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The role of innovation transfer mechanisms in economic development: perspectives and legal approach

El papel de los mecanismos de transferencia de innovación en el desarrollo económico: perspectivas y enfoque jurídico

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Abstract

Currently, innovation depends largely on the efficiency of the legislation concerning means to transform knowledge into innovation, and the mechanisms of international innovation transfer. The way and speed of knowledge transmission and know-how are crucial for the economic development of a nation. The following paper explores, first, the status of the legal framework for innovation transfer articulated with an economic analysis; then, the main features of the regulations on intangible property for the Colombian case are identified; finally, conclusions are drawn in terms of economic and legislative policies.

Keywords: technology transfer, innovation transfer, free trade agreements, copyright, legal and institutional framework, economic development

Resumen

La innovación depende en gran medida de la eficiencia de la legislación concerniente a los medios para transformar el conocimiento en innovación, y los mecanismos de transferencia internacional de innovación. La forma y la velocidad de transmisión de conocimiento y el *know-how* resultan cruciales para el desarrollo económico de una nación. El siguiente trabajo explora, en primer lugar, el estado del marco legal para la transferencia de innovación y lo articula con un análisis económico; después, se identifican las principales características de la normatividad sobre propiedad intangible para el caso colombiano; finalmente, se extraen conclusiones de política económica y legislativa.

Palabras claves: transferencia de tecnología, transferencia de innovación, acuerdos de libre comercio, derechos de autor, marco institucional y legal, desarrollo económico

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I. Introduction

Linked to technological progress and new different forms of consumption, different sectors must find more efficient methods of distribution and marketing. At the macro-level, governments must address the issue of development by providing and spreading scientific knowledge. In this regard, it is necessary to establish alliances and foster education by modern ways. Innovation transfer becomes important to address these challenges.

This paper begins with an attempt to construct a more rigorous and coherent conceptual framework about innovation, technology, and innovation transfer. Subsequently, it touches the scenario of collaboration between different agents oriented to market competitiveness.⁴ Finally, after having an overview of these concepts, we deep on the Colombian and Andean legal framework for innovation, with a critical review of some regulations related to innovation transfer.

II. The innovation process

Before all else, it is necessary to start with the notion of creation defined as anything made by humans. This creation is done through knowledge, which are “[f]acts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.”⁵

If a creation has technological character, it is called an invention.⁶ On the other hand, innovation is the successful entry of a creation into a particular market. In other words, is a creation that transforms market conditions.⁷ Innovation is one of the engines of economic development.

There are two significant components of innovation process: knowledge and successful diffusion of that knowledge resulting in new products or services being offered to customers or in other more common words – invention and successful implementation.⁸

According to Schumpeter, innovation means "doing new things or doing things that are already done in a new way."⁹ Innovation consists of new and improved products, new production processes, new forms of organization, application of new technologies, the discovery of new resources and opening of new markets.¹⁰ These definitions are rather different to the one that was mentioned before. The reason is that he describes the change process with three stages: Invention, Innovation and Diffusion. In that context, innovation corresponds to the second stage of

⁴ Knut Koschatzky, Fundamentos de la economía de redes. Especial enfoque a la innovación, 4 *Economía Industrial*, n.º 346, 15, 15–26 (2002); Jorge Niosi et al., Les systèmes nationaux d'innovation: à la recherche d'un concept utilisable, 7 *Revue française d'économie*, n.º 1, 215, 215-250 (1992).

⁵ Oxford Dictionaries, *knowledge*, <https://en.oxforddictionaries.com/definition/knowledge> (last visited on September 25, 2016).

⁶ WIPO, *WIPO Intellectual Property Handbook: Policy, Law and Use* 17 (2008); European Patent Office, *Guidelines for Examination in the European Patent Office* part G, chapter 2, numeral 1 http://www.epo.org/law-practice/legal-texts/html/guidelines/e/g_ii_1.htm (last visited on September 25, 2016).

