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**Working Paper**

## Enforcing IPR through informal institutions: The possible role of religion in fighting software piracy

MAGKS Joint Discussion Paper Series in Economics, No. 20-2011

**Provided in Cooperation with:**

Faculty of Business Administration and Economics, University of Marburg

*Suggested Citation:* Elbially, Nora; Gouda, Moamen (2011) : Enforcing IPR through informal institutions: The possible role of religion in fighting software piracy, MAGKS Joint Discussion Paper Series in Economics, No. 20-2011, Philipps-University Marburg, Faculty of Business Administration and Economics, Marburg

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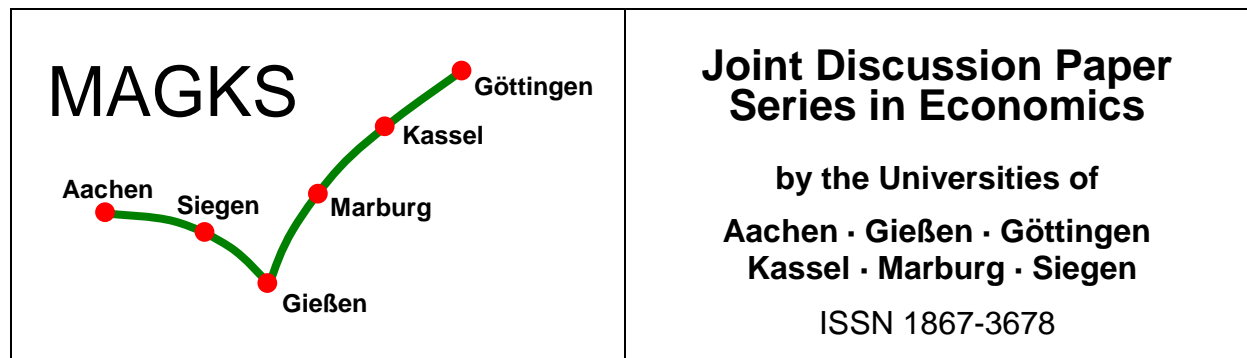
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**No. 20-2011**

**Nora Elbially and Moamen Gouda**

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# Enforcing IPR through Informal Institutions

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[The possible role of religion in fighting software piracy]

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**05.09.2011**

## **Abstract**

The existence of formal IPR laws can be considered a prerequisite for having efficient law enforcement but does not imply efficient enforcement in itself. A simple model is constructed to explain the interplay between the IPR law and human behavior within counterfeiting countries. It shows how a politically monitored IPR enforcement strategy is able to alter formal IPR laws or institutions but might not affect informal institutions, or human morals and behavior, to the same extent, hence barely affecting piracy situation. The model shows the essential role of informal institutions and its sanction mechanisms in the enforcement process. The main obstacle of IPR enforcement is that people are still not convinced that IPR violations are unethical. Religion can be considered an informal institution that might support or hinder formal laws issued with regards to IPR and hence influence de facto enforcement of laws, especially in countries with high piracy rate if a high adherence to religion is found. As the Religion-Loyalty Index (RLI) developed by this study shows, Muslim countries have the highest religiosity level among different religions. Consequently, an investigation of how Islamic jurisprudence views IPR piracy is conducted. As Islam generally prohibits IPR piracy, a set of policy recommendations based on new institutional perspective is presented that can effectively help in minimizing IPR piracy in developing countries in general and Muslim ones in specific.

## **JEL classification**

F19, K39, K42, L86, Z12

## **Keywords**

Intellectual Property Rights (IPR), Formal vs. Informal Institutions, New Institutional Economics (NIE), Software Piracy, Religion, Enforcement.

"It is by changing mindsets that we achieve the most lasting change. People have to understand that morally and ethically it is wrong to use pirated software"

**Ajay Advani, chair of BSA Malaysia**

## **I-Introduction**

Intellectual Property Right (IPR) enforcement is one of the most crucial topics of today's trade settlements among countries. Many countries claim to have an IPR law but are still suffering from a significant amount of IPR infringement. IPR infringement or piracy means the unauthorized use or copying of protected material without having permission from the right holder (Maskus, 2000). In 2008, pirated PC software was estimated to reach 41% of total PC software existing worldwide. Global losses due to IPR piracy increased to USD53bn in the same year, out of USD48bn in the previous year. In other words, for every USD100 of legitimate software sold, another USD69 was pirated. Average piracy rate in the field of software within the Middle East, Asia-Pacific, Latin America and Central and Eastern Europe reached 63% in 2008. Accordingly, more than half of the software users in these regions use pirated software (BSA, 2009). External pressure from both international organizations as well as developed countries is exerted on infringing developing countries which led, wholly or partially, to the issuance of laws that protect IPR in these countries. However, the impact of such laws is still not fully realized as the piracy rate<sup>1</sup> is increasingly disproportionate between developing and developed countries. Interestingly, in persuading infringing countries to impose stricter regulations and formal laws against IPR piracy, no real concern was given to the informal moral and ethical structure existing in these countries. IPR piracy may be considered illegal. However, it is still ethically acceptable in the infringing countries depending on the prevailing ideology in these societies. Consequently, this will negatively affect the enforceability of these IPR laws as the law enforcers themselves also count as members of the society. Therefore, they will not be motivated enough to prevent piracy. Moreover, a pirate's feelings of guilt and fear of shame and embarrassment will be held at a minimum as she conforms to the society's ideology which does not condemn such an act.

Assessing a certain society's ethical orientation towards IPR is thought to be a cumbersome task. However, two important observations can be used to deal with such difficulty, first; several studies show that religiosity is inversely related to the level of economic development

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<sup>1</sup> Piracy rate is defined as the total number of units of pirated software put into use in a year divided by the total units of software sold (BSA, 2008).

in countries investigated. Second; IPR-related literature stresses on the negative relation between IPR piracy rate and economic development. Therefore, a link between religiosity and IPR piracy can be examined. Since an increase in level of religiosity directly affects the morality and ethics of individuals in a certain society, we can investigate the moral and ethical stance of this society towards IPR by investigating how this highly-adherence religion deals with this controversial issue. However, to establish the evidence that this religion is being closely followed by its adherents, it is essential first to measure the level of religiosity related to different religious sects. For this purpose, we develop an index of religious loyalty in this study. We find that Islamic societies are the highest religiously-loyal societies among other religious sects. Moreover, Islamic countries have a very high piracy rate in comparison with countries. We then check to see if Muslim scholars think that IPR piracy is ethical from the Islam's point of view. We examine Islamic texts and *fatwas* and we reach the conclusion that, although Islam generally forbid IPR piracy, special permissions to copy illegal software is given to individuals in cases of necessities. The main issuers of such permissions are the Muslim scholars and sheikhs whom, in case they were asked for a *fatwa*<sup>2</sup> with regards to this issue, they consider the inquirer's specific social and economic circumstances before passing on their opinion. Since most, if not all, of the Muslim countries are developing ones, they have a high percentage of poor citizens that cannot bear the cost of buying legal software copies. Consequently, Muslim scholars and sheikhs give permissions for the needy individuals to pirate this software in case it is essential to the inquirer (e.g. Microsoft Windows, Microsoft Office). We propose that software companies that suffer losses due to piracy in Muslim countries collaborate with Muslim scholars in these countries so that an agreement is held between both parties. This agreement entails software companies to establish a price differentiation policy in Islamic countries where software prices are reduced respectively in these specific countries which enables Muslim scholars and sheikhs to condemn and forbid Muslims of committing acts of IPR piracy since the necessity of pirating software is abolished in this case.

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<sup>2</sup> According to Oxford online dictionary (2010), Fatwa is a ruling on a point of Islamic law given by a recognized authority.

## 1.1 Literature Review

Most of the economic literature dealing with IPR initially focused on two research points. The first was mainly investigating the effect of IPR on innovation, while the second analyzed the relation between IPR enforcement and economic growth. Different levels of analysis were used in these researches, whether it is national, regional or global. Regarding the former, several studies showed that IPR broadly fosters innovation which positively affects future growth and prosperity (e.g. Chin and Grossman, 1988; Diwan and Rodrik, 1991; Helpman, 1993; McCalman, 2000; Yang and Maskus, 2001; Alfranca and Huffman, 2003, Kanwar and Evenson, 2003; Lai and Qiu, 2003; Schneider, 2005; Hu and Mathews, 2005; and Léger, 2007). Similarly for the latter, another body of economic literature supported the hypothesis that IPR positively affects the economic development (e.g. Gould and Gruben, 1996; Ginarte and Park, 1997; Markusen, 1998; Thompson and Rushing, 1999; Schneider, 2005; and Falvey, Foster and Greenaway, 2006). Nevertheless, a considerable number of studies supported the opposite idea on both accounts and argued that IPR laws inhibit innovation and hinders the economic growth, especially in developing countries (e.g. Penrose, 1951; Plant, 1974; Kinsella, 2001; Verzola, 2004; Stiglitz, 2006; Boldrin and Levine, 2008; and Mason, 2009).

Although the literature on the effect of IPR on economic development is still controversial, most countries already signed the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) and have already issued their IPR law according to the international standards. Moreover, some countries have even established a special police unit to combat IPR piracy, as in the case of Bulgaria, Colombia, Egypt, France and Turkey among others (WIPO, 2010). Accordingly, the focus point of recent literature on IPR became identifying the determinants of IPR piracy within a country, to be able to explain why IPR laws are not efficiently implemented although they exist in infringing countries, especially developing ones which continue to have a high recorded levels of piracy rate. A common conclusion of most IPR studies -whether for or against IPR in the first place - is that IPR piracy is mainly related to levels of per capita income or economic development of each country. In other words, rich nations (Western countries) are more likely to convey with formal IPR laws, rather than poor ones. This finding is supported by Maskus and Penubarti (1995), Ginarte and Park (1997), Maskus (2000), Marron and Steel (2000) and Husted (2000). Recently, other studies have analyzed the effects of a range of domestic economic, political and social variables, such as the size of the economy, research and development expenditures, education

