SMART IP FOR LATIN AMERICA (SIPLA) INITIATIVE

COMPARATIVE STUDY

INTERNATIONAL TECHNOLOGY TRANSFER REGIMES IN LATIN AMERICA

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(Coordinators)

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A) Introduction

Today, technology[1] is an increasingly important factor in economic development. It is diffused and forms part of international trade and foreign direct investment, leading to increased economic interdependence between countries. Also, absolute and relative changes in the stock of technology are linked to a country's research and development (R&D), whether carried out by the public sector or by private companies.[2]

Technology transfer involves transferring knowledge from one human being to another, whether through education, scientific literature, or direct human contact (Teece, 1977). In the legal field, technology transfer refers mainly to licences that enable the use of particular technologies in a specific context.

While there is no unanimous definition of technology transfer,[3] can be conceived as the transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the provision of a service. [4]

Today, most of the world's technological advances take place in around 20 countries, from which they are then transferred to other parts of the world through international trade, cross-border education and foreign direct investment (FDI).[5]

That is, technology transfer processes are a central element for growth in developing countries, and there is ample evidence that differences in technology, rather than differences in resources, are the most important determinant of the pattern of comparative advantage. [6]

Different authors consider technological progress as the driving force of economic growth, productivity and therefore of the improvement of the living conditions of the population by incorporating it into economic analysis.[7] They mainly develop the idea that the main sources of

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[1] Technology is the branch of knowledge that is constituted by a set of knowledge and skills necessary in the use, improvement and creation of techniques.

[2] Koopmann, G. & Münnich, F. Intereconomics (1999) 34: 267. https://doi.org/10.1007/BF02929893

[3] UNCTAD, 1985; Norman Abramson (1997); Cotec (2003); OECD (2003); Wikipedia,Technology transfer (2009); Finston SK. 2010.

[4] United Nations Conference on Trade and Development (UNCTAD) (1985) "Draft International Code of Conduct on the Transfer of Technology, as at the close of the sixth session of Conference on 5 June 1985" (Geneva: United Nations), United Nations document, No.TD/CODE TOT/47, 20 June.

[5] Margalioth, Yoram Y., Tax Competition, Foreign Direct Investments and Growth: Using the Tax System to Promote Developing Countries. Virginia Tax Review, Vol. 23, Forthcoming. Available at SSRN: https://ssrn.com/abstract=462622 or http://dx.doi.org/10.2139/ssrn.462622

[6] Card, David and Krueger, Alan B. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania." American Economic Review, September 1994, 84(4), pp. 772-93.

[7] See for example (Abramovitz, 1956), (Kendrick, 1956), (Solow, 1957) among others.

productivity growth come not only from improvements in the quality of labour and capital, but also from technological progress, associating it also with formal and informal R&D investments.

Solow, postulated that technological progress is the basis for economic growth. However, the emphasis on technological change is not based on a clear and convincing understanding of where the sources of technological progress are, within sectors and within countries.[8] Schools of economics that emerged in Latin America such as the developmentalist[9] studied the problems broadly as three central themes: the promotion of technological innovation, the encouragement of capital accumulation, and the introduction of structural changes of production within economies.[10]

From this perspective, the idea of generating socially useful information was seen as a central challenge to technological advances in society. Arrow was one of the first economists to identify the problem of creating technological knowledge (framed strictly as information) in a perfectly competitive market. Attributed to the economic concepts of indivisibility, inappropriability and uncertainty. The literature proposes two possible solutions. The first is based on setting incentives, such as intellectual property rights - the best available solution, but not the optimal one - to encourage innovators to produce socially useful information. The second available solution relies on a necessary direct public intervention by the state, through some form of core funding of scientific research.[11]

During the 1970s, there was much international debate about technology transfer. Concerns were that technology costs (many of which were hidden through transfer prices or management fees) were too high, that the recipient nation's use of the technology was hampered by restrictive clauses, and that licensees were not receiving the best technology. An early response was to form national technology transfer offices to review incoming technology transfers, to prohibit a number of clauses that are often contained in these licences, and to try to limit the price of technology. This was done at the national level and was proposed, albeit unsuccessfully, at the global level (through the 1985 UNCTAD Code of Conduct on Technology Transfer).

Later, in the Uruguay Round, developing countries considered that technology transfer should be a central part of the negotiation of the incorporation of intellectual property rights into the WTO.

[8]Both Arrow and Nelson were part of the movement that originated the idea in the economic literature of treating information as a resource to be allocated through the market, as well as influencing the formulation of policies related to intellectual property and R&D.

[9] Authors such as Prebisch, Raúl, Celso Furtado, or Ocampo are exponents of this school.

[10] Sampath, Padmashree and Roffe, Pedro, Unpacking the International Technology Transfer Debate: Fifty Years and Beyond (Novermber 22, 2012). ICTSD, Issue Paper 36, November 2012, ISSN 1684-9825. Available at SSRN: https://ssrn.com/abstract=2268529

[11] Archibugi, Daniele and Bizzarri, Kim, The Global Governance of Communicable Diseases: The Case for Vaccine R&D. Law & Policy, Vol. 27, No. 1, pp. 33-51, January 2005. Available at SSRN: https://ssrn.com/abstract=639771.

The TRIPS Agreement contains a number of provisions in this regard. For example, it stipulates that one of the purposes of intellectual property protection is to promote innovation and technology transfer, and developed country governments are required to provide incentives to enterprises and institutions in their territories to encourage and facilitate the transfer of technology to least developed country Members (Article 66.2).

In the Doha Round launched in 2001, ministers agreed that the TRIPS Council "shall establish a mechanism to ensure the monitoring and full implementation of obligations". In February 2003, the Council adopted a decision to establish such a mechanism.

To date, existing research suggests that strengthening intellectual property rights (IPR) regimes is unlikely to lead to a sudden increase in FDI. While it is possible to establish that IPRs stimulate formal technology transfer, through FDI and cross-border technology licensing,[12] is not sufficient to ensure transfer between developed and developing countries.[13] TT depends on private incentives, so that in the absence of private incentives in certain circumstances private firms are not interested in engaging in TT. [14]

Technological progress is an essential precondition for improving productivity, achieving industrial development and promoting export growth. For this reason, technology transfer policies are a key element for the integration and progress of developing countries in the global economy.

But most of the relevant technology is currently owned by multinational companies.[15] The incentives of multinationals and developing countries are not normally aligned. Consequently, in the absence of appropriate legislation in host countries, the following strategies may often be used by these companies to maximise their profit: (i) refusing to negotiate, (ii) refusing to grant licenses, (iii) charging excessive prices for transferred technology - which may be the case for very sensitive technologies for which the elasticity of demand is very low - or (iv) incorporating anti-competitive restrictions in technology transfer agreements.[16] These practices hamper the efforts of developing country firms seeking to acquire technology, especially IPRs-intensive technology.[17]

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[12] Carsten Fink and Keith E Maskus, Intellectual Property and Development (World Bank 2005).
[13] ibid
[14] See generally Keith E Maskus, 'Encouraging International Technology Transfer' (UNCTAD-ICTSD 2004) Issue Paper 7 <https://www.files.ethz.ch/isn/111411/2010_01_encouraging-international-technology-transfer.pdf> accessed 1 December 2021.
[15] See footnote 5.
[16] Jefferies, Countess P. (2001), 'A Preliminary Evaluation of the Proposed Text', in Surendra Patel et al. (eds), International Technology Transfer: The Origins and Aftermath of the United Nations Negotiations on a Draft Code of Conduct, The Hague: Kluwer Law International, pp. 22-25; Blakeney, Michael (1988), 'Transfer of Technology and Developing Nations', Fordham Int'l L. J., 11, 708-711.
[17] Tú Thanh Nguy□ □ n, Competition Law, Technology Transfer and The TRIPS Agreement (Edward Elgar 2010).

While developed countries have adapted their competition law to cover intellectual property rights in general - and technology transfer in particular - in developing countries, competition law is fairly new and not mature enough. Moreover, even if certain anti-competitive conduct related to intellectual property rights could be addressed in their jurisdiction, developing countries rarely enforce these laws. [18]

On the other hand, contractual rules also play a central role, the legal frameworks associated with the transfer such as licensing, confidentiality and the clauses they contain are fundamental to understand the diffusion of technology between source and recipient countries[19] . Civil or commercial law frameworks have different aspects in the countries of the region, so that, in TT matters, they can influence in different ways how the transfer processes take place, as well as establish, outside the competition rules, clauses that can be considered unfair or abusive from a legal perspective and not from a market efficiency perspective, as analysed by competition rules.

Currently, some studies on technology transfer have been carried out in the region, such as in Colombia[20] , however, they focus on specific elements[21] , as is the case of transfer in the university environment or are outdated.[22] This project seeks to fill this gap in the study of technology transfer in the region, both from a legal and economic perspective. It is intended that a better understanding of the phenomenon from an interdisciplinary perspective can serve as a basis for contributing to the development of sectors of interest to the region.

It is noteworthy to mention that the academic contribution on technology transfer had a great development around the end of the 20th century. However, the global situation and the COVID-19 pandemic highlight the relevance of international technology transfer processes, and the need for analysis in order to encourage these processes, which have been one of the central demands of developing countries prior to the creation of the World Trade Organisation and which have not been remedied despite the efforts that have been made since its creation.

In particular, a comparative study in eight countries is presented, which analyses in its first part, the national regulations on technology transfer, whether they incorporate definitions or whether there are specific incentives to encourage international technology transfer between countries. It

[18] OP. Cit.
[19]Op. cit.
[20] Martínez, Héctor Adrián (2004). APPROPRIATION OF KNOWLEDGE IN COLOMBIA. THE CASE OF TECHNOLOGY IMPORT CONTRACTS. Cuadernos de Economía, 23(41), 195-228. Retrieved July 17, 2019, from http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0121-47722004000200008&lng=en&tlng=es.
[21] See the case of Argentina, in UNCTAD, Studies in Technology Transfer: Selected cases from Argentina, China, South Africa and Taiwan Province of China - UNCTAD Current studies on Science, Technology and Innovation, No. 7, 2014, (UNCTAD/DTL/STICT/2013/7).
[22] Patel, S. (1972). The transfer of technology to developing countries. International Forum, 13(1 (49)), 11-26. Retrieved from http://www.jstor.org/stable/27753586

also examines whether the different jurisdictions establish registration conditions for this type of contract.

The second part analyses the contractual elements of both civil and commercial law and antitrust law. This point is of great relevance since antitrust laws aim at consumer welfare and market efficiency[23] . In order to achieve this objective, these rules are limited to prohibiting, in absolute or relative form, certain acts, which in particular restrict competition and abuses of dominant position. In particular, this branch of law analyses whether conduct or behaviour will be anti-competitive and can establish three situations in particular, a) collusion between competitors b) abuse of dominant position c) control of economic concentration operations[24] . Abuses include, for example, non-compete agreements, exclusive distribution contracts, refusals to deal, among others[25] .

On the other hand, civil and/or commercial law also have a bearing on technology transfer matters. As Guerrero Gaitán mentions[26] , *the contracts included here are synallagmatic or bilateral, since they impose reciprocal rights and obligations between the contracting parties; in the same way, we can say that they are of successive tract , by establishing reiterated benefits such as the payment of royalties with an established periodicity according to different criteria such as sales levels, dividends obtained, units produced, etc. Finally, it is possible to affirm that they are intuito personae contracts insofar as they are carried out taking into account the special qualifications of both the producer and the recipient of the technology that is the object of the agreement ".*

Finally, in its last part, the study compares available statistical information from the selected countries.

[23] Static efficiency manifests itself as the way in which multiple suppliers of existing products supply at low prices, offering an unchanging menu of products at very good prices. In other words, the market variable is the price and quantity of products put on the market, without considering competition from new product introductions.
On the other hand, dynamic efficiency refers to the optimal use of resources to increase innovation, i.e. the development of new technologies and products over time. See generally JG Sidak and DJ Teece, 'DYNAMIC COMPETITION IN ANTITRUST LAW' (2009) 5 Journal of Competition Law and Economics 581.
[24] Marcelo R D'Amore, Defensa de la competencia y propiedad intelectual (B de F ; Euros 2015). Pp. 29-32.
[25] ibid.
[26] Guerrero Gaitán, M. 2009. Typology of technology transfer contracts. La Propiedad Inmaterial Journal. 13 (Nov. 2009), 199-252.

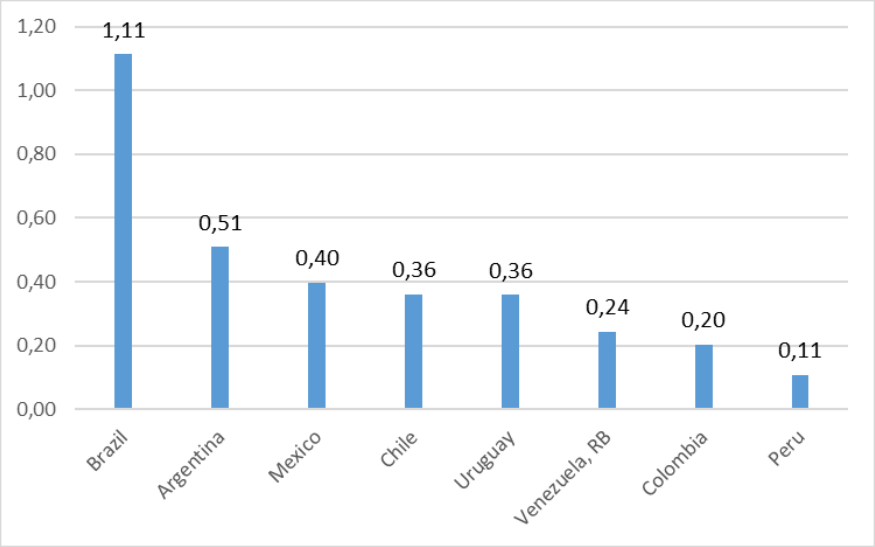
B) Indicators on technological development

As mentioned at the beginning of this study, a country's technological development is affected by a number of factors, including the education of its population and strong institutions. It is therefore difficult to find a measure that captures the phenomenon at hand holistically. Nevertheless, some variables can be presented that can give an idea of what the situation is like in broad terms in the countries under study. This section briefly presents the evolution of indicators on R&D investment and the economic complexity index.

The idea behind R&D investment data is to reflect a country's capacity to be a producer of technology versus the importance of technology imports for productivity improvements that ultimately lead to increases in the living standards of the population.

The annual average for the period 2000-2018 of the R&D investment rate is presented in Graph 1 presents the average annual R&D investment rate for the period 2000-2018. It can be seen that there is some variability among the countries under study. Brazil is a special case as it is the only country where the R&D investment rate exceeds 1 per cent of gross domestic product (GDP). The next country is Argentina, where the average R&D investment rate is half a percentage point. The lowest average is Peru, which is about one-fifth of the Argentinean average.

Graph 1- Annual R&D investment as a percentage of GDP - Average 2000-2018



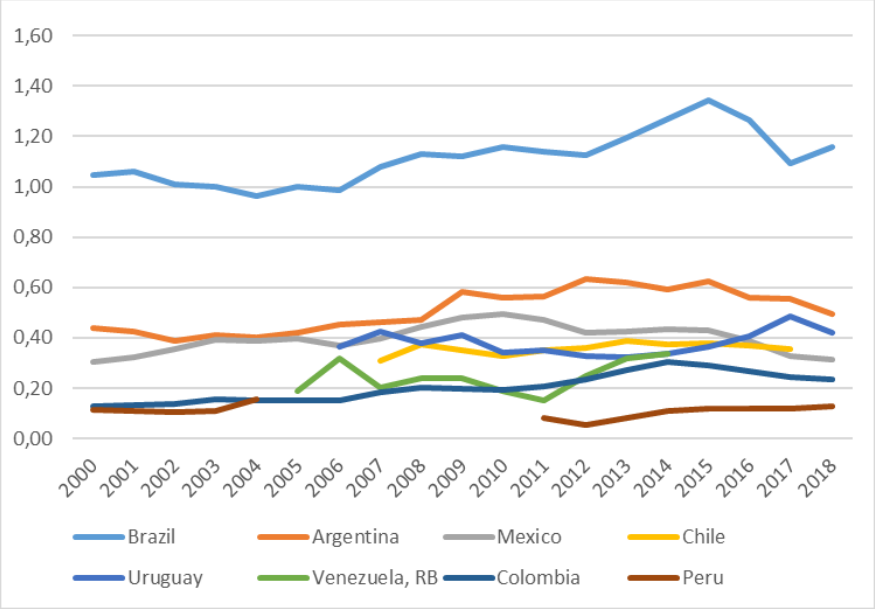
World Bank data (2022)

Note: Data for Chile is for 2007-2017; Uruguay for 2000, 2002, and 2006-2018; Venezuela for 2005-2014; Peru for 2000-2004 and 2011-2018.

An important point to note is that the world average annual rate of R&D investment is 2.04. In light of this benchmark, even the Brazilian rate can be considered low. As an additional benchmark we can consider the average in East Asia and the Pacific (excluding high-income countries) which is 1.45 percent. This is of course a coarse comparison but it also provides a general idea of the levels of R&D investment in the countries under study.

The Graph 2 additionally shows that the behaviour of the R&D investment rate has been relatively stable with the exception of some cases of modest growth such as Colombia and Uruguay.

Graph 2 - Annual R&D investment as a percentage of GDP



World Bank data (2022)

Another measure that captures a country's technological development is an economy's economic complexity index. The index, developed by a group of US academics, captures the level of knowledge implicit in the economic activities present in a country.[27] The starting point for constructing the index is the diversity of the national economy and the ubiquity of the production of a product in the world. The logic behind this is that goods produced in a small number of countries tend to be technologically complex. Likewise, countries that produce goods that are only produced in a few economies tend to have a higher level of complexity. To calculate the index, the information on economy diversity and ubiquity of a good must be adjusted to exclude for example goods that are not produced in many countries for reasons other than their technological complexity. This can be done for example by measuring the average diversity of the countries

[27] Ricardo Hausmann et al., *The Atlas of Economic Complexity - Mapping Paths to Prosperity* (Harvard & MIT 2014) < https://oec.world/pdf/AtlasOfEconomicComplexity.pdf> accessed 18 May 2022.

producing a good and the average ubiquity of the other goods produced in those countries.[28] The index is a relative measure adjusted by the difference between the country's score and the world average divided by the standard deviation. Thus, countries with economic complexity below the world average have negative values.

As can be seen, the construction of the index has a circular character - a good is complex because it is produced in a complex economy and vice versa. One advantage of this is that it avoids the difficulties of directly measuring the amount of knowledge embedded in a product. On the other hand, the disadvantage is that circularity may introduce biases in such an indicator, for example, by tending to overestimate the complexity of higher income economies. However, the latter can be mitigated by the adjustments described above that are made to the diversity and ubiquity data for the construction of the index.

With these background considerations in mind, we proceed to present the information on the countries under study. As can be seen in the Graph 3Mexico has the most complex economy. Brazil, Colombia and Uruguay have a positive value close to zero. The remaining countries - Chile, Argentina, Peru and Venezuela - have negative values, i.e. their economies are less complex than the world average. Another interesting fact is the reduction in the case of Brazil in 2019 compared to 2010.

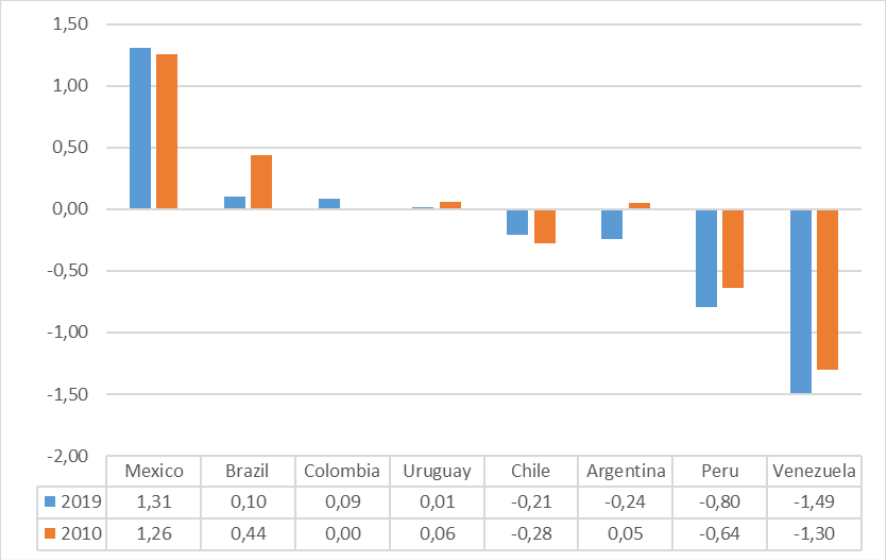
The evolution of the economic complexity rankings can be seen in Graph 4 the evolution of the economic complexity rankings can be seen. Mexico has maintained its 18th place out of 133 economies in the ranking since 2010, a substantial improvement over its ranking in 1995. Brazil is the opposite. It is currently ranked 53rd, which is a significant decline from its 1995 ranking of 25th. The ranking of Colombia and Chile has been relatively stable over the period 1995-2019. Uruguay, Argentina, Peru and Venezuela, on the other hand, show a negative performance. Venezuela is a special case, going from a ranking close to the median to one of the least complex economies in the world today - 128th out of 133.

To get a more specific idea behind the information in the scores and rankings, see the information on the top exports of selected countries.[29] In 2020 in Mexico these were automobiles ($41.6B), computers ($31.5B), vehicle parts ($27.1B), cargo trucks ($23.8B) and crude oil ($17.8B). In Chile, by contrast, the main exports are less complex goods at first sight: copper ore ($21.4B), refined copper ($14.5B), fish fillet ($2.57B), sulphate wood pulp ($2.1B), and pitted fruit ($1.96B).

[28] *Id.* , 24

[29] Information on main exports in this section is taken from the Observatory of Economic Complexity < https://oec.world/> accessed 18 May 2022.

Graph 3 - Economic Complexity Index - Annual values 2010 and 2019



	Mexico	Brazil	Colombia	Uruguay	Chile	Argentina	Peru	Venezuela
2019	1,31	0,10	0,09	0,01	-0,21	-0,24	-0,80	-1,49
2010	1,26	0,44	0,00	0,06	-0,28	0,05	-0,64	-1,30

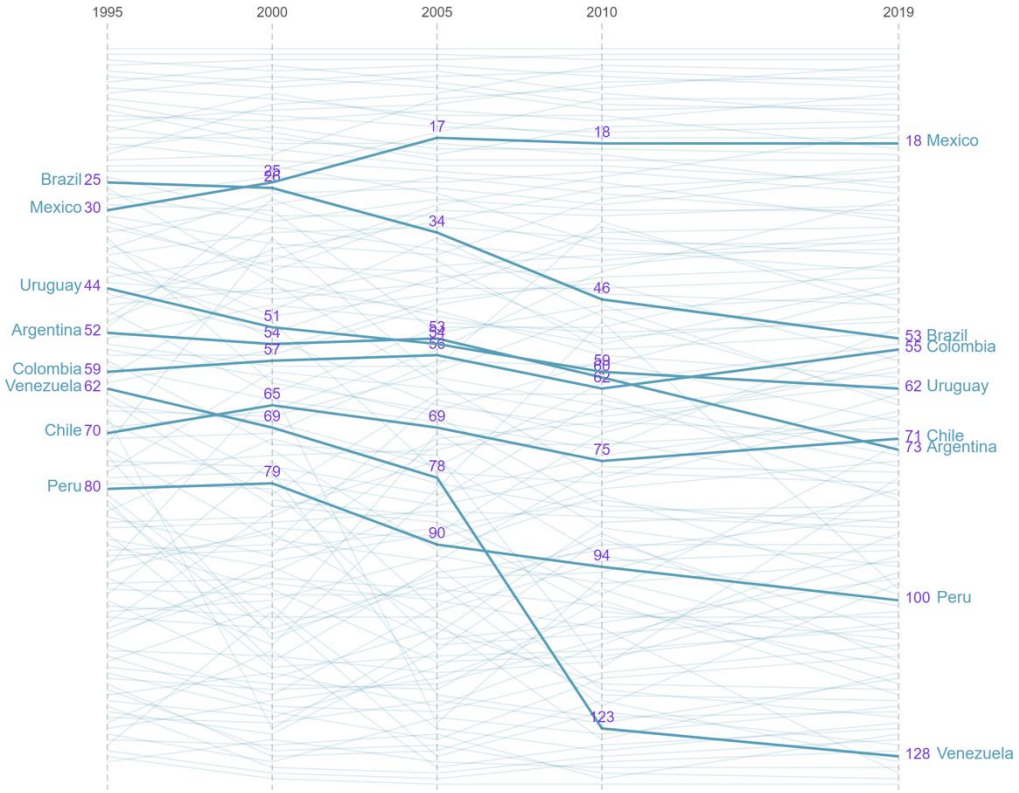
Data from the Observatory for Economic Complexity (2022)

One point to note in this comparison is the average income levels of these economies. Chile's GDP per capita adjusted for purchasing power parity (PPP) surpassed Mexico's in 2005, with Chile's currently standing at $25.1 thousand per year in 2020 and Mexico's at $18.4 thousand. Chile's relative affluence is due more to the exploitation of its natural resources - its mining exports accounted for 57 per cent of the total in 2020[30] - than to its technological progress.

It is also worth presenting the information on Brazil as the complexity of its economy contrasts with the figures presented on R&D investment. In 2020, Brazil's main exports were soybeans ($28.6B), iron ore ($26.5B), crude oil ($19.8B), raw sugar ($8.95B), and frozen beef ($6.69B).

Graph 4 - Ranking of countries Economic Complexity Index

[30] Central Bank of Chile data (2022) < https://www.bcentral.cl/web/banco-central/areas/estadisticas> accessed 18 May 2022.



Atlas of Economic Complexity (2022)

An interesting question, which is beyond the scope of the present study, is how to reconcile the fact that Brazil is a special case in terms of R&D investment - the highest annual average in the region by far - with the composition of its main exports compared to Mexico, a country with very low R&D investment. To answer this question it is necessary to look in more detail at the composition of R&D investment, among other relevant information. However, the result in question can also be seen in the following perspective: Brazil presents anyway a lower average annual R&D investment than the world average, so one would not expect its economy to be more complex in relation to the rest of the countries.

An interesting question in this perspective is about the causes of Mexico's positive performance in terms of the economic complexity of its exports in view of its low investment in R&D. One possible hypothesis may be that Mexico has been particularly successful in implementing technologies generated in other countries even though it is not a leading innovator. One possible hypothesis may be that Mexico has been particularly successful in implementing technologies generated in other countries even though it is not a leading innovator. This is important for the present study since it opens up a line of research that may be of interest: What are the factors that determine Mexico's relative success in terms of technology recipients compared to the rest of the countries in the region?

C) Regulatory framework on technology transfer

C.1 Definition of technology transfer

C.1.1 The concept of technology

As already mentioned, technology transfer, both international and domestic, can be described as a relationship between different public or private actors, with the aim of one party gaining access to the technological portfolio of the other party[31] . That said, one of the first phenomena to be referred to is the concept of technology, which has also been defined in different ways.

Technology can be classified along several dimensions. Some types of technology, for example, can be translated into formulas, blueprints, patents or software, and can be considered codified, while others are uncodified and involve implicit knowledge of production and management techniques. In addition, some technologies - such as those related, for example, to chemical formulae or simpler machinery - may be classified as "embedded" in certain products and therefore may be reverse engineered. Other technologies, such as those used to produce complex machinery or provide business services, are "embodied". complex machinery or the provision of business services, are "incorporeal" and less easy to copy or reverse engineer[32] .

Therefore, it can be inferred that intellectual property rights are highly relevant in technology transfer processes, in particular patents, trade secrets, plant breeders' rights and copyright, among others, are tools used to grant exclusive rights over those intangible assets that meet the protection criteria.

The definition given by Dahlman and Westphal states that "*technology can be defined as a method (or procedure) for doing* something"[33] . However, as can be seen, this definition is rather generic and too broad.

A few years later, Nezeys provided a somewhat more accurate definition of what can be defined as technology by distinguishing between technology and technique. For this author, "technology is a branch of knowledge consisting of all the knowledge and skills necessary for the use, improvement

[31] Peter J Buckley and others (eds), International Technology Transfer by Small and Medium-Sized Enterprises (Palgrave Macmillan UK 1997) <http://link.springer.com/10.1007/978-1-349-25686-0> accessed 22 December 2021.
[32] Maskus (n 14).
[33] International Monetary Fund, Finance and Development, December 1983 (International Monetary Fund 1983) <http://elibrary.imf.org/view/IMF022/12488-9781616353551/12488-9781616353551/12488-9781616353551.xml> accessed 22 December 2021.

and creation of techniques. And a technique is made up of the set of operations that must actually be carried out to manufacture a given good"[34] .

More recently, Dodgson provides a more comprehensive definition: "*technology is a reproducible product with practical applications and the knowledge that enables its use and development. Technology manifests itself in new products, processes and systems, including the knowledge and skills needed to functionally produce what is reproducible*"[35] .

With respect to the countries of the Study, only Argentina, through Decree No. 580/1981, which regulates the Law on Technology Transfer (Law No. 22.426), understands technology. Article 1 states that: "for *the purposes of Article 1 of Law 22.426, "technology" means: a) patents of invention, b) industrial models and designs, and c) any know-how for the manufacture of a product or the provision of a service*"[36] .

In addition, INPI Resolution P-328/2005 also indicates which services will not be considered "technology" for the purposes of the registration provided for in Law 22.426 and its Regulatory Decree 580/81. *a) The acquisition of products; b) Technical assistance or consultancy services, as well as licences of know-how or information, knowledge or methods of application in the financial, commercial, legal, marketing or sales areas, to prepare for participation in tenders, contracting competitions or obtaining permits, placement of securities or similar, as well as all those services that do not clearly and specifically demonstrate the effective incorporation of technical knowledge directly applied to the productive activity of the local contracting party; c) Licences for the use of software or software updates*;[37] *d) Repair services, supervision of repairs, maintenance, commissioning of plants or machinery, etc., that do not include the training of the local firm's personnel; e) In general, all activities that represent the direct contracting of tasks inherent to the current operation of the local firm.*

It is clear from the regulation in question that in Argentina the definition of technology is associated with technical knowledge that results in a product or process, leaving out any knowledge that is not considered "technical".

From the definitions it can be identified that technology can consist of a desired result (i.e. the solution of a problem or a new development); or the procedure that contributes to achieving the desired result. Furthermore, it can be concluded that the concept of "technology" is not static, nor unique, but on the contrary is dynamic and advances along with the regulatory frameworks that

[34] Bertrand Nezeys, Commerce international, croissance et développement (2. éd., Economica 1990).
[35] Mark Dodgson, David Gann and Ammon Salter, The Management of Technological Innovation: Strategy and Practice (New ed, revupdated, Oxford University Press 2008).
[36] To which we should add utility models, which were incorporated into the Argentinean industrial property rights regime with Law 24.481 (arts. 53 to 58), i.e. after the enactment of Law 22.426.
[37] However, software support and maintenance services (implementation, technical assistance, training, etc.) can be registered. Source: https://www.argentina.gob.ar/inpi/transferencia/preguntas-frecuentes-15.

have focused on the importance in public policy of technology transfer, or of fostering innovation as a necessary variable for economic growth and development[38] .

C.1.2 The definition of technology transfer

Technology transfer has been one of the great pending debts at the multilateral, national and regional levels. Different incentive mechanisms for technology transfer have been used at both the international and national levels. In particular, a large number of countries have established incentive or promotion systems for technology transfer through national regulations, however, this has not been sufficient to achieve an effective transfer between developing and developed countries[39] .

However, talking about technology transfer is relatively complex as it not only refers to different branches of law, including intellectual property, but also to different elements that can range from a country's absorptive capacity, measured through its education, or its level of foreign investment, or its promotion policies regarding fiscal or tax incentives[40] . In terms of law, both intellectual property and competition law have fundamental roles to play in establishing the contractual relationships that will determine the regulatory frameworks to ensure a country's technology transfer.

As mentioned, the concept of technology transfer has different definitions, and it is not possible to determine a single definition, as it is dynamic and can be constituted by different approaches that are not exclusive to law. Roffe indicates that the private sector understands technology transfer as "*a commercial transaction that takes place through contractual agreements and involves flows of knowledge, embodied in goods (as in the sale of machinery and equipment) or in the form of ideas, technical information and skills (through licensing, franchising or distribution agreements) and the movement of experts. Technology transfer can take place under market conditions, as in the case of export of equipment or licensing agreements between unaffiliated firms, or it can be internalised through the transfer of new production techniques within a transnational corporation, between affiliated firms*".[41]

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[38] Gómez-Mejía, A. (2017). The concept of Technology in the History of Economic Thought. From the Classics to Schumpeter, Evolutionism and today. Revista Libre Empresa, 14(2), 199-214 http://dx.doi.org/10.18041/libemp.2017.v14n2.28210 pp. 199-201.

[39] 'International Technology Transfer Policies', vol 222 (2019) OECD Trade Policy Papers 222 <https://www.oecd-ilibrary.org/trade/international-technology-transfer-policies_7103eabf-en> accessed 23 January 2022.