⁷ Christian Deblock, Présentation du dossier: innovation et développement chez Schumpeter, 46 *Revue Interventions économiques*, 1, 1-36, (2012).

⁸ Jonas Mitasiunas, *Innovation and Technology Transfer*, http://www.bonita-project.eu/cms_uploads/files/a02innovationtech.pdf (last visited on September 25, 2016).

⁹ Emese Borbély, J. A. Schumpeter und die Innovationsforschung (Budapest: Óbuda University, Keleti Faculty of Business and Management, 2008).

¹⁰ *Id.*

this process.¹¹ However, innovation is also used as a term to describe the whole change process. Accordingly, in this paper innovation is the result of this change process.

Promoting innovation implies that science should acquire greater participation in society. We need to incorporate and appropriate new technologies and knowledge. Competitiveness requires investments in Research and Development (R&D). To achieve productivity is essential to invest in education and research in basic sciences, such as was done in South Korea to increase exponentially the number of patents.

The first source of innovation is the private sector, especially large enterprises in association with main academic centers.¹² Companies forward innovation activities in order to keep improving themselves and not be eliminated because of technical disadvantages. Therefore, our Colombian legal framework must take into account and encourage the relationship among research centers, universities and companies. This represents new sources of knowledge for a more innovative and competitive economy.

Moreover, innovation is executed by the entrepreneur. The Schumpeterian 'entrepreneur' who favors the emergence and development of possibilities not yet known in the economic environment.¹³ He lies, therefore, in the heart of the innovation process and encourages others to participate in the implementation of these activities and is, therefore, a leader.¹⁴ So, the State should create conditions to incite the Schumpeterian entrepreneurial innovation and, consequently, the development.

Other transformations in the educational model, as bilingualism in the population, are important in a modern context to facilitate the emergence of Schumpeterian entrepreneur.¹⁵ "We must deploy the basic skills to make this possible, including teaching other languages in our education system."¹⁶ A widespread ignorance of foreign languages makes difficult the connection to new markets around the world.

An example of these transformations in the educational domain happened in the Asian Tigers (Singapore, South Korea, Taiwan and Hong Kong). They moved from duplicative imitation to creative imitation that involved a significant transformation of imported technologies.¹⁷ They reformed the educational model towards a strong scientific approach. This created a generation of people with the skills to develop their own industry. Subsequently, the investment in human capital was reflected in the appearance of a whole new line of technology in the world market.

¹¹ Darius Mahdjoubi, *Schumpeterian Economics and The Trilogy of Invention-Innovation-Diffusion*, UT School of Information, <http://www.ischool.utexas.edu/~darius/17-Schumpeter-innovation.pdf> (last visited on September 25, 2016).

¹² *Supra* note 5.

¹³ Ernesto Rengifo, *Intangible Property* (2015), (lecture taught at the International School "Copyright and author's rights in the face of the new developments in the creative industries", Universidad Nacional de Colombia).

¹⁴ Jacques Liouville, *La fonction d'entrepreneur: Schumpeter revisité* (2002) (actes du 2ème congrès de l'Académie de l'Entrepreneuriat «Entrepreneuriat et dynamique des sociétés», Université Montesquieu - Bordeaux).

¹⁵ Salomón Kalmanovitz, *Oportunidades y Riesgos de la Globalización para Colombia*, Banco de la República de Colombia, (February 2000), <http://www.banrep.gov.co/sites/default/files/publicaciones/archivos/theglobe.pdf>.

¹⁶ *Id.*

¹⁷ Bernard Hoekman et al., Transfer of technology to developing countries: unilateral and multilateral policy options, 33 *World Development*, n.º 10, 1587, 1593 (2005).

One alternative to improve a scenario encouraging innovation lies in the application of structural competitiveness: “[t]he emphasis on innovation as a key factor for economic development activates potentials of learning in all areas and promotes collaborative networks oriented to innovation and an institutional framework capable of promoting innovation.”¹⁸

III. Innovation transfer and its mechanisms

In the literature is really common the use of the word “technology transfer”. There are different meanings, almost each author has his own definition.