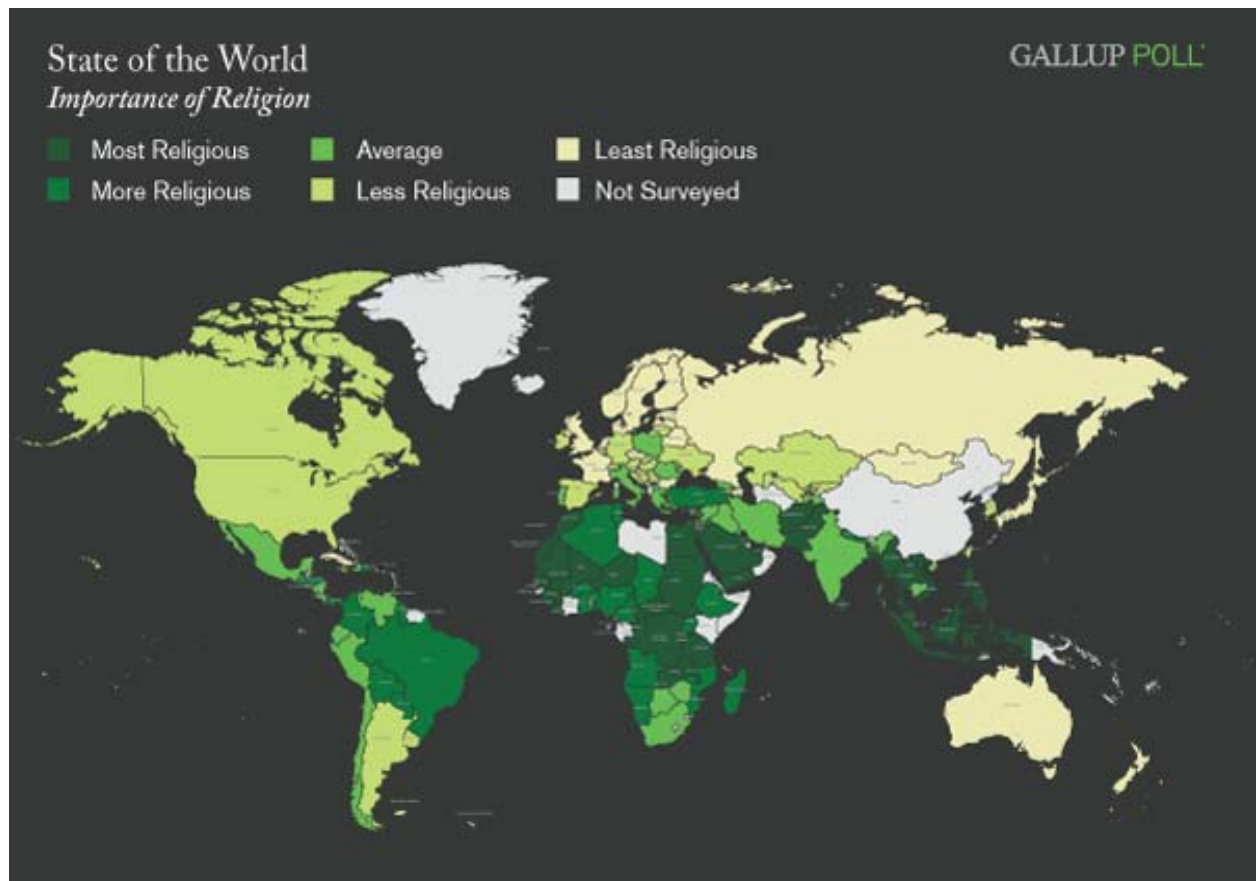
levels, economic openness, political pressure, political freedom, market freedom, sanctions and culture on IPR piracy (see Shadlen, Schrank and Kurtz, 2004; Bezman and Depken, 2004; Depken and Simmons, 2004; Grossman and Lai, 2004; Huk and Shadlen, 2005; van Kranenburg and Hogenbirk, 2005; and Fischer and Andrés, 2005). Almost all of these studies support the claim that economic, political and formal legal factors significantly affect piracy rates. None of the previous studies clearly identifies the informal institutional or cultural factors and their possible impact on the implementation of the IPR law.

As it was previously deduced from the related literature that a negative relation does exist between level of economic development and IPR piracy, another relation is also invoked through literature between economic development and religiosity. Such relation is investigated through two main hypothesis; secularization hypothesis and religion-market model. On the one hand, Secularization hypothesis examine the effect of religiosity related to different religions, on economic development (Chaves, 1994; Grier, 1997; Blum and Dudley, 2001; Bruce, 2001; Barro and McCleary, 2003; Guiso, Sapienza and Zingales, 2003; North and Gwin, 2004; Noland, 2005; Cavalcanti, Parente and Zhao, 2007), however, on the other hand, literature adopting religion-market model hypothesis looks on the impact of economic development on religiosity as a dependent variable (Iannaccone, 1991; Iannaccone and Stark, 1994; Smith, Sawkins and Seaman, 1998; Gill 1999; Smith and Sawkins, 2003; McCleary and Barro, 2006; Lopez and Santos, 2008). A debate is still raging among scholars with regards to the direction of causality of religion-economic development relationship. Nevertheless, a pattern seems to emerge among the aforementioned studies, most importantly in McCleary and Barro (2006), as well as through world values survey and Gallup international surveys that investigated religion along with global demographics. This pattern relates a country's progress in its level of economic development with a negative relation of the spirituality and religiosity of its population. In other words, as countries develop economically, there is less emphasis on dominant religious traditions and values and more emphasis placed on secular institutions. Figure (1) is developed by Gallup to demonstrate this relation.

From the above, we can deduce that developing countries have a high level of both IPR piracy as well as religiosity.



**Figure 1: Demonstrating the international pattern of religiosity, Gallup, 2009**



Source: Crabtree and Pelham, What Alabamians and Iranians Have in Common, Gallup website, 9<sup>th</sup> of February, 2009.

Although religion plays an important role in formulating culture (Lewis-Fernandez and Diaz, 2002), studies that tackled the link between IPR and cultural factors have not taken religion into account so far. Kovacic (2007) affirms that Hofstede's cultural model (Hofstede, 1981, 2004) is the most frequently used cultural model in software piracy research (see for example, Depken and Simmons, 2004; Husted, 2000; Ki, Chang, and Khang, 2006; Kyper Lievano, Mangiameli, and Shin, 2004; Moores, 2003; Ronkainen and Guerrero-Cusumano, 2001; Shin, Gopal, Sanders, and Whinston, 2004). Moreover, as noted by Shore et al. (2001), cross-cultural research that explored the relation between IPR piracy and ethical or moral behavior remains limited. Swinyard, Rinne and Keng Kau (1990) analyze the attitudes towards software copyright laws and the behavioral intentions towards these laws in the US and Singapore and found that both attitudes and behavioral intentions of Americans are more harmonious with copyright laws than those of Singaporeans. Moreover, the authors find that "not only does the Asian culture provide *less* support for copyright legislation; it provides *more* support for the human benefits which might come from the piracy". Al-Jabri and Abdul-Gader (1997) derive a model to explore the effects of individual and peer beliefs on software

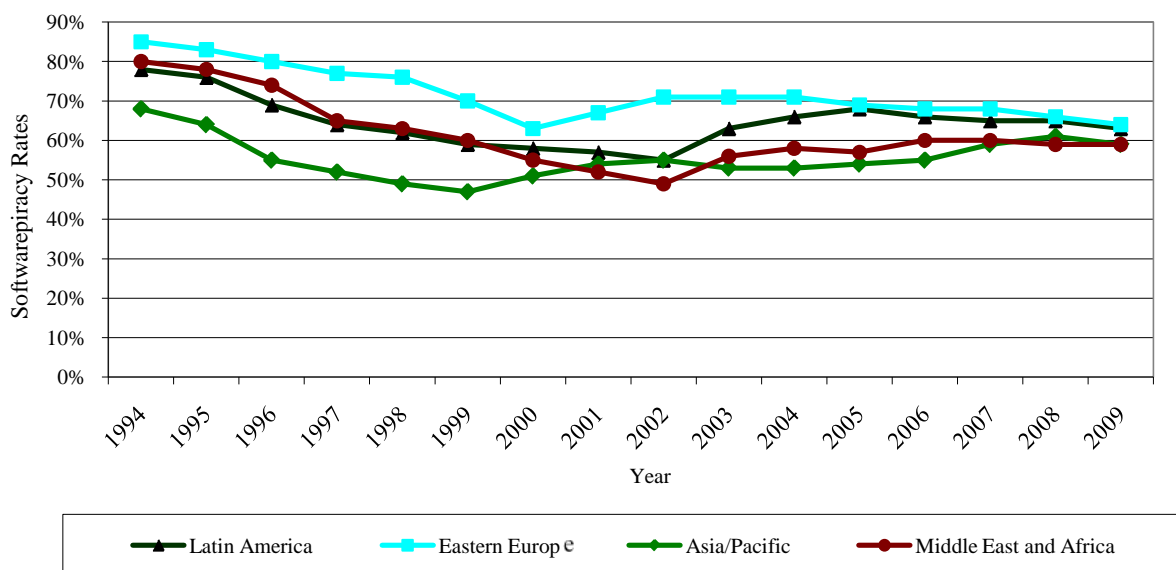
copyright infringements in Saudi Arabia through conducting a survey. The results of this study show that beliefs, whether for individuals or for peers, have significant effects on ethical intention to respect or infringe protected software. El Sheikh, Rashed, Qudah, and Peace (2006) conduct a similar study in Jordan and discovered that the majority of the survey respondents (63%) believe that the act of piracy is unethical and wrong. The authors argue then that raising the awareness of the negative ethical consequences of piracy could be useful. Most recently, Haigh (2008) examines the interaction of technology, software users, and regulatory regimes related to piracy in Ukraine. The author concludes that “because each nation has its own history, the traditional understandings and social norms on which Internet users draw will be quite different in each country”.

## **1.2 Background of the Study**

IPR laws are a set of formal institutions that are designed to influence human behavior towards respecting IPR. All the previous efforts and pressure practiced by international organizations to enforce IPR in developing countries stimulate the procedure of improving formal administrative and judicial institutions of IPR without any significant effect on factual enforcement, since almost all of these countries have signed TRIPS agreement and issued their own IPR laws. Nevertheless, average piracy rate among this group of countries is still 70% (BSA, 2009). Improving the de jure legal institutions of IPR is not necessarily accompanied by successful de facto institutions. Factual enforcement of IPR is one of the most crucial topics of today’s trade agreements among countries. Legislative movements and government reforms toward achieving a best practice model or best practice institutions of IPR protection have increased significantly, mainly as a result of the growing attention given to IPR related issues in the foreign trade policy of the United States. Right holders expected the government of each country to bear the responsibility creating, specifying, enacting and enforcing IPR according to the international standards, as they assumed that it can do so at lower cost. During the 21st century, several right holders, especially in the field of software came together and formed collective interest groups that started to practice further pressure on governments to impose more severe punishments for deterring IPR infringement. Being the world’s largest software supplier, the US has launched an anti piracy campaign, putting countries who fail to impose deterrent penalties on a “Watch List” which was set up by the 1988 US Trade Act to be able to impose trade sanctions on persisting counterfeiting

countries<sup>3</sup>. Section 182 of the Omnibus Trade and Competitiveness Act of 1988, 19 U.S.C. § 2242 encompassed the so called "Special 301" provisions. These provisions were issued to form a major US trade tool to control international copyright piracy and are considered a vital tool for the United States Trade Representative (USTR)<sup>4</sup> to stop the increasing losses in US jobs and competitiveness (Sykes, 1992). Hence, developing countries who have signed Bilateral Trade Agreements (BITS) with the US and members of the Generalized System of Preferences (GSP) trade program will be threatened to be deprived from the benefits they are enjoying. The U.S. GSP is a program designed to promote economic growth in developing world by providing preferential duty-free entry for about 4,800 products from 131 designated beneficiary countries. However, looking at the piracy trends of most developing countries mostly benefiting from the GSP program, it can be said that sanction threats does not significantly affect software piracy. Figure 2 shows software piracy trends per region, indicating fluctuations around an average piracy rate of 63% in 2009 after having reached an average piracy rate of 57% during 2002/2003. Hence, sanction threats and the pressure towards more legal reforms alone might not be enough.

**Figure 2: Software Piracy Trends per Region 1994-2009**



Source: Business Software Alliance (BSA), Annual BSA and IDC Global Software Piracy Study, Various Issues.

<sup>3</sup> As it is the prevailing case with China, with 100% tariffs on its trade with the US.