[40] See for example, Edwin Mansfield, Intellectual Property Protection, Direct Investment, and Technology Transfer: Germany, Japan, and the United States (World Bank 1995). 'International Technology Transfer Policies', vol 222 (2019) OECD Trade Policy Papers 222 <https://www.oecd-ilibrary.org/trade/international-technology-transfer-policies_7103eabf-en> accessed 23 october 2021.

[41] Roffe, P. (1999). Transfer of technology and competition policy in the context of a possible multilateral investment. In R. M. S Picciotto, Regulating International Business: Beyond Liberalization (p. 151). Macmillan Press.

Maskus, on the other hand, indicates that international technology transfer "*is a broad term that encompasses the mechanisms of information transfer across borders and its effective diffusion in recipient economies. It thus refers to numerous and complex processes, ranging from innovation and international commercialisation of technology to its absorption and imitation*"[42] .

WIPO defines technology transfer as "a series of processes of sharing ideas, knowledge, technology and skills with another individual or institution (e.g. a company, a university or a government agency) and of acquisition by the other of such ideas, knowledge, technology and skills"[43] .

At the regional level, few countries include definitions of technology transfer[44] . In the case of Colombia, the Colombian National Council for Economic and Social Policy (**CONPES)** document **3582**[45] defines technology transfer as "the process by which the whole set of skills and knowledge is made accessible to those who do not generate the knowledge".

In Peru, Law No. 30018 on the use of patent information does not include such a definition; however, its Regulation Supreme Decree No. O19-2016- PCM does, in the following terms: "*It is the process of transmission of scientific and technological information, knowledge, means and exploitation rights to third parties for the production of a good, the development of a process or the provision of a service, contributing to the development of their capacities*" (paragraph 9, article 3 of the Regulation of Law No. 30018).

In other cases, such as in Argentina, although there is legislation on technology transfer (Law 22.426), which establishes in the first article of the Law that contracts whose main objective is the "*transfer, assignment or licensing of technology*" are those that are covered by the rule. A similar case is Brazil, where although the INPI does not define technology transfer, it states that *"contracts involving the licensing of industrial property rights (trademarks, patents, industrial designs and integrated circuit diagrams), technology suppliers, technical assistance services and* franchising" can be registered as "*technology contracts*"[46] .

The inclusion of rules on technology transfer, as well as its definition, is of great relevance for the purpose of interpreting the scope of the concept. As can be seen from the definitions analysed, in many cases, when referring to technology and its transfer, reference is made to intellectual property

[42] Maskus (n 14). Pp. 7-8.
[43] WIPO, 'Transfer of Technology' (WIPO 2011) SCP14 <: http://www.wipo.int/edocs/mdocs/scp/en/scp_16/scp_14_4_rev.pdf> accessed 1 December 2022.
[44] For the purposes of this study, the countries that do not have a definition are Argentina, Brazil, Chile, Mexico and Uruguay.
[45] CONPES are recommendations produced by the highest national planning authority, the National Council for Economic and Social Policy, which is the government's advisory body on all aspects of economic and social development.
[46] INPI, 'Technology Transfer' http://antigo.inpi.gov.br/menu-servicos/transferencia.; http://antigo.inpi.gov.br/menu-servicos/transferencia/transferencia-de-tecnologia-mais-informacoes. Accessed 15 Jul. 2020.

rights where there is scientific knowledge applied to a process or product, leaving out of such definition those intellectual property rights that are not associated to the definition of technology, as is the case of trademarks, where several legislations include trademarks within the special regulation of technology transfer[47] .

Another relevant aspect of the definition is for example if some of the definitions provided here are taken and interpreted restrictively, it could be understood that there is no international technology transfer when the technology remains within the boundaries of the foreign company (e.g. the application of technology in a new location through a foreign subsidiary).

As can be seen, in some cases, the countries analysed established regulations aimed at regulating the importation of technology, as in the case of Argentina, or the Andean Community countries.

In this sense, the Argentinean law establishes that registrable contracts will not be those that "have as their main or accessory object, the transfer, assignment or licensing of technology or trademarks by persons domiciled abroad, in favour of natural or legal persons, public or private, domiciled in the country, provided that such acts have effects in the Argentine Republic"[48] .

For the countries of the Andean Community, Decision 291 of 1991 regulates the importation of technology and in its article 12 establishes that "*Contracts for the licensing of technology, technical assistance, technical services, basic and detailed engineering and other technological contracts in accordance with the respective legislations of the Member Countries, shall be registered with the competent national agency of the respective Member Country, which shall evaluate the effective contribution of the imported technology by estimating its probable profits, the price of the goods incorporating the technology, or other specific ways of quantifying the effect of the imported technology*"[49] .

In conclusion, some countries have incorporated rules or definitions that delimit the concept of technology transfer and also establish rules with respect to international technology transfer, the following sections will discuss the purpose of these rules as well as the elements they contain.

C.2 Forms and channels for technology transfer

[47] See Argentina: Law on Technology Transfer (Law 22.426) available at: http://servicios.infoleg.gob.ar/infolegInternet/anexos/15000-19999/18804/texact.htm; Andean Community of Nations: Decision 291, 'Common Regime for the Treatment of Foreign Capital and on Trademarks, Patents, Licenses and Royalties' ; http://www.sice.oas.org/trade/junac/decisiones/Dec291s.asp accessed 1 September 2021.

[48] According to Article 1 of the Law on Technology Transfer (Law 22.426) available at: http://servicios.infoleg.gob.ar/infolegInternet/anexos/15000-19999/18804/texact.htm.

[49] Decision 291, 'Common Regime on the Treatment of Foreign Capital and on Trademarks, Patents, Licences and Royalties' ; http://www.sice.oas.org/trade/junac/decisiones/Dec291s.asp accessed 1 September 2021.

According to WIPO, the term "transfer of technology" can be understood in a narrow or broad sense when used in the context of intellectual property, especially in the field of patents. Broadly understood, technology transfer is a series of processes aimed at sharing ideas, knowledge, technologies and skills with another individual or institution (e.g. a company, a university or a government agency) and the acquisition by the other party of those ideas, knowledge, technologies and skills[50] .

That is, the objective of the transfer is usually the establishment of a plant and the start of production, or the provision of commercial services or government infrastructure. Technology transfer is not just a developing concept; the principles of technology transfer apply even in the most industrialised environments as long as the owner of the technology transfers it to a recipient[51] .

There are numerous channels through which TT can occur. Trade in goods and services is one of them. All exports have some potential to transmit technological information. Imported capital goods and technological inputs can directly improve productivity when used in production processes[52] .

A second channel is foreign direct investment (FDI). Multinational enterprises (MNEs) often transfer technological information to their affiliates, some of which may "leak" into the host economy. A third important channel of TTI is direct trade in knowledge through technology licensing. This can occur within firms, between joint ventures or between unrelated firms[53] .

Licensing and FDI are often substitutes. Which form is preferable for technology owners depends on many factors, including the strength of IPRs protection. Patents, trade secrets, copyrights and trademarks can serve as direct facilitators of knowledge transfer[54] .

Erlsting, based on Blakeney[55] , identifies some of the transactions that make up technology transfer in the aforementioned channels and details the following:

- the granting and licensing of intellectual property rights;

[50] Standing Committee on the Law of Patents, 'THE TRANSFER OF TECHNOLOGY' (WIPO 2011) SCP/14/4 REV 2 14/4rev.2 <https://www.wipo.int/edocs/mdocs/scp/es/scp_17/scp_14_4_rev_2.pdf> accessed 14 September 2021.
[51] Jay Erstling, 'International Technology Transfer and Intellectual Property Rights: Some Essentials and Options for Technology Transfer Partners' (1992) 34(3) The International Executive 215.
[52] Based on Maskus (n 14).
[53] ibid.
[54] ibid.
[55] Erstling (n 49). Pp. 217 based on Blakeney, M. (1989) Legal Aspects of the Transfer of Technology to Developing Countries, Oxford: ESC Publishing Ltd.

- the transmission in documentary form of technical information or know-how (i.e. the transmission of technical information or know-how (i.e. information and knowledge concerning the use and application of industrial techniques);

- the communication of technical information or know-how in the provision of services; - the provision of support or services in connection with the establishment of an industrial plant;

- the sale or lease of machinery, or the provision of support or services in connection with the sale or lease of machinery;

- the provision of support or services in respect of the recruitment and training of personnel or the establishment of accounting and management procedures; and the provision of support or services in respect of the marketing, sale and distribution of the final product or service

In the following, different legislations that aim to foster the technology transfer environment in Latin American developing countries are developed.

C.3 The rules on technology transfer

Most of the countries under analysis include policies to encourage or regulate domestic or international technology transfer. As already discussed, this is in many cases associated with the concept of technology transfer. Generally, States at all levels of development have a substantial interest in promoting technology transfer to their country in a way that benefits local firms. Governments, through legislation and/or regulatory measures, can improve the terms of trade for local firms by establishing ground rules that enhance national capacity with respect to negotiating with international firms[56] .

Broadly speaking, national policies range from economy-wide programmes (e.g. education) to funding for technology creation and acquisition, tax incentives for the purchase of capital equipment and intellectual property rights (IPRs)[57] . Some of these policies have the effect of "forcing" technology transfer to varying degrees. Some of these policies have the effect of

[56] See for example: Frederick M Abbott, 'Under the Radar: Reflections on "Forced" Technology Transfer and the Erosion of Developmental Sovereignty' (2020) 69 GRUR International 260.
[57] Bernard Hoeckman, Keith E Maskus and Kamal Saggi, 'TRANSFER OF TECHNOLOGY TO DEVELOPING COUNTRIES: UNILATERAL AND MULTILATERAL POLICY OPTIONS' (World Bank 2004) Policy Research Working Paper 3332 <https://documents1.worldbank.org/curated/en/737591468762912473/pdf/wps3332.pdf> accessed 1 November 2021. Pp. 1

"forcibly" imposing technology transfer to varying degrees. It is understood that they result in a forced transfer of technology.

According to the OECD, "*forced" technology transfer is often the result of some form of compulsion imposed by government policies and practices, which affects the interactions of foreign firms with their local counterparts and prevents foreign firms from entering into agreements with their local partners on market-based contractual terms that are voluntary and mutually* agreed"[58] . It further clarifies that it may involve situations where "*the owner of a technology (e.g. an investor or a licensor) is obliged to transfer it in order to be allowed to operate on the same terms as local companies or to access the market at all. Therefore, even though the transferor of the technology may choose to transfer the technology to overcome serious barriers and therefore there may be some degree of consent, the barriers may still be considered as a forced choice of the owner to transfer the* technology"[59] .

The latter concept has been developed in the literature on the basis of the implementation of such measures in some developing countries. In particular, it has focused on the case study of the People's Republic of China, which is considered to have applied this type of regulation to encourage technology transfer to its local industry[60] .

Latin American countries have also established regulations to promote technology transfer. These can be distinguished in different classifications, rules that seek to regulate the international transfer of technology, tax incentive rules, rules for the promotion of technological sectors, contractual aspects related to intellectual property. Also, in the case of Brazil, the obligation of the federal government to promote technology transfer is established.

The Brazilian Federal Constitution of 1988 contains a chapter on Science, Technology and Innovation, which was also the subject of a Constitutional Amendment in 2015. The articles that comprise it, 218, 219, 219-A and 219-B, consider that*: "(i) it is incumbent on the Brazilian State to promote scientific development, research, scientific and technological training and innovation (art. 218, caput); (ii) technological research will be dedicated mainly to solving Brazilian problems and to the development of the national and regional productive system (article 218, paragraph 2); (iii) the State shall stimulate the formation and strengthening of innovation in companies, as well as in other public or private entities, the constitution and maintenance of technology parks and poles and other environments that promote innovation, the work of independent inventors and the creation, absorption, dissemination and transfer of technology (article 219, sole paragraph); and (iv) the National Science,*

[58] International Technology Transfer Policies' (n 37). Pp. 7-8.
[59] ibid.
[60] See for example: Abbott (n 54); Dan Prud'homme and others, '"Forced Technology Transfer" Policies: Workings in China and Strategic Implications' (2018) 134 Technological Forecasting and Social Change 150; Dan Prud'homme and Max von Zedtwitz, 'Managing "Forced" Technology Transfer in Emerging Markets: The Case of China' (2019) 25 Journal of International Management 100670; 'International Technology Transfer Policies' (n 37).

Technology and Innovation System (SNCTI) shall be organised on a collaborative basis between public and private entities, with a view to promoting scientific and technological development and innovation"[61] .

C.3.1 Rules on the import of technology and the registration of contracts

As already mentioned, some countries establish rules that target international technology transfer contracts.

In Argentina, Law 22.426 on Technology Transfer (hereinafter also "LTT") is the special rule that regulates the transfer of technology by persons domiciled abroad in favour of individuals or legal entities, public or private, domiciled in Argentina, provided that such acts have effects in the country.[62] This law also contemplates the licensing of foreign trademarks, which does not constitute a transfer of technology. [63]

Article 1 of the LTT defines the universe of acts covered by its provisions. The text of the aforementioned article states: "Legal acts for valuable consideration whose main or accessory purpose is the transfer, assignment or licensing of technology or trademarks by persons domiciled abroad, in favour of natural or legal, public or private persons domiciled in the country, provided that such acts have effects in the Argentine Republic, are covered by this Law".[64]

Consequently, the requirements or conditions for the application of the law are that: 1) it is a transfer, assignment or licence of technology or trademarks, 2) the supplier of technology or trademarks happens to be domiciled abroad, 3) the recipient of the technology or trademarks happens to be a person domiciled in the country, 4) the acts are for consideration, and 5) the acts have effects in the country.

Failure to register or file TT contracts does not affect the validity of such instruments, but it does have tax consequences. The scope of these tax consequences has undergone a modification in 2017 as a result of an amendment to Law 22.426, as detailed below.

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[61] See Brazil, 'Constituição Da República Federativa Do Brasil De 1988' and its amendments, available at http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm.

[62] The Argentine Legal Digest (approved by Law 26.939, Official Gazette of 16/06/2014) systematised the laws in force in Argentina and their regulations. In this Digest, Law 22.426 has the following title: "Regulation of technology transfer contracts and foreign trademarks".

[63] The updated text of Law 22.426 can be consulted online at http://servicios.infoleg.gob.ar/infolegInternet/anexos/15000-19999/18804/texact.htm. However, several of its articles have lost their validity due to subsequent regulations, as explained in the text of this paper.

[64] Law 22.476, art. 1°.

In this regard, it should be clarified that various provisions originally contained in Law 22.426 at the time of its enactment in 1981 lost their validity at different points in time as they were expressly or implicitly repealed by subsequent regulations.

The content of the amendments to Law 22.426 comprises two aspects. The first aspect, the result of an amendment to this law in 1993, refers to the fact that for all cases covered by its provisions - whether related or unrelated companies - the registration of TT contracts became "automatic", i.e. limited only to a formal or objective control of requirements by the Authority for the Application of this law. The second aspect concerns the elimination in 2017 of a certain negative consequence in tax terms (a kind of penalty) that Law 22.426 originally assigned to the failure to register TT contracts.

With regard to the first aspect, i.e. the automatic nature of the registration, it should be noted that Law 22.426 originally and until the enactment of Decree N° 1.853 of the National Executive Power (PEN) of 1993, contemplated (in its articles 2 and 5) a system of "approval" of TT (or trademark) contracts entered into between related companies, i.e. when the contract has as intervening parties, on the one hand, a local company with foreign capital (recipient of the technology or trademark) and, on the other hand, the foreign company providing the technology or trademark (or another subsidiary of the latter) that directly or indirectly controls the former.

The purpose of the now repealed regime for the approval of contracts between related companies was to avoid the practice of obtaining undue tax benefits through the submission of contracts that did not actually involve a transfer of technology, in order to obtain the better tax treatment of royalties and similar payments compared to the more severe tax treatment of dividends or corporate profits.[65] Currently, the control of this type of manoeuvres falls under the Federal Administration of Public Revenues (hereinafter also "AFIP"), which is the tax authority at the federal level of government.

In the case of Colombia, Peru and Ecuador, **Decision 291 of 1991** regulates the importation of technology[66] . Decision 291 of 1991 regulates the importation of technology and in its article 12, which contracts are included in the regulation and must be registered in order to obtain the benefits provided for in article four of this normative body, which establishes that: "The owners of a foreign direct investment, and sub-regional investors, will have the right to transfer abroad, in freely

[65] This is what is expressed in the Message of elevation of the bill that would later become Law 22.426.
[66] It should be noted that Venezuela denounced the Cartagena Agreement and left the Andean Community in April 2006. The consequence of this was the non-application of all Andean regulations in the country, especially those relating to intellectual property, including Decisions 486 (Industrial Property), 345 (Plant Breeders' Rights), 351 (Copyright), 391 (Access to Genetic Resources), 291 (Treatment of Foreign Capital and on Trademarks, Patents, Licences and Royalties).

convertible currency, under the terms established in the legislation of each Member Country, the proven net profits that come from their foreign direct investment"[67] .

Articles 13 and 14 of the analyzed body of law establish the minimum requirements that must be found in technology import contracts: Article 13 establishes that they must contain: a) identification of the parties; b) forms in which the technology is imported (whether it is know-how, patents, machinery, etc.); c) the economic value) of the elements incorporated in the contracts; and finally d) the term of the contract[68] . While article 14 establishes which clauses should not be contained in such contracts[69] .

Finally, Article 15 of the Decision refers to know-how or intellectual property rights by referring to "intangible technological contributions" and to the possibility of royalties being collected by the company issuing the technology, which may capitalise and remit this income abroad, once the taxes established in the CAN member countries have been paid[70] .

In the case of Colombia, Decision 291 is implemented by Decree 4176 of 2011. This regulation assigned the National Tax and Customs Directorate (hereinafter DIAN) the function of administering the registration of technology transfer contracts. And Resolution 000062 of 24-02-

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[67] See Article 4 Decision 291 (n 47)

[68] Ibid. Article 13 'Article 13.- Contracts on the importation of technology shall contain, at least, clauses on the following matters:
a) Identification of the parties, stating their nationality and domicile;
(b) Identification of the modalities of the transfer of the technology being imported;
c) Contractual value of each of the elements involved in the technology transfer;
(d) Determination of the period of validity;

[69] Article 14.- For the purposes of registering contracts on external technology transfer, trademarks or patents, Member Countries may take into account that such contracts do not contain the following:
(a) Clauses whereby the provision of technology or the use of a trademark carries with it an obligation on the recipient country or enterprise to purchase, from a specified source, capital goods, intermediate products, raw materials or other technology or to use on a permanent basis personnel designated by the technology provider enterprise;
(b) clauses according to which the technology seller or licensor reserves the right to fix the selling or resale prices of products produced on the basis of the respective technology;
(c) Clauses containing restrictions on the volume and structure of production;
(d) clauses prohibiting the use of competing technologies; (e) clauses providing for an option to purchase, in whole or in part, in favour of the supplier of the technology;
(f) clauses requiring the technology purchaser to transfer to the supplier any inventions or improvements resulting from the use of the technology;
- (g) clauses requiring royalties to be paid to patent or trademark owners for unused or expired patents or trademarks;
(h) Other clauses having equivalent effect. Except in exceptional cases, duly qualified by the competent national body of the recipient country, clauses prohibiting or limiting in any way the export of products produced on the basis of the respective technology shall not be admissible. In no case shall such clauses be admissible in connection with sub-regional trade or for the export of similar products to third countries.

[70] Article 15.- Intangible technological contributions, insofar as they do not constitute capital contributions, shall be entitled to the payment of royalties in accordance with the legislation of the Member Countries.
Royalties accrued may be capitalised, in accordance with the terms provided for in this Regime, upon payment of the corresponding taxes.
Where such contributions are provided to a foreign enterprise by its parent company or by another subsidiary of the same parent company, royalty payments may be authorised in cases previously qualified by the competent national agency of the recipient country.

2014 of the DIAN: By which the form, content and terms for the Registration of Technology Import Contracts with the National Tax and Customs Directorate are regulated and established.

C.3.2 Tax incentive rules for technology transfer

Tax policies of technology-importing countries, as well as of technology-exporting countries (in some cases, even third countries acting as intermediaries), have direct implications for the form and manner in which technology transfer takes place. In general, tax rules affect technology transfer in two ways: (a) by increasing the cost of the actual transfer, and (b) by reducing the subsequent return to the transferor[71] .

In the context of technology transfer, one of the most important functions of tax rules is to reduce withholding tax rates imposed by the importing country on royalty payments, technical fees and the like. These provisions, while primarily aimed at sharing taxing power between states, in some cases also help to eliminate (or reduce) double taxation. In addition, close cooperation between the tax authorities of tax treaty parties helps to develop common tax definitions and classifications that reduce ambiguities between countries' tax rules[72] .

In this sense, the design of tax policies that aim to promote technology transfer faces the difficulty of balancing conflicting objectives. On the one hand, countries wish to facilitate the acquisition of technology; on the other hand, they wish to obtain, in the form of tax revenues, a fair share of the benefits accruing to the foreign owner of that technology by virtue of the transfer[73] .

On the tax side, different strategies can be addressed, such as tax reductions on FDI, transfer tax incentives, taxes on corporate capital contributions, taxes on technology imports, among others. For example, some countries impose restrictions on the contribution of assets to a company's capital. In Argentina, and a similar rule is found in Brazil, such contribution is allowed but must be approved by a special agency established to oversee and register all technology transfer agreements.

For example, ECLAC in analysing tax incentives in the region indicated that "In the vast majority of the countries analysed, there are temporary tax exemptions that include corporate income tax (among other taxes). The duration of these tax holidays varies from country to country and even within the same country, depending on the sector benefited and/or the location of the company. They range from 2 years (small and medium-sized film and audiovisual services companies in Panama) to 50 years, such as the preferential customs and tax regime of the XII Region in the

[71] See United Nations Conference on Trade and Development (ed), Taxation and Technology Transfer: Key Issues (United Nations 2005). Pp. 7-9.
[72] ibid.
[73] ibid. p. 19.

extreme south of Chile (which is valid until 2035). Similar to the Chilean case, in Argentina there is an economic promotion regime in Tierra del Fuego (also in the extreme south of the country) that dates back to 1972 and exempts from the payment of all national taxes, although it does not have a term of validity specifically provided for in the law. The average duration of tax holidays in many countries is around 10 years, and in several legislations the terms are extendable in the case of additional investments and under certain requirements"[74] .

In Argentina, tax rules related to technology transfer are enforced by the tax authority (Administración Federal de Ingresos Públicos); these are Income Tax Law No. 20.628, Decree No. 862/2019 regulating Income Tax Law No. 20.628, and Law 27.430, amending Income Tax. Indeed, it should be noted that the application of Law 22.426 is closely linked to tax benefits established in the LIG.[75] In this respect, the provision of the Income Tax Law applicable to the issue of international transfer of technology is Article 104 (a). [76]

[74] Economic Commission for Latin America and the Caribbean (ECLAC)/Oxfam International, "Corporate tax incentives in Latin America and the Caribbean", Project Papers(LC/TS.2019/50), Santiago, 2019.
[75] The text of Decree No. 824/19 is available at http://biblioteca.afip.gob.ar/dcp/DEC_C_000824_2019_12_05.
[76] In the previous version of the ordered text, established by Decree No. 649/97, the same provision appeared as Article 93(a).

Likewise, Decree No 862/2019 is also relevant with regard to international technology transfer contracts, specifically in its articles 263 to 267[77] . Indeed, the aforementioned decree currently constitutes the regulation of the Income Tax Law, according to the text ordered in 2019.[78]

In Brazil, the National Tax Code determines the taxation of income resulting from technology transfer (art. 44).

The income tax legislation brings specific rules on the deduction of expenses incurred by legal entities with royalties on technology transfer contracts and sets limits for such deduction (Article 74 of Law no. 3.470/1958; Articles 52, 53 and 71 of Law no. 4.506/64; Article 50 of Law no. 8.383/91), the maximum deduction for patent royalties cannot exceed 5% of the income from sales of products manufactured under the patent. Somewhat similar restrictions apply to technical assistance fee payments.

Law no. 10.168/2000 (subsequently amended by Laws no.s 10.332/2001 and 11.452/2007) also instituted the contribution of the economic domain intervention - CIDE, aimed at financing the Stimulus Program for the University-Company Interaction for the Support of Innovation. This contribution is due by the legal entity holding the license of use or acquiring technological

[77] Technology Transfer. ARTICLE 263.- For the purposes of the provisions of paragraph 1) of subsection a) of section 104 of the Act, the technology transfer enforcement authority shall issue a certificate stating the name of the contracting parties, the date of conclusion, the term of the contract and the registration number in the Register of Technology Transfer Contracts.
It must also indicate that the services foreseen in the contract are covered by the above mentioned point and are not available in the country.
In the cases included in point 2), the competent authority shall certify compliance with the requirements of Law No. 22.426 on Technology Transfer and its amendments.
If the enforcement authority refuses to issue the certificate on the grounds that these requirements are not duly complied with, the provisions of section 104(i) shall apply.
ARTICLE 264.- The registration before the NATIONAL INDUSTRIAL PROPERTY INSTITUTE, a decentralised body within the scope of the MINISTRY OF PRODUCTION AND LABOUR, of contracts including technology transfer services, in accordance with the provisions of the previous Article, shall be carried out pursuant to the provisions of Article 3 of Law No. 22,426 on Technology Transfer and its amendments, with the scope established by Decree No. 1853 of 2 September 1993.
ARTICLE 265.- The requirement established by point 1) of subsection a) of section 104 of the Act, regarding the fact that the respective benefits are not obtainable in the country, shall be deemed to refer to the time of the relevant registration, as determined by the competent authority on the matter.
ARTICLE 266.- The requirement of the effective rendering of services, contained in the last part of paragraph 1) of subsection a) of section 104 of the Act, shall be understood to refer to services that, at the time the payments were made, should have been effectively rendered. If the services were not actually rendered at the end of the tax period in question, the respective amounts may not be deducted by the paying entity for the purposes of determining the tax. In such a case, the deduction shall be deferred until the year in which the services are actually rendered.
ARTICLE 267.- When the items by virtue of which payments included in points 1) and 2) of subsection a) of section 104(a) of the Act have not been contractually discriminated, the higher percentage of presumed net profit shall be applied.

[78] The text of Decree No. 862/2019 is available at http://biblioteca.afip.gob.ar/dcp/DEC_C_000862_2019_12_06. In the numbering of the now repealed Decree No. 1.344/98 (previous regulation of the Income Tax Law), the provisions contained in Articles 263 to 267 of Decree No. 862/2019 were found in Articles 151 to 154.

knowledge, as well as the signatory of contracts involving technology transfer, signed with residents or domiciled abroad.

In addition, the legislation regulating foreign capital in Brazil and the transfer of securities abroad (Law no. 4.131/62) provides for the transfer of royalties in technology transfer contracts. This law considers the need to register the operation of transferring royalties abroad with the Central Bank of Brazil (art. 9). It also determines that registration requests must be made with documents issued by the National Institute of Industrial Property (art. 11) and that the exchange authorities have powers to verify the existence and effectiveness of the contract (art. 10). The law provides for limits on the tax deductibility of royalty payments (art. 12) and prohibits the payment of royalties between the subsidiary or affiliate located in Brazil and the parent company located abroad or when the majority of the capital of the Brazilian company belongs to the holders of the royalties abroad (art. 14).

In Colombia there are two laws that enshrine rules related to technology transfer and tax rules. The first one is the Tax Statute, and the second one is Law 1955 of May 25, 2019, which issued the national development plan 2018 - 2022 "pact for Colombia, pact for equity" and modified the tax statute. Unlike what is established in Argentine and Brazilian legislation, in the case of Colombia the tax rules tend to establish tax credits or reductions in cases where investments for technological development and innovation are established.

For example, Article 256-1 of the aforementioned regulation establishes tax credits of 50% of the investment made by Micro, Small and Medium Enterprises in projects qualified as Research, Technological Development and Innovation, in accordance with the criteria and conditions defined by the National Council for Tax Benefits in Science, Technology and Innovation. As well as in the remuneration of doctoral students[79] . This rule was regulated by Decree 1011 of 2020: "Whereby Article 256-1 of the Tax Statute is regulated, added by Article 168 of Law 1955 of 2019, and Chapter 4 is added to Title 2 of Part 8 of Book 1 of Decree 1625 of 2016, Sole Regulatory Decree on Tax Matters.

On the other hand, Article 158-1 establishes that tax deductions will be made for those who make donations or investments in research, technological development and innovation, in accordance with the criteria and conditions indicated by the CNBT. In particular these deductions shall apply

[79] See Colombia, Tax Statute: ARTICLE 256-1. TAX CREDIT FOR INVESTMENT IN RESEARCH, TECHNOLOGICAL DEVELOPMENT AND INNOVATION PROJECTS OR HIGH-LEVEL HUMAN CAPITAL CONNECTIONS available at http://www.secretariasenado.gov.co/senado/basedoc/estatuto_tributario_pr010.html#256-1; accessed 1 September 2021.

when: "*(i) to donations made through Higher Education Institutions or the Colombian Institute of Educational Credit and Technical Studies Abroad (Icetex) aimed at scholarship programmes or forgivable credits that are approved by the Ministry of National Education, and that benefit students of strata 1, 2 and 3 through full or partial scholarships or forgivable credits that may include board, lodging, transportation, tuition, supplies and books, in accordance with the regulations issued by the National Government regarding the conditions of allocation and operation of scholarship programs and forgivable credits referred to in this article, i) <sic, ii)> to donations received by the Fondo Nacional de Financiamiento para la Ciencia, la Tecnología y la Innovación, Fondo Francisco José de Caldas, and which are earmarked for the financing of Science, Technology and Innovation Programmes and/or Projects, in accordance with the criteria and conditions established by the Consejo Nacional de Beneficios Tributarios en Ciencia, Technology and Innovation (CNBT), and iii) to the remuneration corresponding to the employment of personnel with a PhD degree in companies that pay income tax, which is made after the issuance of this law, provided that the criteria and conditions defined by the CNBT for this purpose are met and their employment is associated with the development of R&D&I activities. In the case of doctoral degrees obtained abroad, the validation requirements set out in the current regulations must be met, prior to their affiliation*"[80] .

Along the same lines, article 256[81] establishes that persons who make investments in projects classified by the National Council for Tax Benefits in Science and Technology in Innovation as research, technological development or innovation, in accordance with the criteria and conditions defined by said Council, will be entitled to deduct from their income tax payable 25% of the value invested in said projects in the taxable period in which the investment was made. This deduction will be applied within the framework of the provisions of article 158-1 analysed above.

In conclusion, and as mentioned by UNCTAD, the cost-effectiveness of tax incentives depends to a large extent on the degree of incremental activity or investment that the incentives succeed in stimulating. To the extent that activity or investment would have occurred in any case, the incentive represents a waste of public revenue[82] .

In the same vein, the OECD, in a report analysing only developed countries, states that "*tax incentives for business R&D can impose substantial costs on governments, raising doubts about their effectiveness in increasing private research efforts, as well as opportunities for tax avoidance or evasion. Many studies show a correlation between R&D tax incentives and increased private research spending within each country. Although it*

[80] Ibid. ARTICLE 158-1.
[81] Ibid. Article 256.
[82] United Nations Conference on Trade and Development (n 69).

is difficult to relate increases in R&D intensity directly to tax measures, it appears that, on average, tax incentives can increase private research expenditure by an amount equal to the loss"[83] .

C.3.3 Intellectual property rules

As already mentioned, intellectual property plays an active role in technology transfer, trade secrets, patents, plant variety rights and other rights are used to establish technology licensing agreements between provider and recipient countries. For this reason, intellectual property rules tend to regulate aspects that may restrict technology transfer or generate a position of abuse between the provider and the recipient.

In this regard, the inclusion of rules on the assignment of patent rights is reflected in various regional intellectual property laws.

In Argentina, the Law on Patents and Utility Models (Law 24.481, text ordered by Decree 260/1996) contains in Chapter V ("Contractual transfer and licences") of Title II ("Invention patents") certain provisions (Articles 37 to 40) related to patent and industrial utility model licences. Law 24.481 was enacted in 1995. It contains provisions prohibiting restrictive clauses in patent licences.

In Brazil, Law no. 9.279/96, which regulates industrial property, establishes specific provisions on the assignment and licensing of patents (arts. 58 to 61) and trademarks (arts. 136 to 141). It also includes provisions against restrictive clauses in patent licences.

Article 57 of Decision 486 of the Andean Community states that licences must be registered with the competent national authority. In addition, Chapter VII of the Decision establishes the compulsory licensing regime, which contains provisions in favour of technology licensing.

In Peru, Legislative Decree 1075 - 2008. Approves Complementary Provisions to Law 486 of the Andean Community that establishes the common industrial property regime. Article 7 indicates that the Registers of Acts of transfers and licences affecting industrial property rights may be registered in the Industrial Property Registers. The competent Directorate shall establish the form of organisation of the Register.

