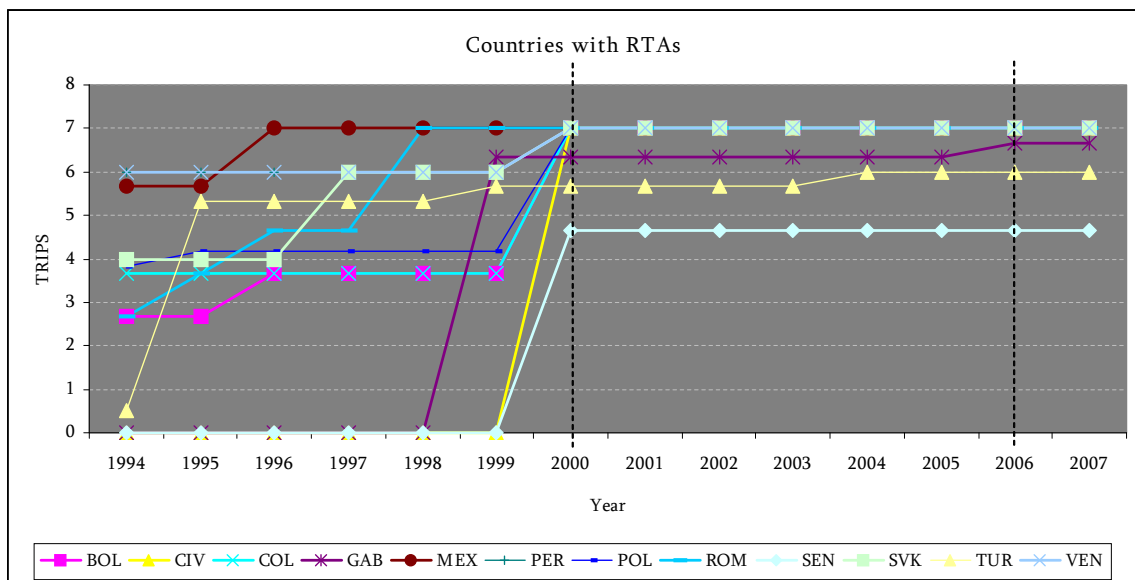


Figure 4: TRIPS compliance for countries with RTAs, 1994–2007

are beneficial and could complement progress at the broader multilateral level.

Pearson pairwise correlation of the TRIPS index with various variables of innovative activities show positive and significant relationship, indicating that there may be links between the institutional change of IPR regime and these activities. Pearson pairwise correlation allows us to see the relationship, if any, between two variables. The advantages of using this correlation to determine the association between two variables is that it does not require that the variables under study have the same units of measurement and that avoids casewise deletion.³⁰ Table 2 shows values of Pearson pairwise correlation of the TRIPS index with the various indicators of economic activities. The columns show the different correlation models for varying income levels.³¹ Model 1 refers to all of the countries in the sample, column 2 refers to all countries that are not considered high income, column 3 are middle income countries (both upper- and lower-middle incomes), column 4 are low income countries and column 5 are LDCs, a subset of low income countries.

³⁰For a detailed comparison of casewise versus pairwise deletion see <http://www.statsoft.com/textbook/stbasic.html#ccasewise>

³¹Note that in the WTO developing country term is politically motivated, however for this paper I refer developing countries as those not considered high income countries, whether in the OECD group or not.

Correlation	TRIPS index				
	1	2	3	4	5
ρ					
FDI	0.2996*	0.3112*	0.2919*	0.2835*	0.1933
High Technology	0.2650*	0.2279*	0.1785*	0.0866	0.1965
Royalties payments	0.2889*	0.3861*	0.3458*	0.4424*	0.0243
Royalties receipts	0.2360*	0.2820*	0.2358*	0.4344*	-0.0517
Trademark nonresident	0.4857*	0.4102*	0.2855*	0.7517*	0.6053*
Trademark resident	0.3358*	0.3284*	0.2735*	0.3788*	0.7921*
Patent filing at EPO	0.1778*	0.2031*	0.3429*	0.3583*	0.1722
Patent filing at JPO	0.1298*	0.1466*	0.2856*	0.3329*	0.1333
Patent filing at national patent office	0.1492*	0.1783*	0.1573*	0.2004	-0.2449
Triadic patent filing ³²	0.1444*	0.1396*	0.2889*	0.3295*	0.131
Patent filing at USPTO	0.1556*	0.2074*	0.3656*	0.3980*	0.1814
GDP per capita	0.2932*	0.3662*	0.2332*	0.5788*	0.5541*
% chemical value added in manufacturing	0.0264	0.0333	0.1967*	0.0623	-0.1497
Export as % of GDP	0.077	-0.0751	-0.2309*	0.0196	-0.0103
Trade as % of GDP	0.0243	-0.1419*	-0.2955*	-0.0753	-0.0211

Table 2: TRIPS index correlation table

Examination of Table 2 show that although there is a positive and significant relationship between the TRIPS index and national income per capita the relationship is not very strong for each of the income categories, varying from 29% to 58%. This simple association test concur with our graphical analysis that the implementation of the TRIPS-compliant regime is not necessarily dependent on economic development level. Across all income levels (models 1 to 4), there is positive and significant relationship between the index and FDI, both royalty payments and receipts, trademark, and patent filings at the EPO, JPO and USPTO. Interestingly, patent filing at the national patent office is positive and significant for models 1, 2 and 3 but not for 4, which consists of low income countries, possibly reflecting some local constraints at these offices. In addition trade is negatively correlated with the TRIPS index for developing and middle income countries only, showing that as the IPR regime becomes

more TRIPS-compliant there net trade moves in the opposite direction; for middle income countries (model 3) there is a negative export as a percentage of national income reduces as well. Further examination of the relationship between these values and the TRIPS index is needed to determine if there is a causality affect, and this will be undertaken in future research papers.

6 Conclusion

The purpose of this paper is to track the TRIPS agreement implementation efforts of WTO member countries that are considered developing. These countries appear to be implementing their obligations as dictated by the WTO, most of the times using the transition periods available to them. Three trends stand out from the collection effort undertaken for this study. Firstly, almost all countries availed themselves to the transition periods afforded by the Agreement and in most cases have exceeded the time limit imposed by the transition period, excluding the LDCs. Secondly, implementation efforts of developing countries vary, and not necessarily because of their income levels. And lastly, countries in regional trade agreements (RTAs) include IPR obligations tend to have their compliant legislations in place sooner than those who are not.

The TRIPS index compiled for this study will be used in future research studies to examine the impact of the TRIPS agreement on local economic activities.

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