It is necessary clarify what is called in the literature as vertical technology transfer. For example, they affirm that technology transfer is done in order to commercialize the knowledge in the form of products or services.¹⁹ Alternatively, technology transfer can be conceived as the process by which a creator makes its technology available to a commercial partner that will exploit it.²⁰ According to this paper’s conceptual framework, this is actually part of the innovation definition because to call something innovation is essential that there is an entry in the market. Therefore, the transmission of discoveries resulting from research in public or private centres to the industry is not a technology transfer, however, this diffusion or commercialization is important so there can be an innovation.²¹

The next step is to define technology. It can be conceived as the systematic application of scientific or other organized knowledge into practical tasks,²² or the application of knowledge to real situations for practical purposes.²³ In other words, it is a tangible or intangible tool. Then, technology transfer is the transfer of that applied knowledge.

Nevertheless, there are many authors that use “technology transfer” in a wider sense. In fact, this appears to indicate a tendency to perceive the need of a broader notion, trying to encompass non-technology. As an illustration, “[t]echnology transfer is defined as the broad set of processes covering the flows of know-how, experience and equipment and is the result of many day-to-day decisions of the different stakeholders involved.”²⁴

However, it is clear that is more valuable to use the notion of “innovation” transfer rather than to twist that of “technology”. In that way it is recognized that not only technology is important, that is why we had chosen a more classical definition. Technology is a part of technological innovation (tangible/intangible goods, services and process), but there is also non-technological innovation

¹⁸ Klaus Esser et al., *Competitividad sistémica: nuevo desafío para las empresas y la política*, 59 *Revista CEPAL* 39, 39-52 (1996).

¹⁹ Jesús Villamil, *Intangible Property Management and Technology Transfer* (2015) (lecture taught at the International School Copyright and author's rights in the face of the new developments in the creative industries, Universidad Nacional de Colombia).

²⁰ Philip Mendes, *Concession de licences et transfert de technologie*, OMPI, http://www.wipo.int/sme/fr/documents/pharma_licensing.html#author (last visited on September 25, 2016).

²¹ *Id.*

²² David Haug, *International Transfer of Technology: Lessons That East Europe Can Learn from the Failed Third World Experience*, 5 *Harv. J.L. & Tech* 209, 210 (1991).

²³ Oxford Dictionaries, *Technology*, <https://en.oxforddictionaries.com/definition/technology> (last visited on September 25, 2016).

²⁴ Intergovernmental Panel on Climate Change, *Summary for Policymakers Methodological and Technological Issues in Technology Transfer*, <https://www.ipcc.ch/pdf/special-reports/spm/srtt-en.pdf> (last visited on September 25, 2016).

(marketing, organization, services and some services and intangible goods) that does not require change in technology.²⁵

For that reason, when it is used the term “technology” transfer but actually referring also to non-technological innovation, it is ought to use the most accurate word, that is “innovation” transfer.

Taking that into account, innovation transfer will be define as a process by which one party gains access to a second party's information and successfully learns and absorbs it into his production function.²⁶ Thus, when we talk about innovation transfer, we do not talk about the mere access to consume or use an innovation, but of its absorption, even though having in hand the actual invention could be a first step to absorb it, for example, through imitation. In that way transfer is a mean to stimulate indigenous innovation,²⁷ and not to become a technology parasite.

Even though innovation is essential to foster economic development, it exists a serious technological gap between developed and developing countries.²⁸ Hence, the international innovation transfer is essential to close this gap, that is the transfer among countries.

There are several mechanisms for the transfer of technology:

- Imitation. It can be made through reverse engineering, product inspection, and trial and error. This can be facilitated by trade or by patent publication.
- Employment of foreign skilled people. The knowledge earn outside can be use and transmitted inside the nation.
- Open Source / public domain. In this case you do not have to pay for the right to use, so this could cause a decrease of costs, thus incrementing revenues. But, it could also cause a decrease of earnings making it financially inviable.
- Private Intellectual Property. Also, it can be both an incentive and an obstacle. For example, patents provide a direct source of transfer, through foreign direct investment (FDI) and licensing, or an indirect through inspection.²⁹ On the other hand, it can make innovation less accessible if the cost of use is elevated or if the owner does not want to let others use it.

