Trademarks in Latin America

A study of their economic impact in five countries in the region

(Chile, Colombia, Mexico, Panama, and Peru)

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OVERVIEW

(for general distribution)

A trademark is a sign with distinguishing features that indicates that certain goods or services have been produced or provided by a given person or company, allowing them to be differentiated from those offered by other suppliers. At the same time, many studies have shown trademarks' positive impact on companies' innovation and growth activities. In the practice of business, there are economic activities that more frequently and *intensively* use trademarks, i.e., that use more trademarks per unit of employment or per unit of sale than other activities. Two recent studies of cases in the United States and the European Union analyze this difference between economic activities with regard to the intensive use of trademarks, and measure the resulting impacts on their respective economies.

Following this line of analysis, the main objective of this report is to study the economic impact of trademark-intensive activities in five countries in Latin America: Chile, Colombia, Mexico, Panama, and Peru. The main question it seeks to answer is the following: what is the impact of trademark-intensive activities on employment, salaries, economic activity, and exports and imports in the countries selected?

The findings presented here show that trademark-intensive activities account for a significant share of employment, economic activity, and foreign trade in the economies of the Latin American countries studied. Furthermore, trademark-intensive activities pay higher salaries, which suggests a higher degree of productivity in companies that use trademarks to identify their products and services. Finally, the study finds that these trademark-intensive activities contribute to the economies of the Latin American countries studied to a degree and scope comparable to what is documented in the case of the United States and the European Union.

To produce this study statistical data were gathered about the trademark registrations from the respective Offices of Protection of Intellectual Property of the countries analyzed and from the World Intellectual Property Organization (WIPO). Economic data comes from the statistical offices in each country and from international sources.

The analysis entailed, in the first place, identifying economic activities that are intensive in their use of trademarks. Intensity is defined by two indicators: trademark registration per unit of employment in each activity and trademark registration per unit of sales. Economic activities whose indicators were higher than those of the average for the economy were considered trademark-intensive. The findings are divided into intensive and non-intensive activities according to WIPO's Nice Classification, which consists of 45 classes (34 for goods and 11 for services). After the trademark-intensive activities were identified, their importance for employment, gross domestic product (GDP), and international trade was measured for each country, and the salary differential between intensive and non-intensive sectors was estimated.

The key findings for the countries show the following:

- In employment, the Nice Classes of products and services considered trademark-intensive account for between 8% and 26% of total employment, varying by country. They account for between 10% and 21% of the GDP of the countries studied. These percentages equal 18.5 million jobs and US $2,390 of value added per capita per year for this group of countries.

- The contribution of trademark-intensive sectors to international trade varies from 9% to 33% in the case of exports and between 13% and 51% in the case of imports, depending on the country. For all five countries studied, US $15 of every US $100 exported corresponds to trademark-intensive products. Similarly, trademark-intensive products account for US $26 of every US $100 imported. In general, the impact on exports is smaller than the impact on imports because of the difference in trade patterns: in a large proportion, the countries selected export goods derived from natural resources that are sold wholesale (oil, mineral, and agricultural products) and import manufactured goods that use trademarks more often for identification in markets.

- The analysis of relative salaries in intensive sectors and the average of the economy shows that those of intensive sectors are higher. The salary "premium" between intensive sectors and non-intensive sectors is positive, and varies from 5% and 25%, depending on the country.

Finally, an international comparison was made with studies available for the European Union and the United States. In terms of the share of employment and GDP, the findings for Latin American countries are in line with the experiences from those regions as regards the extent of the impact, though with a somewhat smaller share.

In the case of employment, the share of trademark-intensive activities is, on average, 16% in the United States and 21% in the European Union. Mexico, Panama, and Colombia align with these figures; Chile is a little above this range, and in Peru the impact is lower.

As for the impact of trademark-intensive activities on GDP, in relatively more developed countries, taken as a reference point, the share is around 30%. In the Latin American countries selected, Chile is closest, with trademark-intensive sectors contributing 21% of GDP.

Because of the differences in the trade patterns between Latin American countries and relatively more developed countries (the former export commodities in a high proportion and import manufactured goods and services), intensive sectors have a smaller impact on international trade in Latin America.