In Mexico, the Industrial Property Law has a chapter on licensing and transfer of patent, utility model and industrial design rights. The law authorises the total or partial assignment and the encumbrance of a patent, utility model or industrial design; in order for it to have effects with

[83] OECD, 'tax incentives for research and development: trends and issues' (OECD, 2002); available at https://www.oecd.org/science/inno/2498389.pdf accessed 1 September 2021. Pp. 23.

respect to third parties, it must be registered with the Mexican Institute of Industrial Property (IMPI). (Chapter IX Licensing and Transfer of Rights). This includes the transfer of a pending right. In addition, it is authorised to license the rights conferred by a patent, industrial design or utility model registration; the holder or licensee may request registration in the Registry, however, in the case of licensing, the warning that if it is not registered, it cannot be opposed to third parties is not established. In addition, franchising is regulated as a trademark licence in which know-how or technical assistance is included. Rights arising from an application for registration or from a registered trademark may be transferred or encumbered; in order to be effective against third parties it must be registered with IMPI.

Finally, in Uruguay, the Trademark Law No. 17.011 of 25 September 1998 establishes in its Articles 57 ff the registration of trademark licensing and assignment contracts and extends their effects to third parties as from said registration[84] . This law was regulated by Decree 34/99 of 3 February 1999[85] . The Patent Law No. 17.164 of 2 September 1999 establishes a similar provision in Articles

[84] Article 57 The Register of Trademark Licenses shall be created and shall be under the responsibility of the National Directorate of Industrial Property.
Article 58 For the purposes of this Law, licence is a contract ancillary to trademark registration, granting the right to use, in whole or in part, a registered or pending registration trademark, for a specified period of time, exclusively or not.
If the contract does not contain an exclusivity clause, it is presumed that no exclusive rights have been granted to the licensee.
Article 59 The licence shall have effect vis-à-vis third parties as from its registration with the National Directorate of Industrial Property.
Article 60 An extract of the substantial parts of the licence contract shall be published in the Industrial Property Gazette.
Article 61 The licensee may not assign his rights, in whole or in part, without the express authorisation of the licensor.
Article 62 Any amendment to the licence or sub-licence contract shall be communicated to the National Directorate of Industrial Property, and the provisions of Articles 58, 59, 60 and 61 of this Law shall be applicable to it.
Article 63 Franchise contracts containing a trade mark licence shall be governed, as appropriate, by the provisions of this Section.

[85] Article 45 For the registration of a trade mark licence, the applicant shall complete the relevant application form.
Article 46 The application form shall be accompanied by the original contract or notarial evidence thereof. Where there are observations on the application for registration of the licence, the interested party shall be given a hearing within thirty calendar days, peremptory and non-extendable, for the purpose of rectifying them, under
The applicant shall be deemed to have withdrawn his application.
Article 47 Once an application has been duly filed, the National Directorate of Industrial Property shall publish it once in the Industrial Property Gazette.
Article 48 Once the formal aspects of the application for registration have been completed, the licence contract shall be registered.
Article 49 Either of the holders of the licence contract shall notify the Industrial Property Registry of any modification relating to the accompanying document, in accordance with the provisions of the preceding Articles.
Article 50 The registration of the licence contract may be cancelled at the request of either party who proves the early termination of the contract.
The cancellation referred to in the preceding Article shall be published once only in the Industrial Property Gazette.

36 and 50[86] . This law was regulated by Decree 11/000 of 13 January 2000[87] . The Copyright Act No. 9.739 of 17 December 1937 (as amended by Act 17.616 of 10 January 2003 and its Regulatory Decree 154/004 of 3 May 2004) provides for the registration of contracts of alienation or transfer in its Article 55[88] .

As can be seen, the countries under study have adopted within their intellectual property rules, especially in patents, trademarks or copyrights, specific regulations on tools for technology transfer. In particular, these provisions aim to: a) regulate the assignment of intellectual property titles; b) the registration of licences; c) establish conditions to prevent abusive licensing behaviour.

C.3.4 Other associated standards

In Argentina, different regulations promote innovation and technology transfer. Law 23.877 on the Promotion and Encouragement of Technological Innovation[89] , a central regulation regarding the promotion of technology development and transfer to the local business environment, its implementation is coordinated by the Ministry of Science and Technology of the Nation.

In addition, Law 25.467 establishes the National System of Science, Technology and Innovation[90] . The purpose of this law is to establish a general framework that structures, encourages and promotes science, technology and innovation activities, in order to contribute to increase the cultural, educational, social and economic heritage of the Nation, tending to the common good, the strengthening of the national identity, the generation of jobs and the sustainability of the environment.

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[86] The economic rights deriving from a patent or patent application may be transferred or assigned by the owner or his successors in title, in whole or in part, by succession or by an inter vivos act. Such acts shall take effect vis-à-vis third parties as soon as they have been entered in the appropriate register.
Article 50 The owner of or applicant for a patent may grant licences for the exploitation of the subject matter of the patent, which shall take effect vis-à-vis third parties as soon as they have been entered in the appropriate register.

[87] Article 16 The application for registration of the assignment or transfer of economic rights deriving from a patent or patent application, as provided for in Articles 36 to 38 of Law No 17.164, shall be submitted together with the assignment or transfer documents or a certified copy thereof and proof of payment.
If there are observations on the application for registration of the assignment contract, the interested party shall be given a hearing of 30 (thirty) calendar days, peremptory and non-extendable, prior to the adoption of a decision.

[88] Article 55 For the registration of any alienation or transfer of a work, the acquirer shall pay a fee equivalent to 20% of the amount of the alienation.
The Executive is hereby authorised to modify the tariffs referred to in the preceding articles.

[89] Argentina, Ley 23.877 de Promoción y Fomento de la Innovación Tecnológica, enacted in 1990. Available at: http://servicios.infoleg.gob.ar/infolegInternet/anexos/0-4999/277/norma.htm accessed 12 September 2021.

[90] Argentina, Law 25.467 establishes the National System of Science, Technology and Innovation, sanctioned in 2001. Available at http://servicios.infoleg.gob.ar/infolegInternet/anexos/65000-69999/69045/norma.htm accessed 12 September 2021.

Finally, Law 27.506, which instituted the Regime for the Promotion of the Knowledge Economy[91] , aims to promote a series of economic activities that apply the use of knowledge and the digitalisation of information, supported by advances in science and technology, to obtain goods, provide services or incorporate process improvements. This regulation establishes a series of economic benefits for companies belonging to the sectors covered by this regulation, with investment in research and development activities being a factor to be taken into account for the granting of benefits.

In the case of Brazil, Law n.º 10.973/2006[92] , amended by Law n.º 13.243/2016, establishes rules to encourage innovation and scientific and technological research in the productive environment, with a view to technological training, the achievement of technological autonomy and the development of the country's national and regional productive system. Among its principles is the "incentive to the constitution of favourable environments for innovation and technology transfer activities". This Law, whose discipline is extensive, considers measures for cooperation between public, private and educational institutions.

Law no. 11.196/2005[93] establishes tax incentives for technological innovation and creates special taxation regimes (Special Taxation Regime for the Information Technology Services Export Platform - REPES, the Special Regime for the Acquisition of Capital Goods for Exporting Companies - RECAP and the Digital Inclusion Programme).

Law no. 11.484/2007[94] provides for incentives to the Digital TV equipment and semiconductor electronic components industries and for the protection of intellectual property of integrated circuit topographies, instituting the Semiconductor Industry Technological Development Support

[91] Argentina, Law 27.506, which instituted the Regime for the Promotion of the Knowledge Economy, sanctioned in 2019. Available at: https://www.boletinoficial.gob.ar/detalleAviso/primera/209350/20190610 accessed 12 September 2021.

[92] Brazil, Law 10.973 Dispõe sobre incentivos à inovação e à pesquisa científica e tecnológica no ambiente produtivo e dá outras providências. Sancionada en 2004. Available at: http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2004/lei/l10.973.htm. Accessed 21 September 2021.

[93] Brazil, Ley 10.973 Institui o Regime Especial de Tributação para a Plataforma de Exportação de Serviços de Tecnologia da Informação - REPES, o Regime Especial de Aquisição de Bens de Capital para Empresas Exportadoras - RECAP e o Programa de Inclusão Digital; dispõe sobre incentivos fiscais para a inovação tecnológica; sancionada en 2005. Available at http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2005/lei/l11196.htm accessed 21 September 2021.

[94] Brasil, Ley 11.484 Dispõe sobre os incentivos às indústrias de equipamentos para TV Digital e de componentes eletrônicos semicondutores e sobre a proteção à propriedade intelectual das topografias de circuitos integrados, instituindo o Programa de Apoio ao Desenvolvimento Tecnológico da Indústria de Semicondutores - PADIS e o Programa de Apoio ao Desenvolvimento Tecnológico da Indústria de Equipamentos para a TV Digital - PATVD; altera a Lei no 8.666, de 21 de junho de 1993; e revoga o art. 26 da Lei no 11.196, de 21 de novembro de 2005. Sanctioned in 2007; available at: http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2007/lei/l11484.htm accessed on 12 September 2021.

Programme - PADIS and the Digital TV Equipment Industry Technological Development Support Programme - PATVD.

In Peru, different regulations establish the regime for the promotion of technology transfer, mainly Law N°28.303 (2004) - Framework Law on Science, Technology and Technological Innovation[95] .

Law N° 28613 (2005) - Law of the National Council of Science, Technology and Technological Innovation (CONCYTEC)[96] . Article 11, section "i" states: to stimulate basic research, applied research and technological innovation activities; and to establish incentives for the participation of researchers in technology transfer activities in all regions of the country.

Supreme Decree N° 001-2006-ED (2006)[97] - Plan Nacional Estratégico de Ciencia, Tecnología e Innovación para la Competitividad y el Desarrollo Humano PNCTI 2006 - 2021.

The Supreme Decree N°032-2007-ED (2007)[98] - Texto Único Ordenado de la Ley Marco de Ciencia, Tecnología e Innovación Tecnológica. In article 11, paragraph "p", it states that one of the functions of CONCYTEC is: -In article 11, paragraph "p". Article 11, paragraph "p", states that one of the functions of CONCYTEC is to design policies on technology transfer, as well as mechanisms for cooperation with other countries and international organisations in the field of STI.

Law No. 30035 (2013) - Law regulating the open access National Digital Repository of Science, Technology and Innovation.

Legislative Decree No. 1168 (2013) - Legislative Decree that dictates measures aimed at improving health care through the development and transfer of health technologies.

The Supreme Decree N°026-2014-PCM (2014) - Regulation of Organisation and Functions of the National Council of Science, Technology and Technological Innovation. Article 44 states that the Sub-Directorate of Innovation and Technology Transfer is the organic unit of the Directorate of STI Policies and Programmes responsible for designing policies, plans and programmes on innovation and technology transfer. In this same article, the functions to be fulfilled by this unit are indicated.

[95] Law N°28.303 (2004) - Science, Technology and Technological Innovation Framework Law
[96] Law No. 28613 (2005) - Law on the National Council for Science, Technology and Technological Innovation (CONCYTEC)
[97] Decreto Supremo N° 001-2006-ED (2006) Plan Nacional Estratégico de Ciencia, Tecnología e Innovación para la Competitividad y el Desarrollo Humano PNCTI 2006 - 2021.
[98] Decreto Supremo N°032-2007-ED (2007) Texto Único Ordenado de la Ley Marco de Ciencia, Tecnología e Innovación Tecnológica.

Legislative Decree No 1228 (2015) - on the creation of the Centres for Productive Innovation and Technology Transfer.

Supreme Decree N° 004-2016-PRODUCE - Regulation of Legislative Decree 1228 (2016). Article 8 states the following: CITEs must provide the following services or carry out the following activities, without being limiting. Regarding technology transfer services: i) technical assistance, attention to the technological and innovation needs of enterprises and productive sectors, ii) access to equipment with knowledge transfer, iii) design, development and/or improvement of products (goods and services), iv) studies and technical analysis of products or processes, v) practical demonstrations of machinery, equipment and experimental plants, vi) assistance in innovation management.

-Supreme Decree N°015-2016-PCM (2016) - National Policy for the Development of Science, Technology and Technological Innovation.

Law n°30806 (2018) - Law amending various articles of law 28303, framework law on science, technology and technological innovation; and law 28613, law of the national council for science, technology and technological innovation (Concytec).

In Uruguay, technology transfer is also covered by the Biotechnology Promotion Law No. 19.317 of 2 March 2015, which establishes it as one of its objectives in article 3[99] and one of the activities covered in article 5 and registered under article 13[100] .

In addition, Law N° 18.797, which regulates the institution "PLAN AGROPECUARIO", establishes the competence of the Executive Power to set the national policy for technology transfer in the agricultural area, which will be established in coordination with the private sector[101] and creates a fund to finance technology transfer projects in the sector.

As this point shows, the countries in the study established guidelines to promote technology transfer in some strategic sectors for their country. In this type of regulations, there is a

[99] Article 3 (Object of the Law): The object of this law is to promote research, technology transfer and the application and development of biotechnology at national and departmental level.
The limitations and scope of the activities covered will be governed by these provisions and by regulatory standards (within the framework of the international obligations that the State has assumed).
[100] Article 13 (National Registry of Biotechnological Undertakings): The National Registry of Biotechnological Undertakings shall be created and shall depend on the Ministry of Industry, Energy and Mining (MIEM), which shall provide the material and human resources necessary for the fulfilment of its tasks.
[101] Article 1.- Article 241 of Law N° 16.736 of 5 January 1996 is replaced by the following:
"ARTICLE 241.- The Institution 'Plan Agropecuario' (Agricultural Plan) is hereby created as a non-state legal entity under public law to fulfil the objectives set out in the following article. This Institution shall coordinate with the Executive Power through the Ministry of Livestock, Agriculture and Fisheries.
The executive branch is responsible for establishing national policy on extension, technology transfer and training related to agricultural production, which shall be established in coordination with the private sector.

predominance of provisions aimed at establishing incentives or promotion mechanisms for the sector covered by the regulation.

C.4 Registration of technology transfer contracts

In the case of technology imports, there is a register of the acts or contracts referred to in Article 1 of Law 22.426. This registry refers to contracts between technology suppliers domiciled abroad and technology recipients domiciled in the country. This is the registry of licences or technical assistance provided from abroad to Argentina, i.e. it is a registry of technology imports. However, no changes of ownership are registered, only licensing contracts and technical assistance contracts.

There is also a second registry where technology transfer contracts between nationals are registered, or when the supplier is local and the acquirer of the technology is domiciled abroad. This registry was created by Resolution INPI 117/2014 with the purpose of covering all the cases excluded by Law 22.426 on Technology Transfer. Consequently, it deals with the registration of contracts that implement licences of industrial property rights or other technological services, including those derived from franchising, leasing, technical assistance or knowledge transfer contracts to a person domiciled abroad or between persons domiciled in the country.[102] This registry - unlike the registry linked to Law 22.426 - does not have fiscal effects, i.e. it does not grant any tax benefits, but it does grant certain date and publicity to private instruments involving the transfer or licensing of technology or intellectual property assets. In short, it is a technology transfer registry, which covers the transfer between local residents and also the export of technology, but without tax benefits.

Finally, there is a third register, which refers to transfers of ownership and changes of industrial property rights, which is currently regulated by INPI Resolution No. 39/2011. Entry in this register is necessary in order to be enforceable against third parties.[103] This register is kept by the Technology Transfer Directorate of the INPI under the terms of Resolution INPI Nº 39/2011. Unlike the register linked to Law 22.426, this register does not generate tax benefits.

[102] Source: https://www.argentina.gob.ar/inscribir-instrumentos-privados-contratos-entre-nacionales-o-argentina-al-exterior-res-1172014.

[103] The transfer is the procedure for registering a change in the ownership of a trademark, patent or utility model or industrial model and design right. It consists of an event or legal act of transfer of assets from one person or legal entity to another. They can be registered for example: a donation, free or onerous transfer, trust, transfer of goodwill, adjudication of assets, merger or transformation of companies, judicial auction. They are also registered by death, inheritance, will or legacy. A change of ownership is a modification in the ownership of the right consisting of a change in the name of a human person or in the name or type of company of a legal entity, without the owner changing. Registration is a guarantee for the knowledge of third parties and implies the possibility of bringing actions against them in the event of infringements of trademark, patent or model rights. Information extracted from https://www.argentina.gob.ar/inpi/transferencia/transferir-derechos-0.

In Brazil, according to article 211 of the IPL, in order to produce effects before third parties, contracts must be registered at the INPI.

In addition, if it is necessary to transfer royalties abroad, after registration with the INPI, the operation must also be registered with the Central Bank of Brazil - BACEN (art. 9 of Law no. 4.131/62), by means of the Electronic Declaratory Register of Financial Operations (RDE-ROF).

The Law n.º 9.279/96 , which regulates industrial property in Brazil, deals with technology transfer contracts in its article 211. This article, transcribed below, determines that the contracts must be registered with the National Institute of Industrial Property (INPI) in order to produce effects in relation to third parties.

"Article 211. The INPI shall register contracts involving the transfer of technology, franchising and similar contracts that produce effects in relation to third parties.

Sole Paragraph. The decision on the requests for registration of contracts referred to in this article shall be issued within 30 (thirty) days from the date of the request for registration".

This article does not define technology transfer, nor does it clarify whether patent or trademark assignment and licensing contracts would be considered. A systematic reading of the law would lead to the conclusion that they would not, as there are specific provisions on the assignment and licensing of patents (Arts. 58 to 61) and trademarks (Arts. 136 to 141).

Furthermore, this article has been regulated by the National Institute of Industrial Property - INPI, by means of Resolutions. Currently, Resolution n.No. 199, of 07 July 2017, establishes the Examination Guidelines for the registration of technology transfer contracts and other intellectual property contracts and sets out the following topics: (i) general conditions for contract admissibility;(ii) formal and technical examination of contracts and invoices; (iii) contractual modalities in the certificate; (iv) parties in the certificate; (v) subject matter of the contract in the certificate; (vi) term of the contract stated in the certificate; (vii) value of the contract stated in the certificate; (viii) form of payment of the contract stated in the certificate; (ix) term of the industrial property rights granted by the INPI in the certificate; (x) date of the protocol in the certificate; (xi) date of publication of the deferral of registration in the Journal of Industrial Property at the INPI; (xii) decision; (xiii) issuance of the Certificate; (xiv) provision of services. In addition, the INPI published, in 2019, a Manual to explain the procedures concerning the above Resolution and to guide users on how to complete the respective form.

INPI Resolution no. 156/2015 establishes that technical and scientific assistance services should not be registered with the INPI as they do not involve the transfer of technology.

In Chile, technology transfer contracts consisting of assignment, transfer, change of ownership, licence of use or other encumbrances on inventions are registrable before the Patent Registry of the National Institute of Industrial Property ("INAPI") when they deal with registered rights. In relation to copyrights, these must be registered with the Intellectual Property Registry of the DIBAM within 60 days of their conclusion.

In Colombia, **Decree 4176 of 2011** assigns the DIAN (Dirección de Impuestos y Adunas Nacionales) the function of registering and administering the registration of technology import contracts, which was previously the responsibility of the Ministry of Commerce. Similarly, it should be recalled that the registration of this type of contract is carried out as a development of the Andean Regulation 291 of which establishes the Common Regime on Trademarks, Patents, Licenses and Royalties.

In order to establish the conditions under which the registration was to be carried out, **the DIAN** issued **Resolution 062 of 2014**. However, the Council of State, the highest court in administrative matters, in the **judgment of 28 November 2019**[104] rendered ineffective a part of DIAN Resolution 062 of 24-02-2014 which imposed a renewal of the registration on the grounds that it imposed unjustified burdens on the registrant, meaning that the parameters for registration as set out in the regulation were not a development of Decision 291.

Thus, the Council of State found that the principle of equality was violated, since the transitory article 12 of the aforementioned Resolution 062 of 2014 generated a discriminatory treatment for those importers who registered their technological import contracts of undetermined amount before the ministry of commerce compared to importers whose registration was granted for the same term of the contract and did not have to make a new registration before the DIAN to access tax benefits.

Similarly, the high court considered that some of the requirements enshrined in Resolution 062 of 2014 involved unnecessary formalities, which disregarded Article 12 of Decree Law 19 of 2012, which seeks precisely to eliminate unnecessary formalities to ensure the effectiveness of the rights of individuals before the authorities and facilitate access to the services provided by public entities.

In Mexico, contracts are registered by the IMPI, which makes the registration of total or partial assignments of patent applications, patents, industrial designs or utility models voluntary; it is mandatory for them to be enforceable against third parties. There is a registration of patent, utility

[104] **Ruling of the Council of State 11001-03-27-000-2017-00035-00(23344).**

model and industrial design licences, which is not compulsory; registration has the effect of making the licence enforceable against third parties and can be used to obtain tax benefits, if applicable.

If know-how is transferred in a franchise licence, the licence must be registered in order to be enforceable against third parties.

In Peru, Andean Decision 291 requires the registration of Foreign Technology Transfer Contracts at INDECOPI, Directorate of Inventions and New Technologies.

In the case of a transfer contract outside the scope of Decision 291, it is also possible to register it at the same Directorate of INDECOPI through the procedure of Registration of Modifying Acts (modifications to the registration) contemplated in Decision 486 and Legislative Decree 1075, in a similar manner to the contracts of licence of use, as long as it is related to an industrial property right.

Registration began with the creation of the National Institute of Industrial Technical Standards and Certification (INANTIC) by the Industrial Promotion Act of November 1959. This institution continued its activities until 1970, giving way in that year to the National Institute for Technological Research and Technical Standards (ITINTEC), created by the General Law on Industries. That year also saw the approval of Andean Decision 24 on the Common Regime for the Treatment of Foreign Capital and on Trademarks, Patents, Licenses and Royalties.

In May 1976, Decree-Law No. 21501 created the National Commission on Foreign Investment and Technology (CONITE), which was responsible for proposing and implementing national policy on the treatment of foreign investment, technology and trademarks, in accordance with national economic plans and integration policy.

But, finally, since the end of 1992, the work of standardisation and technology transfer contracts has been the responsibility of the National Institute for the Defence of Competition and the Protection of Intellectual Property (INDECOPI), created on 24 November of that year. Since then, they have remained there with a series of modifications.

D) Incentives for technology transfer.

This section is devoted to the various forms of incentives that the jurisdictions under analysis have used to encourage international technology transfer. Historically, attempts to transfer technology from the public to the private sector have not worked well for individuals and institutions due to a lack of incentives. Although legislative acts have created a more favourable legal-political environment, state institutions must take initiatives to transform the regulatory framework into reality. Such initiatives must recognise that technology transfer is not a one-way transaction, but an exchange between two parties, allowing each to benefit or profit. To properly motivate, the profit incentive must produce a tangible return on the investments made by both parties.

The reference to incentives includes those public policies that aim at effective domestic access to and use of technologies. Maskus points out that an important determinant of the ability of domestic firms to absorb foreign technologies is the existence of a domestic R&D capacity, even if it is relatively limited. Thus, the prospect of transfer increases and a positive return on investment is expected. Where restrictive capital market and fiscal policies restrict this return or discourage such investments, they should be reformed to encourage greater innovation[105] . That said, it uses as examples tax credits or deductions for domestic R&D expenditures and technology licensing payments; national technical education and training policies; policies aimed at reducing barriers to entry in supplier industries such as loan guarantees to overcome sector weaknesses; monitoring of anti-competitive abuses of licensing agreements; finally, intellectual property rules that recognise inventors' rights, but use TRIPS flexibilities to encourage dynamic competition[106] .

The following are the incentives that are available in the jurisdictions under analysis to promote technology transfer.

D.1 Promotion of technology transfer.

D.1.1 Argentina.

With regard to measures to promote technology transfer to the local productive sector by local public entities, Argentina has a long history that began in the 1950s with the creation by the state of various scientific and technological institutes - with different profiles - dedicated to the generation, adaptation and dissemination of technologies in the local productive fabric. The idea behind the state's intervention in the production of technologies was to make up for the lack of investment in R&D by the private sector.

[105] Maskus (n 14). Pp. 33-34.
[106] ibid.

Among the most important institutions created for this purpose were the CNEA (National Atomic Energy Commission) in 1950, the INTA (National Institute of Agricultural Technology) in 1956, and the INTI (National Institute of Industrial Technology) in 1957. The CONICET (Consejo Nacional de Investigaciones Científicas y Técnicas), created in 1958, and the institutes of the National Universities were mainly devoted to basic science research.[107]

In the 1990s, the approach to the promotion and transfer of technology took a turn with the approval of National Law No. 23.877, which foresaw the creation of technology funds as a stimulus mechanism with the aim of promoting technological change in companies by means of financial instruments.[108] In the type of mechanism adopted by National Law No. 23.877, it is the demand of the productive framework that guides the allocation of resources to the different sectors.

Thus, at present, the National Law Nr. 23.877 on the Promotion and Technological Innovation of 1990 is the main tool aimed at the local generation of technology and transfer. This law contemplates several promotional instruments: tax credits, non-refundable contributions, credits, mainly. [109]

Within the framework of Law 23.877, the Ministry of Science, Technology and Innovation is the jurisdiction that concentrates the largest number of technology transfer promotion programmes. To this end, the National Agency for the Promotion of Research, Technological Development and Innovation (also known as the "R&D&I Agency") is in charge of organising and administering instruments for the promotion and encouragement of scientific-technological development and technological innovation in the country. [110]

The R&D&I Agency organises its activity in three funds: 1) the Fund for Scientific and Technological Research (FONCyT), 2) the Argentinean Technological Fund (FONTAR), and 3) the Argentinean Sectoral Fund (FONARSEC). [111]

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[107] Muñoz, I., Vivori, A. and Galante, O. Uniades de Vinculación Tecnológica de los organismos de ciencia y tecnología, CEPAS (Centro de Estudios de Política, Administración y Sociedad), available at http://www.asociacionag.org.ar/pdfcepas/cuad11.pdf.

[108] See in this regard Aristimuño, Francisco Javier, "De Institutos a Fondos Tecnológicos: la transformación del Estado argentino en la década de 1990", Realidad Económica, No. 323, Year 48, 1 April to 15 May 2019. Available at http://www.iade.org.ar/system/files/articulos/4aristimuno.pdf.

[109] Argentina Innovadora 2020 - National Plan for Science, Technology and Innovation: Lineamientos estratégicos 2012-2015, Ministerio de Ciencia, Tecnología e Innovación Productiva. Available at https://www.argentina.gob.ar/sites/default/files/pai2020.pdf.

[110] The National Agency for the Promotion of Research, Technological Development and Innovation replaced the National Agency for the Promotion of Science and Technology (ANPCyT), which had been created by Decree 1660/96, by Decree 157/2020 published in the Official Gazette on 17 February 2020.

[111] As of 2018, the Software Industry Promotion Trust Fund (FONSOFT) is administered by FONTAR through the National Software Industry Directorate. Source: National Agency for the Promotion of Science and Technology. Informe de Adjudicaciones 2018, available at https://www.argentina.gob.ar/sites/default/files/informe_de_gestion_anpcyt_2018_anpcyt_2019.pdf.

The Funds design and implement different promotional instruments, each of which targets specific objectives, thematic areas, sectors and/or types of beneficiaries. These instruments may change over time.

C.1.1.1. the legal amount of the reduction, exemption and/or subsidy and the year from which the benefit exists.

The tax benefits envisaged relate to the payment of Income Tax (LIG). Article 102 of the LIG provides that when net profits of any category are paid to companies, firms or any other beneficiary abroad, the payer must withhold and pay to the Federal Administration of Public Revenues (AFIP), as a single and definitive payment, thirty-five per cent (35%) of such profits. In turn, this thirty-five percent (35%) shall be applied to the net profit presumed by law for the type of profit in question.

In the case of international technology transfer contracts that duly comply with the requirements of Law No. 22.426 at the time the payments are made, Article 104, paragraph a) of the LIG (text enacted in 2019 by Decree No. 824/19) establishes the following presumptions of net profit, without admitting evidence to the contrary:

> Sixty per cent (60%) of the amounts paid for technical assistance, engineering or consultancy services which, in the opinion of the competent authority on technology transfer, were not obtainable in the country, provided that they were duly registered and actually provided.
>
> Eighty percent (80%) of the amounts paid for benefits derived from the assignment of rights or licences for the exploitation of patents of invention and other objects not contemplated in point 1 of this subsection.

In the event that payments are made under the same contract to which different percentages apply in accordance with points 1 and 2 above, the higher of the two percentages shall apply.

In order to qualify for the benefit established in points 1 and 2, the technology transfer contracts must be registered with the INPI at the time the payments are made. Furthermore, in the case of point 1, in order to access the benefits, the technical assistance, engineering or consultancy contracts must have been effectively rendered.

If the technology transfer contracts are not registered with the INPI or if the INPI refuses to issue the certificate because the requirements are not met, then the presumption of net profit is ninety per cent (90%) of the amounts paid for profits, as provided for in section 104(i) of the LIG and section 263 of Decree 862/2019, which regulates the LIG.

Thus, the tax benefit consists of a reduction of the net profit via a legal presumption of a de jure and de facto nature.

In summary, in the case of technical assistance, engineering or consultancy contracts not obtainable in the country (point 1 of paragraph a) of art. 104 of the LIG) the effective withholding rate on payments to the foreign supplier as net profit is 21% (35% on 60%). In the case of licensing contracts for patents and other industrial property rights (point 2 of section 104(a) of the LIG) the effective withholding rate is 28% (35% on 80%). Finally, if the contract is not registered or its registration is refused, the effective withholding rate is 31.5% (35% of 90%).

In the event that the contract provides for the amount of income tax corresponding to the foreign supplier to be borne by the acquirer of the technology, by application of the grossing-up system provided for in Article 227 of Decree 862/2019, then the effective tax rate amounts to 26.58% in the case of point 1 of subsection a) of Article 104 of the LIG, 38.88% in the case of point 2 of the same subsection, and 45.99% if the contract is not registered or its registration is denied.

The income tax benefit for payments abroad for technology transfer, although with a different configuration to that of the Income Tax Law currently in force, has existed at least since 1977 (Decree 3.984/77, art. 86). Since 1986 (Decree 450/86, art. 93, sub. a)) the configuration of this benefit is quite close to the current one.

With regard to the deduction as an income tax expense of the amount paid for the transfer of technology by the individual or legal entity domiciled in the country, Law 22.426 (section 9) - as amended by Decree 1.853/93 - established that the lack of registration of the legal acts covered by section 1 would mean that the payments for the services in favour of the supplier could not be deducted by the recipient for tax purposes. In other words, a kind of sanction was established for the lack of registration, since the general principle of deductibility of expenses necessary for obtaining, maintaining or preserving the taxable income (Income Tax Law) applies. However, as of Law 27.430, which explicitly repealed article 9 of Law 22.246, such sanction or penalty for lack of registration has ceased to have effect, and therefore the absence of registration with the INPI no longer results in the impossibility of making the deduction in the tax balance sheet of the recipient of the technology.

In the event that Double Taxation Agreements (DTA) exist, the regime of these agreements will be applied, which usually contain more beneficial provisions in terms of tax benefits in relation to the provisions of the LIG. In general, such DTAs require registration in the corresponding registry in Argentina (in the case of industrial property rights, the INPI) in order to access the benefits. In general terms, the BITs provide for a maximum royalty rate that can typically be 10% of the gross

amount of the royalties (BIT with the Kingdom of Spain) or 15% (e.g. the BIT between Argentina and the Federal Republic of Germany).

D.1.2 Brazil

In Brazil, there is no precise and systematised information on the measures used by the state to promote technology transfer. It is very difficult to obtain official data on these incentives in the country. Moreover, search results reveal that data are presented in different sources and often only refer to innovation incentives in general (and not specifically to technology transfer). Another problem is the federative organisation of Brazil (União Federal, 27 States and 5570 Municipalities), as their competence comes from each of these entities to establish incentives, which makes it more difficult to map all existing measures. This section was limited to federal incentives.

D.1.2.1 Discount on the registration of the technology transfer contract

According to INPI Resolution no. 251, dated 02 October 2019, persons who do not hold a shareholding in a company in the sector to which the item to be registered belongs; micro-enterprises, individual micro-entrepreneurs and small companies; cooperatives; education and research institutions; non-profit entities, and also public bodies, when they refer to their own acts, may obtain a reduction of up to 60% in the value of the remuneration paid to the INPI in consideration for registration and other services related to technology transfer contracts.

D.1.2.2. Tax deductibility of expenses

Income tax legislation allows for the deduction of expenses incurred by legal entities with royalties on technology transfer contracts and sets limits for such deduction (Article 74 of Law No. 3.470/1958; Articles 52, 53 and 71 of Law No. 4.506/64; Article 50 of Law No. 8.383/91).

According to Law no. 4.131/62 (art. 12), the values due as royalties may be deducted from the basis for calculating income tax by the company receiving the technology, up to a limit of 5% of the gross income of the product manufactured or sold.

D.1.2.3. Incentives for innovation in general

Law no. 10.973/2004 deals, in general terms, with innovation incentives for scientific and technological research in the productive environment and establishes different measures for the

promotion of cooperation between the State, on the one hand, and scientific institutions or companies, on the other. This law was regulated by Federal Decree no. 9.283/2018.

Among the principles set out in the Law is the "encouragement of the creation of environments favourable to innovation and technology transfer activities". 4); minority state participation in the capital of innovative companies (art. 5); awarding of partnership contracts (art. 9); granting of resources for the implementation of research, development and innovation projects (art. 9-A); subsidies, financing, tax and other incentives for companies (art. 19); the hypothesis of exemption from tendering (art. 20); support for independent inventors (art. 22); and the institution of investment funds in companies whose main activity is innovation (art. 23).