Intellectual property rights are important because they “are elements of a market economy system and, as such, are instruments of competition.”³⁰ The Agreement on Intellectual Property Rights in Annex 1C of the Marrakesh Agreement considers that the protection and respect for intellectual property rights contribute to promoting the transfer and dissemination of technology.³¹ These

²⁵ Following M. Frenz & R. Lambert, Exploring Non-technological and Mixed Modes of Innovation Across Countries, in *Innovation in Firms: A Microeconomic Perspective* 71, 72 (OECD, Paris: OECD Publishing, 2009); OECD, *OECD Science, Technology and Industry Outlook 2012* 166-168 (Paris: OECD Publishing, 2014); Tobias Schmidt & Christian Rammer, *Non-technological and Technological Innovation: Strange Bedfellows?* 4 (2007) (ZEW Discussion Papers No. 07-052).

²⁶ Keith Maskus, *Encouraging international technology transfer* 9 (2004) (Issue Paper N.º 7, International Centre for Trade and Sustainable Development).

²⁷ UNCTAD, *Transfer of technology and knowledge-sharing for development: Science, technology and innovation issues for developing countries* 39 (2014) (UNCTAD Current Studies on Science, Technology and Innovation N.º 8, United Nations).

²⁸ *Supra* note 23 in 227.

²⁹ *Supra* note 23

³⁰ *Supra* note 28.

³¹ OMC, Acuerdo Sobre la Propiedad Intelectual, April 15, 1994.

transfer processes generate mutual benefits for both the people who generate technology and those who use the technological expertise for the social and economic welfare.

With regard to the developing countries, the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) instructs in article 66(2) that developed countries shall “provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members,” however it is written in aspirational language, and there are no sanctions for developed countries for failing to do so, nor are there any specific instructions on how they should do it, so at the end this agreement does not give to provide developing countries an effective tool against the developed nations.³²

Moreover, TRIPS makes insufficient concessions to developing countries that have low innovation so cannot profit from intellectual property rights. Often, these countries cannot afford to develop their own innovations and innovative companies in the developed countries are not interested transfer the innovations and instead they prefer to sell directly the innovative output to developing countries.³³

The transfer of innovation is not automatic or costless, so the role of the public sector is critical to provide legal and policy incentives required to achieve the most effective rate and approach for transfer according to their needs and objectives.³⁴

IV. National and Andean Community legislation on innovation transfer

In regard to innovation transfer, the Colombian and Andean legislation is technology-centered. That is, there is little are no consideration about non-technological innovation. The following are some insights about these regulations.

The Decree 591 of 1991 regulates the mechanisms of contracts by which the Colombian State encourages scientific and technological activities.³⁵ This Decree must be coherent with the provisions of the Decision 486 of 2000 that regulates Intellectual Property in the countries of the Andean Community (CAN) in which Colombia is a member.³⁶

In the Article 2 of the Decree 591, technology transfer is regarded as scientific and technological activity. Therefore, the Colombian State has to promote it and protect it. Taking into account that technology transfer not only spans scientific and technological activities, but also involves their assimilation, adoption and implementation to the national productivity features.

Besides of the Decree 591, there are some mechanisms of technology transfer that can be carried out according to some rules of foreign direct investment. For this reasons the Decree 2080 of 2000,

³² Kristen Riemenschneider, *Philosophy, Trade, and Aids: Current Failures to Obtain a Substantive Patent Law Treaty*, 11 *Virginia Journal of Law and Technology*, n.º 5, 1 (2006).