Regarding salary premiums, comparative analysis showed that these are greater in the European Union and the United States, though the figures are not strictly comparable because of the large share of informal jobs in Latin America (55% of workers in Latin America did not contribute to Social Security in 2013, according to data from the Inter-American Development Bank). Given that salary statistics do not reflect a portion of the lowest salaries of the economies in the region, correcting for this effect would probably augment the salary premium in our countries.

In sum, an analysis of the findings from the Latin American countries selected shows a great similarity between them. In the five countries, economic activities that register and use trademarks intensively account for 18.5 million jobs and, on average, make up 15% of the Gross Domestic Product, 15% of exports, and 26% of imports. Furthermore, trademark-intensive sectors pay higher salaries than the rest of the economy, which indicates their greater productivity. The international comparison showed that these findings are similar to those available for the United States and the European Union, taking into account the differences in production patterns between the two groups of countries.

GLOSSARY

Colón Free Trade Zone: a specific geographic area in Panama where foreign commodities can enter and remain without being subject to the tax regime.

Economic census: statistical economic information from the establishments engaged in activities producing goods and providing services.

GDP at constant prices: value of the Gross Domestic Product measured at the prices of a base year to take into account the variations in quantities and not in prices.

Gross domestic product (GDP): value of total final goods and services produced in a country over a certain period.

Gross production over sales value: the value of final goods and services and those as inputs or in intermediary stages of production.

Gross world product: value of all goods and services produced worldwide over a certain period of time.

Harmonized system: international classification established by the World Customs Organization for foreign trade that classifies commodities using a six-digit system.

Human capital: the set of productive skills that an individual acquires through accumulation of knowledge.

Industry surveys: surveys that provide basic information for understanding the characteristics of the industry and for analyzing its structural characteristics.

Informal economy: those economic and productive activities that elude legislation and therefore are not registered.

National accounts: an accounting record of the transactions carried out by the different sectors of the economy.

Nice Classification: international classification of products and services applied to trademark registration.

Salary premium: value that measures how much larger, as a percentage, the salaries of employees in trademark-intensive sectors are compared to those of employees in non-intensive sectors.

Standard deviation: the average of the individual deviations from the mean of a distribution (technically, the square root of the average of the squares of the individual deviations).

Trademark-intensive Nice Class: the Nice Class for sectors or economic activities whose products, taken as a whole, show higher trademark registration per unit of employment or per unit of sale than those belonging to other Nice Classes.

Trademark-intensive sector or economic activity: a sector or economic activity whose levels of trademark registration are higher than in other sectors by unit of employment or unit of sales.

Trademarks over employment: registered trademarks in relation to sectoral employment.

Trademarks over GDP: share of trademarks registered in relation to the total final goods and services produced in a period.

Trademarks over sales: registered trademarks in relation to sectoral sales.

Trademarks registered by residents: trademarks registered in a country by a resident thereof.

Value added: the value added to a good in each production stage. The sum total of the value added of all economic activities constitutes the GDP of an economy.

ACRONYMS

CIGEPI-Colombia: Centro de Información Tecnológica y Apoyo a la Gestión de la Propiedad Industrial [Center for Technological Information and Support for the Management of Industrial Property]

DANE (Colombia): Departamento Nacional Administrativo de Estadísticas [National Administrative Department of Statistics], which includes the Dirección de Síntesis y Cuentas Nacionales [Office of Syntheses and National Accounts] (DSCN)

DIGERPI (Panama): Dirección General del Registro de la Propiedad Industrial [General Office of Industrial Property Registration]

ECLAC: United Nations Economic Commission for Latin America and the Caribbean (Comisión Económica para América Latina y el Caribe de las Naciones Unidas)

GDP: Gross domestic product

IMPI (Mexico): Instituto Mexicano de la Propiedad Industrial [Mexican Institute of Industrial Property]

INAPI (Chile): Instituto Nacional de Propiedad Industrial [Mexican Institute of Industrial Property]

INDECOPI (Peru): Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual [National Institute of Defense of Competition and Protection of Intellectual Property]

INE (Chile): Instituto Nacional de Estadísticas [National Institute of Statistics]

INEC (Panama): Instituto Nacional de Estadística y Censo [National Institute of Statistics and Census]

INEGI (Mexico): Instituto Nacional de Estadísticas y Geografía [National Institute of Statistics and Geography]

INEI (Peru): Instituto Nacional de Estadística e Informática [National Institute of Statistics and Computation]

INTRACEN: International Trade Center

ILO: International Labour Organization

ISIC Classification Rev. 4: United Nations International Standard Industrial Classification of All Economic Activities

NAICS: North American Industry Classification System

WIPO: World International Property Organization

EXECUTIVE SUMMARY

A trademark is a sign with distinguishing features that indicates that certain goods or services have been produced or provided by a given person or company, thus allowing them to be differentiated from those offered by other suppliers.