Specifically related to technology transfer, Article 6 of the Law allows the public scientific institution to "enter into a technology transfer and licensing contract to grant the right to use or explore a creation developed in isolation or jointly" and establishes rules for such transfer. Article 9, in turn, allows the scientific institution to "enter into collaboration agreements with public and private institutions to carry out joint activities of scientific and technological research and development of technology, product, service or process" and provides that "the parties shall anticipate, in a specific legal instrument, the ownership of the intellectual property and the participation in the results of the exploitation of the creations resulting from the collaboration, ensuring the signatories the right to exploitation, licensing and technology transfer".

D.1.2.4. Tax incentives for technological innovation

Law no. 11.196/06 establishes tax incentives for technological innovation in general: (i) deduction of operational expenses; (ii) deduction of 50% of the Tax on Industrialised Products applicable to equipment destined to technological research and development; (iii) full depreciation of machines destined to technological research and innovation activities, for purposes of the incidence of Income Tax on profits and Social Contribution on Profit; (iv) accelerated amortization of expenses related to the acquisition of intangible assets linked to technological research and innovation, for income tax purposes; (v) reduction to 0 (zero) of the income tax withheld at source on remittances made abroad for the registration and maintenance of trademarks, patents and cultivars.

Article 1 of the same Law establishes the Special Taxation Regime for the Information Technology Services Export Platform - REPES. Article 2 of the same Law defines the beneficiary of this programme as "a legal entity that mainly carries out software development activities or the provision of information technology services and that, on the occasion of its option for the

REPES, assumes a commitment to export 50% (fifty percent) or more of its annual gross income from the sale of the goods and services referred to in this article".

The aforementioned law was regulated by Decree 5.798/2006 and by regulatory instructions from the Federal Revenue.

Law n.º 10.973/2004 was altered by Law n.º 12.243/2016, whose article 11 established that "the processes of import and customs clearance of goods, inputs, reagents, parts and components that will be used in scientific and technological research or innovation projects will have priority treatment and will follow simplified procedures".

D.1.2.5. Patent Box

Brazil does not adopt the patent box system[112] .

D.1.2.6. the legal amount of the reduction, exemption and/or subsidy and the year from which the benefit exists.

Table 1. Types of benefits to technology transfer. Brazil

Benefit	Value	Year
Tax deduction, for the technology recipient.	Up to five percent (5%) of the gross revenue of the product manufactured or sold.	Since 1962 (Law No. 4.131)
Exclusion of expenses for scientific and technological research and technological innovation from the net profit, for the purposes of real profit maximisation and from the basis for calculating the Social Contribution on Net Profit (CSLL).	Up to 60% of the sum of the expenses incurred during the period of technological research and development of technological innovation.	Since 2005 (Articles 17, 19 and 19-A of Law No. 11.196)
Reduction of the Tax on Industrialised Products - IPI	Up to 50% of IPI	Since 2005 (art. 17 of Law no. 11.196)

[112] In this regard: http://www.cest.poli.usp.br/pt/patent-box-da-incentivos-fiscais-para-inovacao-tecnologica/

incident on research and technological development equipment		
Amortisation, in the year of acquisition itself, for the purpose of IRPJ and CSLLL depreciation, of new equipment, intended for use in technological research and development and technological innovation activities.	Integral	Since 2008 (alteration of Art. 17 of Law No. 11.196 by Law No. 11.774)
Amortisation, for IRPJ adjustment purposes, of expenses related to the acquisition of intangible assets, exclusively linked to technological research and development activities and technological innovation.	Integral	Since 2005 (art. 17 of Law no. 11.196)
Reduction to 0 (zero) of the amount of income tax withheld at source on remittances made abroad for the registration and maintenance of trademarks, patents and cultivars.	Integral	Since 2005 (art. 17 of Law no. 11.196)

Brazilian data on public funding programmes for technology transfer are not directly accessible. It should be noted, initially, that official information generally deals with innovation funding in general and not with funding for technology transfer specifically[113] . Moreover, as Brazil is a Federative Republic, funding can be at the federal or state level, which increases the difficulty of mapping this data.

A recent study on business financing for innovation published in the Journal of the Institute of Applied Economic Research - IPEA, found that the main federal lines of public financing for innovation in Brazil are offered by the Financiadora de Estudos e Projetos (Finep) and the Banco

[113] The Ministry of Science, Technology, Innovations and Communications - MCTIC, for example, reports the federal government's annual expenditure on science and technology, including "research and development" and "related scientific and technical activities". See: https://antigo.mctic.gov.br/mctic/export/sites/institucional/indicadores/arquivos/recursosAplicados/indicadoresConsolidados/tab_2_1_1_E.pdf.

Nacional de Desenvolvimento Econômico e Social (BNDES)[114] . According to this study, between 2012 and 2014, these entities granted R$ 31,459,980,000.00 in reimbursable financing and R$ 945,960,000.00 in non-reimbursable financing for innovation[115] .

D.1.3 Chile

Chilean tax law does not provide for a special tax regime applicable to technology transfer. In that sense, technology transfer is subject to the general rules. However, there are some specific rules in the Income Tax Law ("LIR") that aim at promoting technological innovation matters.

On the other hand, Law No. 20.241 of 2008, as amended by Law No. 20.570 of 2012 ("R&D Tax Incentive Law") establishes a tax incentive for investment in research and development that seeks to improve the competitive capacity of Chilean companies.

Likewise, the recent creation of the Ministry of Science, Technology, Knowledge and Innovation by Law No. 21.105 published on 13 August 2018 envisages direct government action on two fronts: (i) diagnosis and development of a National Strategy for Science, Technology, Knowledge and Innovation that aims to guide the development of these areas in the long term; and (ii) transformation and strengthening of the Institutionality in Science, Technology, Knowledge and Innovation, through the creation of the Ministry itself, the National Council for Science, Technology, Knowledge and Innovation and the National Agency for Science, Technology, Knowledge and Innovation, which have tools for planning, financing and monitoring the use of public resources for the promotion and financing of research, development, creation and technology transfer.

Additionally, the National Agency for Research and Development ("ANID"), the legal successor of the National Commission for Research, Science and Technology ("CONICYT") administers the funds corresponding to public R&D competitions, as well as scholarships for postgraduate studies in Chile and abroad. In this sense, the Decree with Force of Law No. 33/1981 of the Ministry of Education, which regulates the National Fund for Scientific and Technological Development ("FONDECYT"), establishes the financing through the allocation of freely available funds to individuals or institutions through public competition. ANID allocates these funds and oversees their use.

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[114] SANTANA, José Ricardo de; Teixeira, André Luiz da Silva; RAPINI, Márcia Siqueira; ESPERIDIÃO, Fernanda. Financiamento Público à Inovação no Brasil: contribuição para uma distribuição regional mais equilibrada? Planejamento e políticas públicas, n. 52, Jan./Jun. 2019, p. 356. Retrieved from: http://www.ipea.gov.br/ppp/index.php/PPP/article/download/796/512.

[115] SANTANA, José Ricardo de; TEIXEIRA, André Luiz da Silva; RAPINI, Márcia Siqueira; ESPERIDIÃO, Fernanda. Financiamento Público à Inovação no Brasil: contribuição para uma distribuição regional mais equilibrada? Planejamento e políticas públicas, n. 52, Jan./Jun. 2019, p. 373. Retrieved from: http://www.ipea.gov.br/ppp/index.php/PPP/article/download/796/512.

Finally, the Production Development Corporation ("CORFO") also grants benefits such as soft loans and subsidies for Innovation and Development, also contemplating the promotion of technology transfer through programmes such as "Innovation Challenges of Public Interest" aimed at public bodies, the "Regional Public Goods 2019" programme that co-finances projects that solve market failures, or the "Regional Technology Dissemination Programme" that promotes through co-financing the diagnosis and acquisition of technology for MSMEs.

D.1.3.1. the legal amount of the reduction, exemption and/or subsidy and the year since when the benefit exists.

Article 31 N° 11 of the LIR provides for the possibility of deducting as an expense the disbursements made by a company for scientific and technological research in the interest of the company, even if they are not necessary to produce the gross income of the year, and can be deducted in 6 consecutive years. This rule allows for greater flexibility in the reduction of tax expenditures.

On the other hand, although as a general rule Chilean source income obtained by taxpayers not domiciled or resident in Chile is subject to a withholding tax at a rate of 35%, the LIR provides for a more beneficial treatment for payments made abroad for items related to technology transfer, namely: (i) 15% for engineering or technical works and professional or technical services; (ii) 15% or 30% to royalties and other payments for patents, models and designs; and (iii) an exemption from such tax in respect of payments for the use of standard software.

Likewise, in order to promote entrepreneurship and technological innovation, Law No. 21.210 of 2020 on the modernisation of the tax system incorporated an amendment to the LIR by virtue of which entities related to a small or medium-sized enterprise (for the purposes of calculating the limits to benefit from the tax regime that benefits such enterprises) will not be understood as entities that participate in it or finance it for that purpose. For these purposes, the agreement in which the entity participates or finances the small or medium-sized enterprise must be previously certified by CORFO and its purpose must be to support the start-up, development or growth of undertakings or technological innovation projects.

For its part, the R&D Tax Incentive Law allows access to a tax credit against the first category tax of article 20 of the LIR, equivalent to 35% of the total investments made under a research and development contract duly accredited by CORFO, with a ceiling of 15,000 UTM in each financial year (art. 5). It is also possible to deduct the remaining 65% as an expense necessary to produce income, regardless of the company's line of business (which constitutes a relaxation of deductibility as an expense). The contract must be entered into with a Research Centre certified by CORFO and be for an amount greater than 100 UTM.

Both benefits, credit and imputation to expense, meet the first category tax liability.

The same benefit is granted on Research and Development Projects that are certified by CORFO. Research and Development activities that are relevant for the country and are carried out in national territory are considered in this category.

Both benefits do not exclude other State aid and operate on the basis of the expenditure actually incurred by the beneficiary.

D.1.4 Colombia

Colombian law provides for three types of tax benefits related to technology transfer. The deduction, the discount and the exclusion from payment of value added tax. The table below details these benefits.

Table 2. Types of benefits to technology transfer in Colombia.

Deduction	Article 158-1 of the tax statute states: **ART. 158-1. DEDUCTION FOR DONATIONS AND INVESTMENTS IN RESEARCH, TECHNOLOGICAL DEVELOPMENT AND INNOVATION.** The investments made in research, technological development and innovation, in accordance with the criteria and conditions established by the National Council of Tax Benefits in Science, Technology and Innovation (CNBT), will be deductible in the taxable period in which they are made. The above does not exclude the application of the discount referred to in Article 256 of the Tax Statute when the conditions and requirements set out therein are met. In this case, a deduction implies that, at the time of calculating the tax payable, the investment in technology is taken into account as an expense of the taxable period and not as a gain.
	Art 256 of the tax statute states: **ARTICLE 256. DISCOUNT FOR INVESTMENTS MADE IN RESEARCH, TECHNOLOGICAL DEVELOPMENT OR**

Discount	**INNOVATION. <See Editor's Notes> <Article modified by** article 171 of Law 1955 of 2019. The new text is as follows:> Persons who make investments in projects qualified by the National Council for Tax Benefits in Science and Technology in Innovation as research, technological development or innovation, in accordance with the criteria and conditions defined by said Council, shall be entitled to deduct from their income tax payable 25% of the value invested in said projects in the taxable period in which the investment was made. (...) In this case, the discount means that what is invested in R&D activities will be deducted from the total amount that is taxed as income tax.
NOTE: The deduction and the discount are not mutually exclusive.	
VAT exclusion	**Law 2010 of 2019 (Tax Reform) Article 476. Services excluded from sales tax -VAT.** The following services and goods explicitly listed below are exempted from the tax: **20.** Acquisition of software licences for the commercial development of digital content, in accordance with the regulations issued by the Ministry of Information Technologies and Communications. **21**. Provision of websites, servers (hosting), cloud computing.

D.1.4.1 Public funding.

Law 1955 of May 25, 2019 (National Development Plan 2018-2020) establishes the following funding mechanisms for research programmes:

- **Credit lines**

Article 165 establishes credit lines for investment in science, technology and innovation activities. It states that "Public resources belonging to Science, Technology and Innovation funds may be used to leverage private investment in Science, Technology and Innovation activities, making use of credit lines through second-tier financial institutions".

In support of these entities, financial dynamisation centres will be created to direct and encourage companies to access and obtain existing public resources for science, technology and innovation purposes.

Similarly, since 2018 Bancóldex[116] , the bank responsible for promoting business growth and foreign trade in Colombia, has a line of financing exclusively for R+D+i projects, which grants credits with the following characteristics:

Table 3. Bancóldex lines of credit

Beneficiaries	Legal entities with a profit motive, companies of all segments with at least 2 years of turnover, which have Research, Technological Development and Innovation projects approved by MINCIENCIAS, for which they must apply to the public call 817. Innovar tiene su crédito - Línea de Financiación de I+D+i of this entity. The company must present to the financial intermediary[117] the certification issued by MINCIENCIAS accrediting it as eligible for the aforementioned call, in order to be a beneficiary of the line and also present, signed by the Legal Representative, the communication in Annex 1 of this circular.
Destination of Benefits	The resources may be used for all costs, expenses and investments included in the Research, Technological Development and Innovation project, approved by MINCIENCIAS, according to the Terms of Reference of the call.
Amortisation to Capital	Monthly, quarterly or half-yearly instalments.
Deadline	Up to 4 years

[116] Bancóldex is an institution created to promote the productivity and competitiveness of the business sector in Colombia through innovation, modernisation and internationalisation of companies of all sizes, within a framework of financial sustainability and social responsibility. In turn, Bancóldex is a second-tier bank, which means that its credit resources are not disbursed directly to entrepreneurs, but rely on financial intermediaries for the disbursement of these resources: commercial banks, financial corporations, financing companies, savings and credit cooperatives, financial NGOs, employee funds and banking correspondents abroad.

[117] Intermediaries are banks, finance corporations, finance companies and first-tier financial cooperatives.

Grace Period To Capital	Up to 1 year
interest rate to the entrepreneur	Freely negotiable between the entrepreneur and the financial intermediary
Maximum Amount Per Company	For micro, small and medium-sized enterprises: Up to COP 800,000,000 (eight hundred million pesos) For large enterprises: Up to COP 700,000,000 (seven hundred million pesos)
Prepayments	They shall be permitted and there shall be no prepayment fee. Notice of prepayment must be given to Bancóldex no less than two (2) business days prior to the date on which the prepayment is to be made.
Guarantees	In order to facilitate access to the resources offered in this credit quota, the beneficiary MSMEs will be able to make use of the guarantees established by the National Guarantee Fund.

D.1.4.2. Discounts for the incorporation of science and technology companies.

Article 166 establishes the benefits for the establishment of innovative technological development companies. This provision states that:

> *"Those who intend to implement innovative technological developments to carry out activities of the entities controlled by the Superintendence of Finance, may constitute one of these entities and obtain a certificate to operate temporarily, in accordance with the conditions, requirements and prudential requirements, including the determination or application of minimum capital, in accordance with the regulations issued by the national government for such purpose. Such temporary operating certificate shall not exceed two (2) years and may be revoked at any time by the Superintendence of Finance.*
>
> *The Superintendence of Finance shall authorise the constitution of these entities and shall grant the corresponding operating certificate, according with the procedure established for such purpose. In the development of this provision, the National Government may determine the minimum amounts of capital that must be accredited to request the constitution of entities subject to the control and vigilance of the Superintendence of Finance of Colombia, which may be differentiated according to the operations authorised by the Superintendence of Finance of Colombia, under the terms of numeral 2 of article 53 of the Organic Statute of the Financial System.*

Subject to the conditions, requirements and prudential requirements established by the regulations referred to in this article, the entities supervised by the Superintendency of Finance of Colombia may implement innovative technological developments to temporarily test new products or services, under the supervision of the Superintendency of Finance of Colombia, for the term indicated in this article.

Paragraph 2. The national government, through the Intersectoral Commission for Financial Inclusion, will coordinate the measures and policies aimed at developing financing mechanisms for companies and entrepreneurs, in order to avoid duplication and to design appropriate instruments for the different stages of business development.

Similarly, the Ministry of Science and Technology, through MINCIENCIAS, created the recognition of "Highly Innovative Companies", which are those companies incorporated in Colombia that systematically carry out activities conducive to innovation, through clearly established processes, allocated resources and verifiable results. These companies must accredit:

1. A minimum creation time of three (3) years.

2. A document in which the top management formalises the creation of the R&D&I Unit in the company and evidences the systematic implementation of R&D&I.

3. An R&D&I strategy involving the reason and need for R&D&I, which must be duly documented in the strategic plan. The strategy must include a clear and defined process for the management of R&D&I activities and the portfolio of R&D&I projects, which shows how the organisation carries out creative processes for the generation of knowledge and ideas that later materialise in projects, technology watch activities, competitive intelligence, knowledge transfer, planning, structuring, execution and monitoring of projects (portfolio of R&D&I projects6), among other R&D&I activities.

4. A clearly identified network of experts and/or potential allies and other actors of the National Science, Technology and Innovation System - SNCTeI, with whom they jointly develop projects for the achievement of the company's R&D&I strategies7 .

5. A separate cost centre for R&D&I activities and projects, showing the annual budget allocation for research, technological development or innovation projects and their annual execution; these cost centres are clearly differentiated from the company's normal or core business processes.

Companies that obtain the recognition of high innovation become part of the National System of Science, Technology and Innovation - SNCTeI".

D.1.4.3. Legal amount of the reduction, exemption and/or subsidy and the year since when the benefit exists.

In Colombia, Law 1286 of 2009, in its article 31, created the National Council for Tax Benefits in Science, Technology and Innovation (hereinafter CNBT), an entity in charge of establishing the criteria for granting tax benefits granted by the government for investment in technology. According to these criteria, in order for an individual to be eligible for these benefits, he/she must submit a joint project with an actor recognised by MINCIENCIAS to the CNBT.

The main change in terms of the configuration of these benefits occurred after the Tax Reform approved in 2016 (Law 1819 of 2016), since it indicates that the form of application of the benefit for investments in Science, Technology and Innovation (STI) would no longer be a tax deduction but a combination of deduction and tax discount. With the above, it should be noted that the benefit will no longer be applied to the calculation of the net taxable income, but to the value of the tax payable. This change in the way the tax benefit is applied makes it easier for companies to monitor and quantify the savings. Currently, the tax benefits granted by the government are enshrined in articles 158-1 and 256 of the tax statute.

Table 4. amounts of benefits.

Deduction	• The deduction was established by Law 1286 of 2009, • Art 158-1 does not establish any amount for the deduction.
Discount	• The discount was established by Law 1819 of 2016. • 25% of the value invested in such projects in the taxable period in which the investment was made (...).
Amount of credits.	According to the Bancoldex credit, the amount to be lent to small and medium-sized companies will be COP 800,000,000 (eight hundred million pesos), and for large companies: up to COP 700,000,000 (seven hundred million pesos).

In Colombia, public funding for technology is provided through the National Financing Fund for Science, Technology and Innovation, -Fondo Francisco José de Caldas-, under the Ministry of Science, Technology and Innovation -MINCIENCIAS. This is a financial mechanism that allows MINCIENCIAS to integrate public, private, international and donor resources to finance the

development of Science, Technology and Innovation. The Fund is an Autonomous Patrimony with MINCIENCIAS as the sole Trustor and beneficiary.

The Fund is administered by Fiduprevisora, selected by public tender, through a commercial trust contract. The acts and contracts that it carries out are subject to the rules of private law, subsidiarily to those of Science and Technology.

In accordance with Law 1286 of 2009, the Fund finances programmes, projects, entities and activities of Science, Technology and Innovation. And among the benefits it offers to both the public and private sectors are: the increase of resources to finance science, technology and innovation, the integration of public, private and international resources for the development of projects, programmes, activities, financial instruments, capital funds, tax benefits for investments in scientific and technological development, the use of new mechanisms for financing science, technology and innovation, transparency.

D.1.5 Mexico.

It is considered part of the cost of production, i.e. it is deducted from profits. The National Council for Science and Technology (CONACYT) has financial and fiscal stimulus programmes to support technological research projects in companies and universities; if these projects require the import or acquisition of technologies or know-how in the country for their development, they can be included in the project, subject to requirements.
As of 2019 CONACYT restricts programmes with companies in general to the maximum and the restriction is complete with respect to majority foreign-owned companies.

D.1.6 Peru.

In Peru, a tax benefit applicable to expenditure on scientific research, technological development and technological innovation projects has been established by Law No. 30309, Law that promotes Scientific Research, Technological Development and Technological Innovation, and its amendment by Emergency Decree No. 010-2019; this benefit consists of taxpayers making expenditure on scientific research, technological development and technological innovation projects linked or not to the line of business.

Through Law No. 30018, Law on the Promotion of the use of Patent Information to promote innovation and technology transfer, and its Regulation, approved by Supreme Decree No. 019-2016-PCM, the aim is to implement patent databases with free and open access in order to promote innovation and technology transfer for its application in the country. Likewise, in coordination

with the National Council for Science, Technology and Technological Innovation (CONCYTEC), it disseminates the free and open access patent technical information database in the National Science and Technology System (SINACYT), which serves to promote innovation and technology transfer for exclusive use in the country.

The National Innovation Programme for Competitiveness and Productivity of the Ministry of Production was created on 24 July 2014, through Supreme Decree N°003-2014-PRODUCE, which in its article 2° establishes that the general objective of this programme is to promote and consolidate innovation to increase the competitiveness and productivity of companies, sectors and the economy as a whole. Article 3 of the same regulatory framework also details the specific objectives of the programme, which are: to increase innovation in business production processes, promote innovative entrepreneurship, and facilitate the absorption and adaptation of technologies for companies. Likewise, in 2018, the Ministry of Production of Peru (PRODUCE) and the Ministry of SMEs and Startups of the Republic of Korea (MSS) signed a two-year cooperation agreement for the establishment of the Peru - Korea Technology Exchange Programme (PKTEC), which will connect Peruvian entrepreneurs with tailor-made technology and thus improve their productivity. With this agreement, Korean companies will transfer technologies to Peruvian small and medium-sized enterprises (SMEs).

In addition, the National Council for Competitiveness and Formalisation (CNCF) has been established, which is a coordination commission that seeks to improve Peru's ability to compete in the international market, and therefore unites the efforts of both the public and private sectors and academia, in order to prioritise actions and promote reforms that have an impact on competitiveness. The CNCF was created in 2002 and then in 2009 became part of the Ministry of Economy and Finance. In this sense, the CNCF presents the National Competitiveness and Productivity Plan 2019-2030 (PNCP), which seeks to address the challenges currently facing Peru in its transition to a modern country. Thus, as priority objective No. 3, the PNCP establishes "generating the development of capacities for innovation, adoption and transfer of technological improvements", which includes policy measures such as: Measure 3.3. promoting Law 30309 through greater incentives and the simplification of procedures for access to the instrument, so that by 2025 the number of companies using the R&D incentive will increase. Measure 3.6 seeks to coordinate the services offered to MSEs through the Tu Empresa National Programme with those of the Business Development Centres (CDE) and the services of the Productive Innovation and Technology Transfer Centres (CITE). At the same time, based on the establishment of sectoral research agendas, the services provided by the CITEs in various productive chains and the way in which the services promoted in these have an impact on productivity will be promoted and

strengthened, with the aim that by 2030 the System will integrate the services of the CDEs and CITEs and Research Agendas 100%.

CONCYTEC, in collaboration with different governmental institutions, research institutions and representatives of the private sector, has elaborated the Special Programme for Technology Transfer and Extension - PETT, which aims to generate the necessary conditions for the development of technology transfer in the country, with the following objectives: (i) to promote greater links between research centres and the productive sector, (ii) to generate the necessary capacities in HR for an adequate management of technology transfer, (iii) to promote the appropriate mechanisms for the institutional development of technology transfer, (iv) to generate and promote capacities for the exploitation of research results. See next page for the main components and activities that Concytec has in relation to the development of technology transfer.

Table 5. CONCYTEC's purposes and activities[118] .

Propósito	Componentes	Actividades
Generar las adecuadas condiciones para el desarrollo de la Transferencia Tecnológica en el Perú	Adecuados y suficientes mecanismos para la vinculación academia - empresa	• Encuentro tecnológico • Misiones in country • Ferias tecnológicas • Foro de líderes academia – empresa • Proyectos de I+D+i colaborativa (academia - empresa) • Misiones tecnológicas • Asesorías tecnológicas • Proyectos Asociativos de Transferencia Tecnológica para Microempresas • Proyectos de Innovación Productiva para Empresas Individuales • Laboratorios de innovación mixtos • Apoyo a la creación de clúster tecnológicos • Plataforma virtual de TT • Creación de portafolio de transferencia tecnológica • Creación de portafolio de demanda tecnológica • Talleres para la utilización de la plataforma virtual
	Adecuadas capacidades en RR.HH. para la Gestión de la Transferencia Tecnológica	• Maestría en PI y transferencia tecnológica • Diplomado en PI y transferencia tecnológica • Cursos en PI y transferencia tecnológica • Subvenciones pasantías nacionales en TT • Subvenciones pasantías internacionales en TT • Acreditación de profesionales en PI y transferencia tecnológica • Conferencias virtuales en PI y transferencia tecnológica • Red de especialistas en propiedad intelectual y transferencia tecnológica (incluye registro de especialistas en plataforma virtual) • Congreso Internacional en PI y transferencia tecnológica
	Suficientes mecanismos e instrumentos para el desarrollo de una institucionalidad en materia de propiedad intelectual y de transferencia tecnológica	• Evento de reconocimiento al impulso de actividades de protección intelectual y transferencia tecnológica • Cursos de PI y TT para pregrado en Ciencias e Ingeniería. • Promoción de directivas que reconozcan las actividades de transferencia tecnológica en los centros de investigación. • Asesorías especializadas en la elaboración de políticas institucionales de PI y TT. • Elaboración de manuales y normas técnicas en PI y TT. • Estudio de identificación de trabas normativas que dificulten la protección de la PI y TT. • Creación y fortalecimiento de OTT.
	Suficientes condiciones para explotación de resultados de investigación	• Proyectos de desarrollo de prototipo y empaquetamiento tecnológico • Financiamiento de patentes nacionales • Financiamiento de patentes internacionales vía PCT • Créditos blandos para proyectos de TT • Proyectos de Validación y Empaquetamiento de Innovaciones • Incorporación de Recursos Humanos Altamente Calificados en Empresas • Proyectos de innovación multidisciplinarios • Ideas audaces • Competencia de Impacto Global • Capital semilla para EBT (prueba de concepto) • Capital inicia EBT (Inicio de producción y comercialización) • Créditos blandos para EBT • Atracción de fondos de capital de riesgo

On 5 January 2009, the National Council for Science, Technology and Technological Innovation (CONCYTEC) and the Centre for the Development of Industrial Technology (CDTI) of Spain renewed the Collaboration Agreement, agreeing to promote the development of innovative joint

118 SOURCE: CONCYTEC, https://portal.concytec.gob.pe/index.php/programas-especiales-de-soporte-de-cti/programa-especial-de-transferencia-y-extension-tecnologica

projects from the technological point of view between companies and institutions of both countries in the following areas: (i) agriculture, agro-industry and agro-export, (ii) timber forestry and manufacturing, (iii) aquaculture and fisheries, (iv) fibres, textiles and clothing, (v) mining, metallurgy and metal-mechanics, (vi) tourism and handicrafts, (vii) education, (viii) health and nutrition, ix) security, x) water resources, xi) energy, xii) climate change and natural disasters, xiii) biotechnology, biomedicine and pharmaceuticals, xiv) information, telecommunications and knowledge technologies, and, xv) new materials and nanotechnology. The funding and terms granted are: FONDECYT grants Peruvian companies whose projects have been selected a maximum amount of funding of S/ 427,500 (four hundred and twenty-seven thousand five hundred soles). The maximum project execution period is 24 months. Funded 2019: 2 projects with S/. 427,500.00; Funded 2018: 2 projects with S/. 427,500.00; Funded 2017: 1 project with S/. 427,500.00. The total allocated for the 2019 call is: S/. 2 137 500.00

Finally, Innovate Peru of the Ministry of Production co-finances business innovation projects, productive development, entrepreneurship and ecosystem institutions through national competitions. In this regard, the Strategic Strengthening of Extension and Technology Transfer Centres (CET) Competition will seek to expand and improve the supply of advisory services and support for the technological development and innovation of Peruvian companies, through the expansion and consolidation of technology extension centres.

D.1.6.1. the legal amount of the reduction, exemption and/or subsidy and the year from which the benefit exists.

Companies that comply with the requirements established in Law No. 30309, Law that promotes Scientific Research, Technological Development and Technological Innovation, and its amendment, by means of Emergency Decree No. 010-2019, may access the following deductions:

a) Taxpayers whose net income does not exceed two thousand three hundred Tax Units (2300 UIT) and who incur expenses in scientific research, technological development and/or technological innovation projects, whether or not linked to the company's line of business, and who comply with the requirements established in Article 3 of the Law, are eligible for the following deductions:

a.1) 215%: If the project is carried out directly by the taxpayer or through scientific research, technological development or technological innovation centres domiciled in the country.

a.2) 175%: If the project is carried out by scientific research, technological development or technological innovation centres not domiciled in the country.

b) Taxpayers whose net income exceeds two thousand three hundred Tax Units (2300 UIT) and who incur expenses in scientific research, technological development and/or technological innovation projects, whether or not linked to the company's line of business, and who comply with the requirements established in Article 3 of this Law, are eligible for the following deductions:

b.1) 175%: If the project is carried out directly by the taxpayer or through scientific research, technological development or technological innovation centres domiciled in the country.

b.2) 150%: If the project is carried out by scientific research, technological development or technological innovation centres not domiciled in the country".

Legal basis: Art. 1° of Law No. 30309

Likewise, Article 2 of the aforementioned Law establishes that taxpayers will have this right with respect to scientific research, technological development and technological innovation projects that are initiated as of 2016, provided that no deductions are made in respect of such projects under Article 37(a.3) of the Income Tax Law.

Article 3, however, provides for the existence of an additional deduction of 50%, 75% or 115% of the tax benefits, establishing the minimum requirements to be met by the taxpayer in order to access them.

Under the Sole Transitory Supplementary Provision of Law 30309, the scientific, technological research and technological innovation expenses referred to in paragraph a.3) of Article 37 of the Income Tax Law, prior to the amendment made by this Law, which were accrued in 2014 or 2015, and which correspond to scientific, technological research and technological innovation projects initiated before 2016, may be deducted in 2016, provided that they have not been qualified by Concytec or that there are tax benefits.

In addition, the Ministry of Economy and Finance, through Supreme Decree No. 326-2015-EF, has established the total annual amount that the companies that avail themselves of this benefit may exceed in each financial year. It should be noted that for micro and small companies, a minimum of 10% of the total maximum annual deductible amount will be allocated.

B.3. If there are public funding programmes, indicate the amounts allocated in the last five years for such purposes.

The total budget of the Special Programme for Technology Transfer includes activities that are being financed by PRODUCE and CONCYTEC through INNOVATE Peru and CIENCIACTIVA, respectively. Likewise, entities such as INDECOPI and the Business Associations that are part of the Programme Committee carry out training and promotion activities

on intellectual property and technology transfer, contributing to the Programme's activities through their budgets. This budget has a duration of 6 years, from 2016 to 2021.

D.1.7 Uruguay.

For the choice of instruments described in this section, consideration was given to whether technology transfer was explicitly part of the basis of the calls.

This section could be expanded depending on the definition of technology transfer to be adopted, since Uruguay has a wide variety of instruments to promote companies and businesses that could also be covered, such as instruments that promote the incorporation of infrastructure or equipment, the hiring of professionals or consultants, certification, etc.

D.1.7.1. Tax benefits (tax reductions or exemptions, subsidies)

Investment Law No. 16.906. The investment law establishes benefits that act as self-financing, substantially improving the return on investment. Companies based in the national territory that are IRAE (Income Tax on Economic Activities) taxpayers, whatever their line of business (commerce, services, industry, hotels and tourism), are eligible for these programmes; investments in clean technologies and investments in R&D&I, among others, are particularly included.

Through this law, the projects can be declared of National Interest and thus have access to important exemptions in the payment of their taxes: Income Tax (IRAE), Wealth Tax (IP), VAT on purchases and Taxes and Import Taxes under certain conditions.

The tax benefits are obtained through the commitment in a matrix of indicators in which investments in innovation and research, investments in energy efficiency, technological level of the products, continuous education and training of the personnel, among others, are especially valued.

Depending on the score of the parent company, the exemption from income tax (IRAE) may be between 20% and 100% of the investment made, the term for the use of this benefit will also depend on the score, the minimum being 3 years. Annually, the company may exempt up to a maximum of 60% of the IRAE generated, depending on the investments made. The exoneration of the Wealth Tax (IP) is on 100% of the investments promoted in the project, for 8 years in Montevideo and 10 years in the interior of the country.

VAT on purchases of civil works may be 100% exempted.

Import Duties and Taxes may be exempted up to 100% when the goods are not competitive from the national industry and depending on the sector of activity, the extent of the benefit will depend on the sector of activity.