³³ *Id.*

³⁴ International Centre for Trade and Sustainable Development, *Climate Change, Technology Transfer and Intellectual Property Rights 2*, (August 2008), https://www.iisd.org/pdf/2008/cph_trade_climate_tech_transfer_ipr.pdf

³⁵ Decree 591 of 1991, [Ministerio de Gobierno, Colombia], arts.1-5.

³⁶ Comunidad andina de Naciones (CAN), Decision 486, September 14th, 2000.

which regulates the FDI, contains a few important lines about this subject. Some of them define some modalities of technology transfer as FDI.³⁷

The regulation about FDI related to the technology transfer is part of the decision 291 of 1990 CAN as well,³⁸ which includes some peculiarities of FDI, for instance about contractual relations relating technology transfer. Also, it should be noted that in the Article 10 is settled that any disagreement or dispute derived from direct foreign investments has to be solved applying the set of rules of the domestic legislation of each country member.³⁹

In addition to the above, the National Development Plan of Colombia (NDP 2014-2018) in its Article 11 about Intellectual Property Rights establish that Colombian State may transfer its rights in the projects of research, science and technology developed with public funds without this constituting financial loss to the State.⁴⁰

Besides of the current NDP, since 2014, COLCIENCIAS has set a goal to quadruple the number of patents in the country over a period of three years.⁴¹ This should reduce the historical backwardness of the country compared to other countries in Latin America.

V. International legislation and FTAs

It is worth noting that in recent years Colombia has signed a number of Free Trade Agreements (FTAs). Two of these agreements are especially important due to the size of the economies of the countries involved in. They are the FTAs with the EU and USA. The FTA signed with EU asserts that is crucial to encourage invention and innovation through an adequate protection of intellectual property.⁴² So that technology transfer eases the economic growth in order to increase the social and economic welfare.⁴³

In the text of this FTA, it is expressed the direction of this technology transfer from Europe which would be provided towards Colombia throughout incentives to their institutions and enterprises for the transfer of innovation to Colombia.⁴⁴

In Chapter 16 of agreement signed with the USA, we can find some important details related to technology transfer of intellectual property.⁴⁵ It should be pointed out that USA and Colombia have

³⁷ Decree 2080 of 2000. Por el cual se expide el Régimen General de Inversiones de capital del exterior en Colombia y de capital colombiano en el exterior, [Ministerio de Gobierno, Colombia].

³⁸ Comunidad Andina de Naciones (CAN), Decision 291, March 3th, 1991.

³⁹ *Id.*

⁴⁰ Ley 1753 de 2015.

⁴¹ The Administrative Department of Science, Technology and Innovation (COLCIENCIAS) promotes public policies to encourage Science, Technology and Innovation (ST & I) in Colombia; Nestor López, *Colombia busca dar gran salto en trámite para patentes*, Portafolio, (September 1st, 2015), <http://www.portafolio.co/portafolio-plus/colombia-busca-incentivar-patentes> (last visited on September 25, 2016).

⁴² Ley 1669 de 2013, art. 4.

⁴³ *Id.*

⁴⁴ *Id.*

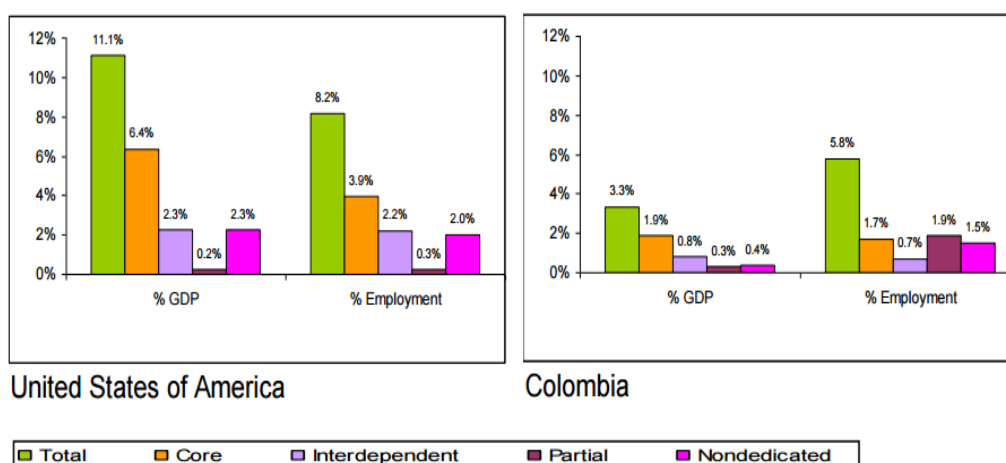
⁴⁵ Acuerdo de Promoción Comercial entre la República de Colombia y Estados Unidos de América, EE.UU.-COL, Ch. 16, November 22th, 2006, <http://www.mincit.gov.co/descargar.php?id=65804>> (last visited on September 25, 2016).