<sup>4</sup> USTR is an agency of over 200 people, a highly committed group of professionals who have decades of specialized experience in trade issues and regions of the world. They negotiate directly with foreign governments to create trade agreements, resolve disputes and participate in global trade policy organizations. They also meet with governments, business groups, legislators and public interest groups to gather input on trade issues and explain the president's trade policy positions. The agency was founded in 1962 and has offices in Washington, Geneva and Brussels ([www.ustr.gov](http://www.ustr.gov)).

From the above figure, it can be noticed that only recently (during the last 5 years) global software piracy rates of the 4 highest piracy regions (Latin America; Eastern Europe, Middle East and Africa, Asia and Pacific) are diverging towards an average of 60 %. In other words the fluctuations tend to diminish and the trends are somehow converging. Right holders link this fact to what can be called cooperative enforcement strategies. These imply that the right holder should participate in the evolution process of IPR institutions depending on joint firm based, as well as government based, enforcement models. These models are usually designed according to the strategic importance, market share, piracy rate, legal environment, corruption level and last but not least the informal institutions of the country in question. Hence, there will be no one-fits-all piracy enforcement model, but rather a tailored model that should suit the prevailing formal and informal institutions in a group of countries. A most prominent cooperative example is done by a number of software firms. They signed cooperative enforcement agreements with a number of selected host countries and offered original products to students and public ministries mainly those of poor developing countries at a cheap price in order to encourage them to adapt efficient IPR policies. The agreement held between Microsoft and the Egyptian ministry of education would reflect such a case where the usage of Microsoft products in all Egypt's public schools was formally legalized. The Egyptian government, in return, was encouraged to enforce IPR laws in a more efficient way; reducing the piracy rate in Egypt from a pre-agreement estimate of 58% to reach 52% in 2002 (Microsoft Egypt, 2002). Moreover, several software companies used the Egyptian media, hiring well known actors to signal the disadvantages of piracy in a simple way<sup>5</sup>. However, such agreements managed to stabilize or hinder the increase of piracy rates rather than significantly diminishing such type of behavior. An average piracy rate of 60% in Egypt can

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<sup>5</sup> An interesting case related to IPR in Arab countries happened when, in 2007, one of the largest Arab media networks, Arab Radio and Television Network (ART), requested Amr Khaled, a famous Muslim preacher and producer of several famous programs through its cable channels, to present a media message, prohibiting the usage of illegal means to watch these channels and endorsing IPR of the right holders. Amr Khaled was called "Islam's Billy Graham" by the British "The Independent" newspaper (2006) and was chosen as sixth most influential intellectual in the world by Prospect magazine in 2005 (Prospect magazine website, 2008) and number 19 of the world's most influential people by Time Magazine in 2007 (Time magazine website, 2007), which shows how much he is influential on the Muslim societies, in particular, Arabic ones. However, several newspapers and news websites started attacking Khaled's message and argued that the Arab Muslims were enraged by this act and described it as a "paid advertisement". The argument behind such attack was not the message itself but rather that ART subscription prices were very expensive to citizens of the Arab region to extent that it was described as "prohibitive" (Ghazal, 2006) and "closer to a monopolist's fees rather than marginal cost" (Malkawi, 2007). Consequently, Amr Khaled's credibility was severely damaged (see for example Alfajr website, 2007; and Bahrain online, 2008). Such attack was so severe that Amr Khaled submitted a public apology for taking part in such an IPR protection campaign. It can be deduced from such case that religious influence was viewed by ART officials as an essential motivator for Arab Muslims' moral and behavior choices. However, these officials did not take into consideration the effect of ART's high subscription prices on individuals' choices to illegally watch ART channels.

still not be tolerated by right holders and that is why an analysis of the informal institutions (morals and ethics) imbedded within the IPR system of counterfeiting countries becomes crucial.

The New Institutional Economics (NIE) presents a clear explanation about the possible failures of laws as a type of formal institutions when not supported by society's norms, culture, beliefs and religion, the so called informal institutions. Hence, one could think of religion as being an effective tool to guide people towards separating what is right from what is wrong. Moreover, it can be considered a main source of identifying morals and ethics in a certain society. This tool might achieve significant results, especially in countries with strong adherence to religion.

This study generally analyzes the significance of using religion as a set of informal institutions to improve the overall piracy situation in strong religious countries. Section two presents a short outline of the emergence and change of IPR institutions in developing countries to show that external pressure and international commitments can be considered necessary but not sufficient for reducing piracy in developing countries, as cooperative tailored enforcement models to tender the gap between formal and informal institutions tend to be more effective. Section three illustrates the role of informal institutions in effectively changing human behaviour. We present a model analysing the interplay between formal rule, religion and human behaviour and describe how this relation can be affected by diverging formal and informal institutions to explain the failure of the IPR transplantation process. Section four uses descriptive statistics to be able to draw conclusions about religious loyalty. The main finding is that Muslim societies are still the keenest to follow the restrictions of their religion. The results interpreted from this measurement are then used to analyse the role of religion as a possible informal institution in shaping human behaviour towards understanding the ethics of IPR protection. Section five will try to shed light on the mechanism of formulating Islamic legal judgments. This will be of importance to see exactly where IPR fit under such Islamic legal framework. However, this can only be realized if the IPR products themselves do not violate the Islamic pricing mechanism. In other words they should be sold in a fair manner. Therefore, section Six will mainly deal with informal enforcement of IPR laws in Islamic countries by investigating the interaction between prices of IPR products and the aforementioned kind of enforcement which is based on the society's

participation in condemning and stopping acts of piracy. Section seven concludes by highlighting the main findings of the study.

## **II- The Emergence and Change of Institutions: “The IPR Law”**

IPR is a field of law that deals with property rights in intangible property. They are humanly made constraints that forbid any unauthorized use or copying of protected work or material. Thus they are considered formal institutions, and as institutions are realized through a sanction system, IPR is protected by the IPR law that includes a punishment for whoever breaks it. A minimum degree of knowledge about institutions needs to be presented before starting to discuss the problems associated with existing IPR laws and the conflicts that often occur in international disputes in order to achieve factual efficient enforcement.

### **2.1 IPR Laws: “A Set of Formal Institutions”**

North (1990) defines institutions as being humanly devised constraints that structure human interaction (economic, political or social). Any institution results from a series of decisions by which a group of individuals determines how to conduct and regulate the interactions among members of the group. In other words, institutions are considered sets of rules that are recognized and frequently followed by members of the community. He differentiates between three types of institutions: formal institutions (e.g. formal rules, laws); informal institutions (e.g. norms, traditions, culture) and enforcement mechanisms (judicial, syndicates) (North, 1990). Thus, it can be said that the distinction between formal and informal institutions in this case, depends on the rule component of institutions. Ostrom (1986:5) defined formal rules or institutions as being prescriptions commonly known and used by a set of participants to order repetitive, independent relationships. Prescriptions refer to devices that structure human behaviour, as to show what is right from what is wrong and prohibited. Voigt (2008), conversely, uses the terms internal and external institutions. He builds his classification of institutions on who sanctions the rule-breaker: if rule breaking is sanctioned by the state, institutions are called “external” and if it is done by members of the society (e.g. family, church), then institutions would be called “internal”.<sup>6</sup>

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<sup>6</sup> Also see Kiwit and Voigt (1995).

Issuing formal IPR rules or amending existing laws is doable, as it only implies the legislation of a new law by the parliament. However, factual enforcement of the law involves a lot of more interactive procedures that are accompanied with high transaction costs. IPR enforcement in general involves a great number of delegations and a great number of tasks until it reaches the hands of last resort enforcers (could be the judges), hence it involves high monitoring and controlling costs. Furthermore, it is worth noting that developing countries with large segments of poor people that rely mainly on access to cheap pirated software face a huge conflict when trying to enforce IPR to abide by extensive bilateral and multilateral pressure. This is due to the fact that they have to bear the extra fiscal cost of enforcement and deprive their poor citizens from using software products that might be essential to the development and knowledge of the whole society. This fact decreases the incentives of authorities to effectively enforce the law. Another important factor that deserves special attention is the lack of any guilt feeling by pirates and the rest of the society concerning the buying and selling of pirated products, which can be considered a main reason behind the prevailing inefficient IPR protection framework. According to the NIE the quality of legal enforcement mechanisms (judiciary, prosecutors) is to a large extent influenced by their beliefs and incentives, which are influenced by their surrounding culture and the mechanisms overseeing their decisions within this culture (Voigt, 2008).

Norms of behaviour are essential to legitimize any set of formal rules. North (1990) points out that institutional evolution is based on definite factors, such as country's history, values and traditions, which give the country its context specific characteristics. As a result, the evolutionary path of institutions can be different among countries as far as it is not determined only on the basis of formal rules and constitutions. In other words, countries applying the same formal rules will have very different economic performance characteristics, due to the fact that they have different informal norms and enforcement characteristics (North, 1998:25). This fact can explain generally the failure of some formal rules from successful Western economies when applied by other Third World economies (North, 1996).

It is very hard to determine a unique set of appropriate formal or external institutional arrangements that could be implemented in all countries without taking the already existing informal or internal institutional setup of each country into consideration. Rodrik (2008:2) describes the type of institutional reform promoted by multilateral organizations as being heavily biased towards a best-practice model. This model presumes that the primary role of

institutional arrangements is to minimize transaction costs in the immediately relevant domain without paying attention to potential interactions with institutional features elsewhere in the system. Accordingly, a new model should be rather designed for IPR enforcement to convince countries and corporations that their own interests will be injured by piracy and that combating these thefts is vital to the interests of both parties. In other words, one should look for alternative tools that converge the existing formal rules in a way that can gradually accommodate with the prevailing informal institutions in each country. The effectiveness of new institutions will thus depend on the path of institutional change and the relation between formal and informal institutions prevailing in each country.

## **2.2 IPR Enforcement and the Path of Institutional Change**

Institutions in general underlie continuous changes according to their social nature. Thus as human behaviour changes over time, institutions might change as well. The problem of IPR protection in developing countries as explained before is the fact that existing formal rules fail to influence the informal behaviour of human beings toward respecting such rights. Thus, it might become useful to search for factors that influence the informal institutions directly, without using the formal ones.

Gursevaja and Eickhof (2007), explain that Institutional change in general can emerge due to one of three factors: a technological change, a change in the way the society value things (Value change), or politically set strategies and rules (politically monitored change). The emergence of IPR laws can be linked to the first and second factor concerning their emergence in developed countries; however, they are a result of path three concerning the case of developing countries. It is worth mentioning that the first two factors stimulate an endogenous change of the society itself. Thus informal institutions lead the change as in the second case or are accompanied by a parallel change of the formal institution as in the first case. The third factor on the other hand stimulates an exogenous change, as it implies the formation of new formal rules discarding completely the informal institutions. This requires a change in the informal institutions without providing a stimulating factor that can effectively lead this change process. Of course, exceptions may exist if by chance the new formal institutions are designed to complement existing informal institutions. Veblen (1961/1919) also argues that institutional change could be achieved best through previous technological change. He argues that technological innovation amends habits and behaviour directly and



indirectly throughout a change in the formal framework (Veblen, 1961/1919:231-251). However, this concept cannot be easily achieved in least developed countries as they still have a long way to go before reaching such level of technological sophistication.