D.1.7.2. Reduction in registration costs, PatentBox systems (tax incentives on the transfer of certain patent rights or intangible assets).

Article 338 of Law 19.355 (regulated by Decree 158/017) empowers the Ministry of Industry, Energy and Mining - through the National Directorate of Industrial Property - to reduce the fees for the services it provides, applying discounts of up to 90% (ninety per cent) to public institutions, small and medium-sized enterprises, associations and groups of producers, cooperatives, independent inventors and research centres, in order to promote national policy on the development of industry, science, technology and innovation.

In this sense, registrations of transfers, assignment contracts and technology licences made by any of the aforementioned parties receive the economic benefit and pay significantly lower fees for this purpose.

D.1.7.1. Technical assistance programmes, public funding (either through investment or granting of credits, etc.).

National Agency for Research and Innovation (ANII): ANII is a governmental entity, created in 2007 by Law No. 18.084 with the aim of promoting research and the application of new knowledge to the productive and social reality of the country. In terms of technology transfer, ANII makes funds available to the public through various incentive programmes with a wide variety of objectives.

Without prejudice to the above, and for the purposes of technology transfer, the following programmes are highlighted:

i. Partnerships for innovation:

Support for the implementation of technological development or innovation projects in partnership between actors in the business sector and actors in the academic sector. The alliance is formed when a company needs to solve a problem through a knowledge-generating institution that carries out research and development activities.

Priority is given to projects involving more than one actor in the business field, who will share risks and benefits. Each proposal should clarify the role of each institution, either as a demander or as a generator of knowledge.

Up to 70% of the projects are financed up to a non-refundable maximum of UYU 6,000,000.

ii. Researchers + Investors:

Financing the development of prototypes, the valorisation and transfer of research results carried out by research centres to the productive sector, so that they can be transformed into innovative products, services or processes that have a potential impact on the market, through the investment of private capital with the support of ANII.

Up to 70% of the projects are financed up to a non-refundable maximum of UYU 3,840,000.

National Development Agency (ANDE).

ANDE was created in 2009 by Law 18.602 and its purpose is to contribute to productive economic development in a sustainable manner, with social equity and environmental and territorial balance. It designs effective, efficient and transparent programmes and instruments, with special emphasis on the promotion of micro, small and medium-sized enterprises.

In terms of technology transfer, ANDE has several incentive programmes with a wide variety of objectives.

Without prejudice to the above, and for the purposes of technology transfer, the following programmes are highlighted:

i. Integral programme of technological adaptation:

The main objective of the programme is to reduce the technological gap of SMEs through the coordination of several institutions, in order to offer them comprehensive support in the process of improving productivity. This process, in which technological aspects are central, requires simultaneous attention to other dimensions of the business, such as market and product diversification, increased sales and profitability, the incorporation of environmentally friendly processes and technologies, and process reconversion.

ii. Supplier development programme:

This programme promotes the development of capacities in MSMEs that supply large companies, and supports the integration of new ones, by identifying business opportunities for the tractor and supplier companies that increase their productivity and competitiveness and improve the business environment. The programme encourages linkages between companies, identifying opportunities to improve business between tractors and suppliers, and generating a long-term relationship of trust.

ANDE co-finances the implementation of the supplier development project by contributing up to 70% of the total amount of the project and up to an average of US$ 1,065,000 per supported MSME. The maximum amount of funding will be $U 10,650,000 per project.

D.1.8 Venezuela.

In the case of Venezuela, in 2017 the National Constituent Assembly enacted the Constitutional Law on Productive Foreign Investment, which repealed the 2014 Foreign Investment Law. This Law establishes that foreign investment may be made in any area, sector or economic activity

permitted by Venezuelan law. This Law defines technology transfer as the provision from abroad of a set of technical knowledge, whether or not expressed in industrial property rights, necessary for the productive transformation, the provision of services and the commercialisation of goods[119] .

The aforementioned Law also provides for the possibility of entering into foreign investment contracts with new foreign investors, which must specify obligations regarding technology transfer, among other aspects. The governing body in Venezuela must make the respective qualifications on the occasion of the approved and registered contracts, in accordance with the procedures, requirements, terms and conditions established by the regulatory norms. The Ministry of the People's Power of Economy, Finance and Foreign Trade is the governing body responsible for the execution of foreign investments in Venezuela, in accordance with Presidential Decree No. 4.310 of 2020. The mining and hydrocarbons sectors, among others, are subject to special legislation. Since Presidential Decree N° 1.103 of 1990, establishes that the then Ministry of Energy and Mines has the functions of competent body, with respect to companies, foreign investments and importation of technology, operating in the hydrocarbon, petrochemical, coal or mining sector and related sectors[120] .

The Income Tax Act 2015 contains its own definitions of technical assistance and technological services and their tax treatment. According to this Law, technical assistance contracts comprise the provision of instructions, writings, recordings, films and other similar instruments of a technical nature, intended for the production of a work or product, or the provision of a service, intended for sale. In turn, according to the same Law, technological services consist of assigning the use and exploitation of invention patents, models, industrial designs and all those technical elements susceptible of being patented.

Expenses for technical assistance or technological services paid in favour of foreign companies are only deductible when the taxpayer proves that such services are not or cannot be provided in the country. The taxpayer is obliged to submit to the Tax Administration the documents proving the steps taken to contract such services in Venezuela. In the cases of technical assistance contracts and technological services rendered from abroad, in which the income corresponding to each concept is not specified, it shall be presumed that twenty-five per cent of all income corresponds to technical assistance and seventy-five per cent to technological services[121] .

[119] Simon Herrera Celis, 'Contratos de Transferencia de Tecnología En La Industria Petrolera Venezolana' [2022] Derecho y Sociedad <https://www.derysoc.com/contratos-de-transferencia-de-tecnologia-en-la-industria-petrolera-venezolana/>.
[120] ibid.
[121] ibid.

On the other hand, when there is an indiscriminate amount for technical assistance and technological services coming from activities carried out in the country and abroad, it will be considered that the income corresponds sixty percent to services from abroad and forty percent to services carried out in the country.

C.2. Main findings on incentives for technology transfer.

Throughout the section, the different incentives for technology transfer provided for in the analysed legislations have been developed. Broadly speaking, different conclusions can be drawn from the above.

First, countries have chosen to establish tax rebate schemes as an incentive for technology transfer. As can be seen, value added tax or income tax deductions are the main incentive mechanisms for technology transfer adopted by these countries. However, in many cases, the tax deduction is linked not only to the transfer but also to R&D. It should also be noted that in cases where the definition of technology transfer is broad, the application of tax deductions will not necessarily meet the objective of technology adoption and diffusion.

According to UNCTAD, these incentives promote FDI inflows in general, technology transfer. When the exporting country adopts the method of tax credits to avoid double taxation, it is clear that a reduction in the amount of tax payable in the home country may simply lead to a reduction in the amount of credit that can be claimed in the country of residence, with a corresponding increase in the amount of tax payable in the home country. Therefore, it does not seem to make much sense for potential host countries to try to attract investment by offering tax incentives or generally low tax rates, as the benefit of the tax forgone, or "saved", would accrue not to the investor but to the investor's home country[122] .

Second, another important incentive is credit lines for the purpose of acquiring goods. Although this policy is focused on the transfer of technology through the acquisition of elements that allow technological development, it is predominantly domestic and is not aimed at direct financing of the transfer, understood in a broad sense.

Third, it is possible to conclude that all countries in the Survey have adopted some form of incentives for technology transfer through fiscal incentives. The OECD stresses the importance of these measures:

[122] UNCTAD, 'TAXATION AND TECHNOLOGY TRANSFER: KEY ISSUES' <https://unctad.org/system/files/official-document/iteipc20059ch3_en.pdf>.

"Clarity, consistency and predictability are essential to help companies make R&D investment decisions based in part on tax incentives. .... Permanence of R&D tax breaks allows companies to plan for the long term; evaluations show that R&D tax incentives are more effective when they are offered over a longer period. Regimes that are too complex - or change frequently - will act as a disincentive to R&D investment"[123] .

However, it remains to be examined whether these forms of incentive have been useful in encouraging TNCs to diffuse their technologies in these countries.

Finally, formulating an incentive policy involves two basic decisions: which firms or activities should receive benefits and what form these benefits should take. The following incentives can be listed from this section:

- reduced corporate tax rates for certain activities or types of companies
- tax holidays (tax reduction or exemption for a limited period of time)
- credits or allowances for investment in capital goods
- deductions or credits for reinvested earnings
- reduced withholding tax rates on remittances to the country of origin
- reduction of personal and/or corporate income tax.
- exemption or reduction of VAT or other sales taxes
- property tax reductions

Most of these forms of incentives can be, and are, used to promote technology transfer, although some are clearly more appropriate than others. In particular, there is a need to focus on the question of how to match the particular type of incentive with the chosen objective or goal, and the widespread use of fiscal incentives suggests that sufficient attention is rarely paid to the actual design of investment incentives.

These incentives in some technology sectors may involve the investor adopting an inappropriate technology to secure tax privileges, and the rewards (in terms of tax saved) being disproportionate to the cost of the technology introduced.

[123] OECD, 'Tax Incentives for Research and Development: Trends and Issues.'

E) Contractual regulation of technology transfer.

When referring to the contractual regulation of technology transfer, one must first distinguish between formal and informal technology transfer. For example, informal technology transfer is defined as a mechanism that facilitates the flow of technological knowledge through informal communication processes that could include technical assistance, consultancy or collaborative research. Unlike formal technology transfer mechanisms, which usually aim to transfer a specific research result, such as a patent, informal mechanisms do not, and are not normally expected to do so. In this sense, formal technology transfer is conceived as a way of assigning property rights, whereas these are of much less importance in informal technology transfer[124] .

In other words, the formal channels of technology transfer can be developed through different methods such as the acquisition or purchase of equipment and intermediation of products, or through different contractual figures; there is no standard contract or agreement, but rather different contractual forms that adapt to the different needs of the country's scientific and technological system. This section explores the regulatory frameworks that regulate the contracts used for technology transfer.

E.1. General considerations regarding contractual regulations on technology transfer.

Guerrero indicates that the most commonly used contractual figures for technology transfer are assignment, licensing, franchising, *joint venture* operations and engineering contracts. He also mentions that they all have common characteristics, such as their synallagmatic or bilateral nature, since they impose reciprocal rights and obligations between the contracting parties; their duration, since most of them are of successive tract by establishing repeated benefits, such as the payment of *royalties* established according to various criteria, such as sales levels, dividends obtained or units produced, and their *intuito personae* nature, since they are carried out according to the special qualifications of both the producer and the receiver of the technology that is the object of the agreement[125] .

This author also establishes sub-categories: technology transfer contracts with simple cause, and the second, those with complex cause. Technology transfer contracts with simple cause are aimed

[124] Albert N Link, Donald S Siegel and Barry Bozeman, 'An Empirical Analysis of the Propensity of Academics to Engage in Formal University Technology Transfer' in David Audretsch and Albert Link, *Universities and the Entrepreneurial Ecosystem* (Edward Elgar Publishing 2017) <https://www.elgaronline.com/view/9781786432780.00014.xml> accessed 12 April 2022.

[125] See generally Manuel Guerrero Gaitán, *Los contratos de transferencia internacional de tecnología: América Latina, Estados Unidos y la Unión Europea* (Universidad externado de Colombia 2014) <http://books.openedition.org/uec/1100> accessed 13 April 2022.

at achieving the authorisation of use, or the change of ownership of a set of technological knowledge protected by the discipline of industrial and intellectual property, while in contracts with complex cause such authorisation or change of ownership is only one of the various elements aimed at achieving a specific purpose[126] .

Among the most commonly used contracts, the licence plays a primordial role, as it allows for the greatest versatility when establishing the rules between the parties, which makes it something more than a contractual figure. Guerrero, again, indicates that:

"Although this is a highly complex performance contract, whenever we speak of technology transfer we are dealing with an authorisation of use, whether simple or reciprocal, of technological knowledge protected by an industrial or intellectual property right. This structure, coinciding with that of the licence, constitutes the fundamental nucleus of contracts with a complex cause, since the element that characterises a joint venture*, engineering or franchising contract, as a tool for carrying out a technology transfer, is the authorisation to exploit technological knowledge; therefore, except for some particular considerations to be made in specific cases, the outline of licence contracts will be applicable to most of the contractual figures used to carry out technology transfer processes in the international sphere"*[127] .

The legal nature of these contracts in the legislations of the countries under study, as well as their main characteristics, are described below.

E.2national legislation on technology transfer contracts in the countries under review.

E.2.1 Argentina.

There is no specific body of Argentinean law that comprehensively regulates technology transfer contracts.

On the contrary, in Argentine law, a good part of technology transfer contracts turn out to be "atypical" contracts. Article 970 of the Civil and Commercial Code (CCyC) approved by Law 26.994 of 1 October 2014 (BO: 8 October 2014) refers to atypical ("innominados") contracts as follows:

> *"Art. 970. Contracts are nominative and innominate according to whether they are specially regulated by law or not. Innominate contracts are governed, in the following order, by:*
>
> *(a) the will of the parties.*
>
> *(b) the general rules on contracts and obligations.*
>
> *(c) the customs and practices of the venue.*
>
> *(d) provisions corresponding to related nominated contracts which are compatible and fit for their purpose.*

Consequently, based on the provisions of paragraph d) of Article 970 of the CCyC, the provisions of related nominative contracts for the transfer of technology to which Argentine law is applicable

[126] ibid.
[127] ibid.

(Article 2609 CCyC) will be applicable to the provisions of related nominative contracts that are compatible and adequate to their purpose, when the situation cannot be defined according to the factors listed in paragraphs a) to c) of the aforementioned article.

The following is a review of the legal treatment of the most common technology transfer contracts in Argentina: 1) Assignment of rights, 2) Licence, 3) Know-how transfer contract, 4) Franchise, 5) Joint venture, and 6) Engineering contract.

As regards the assignment of rights, this contract is regulated in articles 1614 to 1631 of the Civil and Commercial Code (CCyC). Article 1614 provides the following definition: "A contract of assignment exists when one of the parties transfers a right to the other. The rules of sale, exchange or donation apply to the assignment of rights, depending on whether it has been made with the consideration of a price in money, of the transfer of ownership of a good, or without consideration, respectively, insofar as they are not modified by the rules of this Chapter.".

It is worth mentioning that, in the case of the assignment of invention patents and utility models, trademarks and industrial designs, in order to be enforceable against third parties, the assignment must be registered with the INPI.

As far as the licence contract is concerned, it is an unnamed contract under Argentine law. The Law on Patents and Utility Models (Law 24.481, T.O. by Decree 260/1996) contains in Chapter V ("Contractual transfer and licences") of Title II ("Patents of invention") certain provisions (Articles 37 to 40) related to patent and industrial utility model licences.

The know-how contract is also an unnamed contract under Argentine law.

The commercial franchise contract is regulated in Articles 1512 to 1524 of the CCyC. Article 1512 provides the concept of commercial franchise in the following terms: "A commercial franchise exists when one party, called the franchisor, grants another, called the franchisee, the right to use a proven system, intended to market certain goods or services under the trade name, emblem or trademark of the franchisor, who provides a set of know-how and the continuous provision of technical or commercial assistance, against a direct or indirect provision by the franchisee.

The franchisor must be the exclusive owner of all intellectual property rights, trademarks, patents, trade names, copyrights and other rights included in the franchised system or, where applicable, have the right to use and transfer them to the franchisee under the terms of the contract.

The franchisor may not have a direct or indirect controlling shareholding in the franchisee's business'.

It is to be noted that Article 1524 of the CCyC provides that the provisions relating to commercial franchising shall, in so far as they are compatible, be applicable to industrial franchises, in the following terms: 'The provisions of this Chapter apply, in so far as they are compatible, to industrial franchises and to the relations between franchisor and principal franchisee and between the latter and each of his sub-franchisees".

With regard to joint venture or business collaboration contracts, the CCyC contains a specific regulation in Articles 1442 to 1478. Within this general category are included the contracts for Joint Ventures (Articles 1448 to 1452), Grouping of Collaboration (Articles 1453 to 1462), Transitory Unions (Articles 1463 to 1469), and Cooperation Consortiums (Articles 1470 to 1478).

Regarding technical assistance, engineering or consultancy contracts, INPI Resolution P-328/2005 - of an interpretative nature - in its article 5º states that technical assistance, engineering and/or consultancy shall be understood as those services provided in the form of work or services, to the extent that they involve technical knowledge applied to the productive activity of the local contractor and the transmission to the latter or its personnel of such knowledge, either in whole or in part, by means of training, recommendations, guides, indications of technical mechanisms or procedures, supply of plans, studies, reports or similar, provided that the consideration is paid in proportion to the work, which must be previously determined in a concrete and precise manner in the contractual instrument.

In turn, and in relation to the contracts mentioned in the preceding paragraph, the provisions on contracts for works or services contained in the CCyC are applicable. In this respect, the aforementioned body of law regulates such contracts in Articles 1251 to 1279. Article 1251 defines such contracts in the following terms: "A contract for works or services exists when a person, as the case may be the contractor or the service provider, acting independently, undertakes in favour of another, called the principal, to carry out a material or intellectual work or to provide a service in return for payment.

Finally, it is worth mentioning that consultancy contracts entrusted by the National State or by the entities that compose it or in which it has a majority shareholding are subject to Law 22,460.[128]

E.2.2 Brazil

The contracts are atypical because there is no category of "technology transfer contracts" whose benefits and considerations are defined by Brazilian law, nor is there a specific legal regime for these contracts. Article 211 of the Industrial Property Law (Law no. 9.279/96), which deals with

[128] Available at http://servicios.infoleg.gob.ar/infolegInternet/anexos/45000-49999/45338/texact.htm.

the registration of these contracts as a condition for their effectiveness before third parties, only refers generically to "contracts involving technology transfer", without defining them or establishing their elements.

The INPI, when regulating this register, exemplifies which contracts are considered as "technology transfer contracts", however, it does not define their benefits either. Regulatory Instruction No. 70 establishes it as follows:

> *"The INPI shall register licensing, sub-licensing and transfer of industrial property rights contracts and shall register technology transfer and franchising contracts to follow:*
>
> *(...)*
>
> *III - Technology transfer:*
>
> *The contract for the supply of technology ("know how") which covers the acquisition of knowledge and know-how not protected by industrial property rights or the supply of technological information, intended for the production of goods and services; and,*
>
> *(b) the contract or invoice for the provision of technical and scientific assistance services which stipulates the conditions for obtaining techniques, planning and programming methods, research, studies and projects for the execution or provision of specialised services.*

Among these, only the provision of services is a typical contract, governed by articles 593 to 609 of the Civil Code. Even so, the Civil Code provides that its discipline applies to the contract for the provision of services not bound by special law, which brings some interpretative difficulty with respect to the contract for the provision of services for the transfer of technology, which, as we have seen above in A, is subject to special laws.

Patent assignment and patent licensing contracts have their own provisions in the IPL (arts. 58 and 61, respectively) and are therefore considered typical. Likewise, the franchising contract is typical, as defined in Law no. 13.966/19. According to Regulatory Instruction no. 70, these contracts are different from technology transfer contracts. The Instruction considers them under the category of "industrial property assignment contracts" and "industrial property licensing contracts", in the following terms:

> *"Art. 2.º. (...)*
>
> *I - Licensing of industrial property rights:*
>
> *a) The licensing and sub-licensing contract for the exploitation of a granted patent or patent application, in accordance with the provisions of Articles 61 to 63 of Law No. 9.279 of 1996;*

b) The licensing and sub-licensing contract for exploitation of industrial design registration or industrial design application, as provided for in Article 121 of Law No 9.279 of 1996; and,

c) the licensing and sub-licensing contract for the use of a trade mark registration or trade mark application, as provided for in Articles 139 to 141 of Law No 9.279 of 1996.

II - Assignment of industrial property rights:

a) the contract for the assignment of a granted patent or patent application, as provided for in Articles 58 to 60 of Law No 9.279 of 1996;

b) the contract of assignment of industrial design registration or industrial design application, as provided for in Article 121 of Law No 9.279 of 1996; and,

c) the contract of assignment of a trade mark registration or of a trade mark application, as provided for in Articles 134 to 138 of Law No 9.279 of 1996".

In the answers to the following items, reference is made to the regulation of technology transfer contracts in the strict sense of the term, as defined in Article 2, paragraph II of INPI Normative Instruction no. 70[129] .

Since 2017, Regulatory Instruction No. 70 and Resolution No. 199 have been in force within the scope of the INPI. The former establishes the administrative procedure for the registration of contracts with the INPI and the latter provides for the examination guidelines for such registration. With regard to price, Regulatory Instruction No. 70 merely mentions the "declared value of the contract" (Arts. 5 and 13) and Resolution No. 199, in turn, indicates how to identify such value in the different contractual modalities (Arts. 14 and 15). These rules significantly restrict the scope of the examination carried out by the INPI for the purpose of registration of technology transfer contracts[130] . The INPI simply includes in the certificate the information declared by the parties. Article 20.6 of Normative Instruction no. 70 states that: "The information relating to the items declared value of the contract, declared form of payment of the contract and declared term of the contract included in the Certificate of Registration issued by the INPI shall be declared, under the sole and exclusive responsibility of the parties to the contract, and it shall be their responsibility to comply with the legal and regulatory provisions applicable to capital remittances abroad and those of a fiscal and tax nature".

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[129] This distinction is relevant, for example, in relation to the provisions of the already repealed INPI Normative Act no. 15/75, cited above, which established different requirements for each category of contract.

[130] According to the official note of the INPI itself: http://antigo.inpi.gov.br/noticias/inpi-realiza-palestra-sobre-in-de-contratos-de-tecnologia-em-sao-paulo.

Before these regulations, the INPI analysed the adequacy of what was agreed by the parties to the tax, fiscal and exchange regulations and from this analysis resulted the necessary requirements for the registration of the contracts[131] , especially those related to the value of the royalties.

This intervention in contracts was justified on the basis of article 2 of Law no. 5.648 of 11 December 1970, which created the INPI. From the publication of this law until 1996, this article had the following wording:

> *Article 2 The main purpose of the Institute shall be to implement, on a national level, the rules governing industrial property, taking into account its social, economic, legal and technical function.*
>
> *Sole Paragraph. Without prejudice to other powers vested in it, the Institute shall adopt, with a view to the economic development of the Country, measures capable of accelerating and regulating the transfer of technology and of establishing better conditions for the negotiation and use of patents, and shall also be responsible for pronouncing on the appropriateness of the assignment, rectification or denunciation of conventions, treaties, conventions and agreements on industrial property.*

In 1996, this law was amended by the LPI, and the aforementioned article 2.º came into force with the following wording:

> *The main purpose of the INPI shall be to implement, at national level, the rules governing industrial property, taking into account its social, economic, legal and technical function, and also to make decisions regarding the appropriateness of signing, ratifying and denouncing conventions, treaties, covenants and agreements on industrial property.*

Based on this article, the INPI interfered in technology transfer contracts. This intervention - challenged by the parties to the contract - was confirmed by the Brazilian Superior Courts in the following cases: (i) Extraordinary Appeal 95.382-5 RJ judged in 1983 by the Federal Supreme Court (ii) Special Appeal no. 1.200.528-RJ judged in 2017 by the STJ[132] .

E.2.3 Chile

Know-how and engineering services contracts are atypical, and there is no regulation of their requirements, characteristics or formalities.

As for licensing and assignment contracts, the requirements are merely formal and relate to their being in writing, the correct identification of the parties and of the rights to be licensed or

[131] *Denis Borges BARBOSA, Contratos em propriedade intelectual (2003) 31: http://www.denisbarbosa.addr.com/arquivos/apostilas/ufrj/contratos_propriedade_intelectual.pdf*

[132] See annex.

transferred. Only in the case of copyrights, Law 17.336 requires the instrument to be signed before a notary.

In addition, in the case of the transfer of industrial property assets, for the purposes of annotation, it will be required to include a price or the mention of being free of charge in an express manner. In the case of copyright, there is a consensus that the minimum regulation regarding the royalty of copyright licences is given by the regulation of publishing contracts, which establishes a minimum remuneration to the author of 10% of the retail price, and in the case of performance contracts, corresponding to 10% of the value of the tickets for each performance. This requirement is not verified by the register of Intellectual Works, so it is enforced through the courts.

Regarding the modality and level of the price received for technology transfer, the current Article 9 of the Decree with Force of Law No. 33/1981 of the Ministry of Education, which regulates FONDECYT, establishes that all scientific and technological development projects, as well as technology transfer and innovation that have been financed with public funds, will be subject to a non-exclusive, non-transferable, irrevocable and onerous licence in favour of the State.

For the use of this licence, the Minister of Science, Technology, Knowledge and Innovation shall issue a substantiated decision within the terms and time limits set out in the implementing regulations of the Act established by the said Ministry, following consultation with the relevant sectoral ministry and after hearing the right holder. The price shall be set by mutual agreement with the right holder. The above implies an impact on the exclusivity of the use of the technology that is available and can be offered, since it implies having the State as an eventual competitor of any technology developed with public funding.

The regulation also establishes two additional restrictions on technology transfer:

- It obliges the patenting of the innovation or technology in early stages, establishing the State's original right to apply for the patent of these in an original manner if within a period of time to be determined by the regulations of the Law, the creator does not apply for it, or does not show interest in applying for it.
- In the event that the owner of the knowledge, innovation or technology manages to commercialise the industrial property right (it is not established whether it is patented or not), it must return 100% of the funds allocated by FONDECYT and an additional sum equivalent to 5% of the income obtained from the commercialisation. This rule does not establish whether the amount to be returned is obtained only from the funding allocated to the patent or to the entire development, nor the form of commercialisation involved.

E.2.4 Colombia

In Colombia, the provisions referring to intellectual property are governed by the provisions of Decision 486 of 2000, Decision 351, and Decision 291.

Decision 486 refers to technology transfer contracts as follows:

1. Licence,

> *The owner of a granted or pending patent may license one or more third parties to exploit the invention concerned. Any license to work a granted patent shall be registered with the competent national office. Failure to register shall render the license ineffective vis-à-vis third parties. For the purposes of registration, the license shall be in writing. Any interested party may apply for registration of a licence.*
>
> *The owner of a layout-design registration that has been granted or is in the process of being granted may license one or more third parties to exploit the respective layout-design. Any license to exploit a granted patent shall be registered with the competent national office. Failure to register shall render the licence ineffective vis-à-vis third parties. For the purposes of registration, the licence shall be in writing. Any interested person may apply for registration of a licence.*
>
> *The owner of a registered trademark or a trademark that is in the process of being registered may license one or more third parties to use the trademark in question. Any license to use the trademark shall be registered with the competent national office. Failure to register shall render the licence ineffective vis-à-vis third parties. For the purposes of registration, the license shall be in writing. Any interested party may apply for registration of a licence.*

2. Transfer of business secrets

> *Article 264.- Any person who legitimately possesses a trade secret may transmit or authorise the use thereof to a third party. The authorised third party shall be under the obligation not to disclose the trade secret by any means whatsoever, unless otherwise agreed with the person who transmitted or authorised the use of said secret.*
>
> *Confidentiality clauses may be included in agreements transferring know-how, technical assistance or the provision of basic or detailed engineering, in order to protect business secrets contained therein, provided they are not contrary to the rules on free competition.*

The above-transcribed rules are the only ones that refer to the possibility of transferring or trading the respective rights, however, there is no internal regulation addressing substantive issues, such as validity requirements, essential elements, prohibited clauses, etc. In this scenario, this type of

agreement is considered atypical by the legal system and is therefore governed by the general provisions on contracts enshrined in the civil and commercial code.

In Colombia, most technology transfer contracts contain compromissory clauses in which it is agreed that an arbitration tribunal will resolve any dispute arising from the contract, as there are very few judges versed in intellectual property and technology transfer issues. As a consequence, access to court decisions on these issues in Colombia is often limited.

For example, regarding the modality and level of the price received for technology transfer.

Decision 291 of 1991

> ***Article 14.- For the*** *purposes of the registration of contracts on the transfer of external technology, trademarks or patents, Member Countries may take into account that such contracts do not contain the following:*
>
> *(b) Clauses under which the technology vendor or the technology supplier or*
> *The licensor reserves the right to fix the prices for the use of a trade mark in accordance with the sale or resale of products that are produced on the basis of the technology*
> *respective;*

Finally, in Colombia it is understood that technology transfer contracts are subject to the regime of common civil and commercial law, since law 489/1997 provides that whenever the state develops commercial or industrial activities, these will be governed by private and not administrative law. According to Law 489/1997 the state can act as a private party in two hypotheses:

> ***ARTICLE 85.- Industrial and commercial companies of the State****. The industrial and commercial companies of the State are bodies created by law or authorised by it, which carry out activities of an industrial or commercial nature and economic management in accordance with the rules of Private Law, (...)*
>
> ***ARTICLE 97. Mixed economy companies.*** *Mixed economy companies are bodies authorised by law, constituted in the form of commercial companies with state contributions and private capital, which carry out activities of an industrial or commercial nature in accordance with the rules of Private Law, (...)*

E.2.5 Mexico

Contracts for the licensing and transfer of invention patents, utility model registrations and industrial design registrations are authorised. It cannot be considered that this regulation makes them typical contracts (depending on the definition adopted), the law refers to common law. Reference is made to industrial secrets in which confidentiality clauses may be inserted. The Franchise contract, which includes know-how or technical advice, in addition to the trademark, is regulated in more detail.

In principle, licences for patents, utility models, industrial designs and franchises are governed by the provisions of the respective contract and, in addition, by national law. In case of conflict, the parties may agree on foreign jurisdictions, both foreign courts and foreign arbitration systems. Licences in which one of the parties is a legal entity located in a country with which Mexico has signed a free trade agreement with an investment chapter (almost all of them) or bilateral investment protection treaties, if the licensor-investor considers that its interests are substantially affected by a state decision that qualifies as indirect expropriation, or if its rights protected by any of the aforementioned treaties or by the Marrakesh Treaty are affected, it can resort to dispute settlement systems in which treaty law and customary international investment law are applied in a supplementary capacity.

A) 1. The Industrial Property Law prohibits the registration of a technology licensing contract when the term is longer than the patent term.

This rule, which has its antecedents in the regulation of international technology transfer contracts in the 1970s to 1980s and which was intended to protect the interests of the acquirer, may now be detrimental to the acquirer.

a) On the one hand, the legislation does not allow the generic licensee to start production before the patent expires. As a result, the licensor can continue to sell the product or continue to use the licensed process at monopoly prices while the generic producer is able to supply the market.
b) Patent holders can often challenge applications for generic authorisation or seek injunctions to delay the entry of a generic into the market. In such a case, the licensee could continue to sell at monopoly prices;
c) If no one applies for authorisation to trade generics, the licensee could continue to sell at monopoly prices;
d) Even if a generic is introduced, the licensee can take advantage of the price differentials traditionally achieved by exploiting the "branded generic".

e) That is, this limitation can be circumvented by registering a trademark licence simultaneously with the licence of the technology.

2. Registration may be cancelled when the term of the patent or registered rights expires or when the patent or registrations are declared invalid or lapsed.

The Mexican Supreme Court has established special requirements for the granting of injunctions or amparos requesting precautionary or related measures.

Precautionary measures are common to prevent generic access to the market; they are filed before the IMPI to prevent the granting of a patent or before the regulatory body of the marketing authorisation (COFEPRIS) for patents that had been considered to have expired in their term. In principle, and unless otherwise agreed, licensees have the rights of the holder.

There is no special rule prohibiting the extension of jurisdiction. The vast majority of the Free Trade Agreements signed by Mexico specifically provide that the foreign licensor, owner of an investment of an intangible, intellectual property, may choose between suing before national courts or before international arbitration tribunals, and that the law of the treaty and, in addition, customary international investment law apply.

E.2.6 Peru

There are no binding legal provisions or jurisprudence in this regard. No legal provision provides any guidelines as to what the modality should be when entering into a technology transfer contract, nor does it provide any guidelines as to the amount to be received for the technology transfer; the legal system and case law grant contractual freedom to the party to agree on the modality and price of the technology transfer. Payment is subject to the law of supply and demand. The form of payment can be a one-off payment or a percentage of the royalties and/or remunerations. In the first case, the one-off payment is negotiated for short-lived or easily replicable technologies, in order to have a fair return before the technology is outgrown, taking into account that the average life span of technologies is around three (3) years. Royalty rates are typically set between 3% and 5% of net sales for a defined period of time. A one-off piecemeal payment can be negotiated and, in the case of a percentage payment, an incremental percentage with a minimum annual payment amount can be established.

In fact, the transfer of a new technology can normally take between one to three years to be adequately disseminated in markets such as ours, which is why a payment can be established in staggered percentages such as: 2% (year 1); 2.5% (year 2) and so on, successively, until the

calculation completes the estimated amount for the technology transfer, especially in cases of technology transfer (sale). A minimum payment for the use of the technology is established, especially in cases where exclusivity is agreed, as there is an opportunity cost involved.

Peruvian law provides contractual freedom with respect to the applicable jurisdiction, but what can be observed in the latest technology transfer contracts registered in the country, which date back to 2006, is that there is a tendency for disputes arising from the conclusion of the contract to be resolved through arbitration, via an arbitral award. Most arbitrations are settled in the city of Lima, although the method of choosing arbitrators and fixing jurisdiction is by agreement between the parties. There is no public information about contracts in recent years.