committed themselves to implement cooperation policies to advance towards common goals in science, technology and innovation.⁴⁶

In the Article 16.9, also, it mentioned that each country shall allow patent any invention, in any technology field. They must be new, involve an inventive step and are capable of industrial application.⁴⁷

According to Luis Angel Madrid, who was one of the negotiators of the FTA with the USA, the Creative and copyright industries have played a key role in the negotiation and implementation of this treaty, because of their economic importance. In order to understand the agreement, it is necessary to understand the interests of different stakeholders and the size of each sector in the USA and Colombia.⁴⁸ A good proxy to catch on the dimensions of these different interests is achieved if we compare the Contribution of copyright-based Industries (CBI) to GDP of Colombia and USA:

Copyright Industries Contribution to GDP and Employment of USA and Colombia⁴⁹



The graph above illustrates a trend, showing a marked average difference in the economic contribution of the CBI by groups of industries (Core, interdependent, partial and non-dedicated support industries) to GDP between Colombia and USA. On the basis of the above information, one of the main criticisms on the FTA with USA: How has this difference affected the terms of negotiation between countries and their creative industries?⁵⁰ These answers remain unknown.

There are other points controversial about the implementation of the agreements in the sector. They are the discrepancies found between the American and Colombian legislations related to CBI.⁵¹ For instance, about issues of electronic download, related rights, terms of protection of copyright works, digital radio, etc. These discrepancies can lead to problems in the implementation

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ Luis Angel Madrid, *The New Creative industries and the Free Trade* (2015) (lecture taught at the International School “Copyright and author’s rights in the face of the new developments in the creative industries”, Universidad Nacional de Colombia).

⁴⁹ World Intellectual Property Organization, *WIPO studies on the economic contribution of the copyright industries* 1-35, (2013), http://www.sqn.ba/article_files/280_1_economic_contribution_analysis_2012.pdf (last visited on September 25, 2016).

⁵⁰ *Supra* note 51.

⁵¹ *Id.*

of the FTA in the near future. Besides the previous treaties and domestic legislation, Colombia has also agreed and acceded to many international treaties and agreements related to intellectual property and technology transfer such as:⁵²

- a) WIPO (World Intellectual Property Organization) Copyright and Intellectual Property Treaty.
- b) Access agreement to the WTO, in which Colombia accepts the clauses about intellectual property of this Organization.
- c) Universal Copyright Convention.

VI. International legislation and FTAs: innovation

In order to encourage and strengthen investment and innovation, in recent years CAN regulations have been modified so as to allow the signature of FTAs by Colombia. In doing so, Colombian judiciary has intended to respect its former international treaties concerning to regional integration, but at the same time, it has promoted trade liberalization and innovation.⁵³

In Latin-American countries, especially in Colombia, there has been an evident underperformance in fostering innovation through its judiciary, mainly due to social and fiscal problems and political instability.⁵⁴ The recent FTAs signed by Colombia can be a unique chance to reinforce links between innovation, legal system and the private sector.⁵⁵ It is precisely these complex economic, social and political scenarios, the main reason that should guide policy and law makers to continue improving and developing a proper institutional framework for innovation and therefore development.