Hayek (1969) refuses the idea of achieving institutional change through politically set strategies. According to his point of view, institutions are supposed to be the outcome of a selective set of cultural evolutions, not an outcome of preset deliberate human design.<sup>7</sup> Transplantation of rules is considered a pure politically motivated institutional change, hence a type of formal institutions that should create new informal institutions. Thus, it becomes clear that informal institutions enjoy a high amount of power. Without being able to change this type of institution, any change in formal rules will not achieve its desired target. In other words, the importance of informal institutions must be recognized and properly treated in order to achieve the desired institutional change. However, one must keep in mind that as formal institutions (statute law, common law, regulations) can be easily changed, informal institutions (norms of behaviour, self imposed codes of conduct) may change only gradually, and are essential to legitimize any set of formal rules (North, 1990). Accordingly, new social mechanisms or tools that can gradually bridge formal and informal institutions of IPR through creating a change in domestic norms and values might result in higher success.

Formal and informal institutions in general could have a neutral, complementary, substitutive or conflicting relation (Kiwit and Voigt, 1995). Being complementary can lead to optimal results; however being conflicting, will never lead to satisfying results. The authors argue that the problem of inefficient IPR enforcement in developing countries could be the outcome of such conflicting institutions. In other words, it is expected that the efficiency of emerging IPR institutions will be adversely affected by the prevailing discrepancies between both types of institutions, especially in developing countries. Informal institutions could put pressure on the existing legal system and lead the institutional change on the one hand, or resist the practice of an already agreed on formal rule on the other hand (Tridico, 2004:26).

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<sup>7</sup> For more discussions about the evolution of institutions, see: Menger (1883); Hayek (1969); Schotter (1986); Langlois (1986); Kiwit and Voigt (1995).

### **III- The Interplay between Rule and Behaviour**

As mentioned in the above section, the probability of successfully enforcing a formal institution through politically set strategies and rules is very weak. So what should be done in order to ensure institutional effectiveness? The key to answer this question is being able to identify the complementary role of formal and informal IPR institutions in the interplay between rule and behaviour. People usually respond to incentives and act according to certain rules imposed by the society or the government. As long as incentives to follow a certain rule are missing, people will not convey to the rule.

Talking about effectiveness of rules, some would argue that a deterrent sanction is sufficient for determining the effectiveness of any formal institution. However, we should keep in mind that punishment should fit the crime and consequently each country has to set or evaluate IPR piracy based on personal value judgements. Moreover, the existence of a deterrent sanction as stated by the law does not necessary imply practicing the sanction in reality. According to Ghada Khalifa, antipiracy manager at Microsoft Egypt, Comparing the software piracy rates provided by the global software piracy study of the Business Software Alliance (BSA) with the actual number of cases that were factually sanctioned due to IPR violations within the same country, large discrepancies can be noticed (Personal Communication, 6<sup>th</sup> of April, 2005).

The process of IPR enforcement in most developing countries is usually governed by the criminal law and under the supervision of the Ministry of Interior, which implies a significant involvement of the state in investigation and prosecution. Lax enforcement implies that infringement cases might be brought to court by prosecutors but not be sanctioned by judges or they might not be caught by the police in the first place. Thus, the IPR law becomes not deterrent and might lose its power after some time. This fact becomes even more evident when informal institutions and social or cultural norms do not support these formal laws. To simplify the relation between the imposition of a formal IPR law and its enforcement within the society, one could look at the following model that represents the interplay between IPR rules and individual behaviour.

Figure 3, is a simplified model representing the interplay between the imposition of a new formal rule and human behaviour. In other words, it explains how the society responds to imposed formal institutions (e.g. IPR law). Mansfield (1994) determined three areas of concern in assessing the strength of property rights enforcement in a country. These are the laws, the legal infrastructure, and the willingness of governments to actively enforce property rights.<sup>8</sup> Thus, on the one hand, the government should not only approve a law but must also believe in its importance and be willing to practically enforce it in order to achieve strong efficient IPR enforcement. On the other hand, public support must be present. The society should be motivated or carefully guided to the moral reasons behind respecting a certain law. Such moral reasons are affected, whether directly or indirectly, through adherence to a specific religion. The divergence between citizens' actual and expected behaviour after the issuance of the law can be attributed to their moral and ethical stipulation. In other words, *ceteris paribus*, it is expected that a newly-issued law can be enforced more effectively in a society that adhere to a certain moral and ethical code that correspond with that particular law than in a society where its moral stance oppose it.

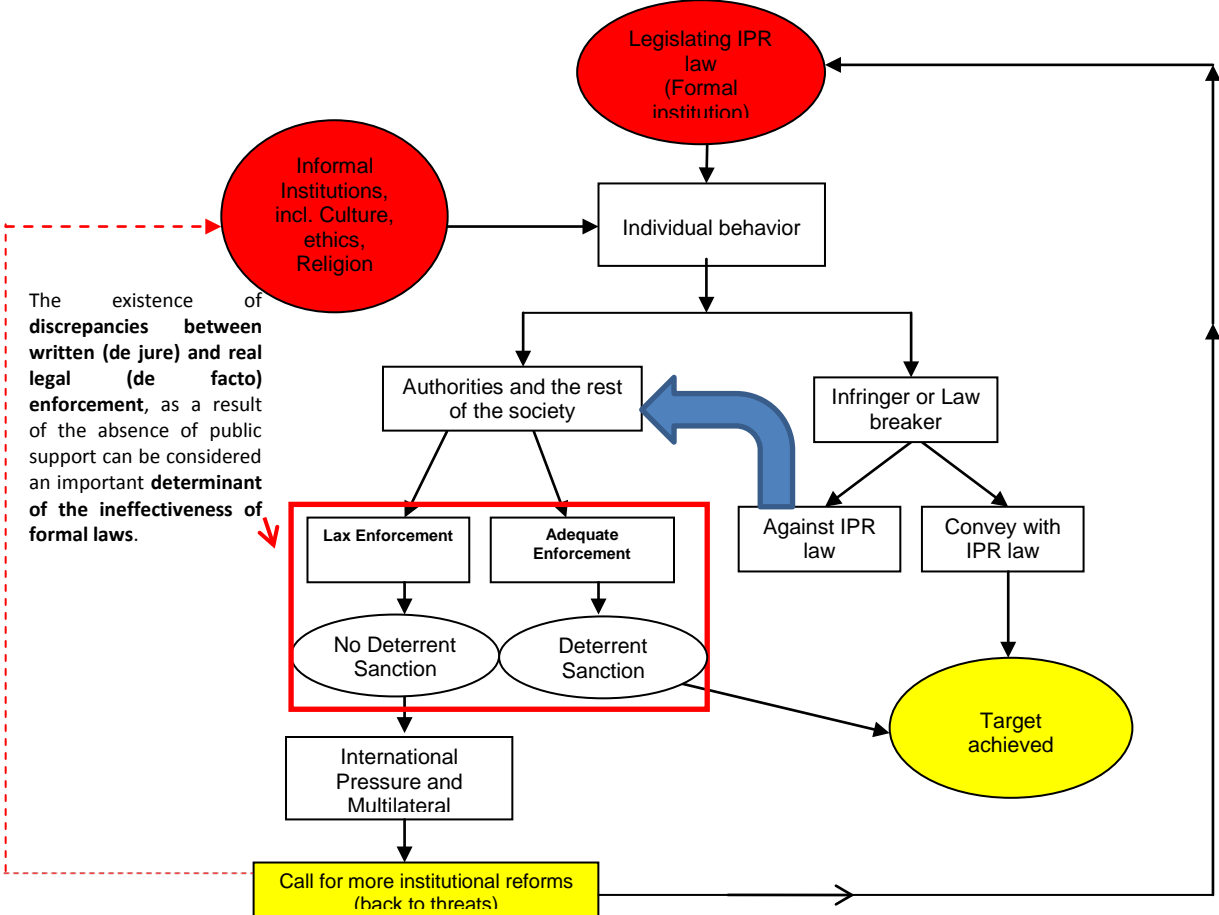
The figure tries to illustrate such observation as it shows that a pirate has to choose between either to conform with or to disobey IPR laws and regulations in her country. The law is said to be implemented efficiently in case the pirate conform to it. However, if the pirate chose not to do so, then the benefit of her piracy must be greater than the cost, which includes her feelings of guilt and as well as the probability of getting caught multiplied by the fine and the consequential social embarrassment she will suffer from. Here, the moral and ethical background of the society is an important factor that controls the pirate's expected action. This is because the pirate's guilty feelings are directly affected with the pirate's morality in the first place. The social embarrassment is related to the society's moral code as well. Moreover, the motivation of law enforcers to apply this law is also affected by their own moral and ethical standards. In a highly religious society, the law enforcers, as well as the society as a whole, could view any formal law as a null if it contradicts with the teachings of the dominant religion. This model will continue to iterate as long as the benefits of breaking the formal institutions outweigh their costs. The existence of discrepancies between *de jure* and *de facto* legal enforcement, as a result of the absence of public support (informal or internal institutions working against or are neutral to formal or external institutions) can be considered an important determinant of the ineffectiveness of formal laws. This diagram

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<sup>8</sup> For more details, see Lanjouw and Lerner (1997: 22).

could be used as a basis to provide a political-economic explanation for the interplay between the designed scheme of IPR enforcement and the pattern of individual behaviour in order to explain the reasons behind existing institutional deficiencies.

**Figure 3: The Interplay between Rule and Behaviour**



A shoplifter who decides to steal is aware of the consequences of his action. If she is caught, the police will sanction him, and this action is totally supported by a general acceptance of the society to punish a thief. The case of IPR piracy in general and copyright products piracy in specific in developing countries is however different: It is weakly probable to get caught, and if the pirate is caught it rarely happens that he is given a proper sanction. Moreover, the society will not be disgraced of him for his action. In addition no one would help the police to catch him at the first place. Therefore, it is difficult to find an efficient solution entirely within the legal system. However, religion can play an important role in this case as data obtained by the Gallup Polls, which were conducted through 143 countries, show that among countries where average annual incomes are USD2,000 or less, 92% of residents surveyed state that religion is an important part of their daily lives. Conversely, among the richest countries

surveyed - those where average annual incomes are USD25,000 or more - the figure drops to 44% only (Crabtree and Pelham, 2009a). This shows that poor countries are more religious. Moreover, according to BSA report on piracy (2009), piracy is mostly high in developing countries (Figure 1). This indicates that as IPR piracy problem is more severe in the case of developing countries and as these countries tend to be more religious, one can think of religion as being a more effective tool to signal the unethical behavior of IPR infringement to the society. To sum up, it can be said that the effectiveness of formal institutions in general and IPR laws in specific will mainly depend on achieving legitimacy through national actors, which imply that the enforcement of the new rule should be approved by the society itself. They must realize the importance of the rule, expect to reap certain benefits from conveying to it and understand the ethical values behind respecting it. In other words, the law or the formal institution must be localized. Issuing new rules or institutions should be accompanied by local awareness about the essentiality of the institution and moreover certain linkages to one or more informal or cultural factors of the country in question. Religious motives can create such an informal protection mechanism, which increases the cost of piracy actions, given that people are religious, or in other words, given that these people are keen to follow their religion.

#### ***IV. Relating Global Religious Loyalty to IPR Piracy***

We illustrated in the previous section how informal institutions can entail a certain informal protection mechanism that can deter IPR piracy. However, due to the informality of this protection mechanism, it is, therefore, totally dependent on the loyalty and adherence of individuals towards a specific informal institution in the first place. As the informal institution focused upon in this study is religion, it is essential to examine how much do different societies adhere to religious teachings and also to check whether these religious teachings can help in reducing the level of IPR piracy through its respective societies. Hence, we analyze the degree of religiosity within different countries to measure the loyalty to the institutions stemming from religion.