E.2.7 Uruguay

In general, technology transfer contracts are atypical or unnamed, since, with the exception of contracts for the licensing or assignment of trademarks and patents, the rest of them are not provided for in national legislation.

Article 50

The proprietor of or applicant for a patent may grant licences for the exploitation of the subject matter of the patent, which shall take effect against third parties as soon as they have been entered in the relevant register

Article 51

Unless otherwise stipulated, the following rules shall apply:

A) The licence shall extend to all acts of exploitation or commercialisation of the subject matter of the patent during its entire term, throughout the territory of the country and in respect of any application of the said subject matter.

B) The licensee may not assign or transfer its licence or grant sub-licences.

C) The licence shall be non-exclusive and the licensor may grant other licences for the exploitation of the patent in the country or exploit it himself.

D) Without prejudice to the powers granted by the proprietor and in the absence of initiative by the proprietor, the licensee may take the measures necessary for the defence of the patent. (*)

Article 52

It is prohibited to establish in contractual licences, clauses or conditions that produce a negative effect on competition, constitute unfair competition, make possible an abuse by the holder of the patented right or of his dominant position in the market.

Among these clauses or conditions, it is worth noting those that produce:

A) Adverse trade effects.

B) Exclusive retrocession conditions.

C) Impediments to challenges to the validity of patents or dependent licences.

D) Limitations on the licensee in the commercial or industrial field, where this does not arise from the rights conferred by the patent.

E) Limitations on the export of the product protected by the patent to countries with which there is an

agreement to establish an economic and trade integration area (*).

SECTION II - LICENCE OFFER

Article 53

The owner of an invention patent resident in the country may authorise the exploitation of his patent to any interested party who can prove technical and economic suitability to carry it out efficiently.

The patent on offer will have its annuity reduced by half.

The offer shall be governed, as applicable, by the rules on conventional licensing.

In the absence of agreement on the remuneration of the leave, either party may have recourse to the procedure provided for in Articles 74 and 75 of this Act. (*)

There are no provisions or jurisprudential criteria relating to the limitation of freedom of contract in relation to the law applicable to the technology transfer contract.

Nor are there any provisions or jurisprudential criteria relating to the limitation of freedom of contract in relation to jurisdiction in the case of disputes in connection with the performance of a technology transfer contract.

However, the appendix to the Uruguayan Civil Code, in Article 2403, establishes that "The rules of legislative and judicial competence determined in this Title cannot be modified by the will of the parties. The latter may only act within the margin conferred by the competent law".

That is to say that the parties may only establish an extension of jurisdiction and/or modify the law applicable to the proceedings provided that this is enabled by an international treaty ratified by law by Uruguay. Otherwise, the criteria of applicable law and jurisdictional competence established in the Appendix to the Civil Code will apply in the ordinary way.

In Uruguay, the legal regime applicable to contracts entered into by the State, both at the preliminary stage of the choice of supplier and at the subsequent contractual stage, is that of administrative law.

E.2.8 Venezuela.

In Venezuela, technology transfer contracts are atypical and there are currently no specific regulations for their subscription and execution. We can say that there is freedom of contracting in this area. The Venezuelan government is a major purchaser of technology from countries such as Russia and China in areas such as oil and armaments, but these are not governed by specific rules, and procurement is based only on the provisions of the contracts, which are reserved or confidential.

Likewise, there are no jurisprudential criteria in the country to serve as parameters or reference on the possibility of extending the uses of the acquired technology, or other aspects involved in the technology transfer process.

Technology transfer contracts entered into by the State or public entities are governed by civil or commercial law, but also by provisions in bilateral agreements with the countries providing the technology, such as the Agreement between the Government of the Bolivarian Republic of Venezuela and the Government of the Russian Federation on the mutual protection of intellectual property during bilateral military-technical cooperation, signed in Moscow on 10 September 2009 and approved by law in Venezuela on 23 November 2009, which protects, in addition to the different categories of pre-existing intellectual property generated during the cooperation, information related to the object of the agreement and the agreements and contracts concluded during the cooperation, which is considered restricted.

E.3 Main findings on national technology transfer legislation.

From the study of the legal provisions of the countries under study, it can be concluded that there is no regulation regarding technology transfer contracts, being considered atypical contracts and therefore their clauses negotiated between the parties bilaterally. Not having a clear framework by which the conditions of technology transfer are established is a deterrent for both the recipient and the owner of the technologies.

As shown in the previous sections of the chapter, countries generally have regulations for licensing or assignment contracts in the case of intellectual property rights, in particular frameworks or patents. However, no relevant aspects favouring technology transfer are regulated.

Furthermore, the laws that regulate technology transfer contracts are aimed at registration for tax exemptions, so there is no control over the content of the contracts, which may include abusive conduct on the part of the technology owner. In this sense, judicial control over the abuse of rights is a tool that makes it possible to regulate the situation of the contracting parties, particularly in relationships where one of the parties has a position of strength.

The figure of abuse of rights imposes on the recipient of the technology the need to prove such abuse, which makes it necessary to submit to complex legal procedures that may be too burdensome for small and medium-sized enterprises. It is therefore necessary to think of instruments that provide clarity and certainty for both parties, thus limiting asymmetries in the different parts of the transfer process.

Licence agreements are an important method for the transfer of technology and know-how between independent companies, parent companies and wholly or partly owned subsidiaries, and joint ventures between private and/or public companies. These agreements, which are in effect contracts, define the terms of a transaction between a supplier (licensor) and the buyer (licensee).

At least three different types of technology transfer situations can be distinguished (a) the North-South case, where a private company located in a developed country contracts the transfer of technology and services to a private or public company in a developing country (b) the North-North case, where private companies in developed countries are the parties to the contract; and more recently (c) the South-North case, where a public entity in a developing country transfers information embodied in natural resources to a private company in a developed country.

Finally, different provisions regarding technology transfer that could be incorporated in contracts are presented below and it is analysed whether they were incorporated in any form in the legislation of the countries under analysis. As can be seen from the table, almost none of the countries introduced such clauses.

Table 6. Specific provisions on technology transfer in the legislation under analysis.

Legal and/or jurisprudential provisions	**Argentina**	**Brazil**	**Chile**	**Colombia**	**Mexico**	**Peru**	**Uruguay**	**Venezuela**
the form and level of the price received for the technology transfer	No	No	No	Yes	No	No	No	No
limitation of freedom of contract in relation to the law applicable to the technology transfer contract.	No	No	No	No	No	No	No	No
limitation of contractual freedom as to the jurisdiction for disputes between the parties.	No	No	No	No	No	No	No	No
guarantees in favour of the licensee as to the effectiveness of the technology received.	No	No	No	No	No	No	No	No
restriction on the right of licensors to seek injunctive relief or court orders for cessation of the infringing practice or early termination of the licence.	No	No	No	No	No	No	No	No
obligation of the party acquiring the technology to transfer or license to the supplying party, or another undertaking designated by it, improvements arising from the acquired technology, on an exclusive basis.	No	No	No	Yes	No	No	No	No
requirements on the acquiring party to refrain from challenging the validity of patents, or other types of protection, for the inventions involved in the transfer or the validity of any other rights of the supplying party.	No	No	No	No	No	No	No	No
freedom of contract of the acquiring party in agreements to obtain competing technology - where this is not only the case with respect to confidentiality clauses.	No	No	No	Yes	No	No	No	No
restriction on the acquiring party to carry out R&D for the purpose of adapting the transferred technology to local conditions or for the development of new products or processes.	No	No	No	No	No	No	No	No
restriction of advertising by the acquiring party or the stipulation of an obligation to include logos or trademarks of the supplying company	No	No	No	No	No	No	No	No
obligation to make payments or obligations to continue the use of industrial property rights that have been invalidated, cancelled or expired.	No	No	No	No	No	No	No	No
payments that were made prior to the declaration of invalidity of an industrial property right.	No	No	No	No	No	No	No	No
indemnification or guarantee of the receiving party for the invalidity of the technology transfer contract due to technical or formal defects on the part of the licensor.	No	No	No	No	No	No	No	No
duty of information from the party providing the technology to the party acquiring the technology at the stage	No	No	No	No	No	No	No	No
restriction of use of the technology after termination of the contract.	No	No	No	No	No	No	No	No

F) Competition regimes

This report covers 8 national and one supra-national competition legislation - the Andean Community of Nations - that use different terms to refer to equivalent phenomena. It is therefore pertinent to begin with clarifications regarding terminology. In general terms, dominance will be defined as the power of a firm to set prices, quantity, or other market conditions independently of its competitors. When referring to specific legislation, the term used is the one that the law specifies. In Mexican law, for example, the specific term used in the law is substantial market power.

Co-ordinated conduct shall be used to refer to horizontal agreements - between competitors - and vertical agreements - between undertakings in different links of the value chain. Unilateral conduct will refer to conduct of economic agents holding a dominant position. Similarly, when referring to a specific law, the terminology used in that law will be used.

Competition law can capture unilateral and coordinated conduct related to technology transfer contracts in each of the countries under study. In these cases, the analysis of the effects on the innovation and diffusion of a technology becomes relevant and introduces a higher level of complexity than in cases of competition in more traditional markets. This comparative report presents how the phenomenon of international technology transfer has been approached from a competition law perspective in the countries under study. In this way, it seeks to provide a starting point for the analysis of the adjustments that need to be made to competition laws and their application based on the different socio-economic contexts in Latin America. On this basis, competition interventions can be designed that are in line with the sustainable development objectives of the countries under analysis.

This chapter is divided as follows: the first section presents a summary of the relevant literature on the analysis of innovation and technology diffusion in competition cases to establish the theoretical framework that serves as a basis for the analysis; the second section briefly describes the relevant characteristics of the competition regimes in the countries under study to contextualise the analysis, with emphasis on international technology transfer; the third section presents the main findings of the comparative analysis of competition rules and cases on the specific topic of this report; on this basis, the fourth section presents lines of research on which future research projects may delve deeper.

F.1 Theoretical framework - analysis of innovation and technology diffusion in competition cases

In the general introduction to this report, a review of the literature on the role of international technology transfer in the socio-economic development of lower-income countries and the structural conditions in the economy that affect technological convergence has been made. In this section the analysis is done more at the micro level - i.e. focusing on the level of the firm and markets - in order to make considerations on how the phenomenon of innovation and diffusion of technologies should be done in cases of competition law enforcement.

At a theoretical level, the relationship of interest is the role that market power - defined as a firm's ability to set prices above long-run marginal cost[133] - plays in a firm's incentives and resources to make investments that may lead to new or better products or more efficient production methods.

Schumpeter is well known for the proposition that technological progress is the product of a process of creative destruction whereby new technologies supplant old ones. In this line of thought, he argues that markets subject to less competition with larger firms are more likely to produce innovation than competitive markets.[134] There are several reasons for this. R&D activities are high-risk investments and hence financing constraints may play a major role, which is mitigated in the case of firms with aggregate profit levels that allow them to make these investments with their own funds.

On the other side of the debate is the proposition that, in the absence of competition, incentives to innovate decline. Arrow - whose work is a must for this school of thought - explains that a dominant firm has less to gain from innovative activities than a firm facing greater competition. This is because a dominant firm has less market to capture as a product of successful innovation.[135] On the other hand, a firm facing competition has the opportunity both to win market share from its competitors and new demand for a new or improved product.

The tension between these hypotheses inspired empirical literature which has come up with the following summary findings: innovation is a combination of opportunity - access to finance - and incentives - the prospect of higher profits if one manages to escape competition. In this sense, evidence has been found that suggests in many industries an inverted U-relationship between increased market power and innovation.[136] That is, on average in a market, starting from a perfect level of competition, an increase in monopoly/oligopoly power is associated with greater

[133] Robert S Pindyck and Daniel Rubinfeld, *Microeconomics* (Pearson/Prentice Hall 2009) 361.
[134] Joseph A Schumpeter, *Capitalism, Socialism, and Democracy* (Harper & Brothers 1942) 81-100
[135] Kenneth J Arrow, 'The Economic Implications of Learning by Doing' [1962] The Review of Economic Studies 155.
[136] Aghion et al., 'Competition and Innovation: An Inverted-U Relationship' [2005] The Quarterly Journal of Economics 701

innovation until a point beyond which the relationship reverses and greater power equals less innovation.

The relationship between competition and innovation is also sensitive to market characteristics. Winner-take-all markets may be more prone to innovation at an early stage where there is oligopolistic coexistence. Similarly, fast-growing markets increase the share of profits a firm can earn from successful innovations.[137] Thus, in such markets, promoting competition at the product and service level can have positive effects on innovation. [138]

These general considerations in the literature can be a guide as to the direction of the analysis that a competition authority should undertake in the sense that they provide the possible hypotheses to be examined in a given case. For the case of the conduct that concerns the present study on technology transfer contracts, the effect on price and market concentration of the different clauses - e.g. territorial exclusivity, tied sales, vertical fixing of minimum sales prices - on incentives to innovate should be quantified as far as possible in order to be able to balance the effects on consumer welfare. This is important since, as noted above, the effects of price level and market structure on innovation are ambiguous. Therefore, qualitative analysis should be avoided in order to balance effects that may exist in theory but have not been found in practice. This may sound trivial, but it is important to note given the proclivity of some competition authorities to conduct a predominantly qualitative effects test, which is given - as will be seen below - by the possibility offered by competition laws to find an infringement based on the potential effects of a conduct. In other words, on the mere suitability that a behaviour has to cause anticompetitive effects. This type of analysis must by rigour be based on assumptions about the net effects of a conduct, which certainly reduces enforcement costs, however, at the expense of a more realistic examination.

Another implication of the literature is that a rigid categorisation of conduct that is more or less risky to competition and consumer welfare is probably not desirable. Specifically, we refer to the EU exemption regime, which at some point could be used as a reference in Latin American countries. In this regime, conducts such as the vertical fixing of minimum sales prices are considered particularly risky regardless of the market structure or the agreed price level.

The analysis of the effects of entrepreneurial behaviour on innovation presents major practical difficulties. On the one hand, there is the problem of measuring a firm's innovation capabilities. R&D expenditures are an imperfect measure, even assuming that they are comparable across firms

[137] Jonathan B Baker, 'Beyond Schumpeter v Arrow: How Antitrust Fosters Innovation' [2007] Antitrust Law Journal 575, 593-598.
[138] Ibid.

and different geographic markets, since what matters is consumer welfare or another performance measure such as reducing the environmental impact of a production process. Therefore, to have a complete picture, a probability of success must be assigned to R&D efforts. [139]

Also, depending on the characteristics of the industry, the appropriate innovation model to be used for statistical estimation must be chosen. Successful innovation by one firm can have both adverse and positive effects on the profits of its competitors.[140] These different scenarios present additional difficulties for the quantification of effects on innovation. In sum, the difficulty of this type of analysis cannot be underestimated, which may be one of the reasons for the lack of competition cases found in most of the countries under analysis in this study.

On the basis of this literature review, some considerations on competition regulatory frameworks and their application to technology transfer contracts in the countries under study will be made below.

F.2 Contextual considerations of competition regimes and rules related to technology transfer

F.2.1 Colombia

The first competition law in Colombia was issued in 1959 as part of the economic policy package of the government of President Alberto Lleras, following the country's return to democratic rule.[141] The competition law was conceived as an instrument to expand Colombia's industrial base by protecting not only existing large firms but also small industries with growth potential. [142]

According to some sources, the law was applied sporadically in its early years.[143] Gutiérrez & Palacios Lleras find that between 1961 and 1968 the enforcement authority averaged one investigation per year.[144]

The 1959 law has only one general provision on prohibited conduct. Art. 1 prohibits: 1. agreements to limit production, distribution or consumption; 2. all kinds of practices procedures or systems tending to limit free competition; and 3. all kinds of practices procedures or systems tending to

[139] Ioannis Kokkoris and Tommaso M Valletti, 'Innovation Considerations in Horizontal Merger Control' [2020] Journal of Antitrust Enforcement 220, 230-231.
[140] Id., 231.
[141] Andrés Palacios Lleras, *Competition Law in Latin America: Markets, Politics, Expertise* (Doctoral thesis submitted at the University College London 2017) 99.
[142] Id., 100.
[143] Organisation for Economic Co-operation and Development, *Competition Law and Policy in Colombia: A Peer Review* (2009) 7; Alfonso Miranda Londoño, 'Origen y evolución del derecho de competencia en Colombia: La ley 155 de 1959 y su legado' [2011] Revista de Derecho de la Competencia 65, 75.
[144] Andrés Palacios Lleras and Juan David Gutiérrez Rodríguez, 'Una Nueva Visión Sobre Los Orígenes Del Derecho De La Competencia Colombiano' [2015] Revista de Derecho de la Competencia 137, 165.

maintain or determine inequitable prices. As can be seen, the level of generality is similar to the relevant provisions of the US Sherman Act. It can still be argued that the Colombian regulation has a broader scope, as paragraphs 2. and 3. can be interpreted more flexibly than the US monopolisation and attempted monopolisation rules.

This general prohibition scheme was changed in 1992 with the introduction of Decree 2153 of that year. This regulation included three catalogues of prohibited conduct, bringing the substantive structure of the law closer to that existing in the European Union. The three non-exhaustive catalogues of prohibited conduct cover horizontal and vertical agreements (Art. 47), abuse of dominance (Art. 50) and unilateral acts (Art. 48).

The non-exhaustive list of prohibited horizontal and vertical agreements includes typical types of agreements such as price fixing, market sharing, fixing of sales conditions, etc. It is noteworthy that the rule expressly mentions agreements limiting technical development. Among the conducts criminalised as abuse of dominance there is nothing that deserves special mention, as the catalogue covers behaviours typically included in competition laws such as predatory pricing, tied selling, market obstruction, etc.

Unilateral acts do not require a dominant position, which is a particular case among competition laws in the region and around the world. This category of conduct includes violations of advertising rules, influencing firms to raise prices or refusing to lower them, refusal to contract, and price discrimination as a means of retaliation against unfavourable pricing policies.

Since 2009, the authority in charge of enforcing competition laws in Colombia is the Superintendence of Industry and Commerce.[145] Within this entity, the Delegation for the Protection of Competition is in charge of substantiating investigations on anti-competitive practices. At the end of the investigation, the Superintendent Delegate for the Protection of Competition issues an opinion on the existence of anti-competitive practices. The economic agents under investigation have the opportunity to dispute this opinion. Based on the above and the evidence in the file, the Superintendent of Industry and Commerce makes the final decision in administrative proceedings, which can be challenged in the courts.[146]

With regard to specific provisions on technology transfer, in the case of the member countries of the Andean Community of Nations, there is a regulation on the registration of patent and trademark licensing contracts. Article 12 of Decision 291 of the Andean Community of Nations

[145] Http://www.sic.gov.co/drupal/historia.
[146] Art. 52 Decree 2153 of 1992.

(CAN) prescribes the compulsory registration of such contracts. Art. 14 states that each country may include as grounds for refusal of registration a number of clauses related to potentially anti-competitive conduct. The types of clauses listed in this article are: a) tied sales of inputs; b) fixing of sales prices; c) restrictions on the volume and structure of production; d) prohibition of the use of competing technologies; e) total or partial purchase option in favour of the supplier of the technology; f) retrocession agreements; g) obligation to pay royalties for unused or expired patents. In the case of Colombia, it was decided to refuse the registration of contracts containing clauses with sales price fixing and retrocession agreements for improvements.[147] The legal consequence of the lack of registration is the impossibility of accessing fiscal benefits related to the payment of taxes on royalties abroad.

F.2.2 Chile

The first Chilean competition law was issued in 1959.[148] It was the product of a package of economic reforms recommended by the Klein-Saks mission to combat the high inflation that prevailed at the time.[149] The idea was to gradually replace the government's approach of price controls and central planning with a free market approach in which an antitrust law would ensure that sufficient competitive pressure was maintained.[150] The mission's recommendations on price controls were not consistently implemented and so competition law coexisted with a planned economy, resulting in its weak enforcement. [151]

The current substantive structure is given by Decree 211 of 1973. Its Art. 3 contains a general clause prohibiting conduct that restricts competition or tends to do so. This provision also contains a non-exhaustive catalogue of conducts typified as anti-competitive. These are divided into 4 categories: 1) agreements between competitors, 2) abusive exploitation of a unilateral or collective dominant position, 3) predatory practices or unfair competition for the purpose of achieving,

[147] Art. 2. of Decree 259 of 1992 and paragraph 2 of Resolution 62 of 2014, issued by the National Tax and Customs Directorate.
[148] Organisation for Economic Co-operation and Development, *Competition law and policy in Chile: Accession review* (2010) 10.
[149] Manuel Abarca Meza, 'Breve historia de la primera ley de competencia chilena (1959-1973)' [2021] Revista de Derecho Económico 91, 94. The Klein-Saks Mission was a commission of US economists hired by the Chilean government to stabilise inflation and transform the economic model. See Klein-Saks (1958).
[150] Klein-Saks Mission, 'Las ideas de la Misión Klein-Saks sobre el futuro económico de Chile' in Juan Pablo Couyoumdjian (ed) *Refrormas económicas e instituciones políticas: La experiencia de la Misión Klein-Saks en Chile (*Facultad de Gobierno Universidad del Desarrollo 1958) 273.
[151] Felipe Irarrázabal Philippi, 'El sistema chileno de defensa de la libre competencia' (Fiscalía Nacional Económica 2010) <https://www.fne.gob.cl/wp-content/uploads/2011/05/OTRO_0001_2010.pdf> accessed 3 December 2021; Manuel Abarca Meza, 'Breve historia de la primera ley de competencia chilena (1959-1973)' [2021] Revista de Derecho Económico 91.

maintaining or increasing a dominant position and 4) interlocking of boards of directors and management positions between competitors.

Normally, the Chilean authorities use the general clause of Art. 3 in a residual manner in conjunction with one of the expressly criminalised conducts. However, there are precedents in which the general clause has been used alone. This has occurred in the case of conducts that are difficult to subsume in one of the specific types of Art. 3. [152]

The enforcement of the law is the power of the National Economic Prosecutor's Office - the body in charge of the investigation - and the Court for the Defence of Free Competition - the adjudicating body since 2003.[153] Thus, Chile has the highest degree of separation in the region between the powers of investigation and adjudication of competition cases.

Relevant for the analysis of technology transfer contracts is also the FNE's Guide for the Analysis of Vertical Restraints. It should be emphasised that this instrument does not have a coercive character, so it is of necessary observance by the TDLC. Nevertheless, it is a relevant instrument in that it informs the FNE's investigation and prosecution practice.

It sets out the main factors that the authority will take into account in assessing the anti-competitive risks and possible efficiencies of conduct. It also contains a market share threshold of 35 percent for both the supplier and the distributor below which vertical restraints are presumed to be lawful. This presumption may be rebutted to the extent that there are parallel networks of agreements that have a cumulative detrimental effect on the market. [154]

It is also relevant that the guidance only establishes a framework of analysis and factors to be taken into account but does not establish a categorisation of conduct based on different levels of potential risks to competition. This is more in line with US law. In the European Union, both in the general regulations on vertical restraints and in the specific rules on technology transfer, there are some conducts that are considered to be particularly harmful and therefore fall outside the exemption regimes. This is the case, for example, of vertical price fixing or passive sales restrictions.

F.2.3 Argentina

The first competition laws in Argentina were issued in 1923 and 1946. These bodies of law were criminal in nature and were poorly enforced. According to the OECD peer review, a total of 4

[152] See, for example, Judgment 172/2020 of the Tribunal de Defensa de la Libre Competencia.
[153] Organisation for Economic Co-operation and Development, *Competition law and policy in Chile: Accession review* (2010) 11.
[154] Fiscalía Nacional Económica, *Guía para el análisis de restricciones verticales (*2014) 8.

cases resulted in sanctions between 1933 and 1980.[155] According to the National Commission for the Defence of Competition (CNDC), competition law enforcement became relevant from the mid-1990s after the exit from the centrally planned economic model.[156] In 1997, for example, the CNDC closed almost the same number of cases (24) as in the previous 5 years (25). [157]

The current Argentine competition law - Law 27.442 of 2018 - contains in its article 1 a general clause on prohibited conduct, which broadly corresponds to the language of the other competition laws under analysis. What is worth noting is that the point of reference for the effects of the conduct indicated in that article is not consumer welfare or economic efficiency - standards accepted in legislations around the world where the economic analysis of the neoliberal school is used - but the general economic interest. This gives sufficient latitude to the authorities to choose the approach under which enforcement will be governed.

The non-exhaustive catalogues of anti-competitive conduct are divided into those in which harm to the general economic interest is presumed - agreements between competitors on production quantities and prices (Art. 2) - and those in which such harm or the suitability of the conduct to cause such harm must be proven (Art. 3). Conduct such as vertical price fixing, exclusivity and tied sales are criminalised in the second of the aforementioned catalogues. It is also notable that Art. 3 contains offences focused on the restriction of technological development (letters c) and e)).

The competition law does not contain any other provision referring to innovation or intellectual property rights related to this phenomenon. On the other hand, Law 24.481 on Patents and Utility Models regulates in its Art. 38 possible anti-competitive conducts in licensing contracts. According to this article, "restrictive clauses that affect the production, commercialisation or technological development of the licensee, restrict competition and incur in any other conduct" are not allowed. This provision gives as examples the following clauses: exclusive grant-back arrangements, prohibition of challenges to validity and the imposition of joint compulsory licensing. From the wording of the provision, it seems that the analysis of such clauses in a competition case should be about actual or potential effects of the clauses. In other words, it does not seem that the Argentine legislator intended to treat them *per se* or by object. In any case, since they have been expressly mentioned, it can be interpreted that such clauses have a special risk.

This could be in line with EU law, where exclusive grant-back arrangements are also considered particularly risky. These fall outside the exemption regime for technology transfer contracts, which

[155] Organisation for Economic Co-operation and Development, *Competition Law and Policy in Argentina: A Peer Review* (2006) 8.
[156] Id., p. 9
[157] Comisión Nacional de Defensa de la Competencia, *Memoria de labores (*1997) 3.

covers agreements between competitors where the combined market share is below 20 per cent and between non-competitors where each company's share is below 30 per cent. These are market shares that can be considered relatively low. However, the EU legislator chose to exclude from the exemption regime exclusive grant-back arrangements between companies that fall below these thresholds.

Currently, the authority in charge of competition law enforcement is the NCDC and the Secretariat of Domestic Trade of the Ministry of Productive Development. The NNDC promotes the investigation stage. At the end of this stage, the CNDC issues an opinion with its recommendation to the SCI, which decides the case. The 1999 reforms to the Argentinean law imposed the obligation to create an independent tribunal with adjudicatory powers, similar to the system prevailing in Chile. However, such a tribunal was never created. The current law foresees the creation of a new competition authority and a specialised court, which to date has not happened. Therefore, the current competition law enforcement system depends on the executive branch.

F.2.4 Uruguay

The first competition law in Uruguay was issued in 2000 - Law 17.243. The authority in charge of its enforcement - the Commission for the Promotion and Defence of Competition - was appointed in early 2001.[158] The dissuasive power of this law may have been undermined by the level of fines that could be imposed for an infringement. According to Art. 157 of Law No 17.296, fines were to be between 500 to 20 thousand Readjustable Units (UR) - approximately between 8 thousand and 320 thousand USD.[159] This may be the reason why some commentators consider the current Law 18.159 of 2007 as the first national and general competition legislation in Uruguay. This regulation establishes new ceilings for fines: 20 million UR, 10 percent of the company's annual sales or three times the damage caused by the conduct, whichever is higher (Art. 17). The enforcement authority of the current law is the Commission for the Promotion and Defence of Competition, which started operations in 2009.[160] This makes the Uruguayan regime one of the youngest in the region, even though it has been in place for just over ten years.

Law 18.159 aims to promote the welfare of consumers, current and future, through greater competition, economic efficiency and freedom and equality of access of companies to the market (Art. 1). It is noteworthy that the law expressly mentions the welfare of future consumers, which

[158] Mario Bergara, *Las reglas de juego en Uruguay - El entorno institucional y los problemas económicos (*Udelar. FCS-DE : Trilce : Universidad para la Paz 2003), p. 79.
[159] Juan David Gutiérrez Rodríguez, 'Derecho de la competencia en América Latina y el Caribe: Evolución y principales retos' in Anuario de Defensa de la Competencia (La Ley 2021) 130.
[160] Commission for the Promotion and Defence of Competition, Annual *Report (*2009) 1.

is a clear signal from the legislator to consider dynamic aspects in the analysis of behaviours such as innovation.

The general clause on prohibited conduct (Art. 2) does not present aspects that deviate from those commonly found in the laws of the region, especially those drafted according to the "economic approach" of competition law. It is noteworthy that the law expressly excludes from the scope of application of the law the exercise of an exceptional right, power or prerogative granted or recognised by law. It can therefore be interpreted that the exercise of the power to request a judicial cease and desist order by an intellectual property right holder cannot be considered under any circumstances as anti-competitive conduct, different from what happens in the European Union and some countries that are the subject of this study - Colombia and Chile.

Uruguayan law expressly distinguishes between conduct that is prohibited per se and conduct where the actual or potential effects of the conduct must be proven. Conduct prohibited per se is agreements between competitors on prices and quantities of production. Vertical sales price fixing and passive sales restrictions are analysed under the rule of reason, which differs from the treatment of such practices in EU competition law.

It is worth mentioning that among the conducts mentioned in Art. 4 (b), the limitation and restriction of technological development is criminalised. The curious thing about this provision is that the offence includes conduct affecting either consumers or competitors. This alternative wording means that the restriction of technological development can be sanctioned without the need to prove actual or potential harm to consumers.

As in the case of Argentina, the Uruguayan patent law - Law 17.164 - contains a provision (Art. 52) prohibiting anti-competitive clauses in licensing contracts. The Uruguayan law provides the following specific examples of potentially anti-competitive clauses: exclusive grant back agreements, preventing challenges to the validity of the patent and limitations on exports to countries with which there is an agreement on economic and commercial integration. The article provides two additional examples, but worded in more general terms: clauses with trade-detrimental effects and limitations on the licensee in the industrial and commercial field where this does not derive from the scope of the patent.

Finally, Art. 60 of the patent law provides for the power to grant compulsory licenses when anti-competitive practices have occurred such as: excessive pricing, refusal to supply the market on reasonable terms, hindrance or injury to commercial or productive activities, or when they unjustifiably restrain trade or cause detriment to the transfer of technology.

F.2.5 Peru

The first competition law in Peru - Legislative Decree No 701 - was issued in November 1991. The authority in charge of its application and the current regulation - Legislative Decree 1034 of 2008[161] - is the National Institute for the Defence of Competition and Protection of Intellectual Property, which was created in November 1992 by Decree Law No 25868, starting operations in March 1993.[162] This authority is among the most active in the region in terms of cases resolved per year, along with the authorities of Brazil, Colombia, Mexico and Chile.[163]

A peculiarity of Peruvian competition law is that until the entry into force of Law 31112 in June 2021[164] there was no economy-wide merger control regime. Prior to that, the obligation to notify operations of this nature only existed for the electricity industry. This is not an aspect that directly affects the application of competition law to technology transfer, but it is worth mentioning as an indicator of the currents of thought and political economy that competition law faces in this country.

In Peru, being part of the CAN, the provisions of Decision 291 on registration of technology transfer contracts and the prohibition to register contracts containing anti-competitive clauses are also applicable (Art. 14), which are at the discretion of each member country. Unlike Colombia, Peruvian legislation has not developed which of the clauses listed in Art. 14 are grounds for refusal to register the contract. In any case, the legal consequence of the lack of registration is only the non-publicity of the contract. This does not affect its validity.

The Peruvian competition law contained in Legislative Decree 1034 of 2008 contains three catalogues of unlawful conduct: abuse of dominance (Art. 10), horizontal collusive practices (Art. 11) and vertical collusive practices (Art. 12). Horizontal collusive practices concerning hardcore cartels constitute absolute prohibitions, while the remaining horizontal conducts - such as concerted refusal to contract - are relative prohibitions. In other words, actual or at least potential effects must be proven. The same standard applies to vertical collusive practices and abuses of dominance.

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[161] Subsequently amended by Legislative Decree No. 1205 of 2015 and Legislative Decree No. 1396 of 2018.
[162] Organisation for Economic Co-operation and Development, *Peru - Peer Review of Competition Law and Policy* (2004), p. 13.
[163] Juan David Gutiérrez Rodríguez, 'Derecho de la competencia en América Latina y el Caribe: Evolución y principales retos' in Anuario de Defensa de la Competencia (La Ley 2021) 137.
[164] The law establishes in its final complementary provisions that it enters into force 15 days after the necessary amendments to INDECOPI's Regulation of Organisation and Functions have been made, which was implemented on 30 May 2021 by Resolution 060-2021-PRE-INDECOPI.

Technological development is covered by the prohibition of horizontal or vertical collusive practices that restrict technological development. It should be noted that horizontal agreements restricting technological development do not fall within the list of hardcore cartels in the second paragraph of Art. 11. As a consequence, such agreements are prohibited only if actual or potential effects of the conduct are proven (Art. 9). This allows any horizontal agreement in terms of licensing or R&D to have a lower risk of being caught by competition law, as long as no purchase or sale prices or market shares are agreed upon.