Identifying the main challenges facing Colombia is the first step that should be done to deal with its historical lag in encouraging its technological innovation system, they are:⁵⁶

- ✓ A poor coordination between universities and the private sector. In spite of the fact that these higher education institutions produce a competent human capital and conduct high-quality researches.
- ✓ There are some market failures that hamper new business activities and the performance of technological innovators, such as barriers to entry into-high tech sectors and limited access to credit.
- ✓ Colombia does not have a high-technology industry; this hinders any process of high technology transfer and technical know-how learning. Most of the Colombian industries are based on a low-level technology (commodities). They are not usually engaged in any innovation activity, for this reason the production of patents is low.

⁵² Cesar Moreno, Evolución de la protección penal del Derecho de Autor en Colombia, *Revista de Derecho*, n.º 34, 147, 147-176 (2010).

⁵³ Liliana Lizarazo Rodríguez & Phillip de Lombaerde, Regional and inter-regional economic rules and the enforcement of the right to health: The case of Colombia, 15 *Global Social Policy*, n.º 3, 296, 296-312 (2015).

⁵⁴ Marga Gual Soler, *Intergovernmental Scientific Networks in Latin America*, (2014), <http://www.sciencediplomacy.org/article/2014/intergovernmental-scientific-networks-in-latin-america> (last visited on September 25, 2016).

⁵⁵ *Id.*

⁵⁶ OECD, *National Intellectual Property Systems, Innovation and Economic Development with Perspectives on Colombia and Indonesia*, (OECD Publishing, 2014).

- ✓ The country must also deal with its high level of inequality, which employs the vast majority of the labor force. In this regard, it is vital to the successful fight against inequality and the high level of poverty the creation of new mechanisms to deal with this lack of a formal workforce, which is in turn aggravated by the internal conflict, internal displacement, lack of basic infrastructure and a historical state neglect.

The Colombian reforms concerning to intellectual property protection and those intended to foster education recognize the crucial and growing role of knowledge assets, this can be viewed as an acknowledgement of the increasing share of intangible product industries in World's GDP and its innovative role.⁵⁷ These endeavours in education and improved technological capacity are expected to borne fruit as the country keeps on enhancing its macroeconomic fundamentals by means of a higher level of education, which supports the productive sector and its innovation.⁵⁸

The FTA between Colombia and the United States led to the signing of international treaties of intellectual property as the Madrid protocol, which have updated the Colombian regulation regarding copyright protection, establishing stronger law and civil sanctions. At the same time, these agreements have had an impact in granting and impelling innovative processes, property applications and foreign investment.⁵⁹

Despite of having made a lot of progress in implementing these international treaties and policies aimed to encourage technology transfer, there is still a long way to go in order to have a proper and modern legal and institutional framework that allows making the most of Colombian productive and innovative potential.

VII. Conclusion

A profound reform of the education system (and universal coverage thereof) is crucial to qualify human capital. It is a *sine qua non* condition for the potential generation of the Schumpeterian entrepreneur and enhancing industrial competitiveness. The link between business and academia must be foster as a source of new knowledge and ideas. The teaching of foreign languages is also necessary in the new international context.

Innovation transfer, from country to country and between social sectors, is crucial to the development process of the countries. It is therefore necessary to design legal mechanisms of rights and obligations so that knowledge-based sectors have legal certainty to increase investment in development of intangible assets.

Even though there has been progress in innovation transfer from the side of technology transfer, there is a long way for the case of non-technology transfer.

Non-technological innovation must be foster, to do so it is ought to begin with recognizing its existence and value. Then, there should be policies focused specifically in this kind of innovation.

⁵⁷ See, Álvaro Ramirez Bonilla, *The State of Intellectual Property in Latin America: Legal Trends, Economic Development and Trade* (Bogotá: B&R Latin America IP, 2012).

⁵⁸ *Id.*

⁵⁹ *Supra* note 48.