Various measurements of religiosity are already developed. Gallup's religiosity index (Crabtree and Pelham, 2009b) is one of the fundamental measurements of religiosity across countries. Gallup asks respondents in 143 countries and territories whether religion is an important part of their daily lives. However, since the index is only based on this specific

question, it is limited as it does not tackle how much respondents apply their religion in their daily life actions. Barro and McCleary (2006) use Herfindahl index<sup>9</sup> to test for the degree of religion pluralism in a certain country. Nevertheless, their proposed „Pluralism Index“ remains inadequate for our purpose since only it only uses one wave of world values survey, (year 2000). Therefore, a limited number of countries were analyzed, mostly western ones. As a result of the aforementioned, the authors developed a Religious-Loyalty index (RLI) to better capture the adherence of countries to religion. The main premise of RLI is based on figures provided by the World Values Survey (WVS). From the period lasting from 1981 to 2008, The WVS, in collaboration with European Values Study (EVS) carried out five waves of representative national surveys in 97 societies containing almost 90 percent of the world's population. WVS mainly deals with what people in different societies want out of life and what they believe in (World Values Survey, 2009a). We have chosen a set of questions that indicate the degree of religiosity across different societies, these questions are:

- *„Indicate how important it is in your life. Would you say it is: Religion?“* (Question V9).
  - The respondents are asked to provide their answer on a scale of the following four degrees: *„Very important“*, *„Rather important“*, *„Not very important“* and *„not at all important“*.
- *„Could you tell me how much confidence you have in these specific organizations: the Churches<sup>10</sup>?“* (Question V131).
  - The respondents are asked to provide their answer on a scale of four degrees: *„A great deal“*, *„Rather important“*, *„Not very important“* and *„not at all important“*.
- *„Apart from weddings, funerals and christenings, about how often do you attend religious services these days?“* (Question V186).
  - The respondents are asked to provide their answer on a scale of seven degrees: *„More than once a week“*, *„Once a week“*, *„Once a month“*, *„Only on special holy days/Christmas/Easter days“*, *„Once a year“*, *„Less often“* and *„Never practically never“*.

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<sup>9</sup> Although Herfindahl index was originally developed to measure trade concentration in a certain country (Hirschman, 1964), Barro and McCleary (2006) used the same concept on religious denominations in the sampled countries.

<sup>10</sup> WVS 2005 codebook indicates that the word “Churches” in the WVS questions is substituted by the phrase “religious leaders” in surveys done in non-Christian countries (WVS, 2009b).

- *„Independently of whether you go to church or not, would you say you are a religious person? “ (Question V187).
 
  - The respondents are asked to provide their answer on a scale of four degrees: *„A religious person“*, *„Not a religious person“*, *„A convinced atheist“* and *„Other answer“*.*
- *„Generally speaking, do you think that the churches in your country are giving adequate answers to the moral problems and needs of the individual? “ (Question V188).
 
  - The respondents are asked to provide their answer with only *„Yes“* or *„No“*.*

Our country sample includes mainly all the 85 countries that their citizens were surveyed about their religious preferences and denomination through the fourth and fifth WVS survey waves, which was conducted between 1999 and 2008. We have divided the sample countries by the dominant religious denomination in each country. For this cause, we used the data supplied by adherents .com (2005), a specialized website that have a collection of over 43,870 statistics related to religion adherence and religious geography citations. Adherents.com describes itself as the “2nd most frequently visited general religion site on the Internet, with an average of 13,500 unique visitors per day”. Although this source provides the needed data on religion of most of the countries in our sample, the specific religious sect followed by the majority in some countries are not given. Consequently, another source (CIA World Factbook, 2010) was used to review the findings from the previous source as well as to provide us with the missing religious denomination for the remaining countries (for a full list, see Table A in Appendix). Our next step was to assemble the survey results of the questions chosen for each country. The intention here is to assimilate the percentage of religious persons in each country sample through collecting the number of respondents that believe and act according to a certain religion. For our first question (Religion importance in life: Question V9), the percentage of the respondents who chose the first two answer choices (*„Very Important“* and *„Rather important“*) were summed. This is also done regarding the second question (Confidence in Churches: Question V131) as we have also summed the respondents percentages that choose one of the first two answers (*„A great deal “*and *„Rather important“*). As for the third question (attending religious services: Question V186), we have summed the respondents percentage that gave one of those two answers (*„More than once a week“* and *„Once a week“*). As for the fourth question (Religious person: V187), we have indicated the respondents percentage that answered *„Yes“*. The same was done regarding the fifth and last question (Churches give answers to moral problems: Question V188). It is perceived that

these percentages collected so far represent the percentage of society that is inclined towards religion in each country sampled.

A factor analysis followed in order to construct a scale of religious loyalty by the type of religion using the percentage of religion adherents across all sampled countries. Since Hinduism and Shinto are represented through our sample by only one country each, they were discarded from our analysis. A normalization of values then took place so that the index range is [0, 1], where 0 indicates non- or low level of religiosity and 1 indicates a high level of religiosity. An average RLI of each religious denomination is then calculated for comparison. (For the complete list of RLI by country and religion type, see Table B in Appendix). The results, as shown in table 1, indicate that Islamic countries are highly adherent to Islam, since the group RLI average reached 0.72, indicating a high level of religious-loyalty. This becomes more apparent when it is compared by the group averages of other religions, where their group RLI averages range between 0.33 (Buddhism) and 0.49 (Orthodox Christianity).

**Table 1: RLI by Religion**

	Count	Mean	Median	Standard Deviation	Range	Minimum	Maximum
Buddhism	3	0.34	0.23	0.20	0.36	0.21	0.57
Catholic	35	0.47	0.49	0.23	0.87	0.02	0.89
Islam	18	0.73	0.77	0.15	0.50	0.42	0.92
Orthodox	13	0.49	0.44	0.16	0.52	0.26	0.78
Protestant	14	0.36	0.26	0.27	0.76	0.11	0.87

As for the IPR, we investigated the average piracy rate for our sample countries using software piracy data provided by the annual reports of Business Software Alliance (BSA). The data supplied is between the years 2003 and 2009 and had some limitations in its coverage. Therefore, few countries were missing through our dataset (for the full list of countries covered and their respective IPR piracy rates see Table C in the Appendix). Table 2 provides statistics on IPR piracy by religious group. It can be clearly seen that Orthodox Christianity and Islam have the highest rate of piracy through their respective countries.



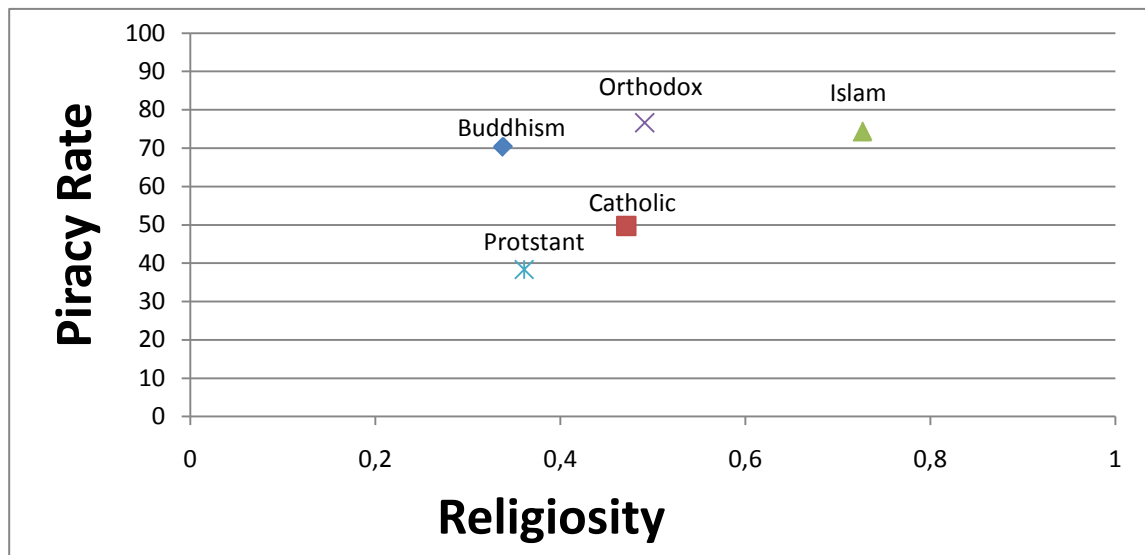
**Table 2: Piracy Rate by Religion**

	Count	Mean	Median	Standard Deviation	Range	Minimum	Maximum
Buddhism	3	70.3	78.3	22.8	43.6	44.6	88.1
Catholicism	31	49.7	45.9	16.7	61.3	21.0	82.3
Islam	13	74.4	76.7	12.2	39.8	52.0	91.8
Orthodox	12	76.6	77.5	13.0	43.6	51.4	95.0
Protestant	13	38.3	28.9	19.5	69.7	20.7	90.4

Source: Business Software Alliance (BSA), Annual BSA and IDC Global Software Piracy Study, Various Issues.

Linking these two results together, Figure 4 illustrates the relation between our two variables. It can be deduced that Islamic countries have a high level of both, IPR piracy and religiosity. Somewhat this result is not surprising since all the Islamic countries in our sample are considered to be developing ones, therefore have this aforementioned trend of low level of economic development and high levels of piracy and religiosity. This can even explain the position of protestant countries which are most composed of countries with high level of economic development. Moreover, these countries have a low piracy and religiosity levels. Islamic countries are shown to be exceedingly more religious than their nearest religious group, Orthodox countries, which, also, are mostly composed of developing ones.

**Figure 4: Linking IPR piracy to Religiosity**



It is clear from this result that Islamic societies are more adherent to religion than other religions. As Islam provides the value system for its adherents, basically reflected in their societies at a macro-level, it can be used as an informal institution to influence the behaviour of these societies towards respecting newly introduced formal rules. The majority of Muslim

societies are still keen to follow the rules of their religion and search for answers using sentences of the Quran. A lot of Islamic rules are still followed which are in their nature much stricter and enjoy a greater opportunity cost than piracy, like *Hijab* or the fastening of Ramadan month. Accordingly, it becomes necessary to ask whether Islam as a religion followed favourably by its adherents can be used as an informal enforcement mechanism to support the IPR enforcement process in Islamic countries. In other words, is it able to formulate a belief among Muslims that IPR piracy is unethical and prohibited by Islam, thus, creating a sort of informal sanction mechanism that can increase the marginal cost of IPR pirates and positively affect combating piracy in these countries? For this reason, an investigation of how Islam views IPR piracy is necessary.