F.2.6 Brazil

Brazil seems to follow the pattern of most countries in the region where competition policies as they are currently understood become relevant only after a period of economic liberalisation in the 1990s. According to the OECD peer review report, competition policy in Brazil started with Law 8.884 of 11 June 1994. There are some cases of the Conselho Administrativo de Defesa Econômica (CADE) - the Brazilian competition authority - based on complaints dating back to 1988. However, enforcement seems to have gained momentum since the mid-1990s. This means that competition policy has been in existence in the country for just under three decades.

The 1994 law was replaced by Law 12.529 of 30 November 2011. CADE's enforcement can be said to be proactive, being one of the most active authorities in the region.[165] It is also perceived as one of the best performing its function, only behind the Chilean authorities, as measured by the World Economic Forum's executive opinion survey.[166]

CADE is composed of the Administrative Court of Economic Defence, the General Superintendence and the Department of Economic Studies (Art. 5 Law 12.529). The Tribunal is the adjudicating body (Art. 9 paragraphs II and III) and the Superintendence is in charge of promoting the investigation (Art. 13 paragraphs III to VI), so there is a degree of separation between these powers, which promotes a greater degree of adversariality in the proceedings.

Law 12.529 characterises anti-competitive conduct as "violations of the economic order". This choice of terminology is noteworthy because it gives a more fundamental character in the legal order to the enforcement of competition law. In other words, it can be interpreted as a signal from the Brazilian legislator about the importance it attaches to upholding this law. It also gives greater

[165] Juan David Gutiérrez Rodríguez, 'Derecho de la competencia en América Latina y el Caribe: Evolución y principales retos' in Anuario de Defensa de la Competencia (La Ley 2021) 137.
[166] Id., p. 138, calculating the average score received based on the question "In your country, to what extent does antitrust policy promote competition?" between 2007 and 2017.

latitude in the analysis of the economic effects of conduct that goes beyond efficiency and consumer welfare than is set as a standard in other competition laws.

Another reflection of the importance of competition policy in Brazil is found in CADE's sanctioning powers. The maximum fine amounts to 20 per cent of the company's gross sales (Art. 37 I) - in the EU, for example, it is only 10 per cent - as well as individual sanctions to executives when guilt or malice is proven of between 1 per cent and 20 per cent of the fine set for the company (Art. 37 III). In the same vein, Brazil is one of the countries in the region where also some violations of competition law (related to hardcore cartels) can be punished with imprisonment - between 2 and 5 years (Art. 4 Law 8.137).

The general anti-competitive practices prohibition clause of the Brazilian law mentions 4 categories of behaviour in Art. 36: 1) limiting, distorting or harming free competition; 2) dominating the respective relevant market; 3) arbitrarily increasing profits; and 4) abuse of a dominant position. The first paragraph of this provision clarifies that (2) does not refer to the conquest of a market by an undertaking through increased efficiency vis-à-vis its competitors.

The catalogue of conducts typified as anti-competitive contains, of relevance to the present study, the following: preventing access to technologies or equipment; agreements restricting research and development of technologies; monopolising or preventing the exploitation of IP rights; and the abusive exercise or exploitation of IP rights. This last type is noteworthy as it may conflict with the essence of IP rights, such as a patent, which is to exclude others from exploiting the knowledge generated. This is an important source of market power for a patent holder, so depending on the criteria for the application of this prohibition of abusive exercise of IP rights, there may be a real conflict between these two branches of law.

As for remedies, Art. 38 numeral IV a) gives CADE the power to recommend to INPI the granting of compulsory licenses of IP rights when the infringement is related to the exercise of these rights.

Art. 36 also exemplifies conducts usually included in competition laws and of relevance for technology transfer contracts: exclusivity, tied sales, vertical price fixing, among others. As in the rest of the countries under analysis, all these conducts are analysed under the rule of reason. As a consequence, in the case of Brazil, also the rules regarding vertical minimum price fixing and passive sales restrictions are different from the EU regulation, where such practices are viewed with greater suspicion and classified as violations by object.

F.2.7 Mexico

Mexico is one of the countries in the region with nearly three decades of application of its general competition law. The first law was issued in 1992 and came into force in 1993.[167] The administrative authority in charge of its enforcement - the Federal Competition Commission (Comisión Federal de Competencia, CFC) - started operations that same year.

The competition regime underwent a process of profound reforms as part of the multi-party political agreement called the "Pact for Mexico",[168] in which competition was placed at the centre of the government's economic policy to promote development in the country. As part of these reforms, two competition authorities were created by constitutional reform: the Federal Telecommunications Institute (IFT) - in charge of applying competition law to the markets under its supervision - and the Federal Economic Competition Commission (COFECE) - in charge of applying competition law to the rest of the economy. This makes Mexico the only country in the region where competition authorities have constitutional status.

Also, in 2014, a new Federal Law on Economic Competition was issued to replace the 1992 law. One of the peculiarities of the law is the language around the phenomenon of monopolies. The purpose of the law is expressed in its Art. 2 as follows: "to promote, protect and guarantee free competition and economic competition, as well as to prevent, investigate, combat, effectively prosecute, severely punish and eliminate monopolies, monopolistic practices, illicit concentrations, barriers to free competition and economic competition, and other restrictions to the efficient functioning of markets." (emphasis added). This formulation departs from the mainstream thinking in competition law that monopolies are not prosecutable per se, only the abuse of market power is punishable.

One of the ways in which Mexican law directly pursues monopoly rather than abuse of market power is through the power to investigate the existence of barriers to entry and essential inputs independently of the existence of the anti-competitive practices typified in Arts. 53 to 56 of the law. If the authority finds the absence of competitive conditions caused by barriers to entry or an essential input, COFECE or IFT have the power to order the divestiture of assets in case other remedies are not sufficient to correct the detrimental effects on the market. This power can be interpreted as applying in cases where a technology is considered essential or where the owner of

[167] Ley Federal de Competencia Económica < https://www.diputados.gob.mx/LeyesBiblio/abro/lfce/LFCE_abro.pdf> accessed 3 December 2021.

[168] Mexican Ministry of Foreign Affairs, *Pact for Mexico* < https://consulmex.sre.gob.mx/calexico/index.php/component/content/article/4-articulos/58-pacto-por-mexico#:~:text=El%20Pacto%20por%20M%C3%A9xico%20es,poverty%20and%20the%20social%20inequality%20> accessed 3 December 2021.

the technology enjoys substantial market power due to structural conditions unrelated to its conduct in exploiting the technology.

Mexican law also divides prohibited conduct into absolute and relative. The first category includes only hardcore cartels - horizontal fixing of prices and production quantities. The second category includes all conduct of interest to the present study: vertical price fixing, exclusivity, tied sales, etc. Art. 54 of the law establishes that the configuration of one of the conducts typified in the catalogue of Art. 56, unilateral or joint substantial market power and the anti-competitive object or effect of the conduct, must be proven. At first glance, it would seem that the catalogue of relative monopolistic practices is taxing. However, paragraph XI of this provision does not describe a conduct per se but is drafted in terms of the effects produced - "increasing the costs or hindering the production process or reducing the demand faced by one or more other Economic Operators". Thus, any conduct not enumerated in the rest of the list but which has the stated effects can be subsumed under numeral XI.

Art. 54 mentions that relative monopolistic practices can be sanctioned by their object or effect, which seems to give latitude to COFECE and IFT to determine conduct that does not require an analysis of actual or potential effects. On the other hand, it must be proven that the economic agent(s) have substantial market power, so in any case practices such as vertical price fixing would be treated more leniently than in the European Union, where it is not necessary to prove that the investigated company has a dominant position.

F.3 Main findings of the comparative analysis on the application of competition law to international technology transfer contracts

Only in Argentina and Brazil were cases of application of competition laws to technology transfer contracts found. In Argentina, two cases were found in administrative proceedings directly related to clauses in technology licensing contracts. One case is pending resolution and one case was closed by the CNDC. The case pending resolution concerns licences granted by Monsanto to soybean farmers for the use of genetically modified seeds. The second case dealt with exclusive licences concerning dosimetry services (detection of radiation in exposed persons, e.g. in the case of use of radioactive equipment or radiotherapy patients).

In the Monsanto case,[169] what is known about the file dating back to 2014 is described below. The complaint was filed by organisations representing agricultural producers for excessive royalties in licensing contracts for the use of seeds incorporating Intacta technology, developed by Monsanto.

[169] Case file S01: 0190035/2014, entitled "Monsanto Argentina SAIC s/ Infracción Ley 25.156 (C. 1521)" (Monsanto Argentina SAIC s/ Infracción Ley 25.156 (C. 1521)).

The technology consists of seeds genetically modified to resist pests and improve yields, among other advantages.

Monsanto charges farmers for three items: 1) the price for the purchase of the seed, 2) royalties derived from the PBR of the seed variety, and 3) royalties derived from the patent covering the seed. The complaint also covers Monsanto's royalty collection practices, whereby the exporter or collector withholds part of the price paid to the farmer.

An important aspect of the case is that the scope of Monsanto's patent on seeds is also at issue. This factor, in conjunction with a case involving excessive pricing by an IP right holder, makes the case of great interest in terms of this study. It will await the criteria to be applied by the NCDC and the courts where appropriate.

As for the second case, the facts were as follows: the US company Landauer - owner of the OSL technology for dosimetry services - signed an exclusive licence agreement with the Argentinean company Nuclear Control covering the provision of the service and use of the equipment incorporating the technology.[170] Under the exclusivity clause, Nuclear Control refused to sell equipment with OSL technology to RX Asesores, one of its competitors in Argentina. The latter decided to file a complaint with the NCDC in response to these facts. The case mainly revolved around the lack of dominance of the investigated company, since it had a non-substantial and inferior shareholding to the complainant, which in turn was the market leader. For the same reason, it was also found that the OSL technology was not indispensable to provide services in the market. As a result, it was found that there was no abuse of dominance. In this respect there are no elements that can be used for the purposes of the present study since the analysis was not based on considerations of innovation and diffusion of technological knowledge.

In Brazil, competition cases on technology transfer in the GM seed industry were found. This is a series of CADE decisions that are directly related, as Monsanto's contracts with different individuals and companies in Brazil regarding the Intacta soybean seed technology - the same technology that is the subject of the pending investigation in Argentina's CNDC - were analysed in separate cases.

The peculiarity of the case was that the contracts were not analysed under the anti-competitive conduct provisions but as vertical mergers between Monsanto and the companies to which the technology was transferred. This was because some clauses were found to give Monsanto some control over commercial decisions of the counterparties. CADE mainly objected to the

[170] CNDC Opinion No 58 of 28 July 2017; Resolution of the Secretary of Commerce RESOL 2017-635-APN-SECC#MP of 17 August 2017.

remuneration system whereby increasing percentages were established in favour of the licensee depending on the share of seed production with Intacta technology. In the opinion of the majority of the Court's counsel, such clauses would discourage the use of competing technologies.

The effects on competition of the joint licensing of RoundUp Ready technology for herbicides compatible with Intacta seeds were also reviewed. However, as there are several brands of glyphosate - the herbicide in question - no competition risks were found.

Based on the above, the contracts were approved at first instance, subject to the condition that the clauses that discouraged the use of technologies that competed with Intacta seeds were removed. This decision was appealed by the petitioners before the same Court, and the decision was modified in terms that are not known, as the votes of the councillors were cast confidentially.

In Colombia, Uruguay, Peru and Mexico, no competition cases dealing with technology transfer were found. Nor were any cases found dealing with technology-related intellectual property rights such as patents and trade secrets. Therefore, it is not possible to make a direct analysis of the tendencies of the authorities towards relevant factors such as incentives for innovation and its diffusion.

In Chile, one case was found on non-compete clauses in the framework of a patent assignment and one case on possible abuses in software licensing contracts. However, incentives for innovation and knowledge diffusion were not factors that formed part of the TDLC's analysis.

Given this paucity of cases, an analysis of judicial and administrative decisions on conduct that may arise in an international technology transfer context was undertaken. This may provide guidance, albeit imperfect, on aspects that authorities will take into account when faced with a case on the phenomenon in question.

The first point that was investigated concerned the limitations on judicial remedies available to the licensor of the technology, taking as a reference the debate that has taken place in other jurisdictions in the case of standard-essential patents. This is an important point for the present study because the limitation of a cease and desist order on the infringement of an intellectual property right is a judicial remedy that forms part of the essence of the negative right that the owners have, in other words, the right to exclude the use of the productive knowledge generated or works created. This is why the limitation of this procedural right of a right holder has been interpreted very restrictively in other jurisdictions such as the EU.

In the Latin American countries under study, no cases were found directly on judicial remedies but on the general figure that covers this type of conduct, which is, as a general rule, the abusive exercise

of a right. In the countries where cases were found in this area, a very high standard was found for proving in a competition case an abuse of dominance of this type. In the case of Colombia, in the instances in which this conduct has been analysed, a violation of competition law has never been found.[171] In Chile, similarly, the casuistry indicates that the standard for proving an abuse of this type is very high, as the conduct must unequivocally have the purpose of restricting competition.[172]

A peculiar case in this regard is Uruguay. As mentioned in the contextual considerations, Uruguayan law excludes from the application of competition laws the exercise of a right, power or exceptional prerogative granted or recognised by law. Therefore, there is not even the possibility of submitting an abusive exercise of a substantive or procedural right to competition analysis.

Another aspect that was studied was the treatment of clauses that can be found in technology transfer contracts and that in other jurisdictions such as the EU and the US have been the object of special study by the competition authorities. These clauses refer to price fixing for the sale of the products that include the technology, territorial exclusivity, tied sales, etc. In short, in all the countries covered by this study, these conducts are analysed by the administrative and judicial authorities under the rule of reason or as infringements by effect. That is, it must be proven that the net effect of the conduct is detrimental to consumers, for which there is no legal presumption as in the case of horizontal price agreements.[173] In the case of Mexico, this has been the practice even though the law allows these conducts to be sanctioned as violations by object.[174]

In the case of clauses such as vertical sales price fixing and passive sales restrictions outside the scope of the licensee's exclusivity, this means a rapprochement to the substantive rules prevailing in the United States.[175] In the European Union, vertical price fixing and passive sales restrictions are generally analysed as anti-competitive conduct by object. This is why in the EU Block Exemption Regulation on technology transfer agreements, these clauses fall under the category of hardcore restrictions and are therefore excluded from the exemption regime (Art. 4 par. 2. lit. (a)

[171] See SIC, Resolution 71584 of 2019, Resolution 76278 of 2016. The only case found in which the existence of an abusive exercise of the right was established was in the context of a case on unfair competition in which the complained company was found to have registered 20 trademarks the same or similar to those that a competitor had in other countries in order to hinder its entry into the market.
[172] TDLC Judgment 47/2006, p. 58.
[173] In Colombia, see e.g. SIC, Resolution 56350 of 2018 (exclusivity contracts). In the case of Chile, see TDLC Ruling 126/2012, p. 40 (exclusivity clauses); TDLC Ruling 97/2010, p. 20 (tied sales). In Argentina, see in the case of minimum sales price fixing, Resolution No 218/2002 of the Secretariat of Competition, Deregulation and Consumer Defence; in the case of territorial exclusivity clauses, see Opinion of the CNDC of 4 September 1997 in the case "SADIT y otros c/Massalin Particulares y otros" and Resolution No 942/97 of the Secretary of Industry, Commerce and Mining.
[174] In the case of Mexico, see CFC decision of 20 November 2009 in case DE-022-2007 (exclusivity contracts); CFC decision of 9 December 2011 in case DE-013-2008; COFECE decision of 22 October 2013 in case DE-015-2010.
[175] See Andrew I Gavil, William E Kovacic & Jonathan B Baker, *Antitrust Law in Perspective: Cases, Concepts and Problems in Competition Policy (*Thomson West 2008), chaps. 4 and 6 for a summary of the state of US antitrust law on vertical restraints.

and (b)). Furthermore, restrictions classified as hardcore restrictions are presumed to be an agreement restrictive of competition under Art. 101, par. 1 TFEU, which most likely cannot be rebutted by claiming efficiencies in terms of par. 3 of that provision.

Notwithstanding the fact that vertical price fixing and retrocession of improvements agreements are treated under the rule of reason in Colombia, their inclusion in technology transfer contracts is a ground for refusal of registration, as mentioned above. It should be recalled that the legal consequence of the above is the inapplicability of fiscal benefits concerning taxes generated by the payment of royalties. This may indicate that the Colombian legislator is more concerned about these clauses in the context of technology transfer than in other types of contracts. It is therefore complex to predict the treatment of a case on the matter by the SIC, in which fines may be imposed on both the company and its directors.

As noted in the section on the theoretical framework on innovation and competition, one lesson from the economic literature on this relationship is that it is not desirable to establish rigid categories of conduct in terms of the anti-competitive risks they generate. The casuistry of the competition authorities of the countries studied and instruments such as the FNE's Guidelines for the Analysis of Vertical Restraints suggest that this lesson has been followed in the region.

Finally, it is worth mentioning that, in the case of vertical restraints, it was found in the legislations and in the case studies that competition authorities must only prove potential anticompetitive effects and not their existence. In other words, it is analysed whether the clauses under study are suitable to hinder competition and not whether they have actually done so.[176] This can be interpreted as a low standard for sanctioning this type of conduct. Likewise, the suitability of a clause to restrict competition is a qualitative analysis, which increases the uncertainty about the final results of an investigation.

It should be recalled that the relationship between competition and innovation is sensitive to market conditions such as concentration, demand growth and network effects, which is hardly captured by a qualitative type of analysis on potential effects: This type of examination, by definition, can only be done on the basis of assumptions that have not been tested in practice since no statistical estimation of actual effects is made. This can be illustrated by the following example. Assuming that the effects of a vertical sales price fixing clause are being analysed, they are usually

[176]In Colombia, see for example SIC, Resolution 56350 of 2018 (exclusivity contracts). Also, see in the contextual considerations of each country, where the provisions speak of the need to prove the harm or the suitability of the conduct to cause it. In Brazil, for example, Art. 36 of Law 12.529 is worded as follows: "They constitute infractions of the economic order . . . . the acts . . . that have as their object or may produce the following effects without the need for them to be reached".

justified since less intra-technology competition leads to a higher margin, which allows for consumer welfare investments such as product improvements. However, as mentioned in the theoretical framework section, the positive effect of higher mark-ups on innovation has on average a limit - beyond a certain level of market power the increase in mark-up has a negative effect on innovation.

This level of market power below which positive effects of increased market power on innovation are still observed cannot be captured by an analysis of relevant market definition, market shares and assessment of other factors such as barriers to entry. These variables, as is well known, are merely proxies for analysing the effects of a behaviour. To the extent that one generalises about the effects of a given clause or holdings on innovation, the error costs of the competition law enforcement system will increase, which may not be compensated by the savings in administration costs that a qualitative analysis implies as compared to a quantitative estimation exercise. This is by no means to claim that an econometric exercise gives an accurate prediction or quantification of effects but it is expected that on average it will give results that are closer to reality.

G) Foreign direct investment (FDI) and international trade.

The economic literature has repeatedly analysed the relationship of international trade and FDI as tools that provide means for the diffusion of technologies internationally, e.g. Acharya and Keller (2007) show how the extent of international technology transfer activities can explain cross-country differences in per capita income. Furthermore, they find that imports are a particularly important channel of technology transfer, although the volume of transfer varies by country, being higher in countries with higher absorptive capacity (as measured by the level of local education) and R&D investments[177] .

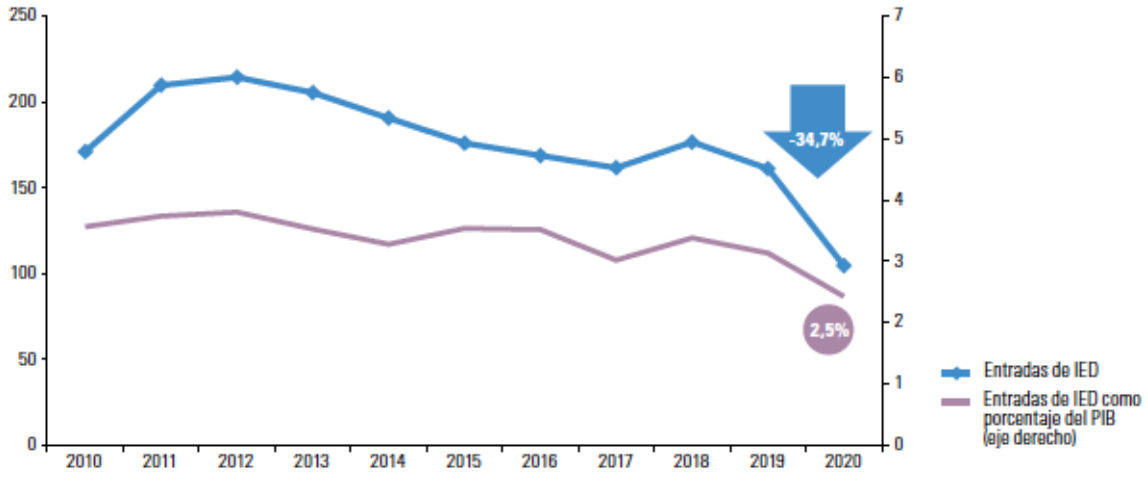

Illustration 1 *Latin America and the Caribbean: foreign direct investment (FDI) inflows, 2010-2020 (Billions of dollars and percentages of GDP) Economic Commission for Latin America and the Caribbean (ECLAC), based on official figures and estimates as of 27 July 2021.*

This chapter analyses national frameworks for foreign direct investment and technology transfer. In particular the introduction of clauses in bilateral investment agreements that allow or restrict performance requirements.

G.1 Theoretical framework for FDI and international trade.

While there is no multilateral agreement that regulates FDI in a comprehensive way, some World Trade Organisation (WTO) agreements address specific aspects of FDI. These include the General Agreement on Trade in Services (GATS), the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and the Agreement on Trade-Related Investment Measures (TRIMs). The latter prohibits host states from imposing certain conditions, known as performance requirements, on foreign investors. Prominent among these are requirements to buy or use domestic products in

[177] See Walter G Park and Douglas Lippoldt, 'Channels of Technology Transfer and Intellectual Property Rights in Developing Countries' in Sanghoon Ahn, Bronwyn Hall and Keun Lee, *Intellectual Property for Economic Development* (Edward Elgar Publishing 2014) <http://www.elgaronline.com/view/9781782548041.00008.xml> accessed 18 October 2022.

preference to imported ones (local content requirements). Performance requirements were a standard part of many countries' development strategies[178] .

On the other hand, many countries offer foreign investors more favourable treatment than that granted to domestic producers. The argument in favour of special treatment for FDI is often based on market failure. The presence of positive externalities associated with FDI would lead to an under-provision of FDI and thus constitute an example of market failure and serve as a justification for subsidising FDI. However, given the difficulties in assessing the benefits of these spillovers, it might be easy to extend subsidies beyond the levels that can be justified on the basis of spillovers. Another justification for subsidising FDI is based on information asymmetries. Domestic investors, who are better informed about investment opportunities in their country, have no incentive to share this information with potential foreign entrants. In such a situation, a capital-importing country would increase welfare by subsidising foreign capital inflows[179] .

In order to encourage FDI, many countries enter into Bilateral Investment Treaties (BITs). These establish provisions that favour foreign investment, but in many cases limit the possibility of introducing performance requirements that encourage technology transfer.

[178] See Sebastián Herreros and Tania García-Millán, 'Opciones Para La Convergencia Entre La Alianza Del Pacífico y El Mercado Común Del Sur (MERCOSUR): La Regulación de La Inversión Extranjera Directa' (CEPAL) <https://repositorio.cepal.org/bitstream/handle/11362/42176/1/S1700855_es.pdf>.
[179] BS Javorcik, 'International Technology Transfer and Foreign Direct Investment', *The Evidence and Impact of Financial Globalization* (Elsevier 2013) <https://linkinghub.elsevier.com/retrieve/pii/B9780123978745000439> accessed 18 October 2022.

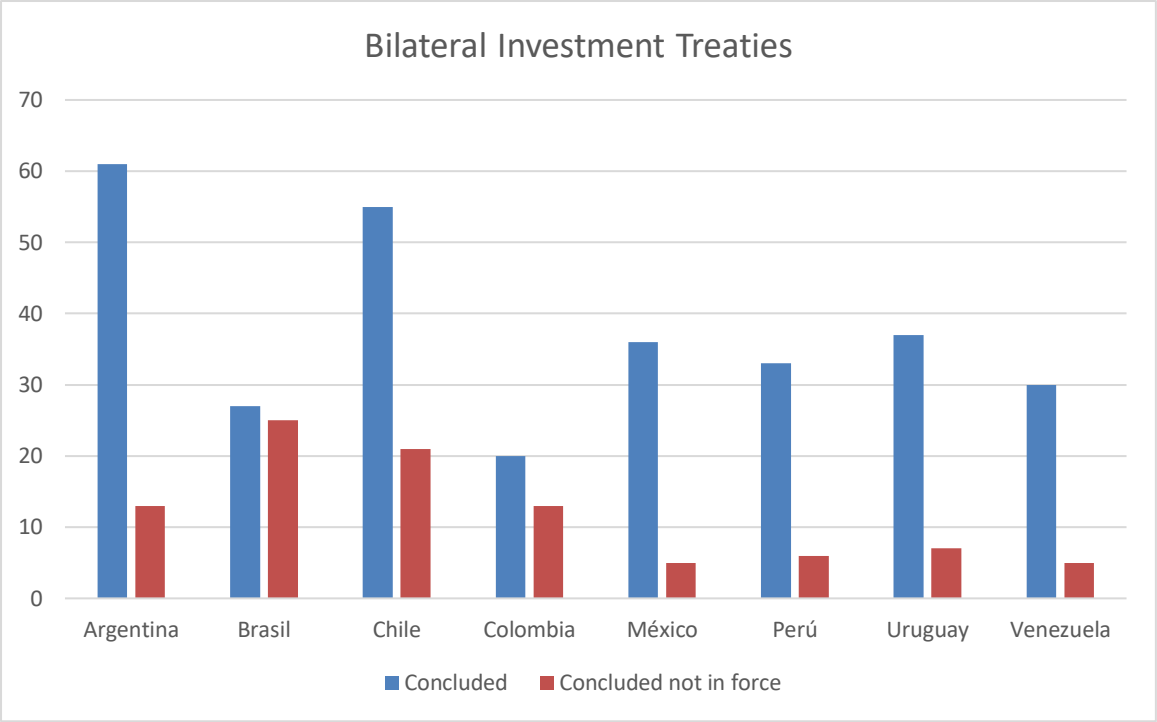

Illustration 2. Bilateral Investment Treaties in force and not in force in the selected countries of the study, historical series. Source: UNCTAD, Investment Policy Hub available at https://investmentpolicy.unctad.org/international-investment-agreements accessed 10 March 2022.

In many cases these treaties establish conditions restricting the transfer of technology, as well as including intellectual property under the concept of investment. For example, the Agreement signed by Argentina with the Government of the Republic of India on the Promotion and Reciprocal Protection of Investments approved by Law 25.540 establishes:

> *"The term "investment" refers to any type of asset constituted or acquired, including changes in the form of such investment, in accordance with the domestic laws and regulations of the Contracting Party in whose territory the investment is made, and in particular, but not exclusively, includes:*
> *(i) movable and immovable property, as well as other rights such as mortgages, pledges or liens;*
> *(ii) shares, stocks and bonds of a company and any other type of participation in a company;*
> *(iii) claims to sums of money or to any benefit under a contract which has an economic value; loans are included only where they are directly linked to a specific investment;*
> *(iv) intellectual property rights, goodwill, technical processes and know-how in accordance with the relevant laws of the respective Contracting Party..."*.[180]

As can be seen in the preceding paragraph, the Bilateral Investment Treaties incorporate intellectual property rights as assets. However, they do not define which rights are covered by the definition

[180]See Agreement between Argentina and the Government of the Republic of India on the Promotion and Reciprocal Protection of Investments, available at: http://www.sice.oas.org/Investment/BITSbyCountry/BITs/ARG_IND_s.pdf accessed 23 May 2022.

of intellectual property. Other treaties, such as the one signed between Argentina and the Russian Federation and approved by Law nr. 25.353, indicate:

> *"The term "investment" means, in accordance with the applicable law of the Contracting Party in whose territory the investment was made, all types of property which the investor of one Contracting Party invests in the territory of the other Contracting Party, in accordance with the law of the latter, including, inter alia, in the territory of the other Contracting Party.*
> *(a) movable and immovable property and their corresponding rights in rem;*
> *(b) shares and other forms of participation in undertakings and commercial companies;*
> *(c) debt securities and other monetary assets that are directly linked to an investment and are intended to create economic assets;*
>
> *d) exclusive intellectual property rights, including industrial property rights, copyrights, trademarks and service marks, patents, industrial designs, trade names, as well as technology and know-how;...".*

In the case of Brazil, it is a signatory to the following free trade and/or bilateral investment treaties that introduce provisions alluding to technology transfer[181] **:**

1.1. No longer in force:

i. *Cooperation and Investment Facilitation Agreement between the Federative Republic of Brazil and the Republic of Colombia (2015), "preamble" ;*[182]
ii. *Cooperation and Investment Facilitation Agreement between the Government of the Federative Republic of Brazil and the Government of the Republic of Mozambique (2015), Annex I, "Thematic Agendas for Cooperation and Facilitation", clause no. 4*[183] *;*
iii. *Agreement and Cooperation and Facilitation of Investments between the Federative Republic of Brazil and the Republic of Malawi (2015), Annex I, "Thematic Agendas for Cooperation and Facilitation", section "d" ;*[184]

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[181] Source:
https://icsid.worldbank.org/es/recursos/base-de-datos/base-de-datos-de-Tratados-Bilaterales-de-Inversi%C3%B3n
http://www.sice.oas.org/ctyindex/BRZ/BRZBITs_s.asp

[182] Cf. "Recognising the fundamental role of investment in promoting sustainable development, economic growth, poverty reduction, employment creation, expansion of productive capacity, technology transfer and human development".

[183] Cooperation on sectoral legislation and institutional exchanges [...] ii. The Parties shall seek to promote technological, scientific and cultural cooperation through the implementation of actions, programmes and projects for the exchange of knowledge and experience, in accordance with their mutual interests and development strategies. The Parties agree that access to and eventual transfer of technology shall be carried out, as far as possible, free of charge and with the contribution in effective trade in goods, services and related investments".

[184] Cf. Regulatory cooperation and institutional exchanges [...] ii. The Parties undertake to promote technological, scientific and cultural cooperation through the implementation of actions, programmes and projects for the exchange of knowledge and experience, in accordance with their mutual interests and development strategies. The Parties agree that access to and eventual transfer of technology shall be carried out, as far as possible, free of charge and to contribute to effective trade in goods, services and related investments.

iv. *Cooperation and Investment Facilitation Agreement between the Federative Republic of Brazil and the Republic of Ecuador (2019), Annex I, "Agenda for Enhanced Cooperation and Investment Facilitation", section "d" ;*[185]

v. *Investment Cooperation and Facilitation Agreement between the Federative Republic of Brazil and the Kingdom of Morocco (2019), preamble*[186] *and Annex I, "Agenda for Investment Cooperation and Facilitation", section "b"*[187] .

1.2. ***Effective:***

i. *Cooperation and Investment Facilitation Agreement between the Government of the Federative Republic of Brazil and the Government of the Republic of Angola (2015), Annex I, "Thematic Agendas for Cooperation and Facilitation", clause no. 3*[188] .

Prohibitions on performance requirements in international investment agreements are one of the central issues in investment negotiations today. The controversy raised by these obligations is a key area of concern for all states that have signed BITs. Developed countries have used performance requirements to promote their development and national interests. However, these countries often support the inclusion of prohibitions on performance requirements with developing countries (e.g. the US, Japan, UK, Germany and France) and emerging economies (e.g. China and South Korea) have these restrictions on FDI in their territories to promote their development objectives.

However, States may establish several exceptions to ensure the legal application of certain types of performance requirements in certain circumstances. First, through general treaty exceptions (e.g. temporary exceptions, national security exceptions and temporary safeguards that allow for transitional performance requirements on capital movements, payments and transfers). Second, exceptions that apply to all types of performance requirements (e.g. existing non-conforming measures, sectoral exceptions and those not explicitly prohibited in BITs). Third, exceptions that apply to some types of intellectual property rights (e.g. to locate production, to carry out research and development, to provide a service, to train/employ workers, to build/expand facilities, with respect to public procurement, to enforce technology transfer requirements, to qualify for export promotion and foreign aid programmes, to qualify for preferential tariffs and preferential quotas,

185 Cf., "d. Institutional Regulatory Cooperation and Exchange: [...] ii. The Parties agree that access to and eventual transfer of technology shall be undertaken, where possible, with the objective of contributing to effective trade in goods, services and related investment.

186 Cf. "Considering the importance of promoting sustainable investment and the transfer of technology and know-how to achieve the objectives of sustainable growth and development".

187 Cf. "The Parties agree that access to and transfer of technology should be realised, whenever possible, and that it should contribute to the development of economic activity, trade in goods and services and productive investment.