## ***V. Does Islam support IPR piracy?***

### **5.1 Islam and IPR protection**

As it was aforementioned, Islam demands its followers to adhere to a large system of rules, regulations, values and normative framework covering all aspects of life for Muslims. Gibb (1950) states that “law in the eyes of the Muslim scholars was not in fact an independent or empirical study. It was the practical aspect of the religious and social doctrine preached by Mohammed. For the early Muslims there was little or no distinction between 'legal' and 'religious'. In the Qur’an the two aspects are found side by side, or rather interwoven one with the other, and so likewise in the *Hadith* (Prophet Mohammed’s sayings). The study and interpretation of the Qur’an involved sometimes the one (*legal*) and sometimes the other (*religious*)”. The primary sources of *Shari’ah* (Islamic legal traditions<sup>11</sup>) are Qur’an, *Sunnah* (words, actions and practices of the prophet Mohammad) as well as the human articulation and comprehension of the aforementioned primary sources (Ali, 2009:117). The human deduction is stressed upon in our analysis since, as Kamali (1991) points out, “The Qur’an and *Sunnah* themselves contain very little by way of methodology, but rather provide the indications from which the rules of *Shari’ah* can be deduced”. As Jamar (1992) notes, that in order to establish a certain legal proposition to be followed by Muslims, one should be able to point to a certain verse of the Quran, or the *Sunnah* of the prophet Mohammad that directly tackles this legal proposition, giving clear rules and regulations regarding it. If this proved to be unfruitful, then if a certain point in history can be found when all Muslim legal scholars

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<sup>11</sup> We use Ali (2009) definition of Sharia as ‘Islamic legal tradition’ rather than ‘Islamic law’ for the same reason he derived; “to avoid creating a restrictive fence around an evolving tradition” (Ali, 2009:117-118)

agreed upon a particular interpretation of a certain Islamic text, then in this case, their consensus may be relied upon as a valid source of Islamic legal traditions. This is referred to as *Ijma*<sup>12</sup>. Use of analogical reasoning, or *Qiyas*, is very limited in Islamic legal traditions (Jamar, 1992:2). *Qiyas* is the extension of a certain legal tradition in Islam from an original case to a new one, because the latter has the same effective underpinning as the former. The original case is regulated by a given text, and *Qiyas* tries to expand the same textual ruling to the new case (Kamali, 1991:180). *Qiyas*, however, seems to be most suitable in legislative situations which, due to the advances of culture and knowledge were not envisaged in the time of prophet Mohammed, 1500 years ago.

Jamar (1992) divides Islamic legal traditions to three areas; firstly, areas which have clear and precise rules and regulations, such as spiritual duties and inheritance. Secondly, areas which were given some general principles, but with some indefiniteness, as in contract law, and finally, areas that were out of Islamic legal boundaries as in the field of intellectual property (IP). Consequently, Muslim Judges are obliged to formulate Islamic verdict that relate to IPR, taking into consideration that these rules do not “run afoul of *shari'ah* prohibitions and are consistent with *shari'ah* principles” (Jamar, 1992:3). The main methodology for derivation of Islamic legislation towards IPR is *Qiyas* (analogical reasoning). Islamic definition of property rights generically concedes with that of North (1990) and Sened (1997) where the former defines it as being the rights individuals appropriate or practice over their own labour and the goods and services they possess. According to North (1990), IP could take the form of industrial property (protected by patents or trade secrets or utility models) on the one hand, or the form of an artistic work or software program (protected by copyrights), on the other hand. Sened (1997) relates the concept of IPR to law and describes IPR as being the field of law that deals with property rights in intangible property, and it refers to the creation of human mind and intellect. Thus, when dealing with IP, we are faced with the problem of providing public goods. Therefore, it can be argued that Islam recognizes the two forms of IP, whether as a public or private good. A considerable amount of Quranic and Sunnah literature strongly tackled stealing and cheating of public and private property. Consequently, Muslim judges use *Qiyas* in dealing with IPR piracy, where the same Quranic and Sunnah literature are expanded through interpretation to include IPR as

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<sup>12</sup> Kamali (1991) defines *Ijma* as “as the unanimous agreement of the mujtahidun, of the Muslim community of any period following the demise of the Prophet Mohammad on any matter” (Kamali, 1991:156)

well (see Alghamdi, 2005:39 and Jamar, 1992:3-4). Moreover, many *fatwas*<sup>13</sup> exhaustively tackled IPR piracy. An Islamic website (islamweb.net) lists 194 *fatwas* that covers IPR from every aspect<sup>14</sup>. Furthermore, The International Islamic Fiqh Academy, which consists of the highest Islamic religious authorities in all Islamic countries, tackled the topic of IPR in its 5<sup>th</sup> round held in Kuwait in 1988 and issued a *fatwa*<sup>15</sup>. The basic consensus in all these *fatwas* as well as a considerable body of research that investigate how Islam views IPR piracy concludes that such type of piracy is prohibited by Islam (see Alghamdi, 2005; Khalil, 2003; Abou Elkhair, 2002 and Alnaggar, 2002; Amanullah, 2006 among others). A list of Quranic verses has been used as evidence for the prohibition of IPR piracy in Islam, among them:

- „And do not eat up your property among yourselves for vanities, nor use it as bait for the judges, with intent that ye may eat up wrongfully and knowingly a little of (other) people's property“ (Qur'an, Chapter 2: Verse 188)
- „O ye who believe! Eat not up your property among yourselves in vanities: But let there be amongst you Traffic and trade by mutual good-will: Nor kill (or destroy) yourselves: for verily Allah hath been to you Most Merciful!“ (Qur'an, Chapter 4: Verse 29)
- “Allah doth command you to render back your Trusts to those to whom they are due; And when ye judge between man and man, that ye judge with justice” (Qur'an, Chapter 4: Verse 58)
- “Help ye one another in righteousness and piety, but help ye not one another in sin and rancour: fear Allah, for Allah is strict in punishment.” (Qur'an, Chapter 5: Verse 2)
- “Give just measure and weight, nor withhold from the people the things that are their due; and do no mischief on the earth after it has been set in order: that will be best for you, if ye have Faith.” (Qur'an, Chapter 7: Verse 85)
- “O ye that believe! Betray not the trust of Allah and the Messenger, nor misappropriate knowingly things entrusted to you.” (Qur'an, Chapter 8: Verse 27)

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<sup>13</sup> Mariam-Webster's online dictionary (2009) defines *fatwa* as a “legal opinion or decree handed down by an Islamic religious leader“. For a thorough look on the range on definitions of *fatwa*, see Ali (2009:121).

<sup>14</sup> See these *Fatwas* on IPR at <http://www.islamweb.net/ver2/Fatwa/FatwaCategory.php?lang=A&CatId=2180> (in Arabic). Retrieved November 17, 2009.

<sup>15</sup> For the *fatwa* issued by the International Islamic Fiqh Academy on IPR, see <http://www.fiqhacademy.org.sa/>

Hadith are also used in presenting the case against IPR piracy in Islam, among hadith used are:

- "Muslims must abide by their agreements, except an agreement that make *Haram* (unlawful) what is *Halal* (lawful) or make *Halal* what was *Haram*." (Al-Tirmidhi, Hadith No. 1272).
- "Whoever precedes others in gaining a *Halal* (lawful) thing, will be more entitled to own it (than others)." (AlQaari, No.492)
- "He who cheats is not of us (Muslims). Deceitfulness and fraud are things that lead one to Hell." (Ibn Hanbal, No. 4968 )
- "Honesty and clarity are blessed for both parties to a sale, while concealment and deceit destroy the blessings of their sale." (Al-Bukharî, No. 1937)
- "Don't betray he who have betrayed you and (Keep and) pay back the trusts of those who entrust you." (Al-Sanaani, No. 1483)

Islamic legal traditions divide the acts of a Muslim into five main categories: *Wajib* (obligatory), *Mustahabb/Sunnah* (recommended), *Mubah* (permitted, neither obligatory nor recommended), *Makruh* (recommended against, abominable) and *Haram* (prohibited, banned). Throughout the Islamic literature and *fatwas*, IPR piracy is judged to be *Haram*- the highest degree of prohibition. This clearly shows that Islam basically backs up laws and regulations - whether nationally or internationally - that prohibits any kind of IPR piracy.

Although the Islamic legal tradition towards IPR piracy generically prohibits this act, there are still many significant factors that Muslim legal scholars take into consideration when they issue any *fatwa* relating to IPR issue. *Fatwa* generally change through time and place, therefore it is of key importance for Muslim Legal scholars to build a real and exact image of the situation in hand so that *Fatwas* can be as close to reality as possible. Ibn Qayyim (d. 1349) mentions that: "*fatwa* can experience change due to differences in period, place, situation, customs and intention". *Fatwas* depend on several factors, which play a crucial role in determining the degree of prohibition of IPR piracy as seen by Muslim legal scholars, and they include the type of infringed intellectual property in question (whether it is for an educational or entertainment purpose)<sup>16</sup> (Islamweb, 2009), the availability of the item under

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<sup>16</sup> *Fatwa* on IPR No. 123712 (in Arabic). Retrieved November 20, 2009  
<http://www.islamweb.net/ver2/Fatwa/ShowFatwa.php?lang=A&Id=123712&Option=FatwaId>

intellectual property protection for purchasing<sup>17</sup> (Islamweb, 2009), whether the act of piracy is done for personal use or for public broadcasting<sup>18</sup> (Islamweb, 2009), and, most importantly, if the price of item under Intellectual property protection is too high for the needy consumer to purchase<sup>19</sup> (Islamweb, 2009; Abou Elkhair, 2002 and Khalil, 2003).

## 5.2 Pricing strategies under Islamic rules

According to Bashar (1997), Islamic Shari'ah has categorised prices as valid or invalid. A valid price refers to the price given in a market with accordance to Islamic Law. This means that such price must be free from any deliberate attempt to cheat, deceive, conceal, lie or withhold relevant information of a certain good or service. Valid price is a one that satisfies all possible *Shari'ah* legal requirements in the process of formation. Muslim legal scholars allow these valid prices to reign in the market and disallow them when they conflict with fairness and justice and/or societal interests. An invalid price, on the contrary, is that price which does not follow the Islamic legal requirements. It is likely that such a price will be higher than normal price. Invalidity of price may occur if a firm manipulated supply by creating artificial scarcity. Therefore, prices that will emerge in the market if monopolists or producers form cartels exert influence on output or prohibit others from competing in the market are considered invalid and not lawful under Islamic jurisprudence (Bashar, 1997:41-42).

As for the case of IPR, Fellmeth (1998) points out in his study on copyright misuse and the limits of intellectual property monopoly that copyright owners are given an exclusive right to make, use, copy, sell or import the respective subject of the patent or copyright for a limited time, allowing them to act as “temporary, limited monopolists” therefore, controlling the nature of their protected goods through using methods that might otherwise breach the antitrust laws. Stiglitz (2008) shares the same opinion and notes that “Intellectual Property Rights generate monopoly power that can be used to leverage further monopoly power. The most obvious example is Microsoft, which has leveraged its monopoly power in operating

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<sup>17</sup> *Fatwa* on IPR No. 13170 (in Arabic). Retrieved November 20, 2009

<http://www.islamweb.net/ver2/Fatwa/ShowFatwa.php?Option=FatwaId&lang=A&Id=13170>

<sup>18</sup> *Fatwas* on IPR No. 125038, 28439 and 117615 (in Arabic). Retrieved November 20, 2009

<http://www.islamweb.net/ver2/Fatwa/ShowFatwa.php?lang=A&Id=125038&Option=FatwaId> ,  
<http://www.islamweb.net/ver2/Fatwa/ShowFatwa.php?Option=FatwaId&lang=A&Id=28439> and  
<http://www.islamweb.net/ver2/Fatwa/ShowFatwa.php?lang=A&Id=117615&Option=FatwaId>

<sup>19</sup> *Fatwa* on IPR No. 121287 (in Arabic). Retrieved November 20, 2009

<http://www.islamweb.net/ver2/Fatwa/ShowFatwa.php?lang=A&Id=121287&Option=FatwaId>

systems to obtain a dominant position in applications like word processing (Microsoft Office) and Internet browsers (Internet Explorer).”

Khalil (2003) deduces that Islam prohibits monopolistic acts by copyright holders based on the Hadith: “He who monopolizes is a wrong-doer” (Muslim, No. 3012). In this case, Muslim legal scholars give permission to Muslim public to illegally copy software but only for personal purposes and not for the intention of selling it afterwards (Islamweb, 2009)<sup>20</sup>. Muslim Legal scholars view such case as a “necessity” and allow it only in a limited account. Quranic verses give legitimacy to this necessity:

- “But if one is forced by necessity, without wilful disobedience, nor transgressing due limits, - then is he guiltless. For Allah is Oft-forgiving Most Merciful.” (Qur’an, Chapter 2: Verse 173)
- “...Except under compulsion of necessity” (Qur’an, Chapter 6: Verse 119)

To sum up, we can state that Islamic prohibition of IPR is not as direct as it was assumed from other studies dealing with this issue (i.e, Jamar, 1992; Alghamdi, 2005; Amanullah, 2006). We have demonstrated that Muslim legal scholars base their opinion in IPR-related fatwa on the inquirer’s social and economic status as well as the kind of intellectually protected item under investigation. Most Muslim societies suffer from low levels of economic development which is also reflected on the low income of a large proportion in Muslims in their respective societies. Moreover, prices of intellectually-protected items coming from developed countries remain relatively expensive for the Muslim layman. Consequently, Muslim legal scholars might issue adverse fatwas that permit Muslims to pirate IPR products due to their high prices. In other words, IPR-related fatwa generally prohibits piracy actions, but given the extreme high prices of the original products that are imposed by international monopolistic firms, without any consideration of the necessity of the product to the poor, fatwas might become more lenient leading to a controversial effect to the extent of supporting piracy. This point can explain why there are numerous fatwas prohibiting IPR piracy and at the same time, Islamic countries have such high level of piracy. In the next section, we will propose a mechanism of how informal enforcement of IPR laws plays a more effective role in Islamic countries.

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<sup>20</sup> Fatwa on IPR No. 121287 (in Arabic). Retrieved November 20, 2009  
<http://www.islamweb.net/ver2/Fatwa/ShowFatwa.php?lang=A&Id=121287&Option=FatwaId>

## ***VI. The Role of Informal IPR enforcement in Islamic Countries***

Becker (1968) described criminals as rational individuals that are trying to maximize their utility. His major idea is that the decision to commit a crime is similar to the decision to undertake an investment. Hence, in order to understand the rationale behind piracy behaviour, one should weigh the expected costs of a pirate with the expected benefits. Pirates are usually faced by minimal costs, due to the low marginal cost of reproducing software products, in addition to the low probability of getting caught and hence punished.

Following the idea of Becker, the pirates maximizing problem can be written as follows:

$$EU_i = p_i U_i(Y_i - F_i) + (1 - p_i) U_i(Y_i) \quad (\text{eq. 1})$$

Where:

$P_i$ : is the probability of a criminal to get convicted per offence

$U_i$ : is the criminal's utility function

$Y_i$ : is the criminal's income

$F_i$ : is the monetary equivalent of the punishment

Varian (1999), however, pointed out that the optimal level of enforcement is supposed to avoid the difficulties related to enforcement such as: the relatively high monitoring costs of the legal system and the relatively low marginal cost faced by thieves.

Accordingly, the shoplifter-maximizing problem will be:

$$\text{Max} B(x) - \prod(e) Fx \quad (\text{eq. 2})$$

Where:

x: is the number of stolen units

B(x): are the expected benefits from stealing

e: is the level of enforcement

$\prod(e)$ : is the probability of getting caught

F: is the expected fine of the thief or /and prison term

Relating Varian's model to our IPR piracy problem and our previously explained model of the interplay between formal rule and behaviour, we have to include both: informal and formal sanctioning mechanisms. Varian only included a formal sanction which is the punishment according to the law and totally monitored by the legal system. However the sanction and impact of the society is still missing. Social disgrace and moreover guilt feelings and other moral impediment were totally abundant by his model. Hence we can rewrite equation 1 to suit our problem as following:



$$MaxB(x) - \prod(e_1 + e_2)FSx \quad (\text{eq. 3})$$

Where:

x: is the number of infringed units

B(x): are the expected benefits from piracy

$e_1, e_2$ : are the levels of enforcement due to formal and informal enforcement, respectively

$\prod(e)$ : is the probability of getting caught

F: is the expected fine or prison term imposed on the thief, according to law

S: is the expected social sanction, imposed by members of the society

This model takes the impact of a formal institution, as well as an informal institution into consideration. Both types are associated with formal and informal sanctioning mechanisms, respectively. Most economists totally neglect the role of informal institutions when determining the costs of committing a crime, focusing solely on the formal sanction of the law<sup>21</sup>. Social disgrace, guilt feelings and other moral impediment were totally abundant by formal models in the field of law and economics tackling the problem of enforcement. S, on the one hand, represents an informal sanction that associates an informal institution (social, cultural or religious rule), that sanctions or disgraces piracy behaviour. While F, on the other hand, represents the possible formal sanction according to law. Moreover, the level of enforcement (e) will be divided into two types: formal enforcement ( $e_1$ ) and informal enforcement ( $e_2$ ). As ( $e_1$ ) represents enforcement held officially through the state (police officers are those who detect the crime), ( $e_2$ ) denotes the enforcement held by the society itself in form of reporting to the police or refusing to buy pirated copies. The pirate will choose the level of x that will equate his marginal benefit MB to his marginal cost MC.

So the equilibrium will be:

$$MB = \prod(e_1 + e_2)FS = MC \quad (\text{eq. 4})$$

Thus, the level of piracy will depend on the marginal cost of piracy, which is  $\prod(e_1 + e_2)FS$  compared to the expected marginal benefit. Watt (2002) summarized the difficulties of copyright enforcement by simply saying that the high transaction costs of monitoring the use of copyrights ( $e_1$ ) and the low copying and distribution cost of copyright materials are the main reasons behind the difficult enforcement of copyrights. In other words, increasing the probability of getting caught through formal devices ( $e_1$ ) fundamentally requires dedicating more authorities and financial resources for the enforcement process, which is very costly and

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<sup>21</sup> See for e.g. Becker (1968) and Varian (1999).

hence forms a main obstacle for achieving adequate IPR enforcement. Varian (1999) for example, used a similar equation to identify the maximization problem of a shop lifter or a thief, totally neglecting the role of informal institutions. He used the following equation:

$$MB = \prod(e)F = MC \quad (\text{eq. 5})$$

Varian explained that in order to determine the optimal level of enforcement, the government should set the lowest possible level of enforcement that results in a positive probability of apprehension and impose a maximum fine. To the extent of our knowledge, all former existing models explaining theft or criminal intents totally neglected the role of S and the informal enforcement process ( $e_2$ ). S in this case can have a twofold effect: First, it creates another level of informal enforcement which might increase  $\prod(e_1 + e_2)$ , as legal authorities, as well as the rest of the society will be discouraging piracy behavior, and hence, citizens might report it to the police, which itself is now more motivated to punish pirates for their unethical behaviour. Second, S is a punishment in itself, as it comprises an informal sanction by the society and imposes a guilt feeling of carrying out a shameful behaviour.

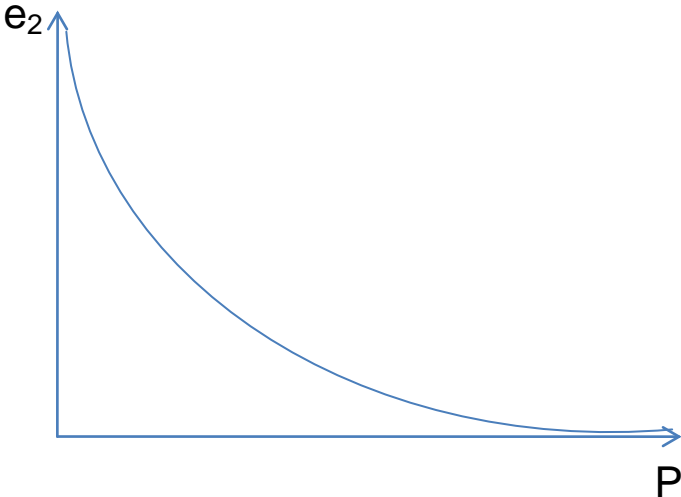
However, it must be taken into consideration that the price of original IPR products still plays a major role in the factual prohibition of IPR piracy in Islamic countries as Muslim legal scholars still perceive the idea that prices of essential software or other IPR products are ridiculously high for the average Muslim living in developing countries. Accordingly, they respond by allowing IPR piracy but in a limited way. Hence, it can be said that prices remain the main impediment against using Islam to combat software piracy in Islamic countries.

Accordingly it can be said that software prices (P) have an inverse relation with the informal enforcement ( $e_2$ ) as administrated in this case by religion over the Islamic societies (Figure 5). High prices can induce Muslim legal scholars to give permission for Muslim public to illegally copy software since such prices prohibits Muslims in developing countries to purchase important software, especially ones used for educational purposes. Such an outcome diminishes social support and enforcement of IPR protection and consequently the resulting sanction, as social disgrace and guilt feelings are kept to a minimal level in this case. Conversely, if right holders of software pursued a price discrimination strategy that takes into consideration the income level per capita for countries where software is distributed, this will consequently make Muslim legal scholars in respective Islamic developing countries more affirm in applying the fundamental Islamic opinion on IPR piracy. As a result, social sanction will increase tremendously since social disgrace and guilt feelings associated with breaking an

Islamic rule will reach its peak since there will be no excuse given to illegally copy software. The inverse relation between (P) and ( $e_2$ ) is represented in the following equation:

$$\lim_{P \rightarrow \infty} [e_2(P)] = 0$$

**Figure 5: The Relation between Software Prices (P) and Informal Enforcement ( $e_2$ ) in Muslim Countries**



**VII. Conclusion and policy recommendation**

This study makes four contributions to the broader literature of institutional economics. First, it applies a new theoretical approach to the concept of embeddedness of institutions, an area that has been neglected so far by most institutional economics literature. Opper (2008) states that “economists so far have paid particularly little attention to the embeddedness of institutions. Politically monitored formal institutions will not achieve satisfactory results without the support of prevailing informal institutions in a country. Research and theorizing on the mechanics of informal norms were left to other social sciences, in particular to sociologists”. Second, linking IPR piracy to NIE is considered genuine in both hypothesis and analysis. Although former studies linked IPR piracy to cultural and ethical determinants, their hypothesis did not relate to the main premise of NIE as demonstrated by Williamson’s (2000) levels of social analysis. Consequently, this affected the tools used by such studies in analyzing the subtle reasons behind increasing piracy rates in different societies, especially in developing countries. Third, an analysis of religious loyalty is carried out through this study as an attempt to assess religion as an informal institutional structure governing different societies. A generic misconception in social sciences literature is to postulate that a certain

society have chosen a certain public action due to its religion inclination, however, it is logically understandable that different societies vary in their adherence to religion due to a vast amount of factors that are out of the scope of this study. By relying on this measurement, the link between rules and behaviour of societies are clearer since religion dimension, with all its consequences on informal institutions, is added to the analysis. Finally, an analysis of the link between IPR piracy and Islam as an informal institution is conducted. We believe that by analysing and understanding the informal structure governing IPR piracy in Islamic countries, we can develop a more effective method to combat this illegal behaviour, without having to bear the additional cost of enforcement.