188 Cooperation on sectoral legislation and institutional exchanges [...] The Parties agree that access to and eventual transfer of technology shall be conducted, to the extent possible, in accordance with the understanding of the Parties so as to contribute to effective trade in goods, services and related investment.

requirements necessary to ensure compliance with national laws and to protect the environment). However, these exceptions may vary considerably from one treaty to another, as each state must carefully exclude relevant sectors or non-compliant measures, among other exceptions, from the scope of application of the obligations of the prohibition on performance requirements.

H) CONCLUSIONS

Throughout the paper, different factors affecting technology transfer in the countries under study have been analysed. The first chapter examined the rules and definitions of the phenomenon under study in order to examine how countries have implemented the rules in favour of technology transfer. The second chapter shows indicators on the subject, while the third chapter analyses the incentives that have been introduced in the legislations in order to promote transfer. The following chapters analyse the regulatory environment, from civil and commercial law, competition and international law.

Among the main findings, it can be concluded that, first, most countries have established rules that regulate technology transfer from promotion, through tax incentives, for which, in most cases, the registration of transfer contracts with the different enforcement authorities is required. However, the registration is merely informative and the authorities do not have the power to analyse its provisions in depth, nor to modify them in favour of technology transfer. Therefore, the effectiveness of these incentives depends on the scope of the concept of technology transfer in these legislations.

Second, there is a lack of data on the effect of the incentives that were implemented in the legislation under study. The question of how to match the specific type of incentive with the chosen objective or goal needs to be focused on, and the widespread use of fiscal incentives suggests that sufficient attention is rarely paid to the actual design of investment incentives. The lack of data does not make it possible to assess whether or not the incentives generated favour transfer and in which technology sectors.

Third, it is possible that developing countries, particularly those under study, can take steps to reduce the "technology gap" between their firms and foreign firms. But this requires the establishment of national or regional innovation systems that encourage local R&D, transfer knowledge from universities and public laboratories to domestic firms, and promote the use of telecommunications, e-commerce, biotechnologies and other cost-saving technologies. This requires a comprehensive regulatory system that covers technology transfer from several aspects and not only incentives.

Fourth, in contractual matters, with the exception of some forms of contracts, there are no specific provisions for technology transfer. The most common forms found in the legislations are the assignment and licensing of patents. However, there are no clear provisions on transfer, royalties and others.

Fifth, the transfer of technology is regulated by the abuse of rights, which does not establish clear requirements and depends on the judicial assessment of these requirements.

Sixth, contracts are the ideal tool to favour the formal transfer of technology and licences are the most used institute, so there is still room for improvement in order to grant legal certainty to both parties of the legal business, promoting international technology transfer. Legal certainty to both parties of the legal business promoting the international transfer of technology.

Seventh, in the area of competition law, there is still a long way to go, unlike in developed countries, in the jurisdictions under study no guidelines or regulations have been developed to allow the application of competition rules in the framework of technology transfer.

Eighth, there is also no case law to evaluate criteria or interpretations, both judicial and administrative, of practices that can be considered abusive in the context of technology transfer.

Ninth, in these jurisdictions, the BITs establish restrictions on performance requirements, something that deserves further study as they are valid tools for developing countries to favour technology transfer.

Tenth, while FDI is desirable, there is insufficient evidence on the relevance of technology transfer to encourage technology transfer. Moreover, FDI and licensing are responsive to an appropriate business environment. Important factors are, among others, an efficient infrastructure and government transparency and stability. For example, a more important impediment to capital inflows and FDI may be inadequate governance and economic institutions in countries, rather than the creation of more favourable conditions than for nationals.

Finally, as this is a first study, a large number of questions remain to be answered and new lines of research are open, in particular at the legal level, where both contractual and competition regulations have great potential to be developed. The same is true at the international level where performance requirements and the regulatory framework are still open to debate.

With regard to transfer regulations, in many cases the rules need to be modified and updated as they have become anachronistic in the face of technological development. It is also necessary to consider that the transfer regulations should cover not only incentives but also more specific regulations per technological sector and that they should be complementary so that the crazy incentives are used effectively.

I) ANNEX I

I.1 Judicial decisions

SUPREME FEDERAL COURT - STF

Extraordinary Appeal No 95.382-5/RJ		
Trial date: *05/08/1983*	*Court:* *STF*	*Rapporteur:* *Minister Oscar Corrêa*
Facts of the case	*Appellant: Instituto Nacional da Propriedade Industrial - INPI* *Respondent: Royal Diamonds Dieletric S/A* This is a case involving a technology transfer contract entered into between a French company, as a technology supplier, and a Brazilian company. When analysing the request for registration of the contract, the INPI demanded modifications to its content, such as: (i) the conclusion of a specific contract for the free licence of eventual patents in force in Brazil; (ii) the inclusion of a maximum term of 5 years for the duty of confidentiality of the Brazilian company receiving the technology; (iii) the reduction of the contractual term to 5 years. As it considered these amendments illegal, the Brazilian company filed a lawsuit. After going through the lower courts, with conflicting judgements, the case reached the Brazilian Constitutional Court. In this case, the scope and interpretation of the legislation relevant to the purposes of the INPI (Laws n.º 5.648/1970 and 5.772/1971) was discussed.	
Legal reasoning of the Court	In its decision, the STF understood that article 2 of Law 5.648/70 granted powers to the INPI in the analysis of technology transfer contracts and affirmed the power of the body to intervene in the conditions contracted between the parties. The Minister Rapporteur recorded the importance of technology transfer as presumed for the development of less developed nations, which is why the INPI (the body destined for the examination and control of the conditions under which technology transfer will take place) should provide the best conditions for the exploration of new techniques, in a competitive manner, in the market and for the defence of the national interest. According to an emblematic section of the rapporteur's vote: "It is necessary to be careful, therefore, the registration of such contracts, which involve the transfer of technology - as foreseen in article 126 of the Industrial Property Code (Law n. 5.772 of 21.12.71), need special examination for the evaluation; what the litigant company seems to be an excellent and real contribution, in know-how, to the Country - under	

	the special, individual optics, in which it places itself, and without prejudice to the honesty of its purposes - may, in reality, not represent it, in the complex examination of a much wider reality, in the general life of the problem, of which the law presumes - the INPI must have, as the centre of all the relative pretensions, the same object. It is up to it to verify the aspects in which the private interest is involved, even if it is alien or indifferent, such as the control of national companies, which can be endangered, under various forms, apparent or surreptitious; the effectiveness and convenience of the intended transfer of technology; the limits within which the processes used will take place; etc. (...) In this respect, intervention in the economic domain finds no opponents, if it is an area in which the private interest is subordinated to the higher general interest, which the State embodies and represents.
Failure	By unanimous vote, the Court heard the appeal and declared the appeal well founded, reforming the decision.

SUPERIOR COURT OF JUSTICE - STJ

Special Appeal No 1.200.528-RJ		
Trial date: *16/02/2017*	*Court:* *STJ*	*Rapporteur:* *Minister Francisco Falcão*
Facts of the case	*Appellant: Unilever Brasil Ltda. and another.* *Respondent: Instituto Nacional da Propriedade Industrial - INPI* This is a case involving technology transfer contracts concluded in 2004 between companies of the same economic group, with activities in the cleaning, hygiene and food sector. The supplier of the technology was a company located in Holland and the acquirers were Brazilian. The contracts were submitted to the INPI for registration, under the terms of article 211 of the LPI. The body, however, presented several demands for such registration, such as: suppression of the clause that established the absence of guarantee on the technology; alteration of the secrecy clause to fix the term at 5 years; inclusion of reciprocity of certain rights and obligations; modification of the clause so that the technology provider would be liable before the acquirer in the event that the technology violated third party rights. Some requirements were complied with by the registrants, including by submitting contractual additives, and others were not, as the registrants objected to them. When issuing the registration certificates in 2006, the INPI,	

	among other considerations, changed the nature of the contracts from onerous to free of charge, which resulted in the filing of legal action by the technology purchasers. In the first instance, it was decided that the INPI has the capacity to interfere in technology transfer contracts and, therefore, rejected the proposed action. The Brazilian companies claimed that the decision would make the effectiveness of the technology transfer unfeasible and filed an appeal to the Federal Regional Court of the 2nd Region - TRF2, for its reform. The TRF2 unanimously reformed the decision (Appeal in Security Mandate no. 0511670-96.2006.4.02.5101), under the main argument that the revocation of the sole paragraph of article 2 of Law 5.648/70 by the LPI did not compromise the "duty of the INPI to adopt measures capable of establishing better conditions for (...) intervening in the contractual conditions established for the transfer of technology, since such duty is contained in the greater one of enforcing the rules governing industrial property, while at the same time attending to its social and economic function....) to intervene in the contractual conditions established for the transfer of technology, since such duty is contained in that greater duty to enforce the rules governing industrial property, while at the same time attending to its social and economic function". Again the companies appealed, this time to the STJ. The appellants argued that the agreement was contrary to articles 211 and 240 of Law 9.279/1996. They claimed that articles 12 and 13 of Law no. 4.131/1962 and article 50 of Law no. 8.383/1991 were violated, which would not prohibit the remittance of securities abroad as industrial property and technology. They argued for the limitation of deductibility to 5% of gross income. The Public Prosecutor's Office argued for the rejection of the appeal, given (i) the impossibility of remitting the royalties to the foreign parent company, given the simultaneity of the technology transfer contract with another trademark licence contract; and (ii) recognised the capacity of the INPI to analyse the contracts.
Legal reasoning of the Court	The Minister Rapporteur acknowledged the possibility of the INPI to intervene in the technology transfer contract signed between the companies, altering the agreed terms. For the rapporteur, the alteration of art. 240 of Law no. 9.279/1996 (excluding the sole paragraph) does not mean that the INPI has lost the power to intervene in the technology transfer contract. Even with the alteration, the INPI maintains the prerogative to make a judgment of convenience and opportunity of contracting, i.e., the power to define which technologies would be the most appropriate for the economic development of the country, due to the *maintenance of the provision that it is up to the INPI to attend to the social, economic, legal and technical functions*. It also cited the provisions of article 5, item XXIX of the Federal Constitution, which

	conditions the protection of industrial inventions to the social interest and to the technological and economic development of the country.
Failure	By unanimous vote, the Court dismissed the appeal, upholding the decision.

TRIBUNAL REGIONAL FEDERAL DA SEGUNDA REGIÃO (TRF-2)

Appeal in Security Mandate No. 0800906-41.2007.4.02.5101		
Trial date: *28/04/2009*	*Court:* *TRF-2*	*Rapporteur:* *Federal Disembarker Messod Azulay Neto*
Facts of the case	*Appellant: Koninklijke Philips Electronics N V* *Respondent: Instituto Nacional de Propriedade Industrial - INPI* This is a case involving a patent licensing contract. When analysing the application for registration of the contract, the INPI demanded the alteration of the value of the royalties adjusted by the parties. The parties contested the demand in court. In the first instance, the judge decided that the INPI could alter the value of the royalties, since (i) it is entitled to eventually assess the abusive exercise of dominant position by the licensor, with prejudice to the local technological development; (ii) the setting of *royalties* at a value of 20% (twenty percent) of the net price of the product violates the constitutional principles of proportionality and reason, not respecting the social function of the patent, ensured by section XXIX, article 5 of the Constitution. The Appellant argued that the INPI's activity is merely registry-related, so that any interference in contracts already signed would represent an abuse of power. It also argued that there was no legal provision limiting the remittance abroad of *royalties* between companies that do not have a corporate relationship. The Federal Public Prosecutor's Office expressed its support for the rejection of the appeal.	
Legal reasoning of the Court	According to the rapporteur, the basis for the solution of the dispute is the constitutional principle of legality. Thus, even before the repeal of the sole paragraph of Article 2 of Law No. 5.648/1970, the INPI could not make demands in the registration of technology transfer contracts that altered what was stipulated between the parties. Furthermore, according to the Rapporteur, Laws n.º 9.276/1996 (on industrial property), n.º 4.506/1964 (on remittance of dividends), and n.º 3.000/1999 (on	

	income tax), do not foresee limits for securities traded between the Parties, only limits of tax deductibility. In summary, it concluded that the INPI could not intervene in the contract for the following reasons: (i) no legal power; (ii) the absence of a public price delimitation rule or policy; (iii) it is an act of speculation, due to INPI's lack of technical knowledge of market pricing policy and its reflection on production; (iv) the state is prohibited from intervening where the parties do not feel aggrieved, on pain of replacing the rule of law with welfarism. Finally, he stressed that excessive state intervention in the economy would harm the attraction of foreign resources, which is essential for the development of any country in the globalised era.
Failure	By a majority (with Mr J.C. Alberto Nogueira Junior partly defeated), the Court allowed the appeal.

Appeal under Security Mandate No. 0504157-77.2006.4.02.5101		
Trial date: *04/06/2008*	*Court:* *TRF-2*	*Rapporteur:* *Federal Embargo Liliane Roriz*
Facts of the case	*Appellant: Koninklijke Philips Electronics N V* *Respondent: National Institute of Industrial Property - INPI* This is a case involving a patent licensing agreement entered into between the Appellant and a Brazilian company (Novodisc Brasil Fonográfica Ltda.). When registering the contract, the INPI included, in the respective certificate, the limitation to the remittance of *royalties. The* Appellant filed an injunction to exclude this information from the certificate. In the first instance, the judge dismissed the injunction on the grounds that it is up to the INPI to assess the possible abusive exercise of a dominant position by the licensor, with prejudice to local technical development, in accordance with the measures regulating unfair competition practices or conditions preventing the transfer of technology in licensing contracts in the TRIPS agreement, rectified by Brazil through Legislative Decree no. 1.355/1994. The Appellant appealed to the TURF, arguing that the INPI acted in abuse of power, since Brazilian law does not stipulate any limitation on the remittance of *royalties* between companies that do not have a corporate relationship.	

	The INPI argued that, in the case of CD-R discs, the massive dissemination of production on a global scale, via a worldwide computer network, led to a drop in prices, due to oversupply, resulting in excessive burdens. For the INPI, the alteration was necessary to mitigate this effect. The Federal Public Prosecutor's Office expressed its support for the rejection of the appeal.
Legal reasoning of the Court	For the Rapporteur, Law No 5.648/1970 confers on the INPI the power to intervene in technology transfer contracts, thus ensuring the social function of industrial property. The repeal of the sole paragraph of Article 2 of the aforementioned law did not, in his opinion, affect INPI's duty to adopt measures capable of establishing better conditions for the negotiation and use of patents and to intervene in the contractual conditions established for the transfer of technology. He observed that by failing to set limits for the remittance of *royalties*, the contract allowed disproportion between the value of the royalty to be remitted and the net selling price of the product. Free competition, he considered, should eventually yield to other limits, such as the protection of public order, the social function of property or the guarantee of national development. It did not envisage, in these terms, illegal or abusive action on the part of the INPI. In a dissenting vote, the Federal Disembargo Messod Azulay Neto opined in favour of upholding the appeal, invoking the same reasons that he presented in Case 1, above, where he was rapporteur.
Failure	By majority, the Court dismissed the appeal, in accordance with the Rapporteur's vote. Federal Disembargo Messod Azulay Neto voted against.

I.2 DECISIONS OF THE ECDC

I. Comments on the decisions

These are administrative decisions of the Administrative Council for Economic Defence (CADE) in rescue proceedings (acts of concentration) and not anti-competitive conduct. The proceedings were initiated under the previous competition law (Law n. 8884/94), however, during their processing, the current Brazilian Competition Law (Law n. 12.529/11) came into force.

The technology transfer contracts entered into by Monsanto with different parties were individually examined and approved by CADE for the preventive control of market structures on the grounds of their possible merger reference framework. Each contract resulted in an administrative process.

Except for case 5, the decisions of the CADE plenary on all the proceedings were issued in the same session, but the votes were issued by the Advisors of each proceeding at different times during the proceedings. Therefore, there are internal references to the votes pronounced in other proceedings and votes of the same tenor.

The decisions initially refer to the frame of reference of the contract as salvage (knowledge) and, only after overcoming this issue, the analysis of the merit of the contracts takes place.

The administrative proceedings were carried out with the attribution of secrecy on certain documents, among which, the technology transfer contract itself is being examined. For this reason, the case was analysed on the basis of the information and documents available for public consultation, in particular the votes of CADE's board members regarding the impact of the technology transfer contract on competition. Therefore, the description of the cases found is prejudiced and has limitations.

In the following items, we describe two cases and cite the others. If you are interested, we can describe the other cases as well.

II. Cases

Case 1: Monsanto and Nidera

Salvage No. 08012.006706/2012-08		
Trial date: *28/08/2013*	*Court:* *CADE*	*Rapporteur:* *Alessandro Octaviani Luis*
Applicants	Monsanto do Brasil Ltda. and Nidera Sementes Ltda.	
Facts of the case	Subject: non-exclusive commercial licence agreement for the development, testing, production and commercialisation of *Intacta RR2 PRO*™ soybean seed varieties (new genetically modified, insect and glyphosate resistant soybean seed technology) between the Applicants. Requests: The Applicants requested that the rescue not be known, because the operation was harmless to competition in the segment. In the alternative, unrestricted approval of the act.	

	Confidentiality: The Applicants protested the confidential treatment of information and documents relating to business secrets, including between each other. Opinions: The General Coordination of Antitrust Analysis 5 SG/CADE recommended that the transaction be approved, without restrictions, considering that it did not generate competition concerns, due to Nidera's low market share in the Brazilian market for soybean seeds for sowing, and also because no exclusivity or penalty clause had been agreed between the applicants.
Raciocinium = The Court's legal arguments	Vote of the Advisor-Rapporteur, Alessandro Octaviani Luis: initially, he took cognizance of the operation, based on art. 54, § 3.º, of Law no. 8.884/1994, and approved it without restrictions. He argued different grounds for the knowledge of the operation, among which (i) the duty of the antitrust administration to protect the conditions of competition in a market inherently permeated by imbalances and disruptions that challenge economic models and legal types; (ii) the potential for greater intensity of corporate dominance in sectors of very high technological density, in which the forms of control of the negotiated technology ("*black box dependence*", or "*the code is the law*") have an impact. For the Advisor, the National Biotechnology Development Policy (Decree no. 6.041/2007) authorises the state to act in the national biotechnology industrial park to promote national industry and the country's technological autonomy. The possibility of dictating *black box* standards in technology transfer contracts to the recipients of supplied products or processes, in turn, requires the examination of business structures by the antitrust authority. On the merits, in view of (i) Nidera's reduced market presence; (ii) non-exclusivity; and (iii) the power to terminate the contract at no cost, it voted to approve the transaction. At the end of the trial, however, he modified his opinion to fully support the conclusion of counsel Eduardo Pontual. Vote of Counsel Ana Frazão: initially, she followed the vote of Counsel Marcos Paulo Veríssimo in the salvage case no. 08012.002870/2012-38 (Case 2, summarised below). He cited as a basis Law no. 12.529/2011, which adopted clearer parameters for salvage scenarios. It argued that, although patent licensing contracts may give rise to external control or dominant influence, these would not be sufficient elements for a prior, notifiable control. The risk of anti-competitive effects of the contract would give rise to conduct control by CADE. Otherwise, he concluded that, ideally, all continuing service contracts between companies should be subject to CADE's preventive control. At the end of the trial, however, he rectified his vote, in order to join counsel Eduardo Pontual. Elvino de Carvalho Mendonça's vote: knowledge of the bailout, as potentially detrimental to free competition. On the merits, he joined the vote of the Advisor-Rapporteur, Alessandro Octaviani. According to his vote, licensing contracts play a dual role in the economy, because they contribute to the dissemination of innovations and, at the same time, represent an element of barrier to the dynamics of competition. He referred to the economic literature on the effects of licensing agreements on competitive

behaviour, namely the adoption of strategies to (i) prevent the development of new technologies by potential entrants; (ii) prevent the entry of potential competitors; (iii) reduce market profits; (iv) prevent imitation. He provided guidance from foreign case law (*Federal Trade Commission* and Comunidade Europeia), which highlights the existence of situations where licensing agreements have potential, measured by the definition of the relevant market and by the application of a market power analysis standard, restrictive to the sectors of goods, technology and innovation. He reviewed the literature on the entry of transnational corporations active in the trade of selected conventional seeds and GM seeds, the latter monopolised by Dupont and its subsidiaries, as well as Monsanto, via subsidiary Monsoy and, mainly, via agreements for the transfer and use of *RoundUp Ready*® herbicide technology for glyphosate-resistant seeds. The Advisor understood that there was a horizontal relationship between Monsoy (Monsanto) and the companies working with its partners' soybean seeds (some through licensing agreements), as well as vertical integration between the herbicides offered by Monsanto compatible with genetically modified soybean seeds. It concluded that Monsanto would use technology transfer via licensing contracts to commercialise the modified soybean seeds that would enhance the use of its crops, functioning as a *special type of non-exclusive integration*, explaining why Monsanto's market share increases as technology transfer via licensing spreads. Therefore, the nature of the licensed technology would determine the union of Monsanto and Nidera, with the former having external control over the latter, regardless of whether or not there is exclusivity in the licensing.

Vote of the Advisor Eduardo Pontual Ribeiro: knowledge of the act, due to stipulate limitations to the performance of independent competence of the licensees and to set, between them and the licensor, holder of a dominant position in the market, *common enterprise*, which would be, the crop obtained, marketed through licenses. On the merits, he voted for the approval of the bailout, with restrictions, which consist of the duty to eliminate clauses that place barriers to entry, as well as those that allow Monsanto to interfere in the management of the licensees.

He did not identify a competition problem in relation to Monsanto's *RoundUp Ready*® line, because there are several brands of glyphosate in Brazil. With regard to the seed and genomics segment, where the glyphosate-resistant enzyme-modified seed *Intacta RR2 PRO*™ soybean is manufactured, he pointed out that it was a transgenic approved for use in Brazil only in 2010, with 68 (sixty-eight) crops registered in the National Crop Register, all obtained under the auspices of research and development contracts, cumulated with those of the operation. It identified the three types of royalties charged by Monsanto: (i) *royalty on seed*, paid by farmers; (ii) *royalty on grain*, paid by farmers on delivery of grain to delivery points; (iii) *multiplication royalty*, paid by the multipliers - including breeders - i.e. those responsible for production and trade, those responsible

	for the large-scale production and trade of seeds, and highlighted its *liquid anti-competitive effect*, by representing a system of incentives that would create external influence by Monsanto on the commercial decisions of licensees, with the effect of raising unjustified barriers to entry. The clauses on the incentive system, by graduating in an increasing way the percentages for the calculation of the bonus for the licensees, in proportion to the Monsanto technology in their portfolio *mix*, according to the Advisor's understanding, would constitute *payment of a premium to reduce the interest of the licensees in developing technology for the competition.* Other clauses would demonstrate cooperation for a common favouring of the *Intacta RR2 PRO*™ brand and, therefore, would be equivalent to exclusivity in the Advisor's view: (i) imposition of penalties on licensees for the risk of eventual non-compliance by farmers; and (ii) regulation of licensees' remuneration, regardless of whether or not farmers have purchased the seeds saved with the licensees (*share* clause). Vote of the President of CADE: he supported, on knowledge and merit, the vote of Advisor Eduardo Pontual. He emphasised that the case in question should be raised regarding the definition of the type of operation framed within the concept of salvage, for the purposes of submission to CADE, for the control of structures. He stated that a definition of salvage should achieve the following objectives: (i) to target transactions that lead to longer-lasting structural changes in the market; (ii) to avoid including transactions that have little chance of generating anticompetitive impacts or that are better controlled by other instruments available to the authorities of the Brazilian Competition Defence System; (iii) to use criteria that are as objective and transparent as possible, without generating legal uncertainty. It understood that the requirements to configure concentration in the case are present, by virtue of: (i) the influence of Monsanto in strategic decisions of the other contractors, beyond the object of the contract, by virtue of the design of the incentive system; (ii) the remuneration of the licensees by parameters outside the sales of the licensed products; (iii) the solidarity generated by sharing the risks, evidenced by the imposition of penalties on the licensees for losses caused by the non-compliance of the farmers. Rather than finding cooperation and collaboration, the characterisation of licensing contracts as salvage would involve considerations of the independence of the contracting parties, mainly based on the analysis of the effects of certain clauses of the contract on the ability of one of the parties to interfere in the contractually relevant decisions of the other party and on the risk-sharing format.
Failure	CADE's decision: by majority vote, the transaction was heard by CADE, after Marcos Paulo Veríssimo's advice, and, without merit, *approved with restrictions*, determining a term of 60 (sixty) days for the verification of the changes, after Elvino de Carvalho

	Mendonça and Marcos Paulo Veríssimo's advice, who voted for the approval without restrictions. Appeal: The Requesters lodged appeals against the decision (declaration embargoes), which were partially accepted, with confidential versions of the votes being prepared for each Requester and the deadline for the verification of the alterations determined being returned. Compliance with the decision: the Requesters attached a copy of the minutes of the additive contractual term. The Specialised Federal Prosecutor's Office together with CADE (CADE/PGF/AGU) attended to the fulfilment of the obligations of alteration of the contractual clauses.

Case 2: Monsanto and Syngenta

Salvage No. 08012.002870/2012-38		
Trial date: *28/08/2013*	*Court:* *CADE*	*Rapporteur:* *Adviser Marcos Paulo Veríssimo*
Applicants	*Monsanto do Brasil Ltda. and Syngenta Crop Protection Ltda.*	
Facts of the case	Object: licensing agreement between Syngenta and Monsanto, for the granting of a non-exclusive licence for the development, testing, production and trade of technology protected by intellectual property rights (Intacta RR2 PRO™ soybean seed varieties) in Brazil, without contracting, supply or payment of royalties for the use of agricultural defensives with patented formula and/or directly related to the transferred technology. Request: The Requesters argued that the transaction did not result in a concentration, so that the rescue should not even be considered by the antitrust authority. In the alternative, they requested that the transaction be approved unrestrictedly. Opinions: The Secretary of Economic Accompaniment of the Ministry of Finance - SEAE/MF recommended the approval without restrictions of the operation due to the absence of exclusivity of the licensing, or of a modifying effect on the corporate structure of the Requirentes. The Secretary of Economic Law of the Ministry of Justice - SDE/MJ - gave its opinion for the approval of the act, without restrictions, adopting the motivation of the opinion of the SEAE/MF, and forwarded the process to the Administrative Council of Economic Defence, for trial. Confidentiality: The request for confidential treatment of the information and documents submitted by the Requesters was granted.	

Raciocínio Court's legal argumentation	Vote of the Advisor-Rapporteur, Marcos Paulo Veríssimo: no knowledge of the bailout, as it does not fall under the hypothesis of incidence of art. 54 of Law no. 8.884/1994[189] . It was reported to precedents of autarchy involving the licensing of patents by the applicant Monsanto itself, which were either approved or were not known by CADE. For the Rapporteur, the competition concerns arising from the abusive exercise of patent rights are related to repressive (*ex post)* control of conduct. Admitting the preventive control of structures in these cases (where there is no joint venture or joint action, no corporate reorganisation, and no provision for an exclusivity clause) could result in strategic behaviour by CADE to approve contracts that, in their execution, will prove to be anti-competitive. Patent licensing contracts, according to the Rapporteur, do not have the effect of producing economic salvage, but deconcentration. Vote of Ana Frazão: initially, accompanied the Advisor-Rapporteur. She invoked as grounds Law n.º 12.529/2011, which adopted clearer parameters for rescue hypotheses. He defended that although patent licensing contracts may give rise to external control or dominant influence, these would not be sufficient elements for a prior, notifiable control. The risk of anti-competitive effects of the contract would give rise to conduct control by CADE. To understand differently, he concluded, would be to subject all continuing service contracts between companies to CADE's preventive control. At the end of the trial, however, he rectified his vote, in order to join Eduardo Pontual. Elvino de Carvalho Mendonça's vote: knowledge as salvage, not merit, accompanied Alessandro Octaviani's vote in CA n.º 08012.006706/2012-08 (Case 1, above). According to his vote, licensing agreements play a dual role in the economy, contributing to the dissemination of innovations and, at the same time, representing a barrier to competitive dynamics. He referred to the economic literature on the effects of licensing agreements on competitive behaviour, especially the adoption of strategies to (i) prevent the development of new technologies by potential entrants; (ii) prevent the entry of potential competitors; (iii) reduce the profitability of the market; (iv) prevent imitation. He explained the orientations of foreign jurisprudence (*Federal Trade Commission* and Comunidade Europeia), which highlight the existence of situations where licensing agreements have potential, measured by the definition of the relevant market and by the standard application of the market power analysis, restrictive in the sectors of goods, technology and innovation. He reviewed the literature on the entry of transnational corporations active in the trade of selected conventional seeds and transgenic seeds, the latter monopolised by Dupont and its subsidiaries, as well as Monsanto, via subsidiary Monsoy, and mainly via agreements for the transfer and use of *RoundUp Ready*® herbicide technology for glyphosate-resistant seeds. The Advisor understood that there was a horizontal relationship between Monsoy (Monsanto) and the companies working

[189] Art. 54. Acts, manifested in any form, which may limit or impair free competition in any way, or result in the domination of relevant markets for goods or services, shall be submitted to CADE for assessment.

	with its partners' soybean seeds (some through licensing agreements), as well as vertical integration between the herbicides offered by Monsanto compatible with genetically modified soybean seeds. It concluded that Monsanto would use technology transfer via licensing contract to commercialise modified soybean seeds that would enhance the use of its crops, functioning as a *special type of non-exclusive integration*, explaining why Monsanto's market share increases as technology transfer via licensing spreads. Therefore, the nature of the licensed technology would determine the union of Monsanto and Syngenta, with the former having external control over the latter, regardless of whether or not there is exclusivity in the licensing. Eduardo Pontual Ribeiro's vote: knowledge of the act, because it stipulates restrictions to the independent competitive performance of the licensees and to establish, between them and the licensor, who holds a dominant position in the market, a common *undertaking*, which would be the crop obtained, marketed through the licenses. On the merits, he voted for the approval of the bailout, with restrictions, consisting of the duty to eliminate clauses that would create barriers to entry, as well as those that would allow Monsanto to interfere in the management of the licensees. He did not identify a competition problem with Monsanto's *RoundUp Ready*® line, as there are different brands of glyphosate in Brazil. In relation to the seeds and genomics segment, where the glyphosate-resistant enzyme-modified seed *Intacta RR2 PRO*™ soybean is manufactured, he pointed out that it was a transgenic approved for use in Brazil only in 2010, with 68 (sixty-eight) crops registered in the National Crop Register, all obtained from research and development contracts, cumulated with those of the operation. It identified the three types of royalties charged by Monsanto: (i) *royalty on seed*, paid by farmers; (ii) *royalty on grain*, paid by farmers on delivery of grain to delivery points; (iii) *multiplication royalty*, paid by multipliers - including breeders - i.e. those responsible for production and trade, those responsible for the production and large-scale trade of seeds, and mentioned its *liquid anti-competitive effect*, by representing a system of incentives that would create external influence by Monsanto over the commercial decisions of licensees, with the effect of raising barriers to entry without justification. The clauses on the incentive system, by graduating in increasing bands the percentages for the calculation of the bonus to licensees, based on the proportion of Monsanto technology in their portfolio *mix*, would, in the opinion of the consultant, constitute *payment of a premium to reduce the licensees' interest in developing competing technology*. Other clauses that would demonstrate cooperation for the common success of the *Intacta RR2 PRO*™ brand and, therefore, would amount to exclusivity according to the Consultant: (i) imposition of penalties on licensees for the eventual non-compliance of farmers; and (ii) regulation of licensees' remuneration, regardless of whether or not farmers have purchased the saved seeds with the licensees (*share* clause).

Failure	CADE's decision: by majority, the transaction was heard by CADE, after the expiry of the term of office of the Advisor-Rapporteur Marcos Paulo Veríssimo, and, without merit, the transaction was *approved* by majority, *with restrictions*, determining a term of 60 (sixty) days to verify the changes, after the expiry of the terms of office of Advisors Elvino de Carvalho Mendonça and Marcos Paulo Veríssimo, who voted for the unrestricted approval. Appeal: The Requesters lodged appeals against the decision (declaration embargoes), which were partially accepted, with confidential versions of the votes being prepared for each Requester and the deadline for checking the alterations determined being returned. Compliance with the decision: the Requesters attached a copy of the minutes of the additive contractual term. The Specialised Federal Prosecutor's Office together with CADE (CADE/PGF/AGU) attended to the fulfilment of the obligations of alteration of the contractual clauses.

Case 3: Monsanto and COODTEC

Salvage No. 08700.003898/2012-34		
Trial date: *28/08/2013*	*Court:* *CADE*	*Rapporteur:* *Adviser Alessandro Octaviani Luis*
Applicants	*Monsanto do Brasil Ltda. and Cooperativa Central de Pesquisa Agrícola - COODETEC*	

Case 4: Monsanto and Don Mario

Salvage No. 08700.003937/2012-01		
Trial date: *28/08/2013*	*Court:* *CADE*	*Rapporteur:* *Adviser Alessandro Octaviani Luis*
Applicants	*Monsanto do Brasil Ltda. and Don Mario Sementes Ltda.*	

Case 5: Monsanto and Bayer

Salvage No. 08700.004957/2013-72		
Trial date: *27/01/2014*	*Court:* *CADE*	*Rapporteur:* *Adviser Alessandro Octaviani Luis*

Applicants	*Applicants: Monsanto do Brasil Ltda. e Bayer S/A*

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