Our main conclusion is that IPR piracy in Islamic countries can be tackled in a more effective way if religious dimensions are integrated in the campaign against this illegal act. This can be done through increasing awareness of Muslim legal scholars on the severity of IPR piracy problem and its economic consequence. It was already mentioned that the International Islamic Fiqh Academy issued a *fatwa* in 1988 prohibiting IPR infringement. This academy is composed of the highest religious authorities in Muslim countries (grand *muftis* in sunni countries and *ayatollah* in shiite ones) whom are highly influential in Muslim societies as they issue the official legal opinions and *fatwas* on interpretations of Islamic law, inducing Islamic texts towards practical application by followers on a national level. Our survey results shows that Islamic countries' population is highly confident in these religious leaders, since an average of 83% of the sample collected from these countries had either 'a great deal of confidence' or 'quite a lot of confidence' towards those religious authorities. Official *fatwas* issued by those leaders are also highly influential in formulating the legal opinion given by *sheikhs* in mosques, since these *sheikhs* are employed by the government. An important dimension that should be however considered by right holders is their pricing strategy in developing countries, especially Islamic ones. Although Islam initially prohibits acts of IPR piracy, high prices of important and essential IPR inversely affect the degree of prohibition set by Islam. Hence a price- discriminatory strategy is required not only for a developing country but also within the different consumer groups of the same country e.g. students, government offices and private sector. Finally, a more focused campaign run by Muslim scholars against acts of IPR piracy in Muslim countries shall be conducted. Integrating religion in the campaign against IPR piracy needs to be covered by more research on this issue. Therefore, this can be a call for more studies to be conducted on the link between adherence to other religions and IPR piracy.

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**Appendix**  
**Table A: List of Countries by Predominant Religion**

**Buddhism**

1. South Korea
2. Thailand
3. Vietnam

**Catholic Christianity**

1. Andorra
2. Argentina
3. Austria
4. Belgium
5. Brazil
6. Canada
7. Chile
8. Colombia
9. Croatia
10. Czech Republic
11. France
12. Guatemala
13. Hungary
14. Ireland
15. Italy
16. Lithuania
17. Luxembourg
18. Malta
19. Mexico
20. Netherlands
21. Northern Ireland
22. Peru
23. Philippines
24. Poland
25. Portugal
26. Puerto Rico
27. Rwanda
28. Slovakia
29. Slovenia
30. Spain
31. Switzerland
32. Trinidad and Tobago
33. Uganda
34. Uruguay
35. Zambia

**Hinduism**

1. India

**Islam**

1. Albania
2. Algeria
3. Bangladesh
4. Bosnia and Herzegovina
5. Burkina Faso
6. Egypt
7. Indonesia
8. Iran
9. Iraq
10. Jordan
11. Kyrgyzstan
12. Mali
13. Morocco
14. Nigeria
15. Pakistan
16. Saudi Arabia
17. Tanzania
18. Turkey

**Orthodox Christianity**

1. Belarus
2. Bulgaria
3. Cyprus
4. Ethiopia
5. Georgia
6. Greece
7. Macedonia
8. Moldova
9. Montenegro
10. Romania
11. Russian Federation
12. Serbia
13. Ukraine

**Protestant Christianity**

1. Australia
2. Denmark
3. Estonia
4. Finland
5. Germany
6. Ghana
7. Iceland

8. Latvia
9. Norway
10. South Africa
11. Sweden
12. United Kingdom
13. United States
14. Zimbabwe

**Shinto**

1. Japan

Source: Aherents.com website, Predominant Religion, 2005. Retrieved November 2, 2010 and CIA World Factbook, Field listing-Religion, 2010. Retrieved November 2, 2010.

**Table B: Religious Loyalty Index (RLI) by Country and Religious Group**

Religion	Country (Year of WVS Survey)	RLI	Average by Religious Group
<b>Buddhism</b>	South Korea (2005)	<b>0.2330</b>	0.3381
	Thailand (2007)	<b>0.5692</b>	
	Vietnam (2006)	<b>0.2123</b>	
<b>Catholic Christianity</b>	Andorra (2005)	<b>0.0223</b>	0.4714
	Argentina (2006)	<b>0.4067</b>	
	Austria (1999)	<b>0.3174</b>	
	Belgium (1999)	<b>0.2395</b>	
	Brazil (2006)	<b>0.6783</b>	
	Canada (2006)	<b>0.3891</b>	
	Chile (2006)	<b>0.4680</b>	
	Colombia (2005)	<b>0.6761</b>	
	Croatia (1999)	<b>0.5591</b>	
	Czech Republic (1999)	<b>0.0293</b>	
	France (2006)	<b>0.1776</b>	
	Guatemala (2004)	<b>0.7816</b>	
	Hungary (1999)	<b>0.2555</b>	
	Ireland (1999)	<b>0.4494</b>	
	Italy (2005)	<b>0.6044</b>	
	Lithuania (1999)	<b>0.5663</b>	
	Luxembourg (1999)	<b>0.2598</b>	
	Malta (1999)	<b>0.7370</b>	
	Mexico (2005)	<b>0.5860</b>	
	Netherlands (2006)	<b>0.1397</b>	
	Northern Ireland (1999)	<b>0.4446</b>	
	Peru (2006)	<b>0.5207</b>	
	Philippines (2001)	<b>0.7398</b>	
	Poland (2005)	<b>0.7067</b>	
	Portugal (1999)	<b>0.6065</b>	
	Puerto Rico (2001)	<b>0.7178</b>	
	Rwanda (2007)	<b>0.7247</b>	
	Slovakia (1999)	<b>0.5522</b>	
	Slovenia (2005)	<b>0.2644</b>	
	Spain (2007)	<b>0.1416</b>	
	Switzerland (2007)	<b>0.2885</b>	
	Trinidad and Tobago (2006)	<b>0.4943</b>	
Uganda (2001)	<b>0.8891</b>		
Uruguay (2006)	<b>0.2832</b>		

	Zambia (2007)	<b>0.7841</b>			
<b>Islam</b>	Albania (2002)	<b>0.4571</b>	0.7263		
	Algeria (2002)	<b>0.7338</b>			
	Bangladesh (2002)	<b>0.8047</b>			
	Bosnia and Herzegovina (2001)	<b>0.4203</b>			
	Burkina Faso (2007)	<b>0.7616</b>			
	Egypt (2008)	<b>0.7711</b>			
	Indonesia (2006)	<b>0.8267</b>			
	Iran (2005)	<b>0.6481</b>			
	Iraq (2006)	<b>0.6271</b>			
	Jordan (2007)	<b>0.8793</b>			
	Kyrgyzstan (2003)	<b>0.4944</b>			
	Mali (2007)	<b>0.8721</b>			
	Morocco (2007)	<b>0.8257</b>			
	Nigeria (2000)	<b>0.9191</b>			
	Pakistan (2001)	<b>0.7841</b>			
	Saudi Arabia (2003)	<b>0.7227</b>			
	Tanzania (2001)	<b>0.8849</b>			
	Turkey (2007)	<b>0.6419</b>			
	<b>Orthodox Christianity</b>	Belarus (2000)		<b>0.2609</b>	0.4912
		Bulgaria (2006)		<b>0.2963</b>	
Cyprus (2006)		<b>0.4265</b>			
Ethiopia (2007)		<b>0.7284</b>			
Georgia (2008)		<b>0.7785</b>			
Greece (1999)		<b>0.4005</b>			
Macedonia (2001)		<b>0.4402</b>			
Moldova (2006)		<b>0.5565</b>			
Montenegro (2001)		<b>0.3636</b>			
Romania (2005)		<b>0.7314</b>			
Russian Federation (2006)		<b>0.4340</b>			
Serbia (2006)		<b>0.4805</b>			
Ukraine (2006)		<b>0.4891</b>			
<b>Protestant Christianity</b>	Australia (2005)	<b>0.1771</b>	0.3609		
	Denmark (1999)	<b>0.2082</b>			
	Estonia (1999)	<b>0.1270</b>			
	Finland (2005)	<b>0.3122</b>			
	Germany (2006)	<b>0.1423</b>			
	Ghana (2007)	<b>0.8662</b>			
	Iceland (1999)	<b>0.3496</b>			
	Latvia (1999)	<b>0.3721</b>			



	Norway (2007)	<b>0.1245</b>	
	South Africa (2007)	<b>0.7321</b>	
	Sweden (2006)	<b>0.1110</b>	
	United Kingdom (2006)	<b>0.1904</b>	
	United States (2006)	<b>0.5079</b>	
	Zimbabwe (2001)	<b>0.8328</b>	

**Table C: Average Piracy Rate by Country and Religious Group (2003-2008)**

Religion	Country	Average Piracy Rate (2003-2008)	Average by Religious Group
Buddhism	South Korea	44.6	70,3
	Thailand	78.3	
	Vietnam	88.1	
Catholic Christianity	Andorra	N/A	50,1
	Argentina	73.7	
	Austria	25.4	
	Belgium	26.9	
	Brazil	60.3	
	Canada	33.1	
	Chile	65.4	
	Colombia	56.1	
	Croatia	55.9	
	Czech Republic	39.1	
	France	43.6	
	Guatemala	79.7	
	Hungary	42.1	
	Ireland	36.7	
	Italy	49.9	
	Lithuania	56.0	
	Luxembourg	21.0	
	Malta	45.6	
	Mexico	62.3	
	Netherlands	29.4	
	Northern Ireland	N/A	
	Peru	71.0	
	Philippines	70.3	
	Poland	57.0	
	Portugal	41.7	
	Puerto Rico	45.4	
	Rwanda	N/A	
	Slovakia	45.9	
	Slovenia	48.9	
	Spain	43.7	
Switzerland	26.7		
Trinidad and Tobago	N/A		
Uganda	N/A		

	Uruguay	69.1	
	Zambia	82.3	
<b>Islam</b>	Albania	70.3	74.8
	Algeria	76.7	
	Bangladesh	83.7	
	Bosnia and Herzegovina	91.8	
	Burkina Faso	68.0	
	Egypt	N/A	
	Indonesia	62.7	
	Iran	86.0	
	Iraq	N/A	
	Jordan	85.0	
	Kyrgyzstan	61.1	
	Mali	N/A	
	Morocco	N/A	
	Nigeria	68.3	
	Pakistan	82.9	
	Saudi Arabia	84.4	
	Tanzania	52.0	
	Turkey	N/A	
	<b>Orthodox Christianity</b>	Belarus	
Bulgaria		87.0	
Cyprus		69.3	
Ethiopia		51.4	
Georgia		N/A	
Greece		95.0	
Macedonia		60.4	
Moldova		71.0	
Montenegro		92.6	
Romania		82.2	
Russian Federation		69.6	
Serbia		77.9	
Ukraine		77.2	
<b>Protestant Christianity</b>	Australia	86.1	38.0
	Denmark	28.9	
	Estonia	25.9	
	Finland	52.3	
	Germany	27.0	
	Ghana	28.0	
	Iceland	N/A	
	Latvia	50.6	

	Norway	56.6	
	South Africa	29.7	
	Sweden	35.4	
	United Kingdom	25.9	
	United States	27.1	
	Zimbabwe	20.7	

Source: Business Software Alliance (BSA), Annual BSA and IDC Global Software Piracy Study, Various Issues.