Since the 1980s, developing countries, including Latin American countries, have joined the worldwide trend of increased use of trademarks to identify products and services on markets. Trademarks are a mechanism for identifying the origin and quality of the products by providing information to consumers and to society as a whole. Additionally, in developing countries it has been observed that trademarks are tools available to small and medium-sized enterprises—which account for most of the companies in these countries—that encourage access to international markets and the transfer of technology and know-how. Likewise, two similar studies have recently been conducted in the United States and the European Union that demonstrate the positive impact on their economies of sectors that use trademarks intensively.

Motivated by these precedents, the main objective of this report is to study the economic impact of trademark-intensive activities in five Latin American countries: Chile, Colombia, Mexico, Panama, and Peru. The study is the product of a joint initiative of the Inter-American Association of Intellectual Property (ASIPI) and the International Trademark Association (INTA), which selected the countries to form a representative sample of Latin America's varied economic environment.

The main questions the report seeks to answer are the following:

- What is the impact of sectors that use trademarks intensively in the economic activity of their countries?
- What is their impact on employment and salaries?
- How important are they to the international trade of these countries?

To answer these questions, this study reviewed the specialized literature available, gathered the necessary statistics, and made estimations of the impacts of trademark-intensive brands on the countries selected.

Broadly speaking, the methodology used seeks to identify the economic sectors in which trademarks are registered with *a higher degree of intensity* and to estimate the share of these sectors in the countries' economic activity, employment, and international trade. *Intensity* is understood to be the number of registered trademarks in a year in relation to some sectoral measurement that allows for comparison between sectors. In our case we used two ratios: *trademarks per unit of employment and trademarks per unit of sales* in each sector.

Study methodology:

The stages of the methodology are as follows:

• First, given that sectoral statistics for value-added sales and employment are classified using the International Standard Industrial Classification (ISIC Rev. 4) or a similar system, while statistics for trademarks use a different classification, the Nice Classification, a conversion table between the Nice Classification and the ISIC Classification system was used to associate the economic activities defined in the latter with each Class of trademarks established in the former.

• Second, we determined which economic activities are *trademark intensive*. For this purpose, intensive sectors are defined by considering the following ratios: *annual registration of trademarks / job* and *annual registration of trademarks / sales*. The Nice Classes that show ratios of trademarks to jobs and / or trademarks to sales higher than the respective ratio for all Classes are considered a trademark-intensive class. For this estimation, annual average trademark registration data was gathered for each Nice Class (2010-14) and associated with the employment and sales data of the corresponding activities. These data were used to calculate the ratios of trademarks to job and trademarks to sales.

• Third, the aggregate totals of trademark-intensive sectors for each one of the chosen indicators (employment, GDP, imports, and exports) were compared to the total for the economy to determine their relative importance. In the case of salaries, the average salary in intensive sectors was compared with average in non-intensive sectors to determine the salary "premium."

Study findings:

In 2014, the countries studied occupied the following positions in the international ranking of trademark applications by residents and nationals living abroad: Mexico, no. 17; Chile, no. 28; Colombia, no. 35; Peru, no. 41; and Panama, no. 57, out of a total of 123 countries (WIPO 2015). In other words, all of the countries selected fall considerably above the midpoint of the international ranking, which attests to a significant activity in trademarks in comparison with other countries in the world.

In the countries selected, the trademark-intensive sectors identified by applying the proposed methodology, using the indicators *trademarks / employment* and *trademarks / sales*, are considerably consistent across countries. Furthermore, this consistency extends to sectors identified by WIPO as having the highest frequency of trademark registration according to its international statistics. Table A summarizes the list of intensive sectors selected by country, indicates the sectors with the highest frequency of trademark registration according to WIPO, and shows the consistencies in the cases studied.

Table A
Selected intensive classes by country and their consistency with classes of highest registration frequency according to WIPO in the Latin American countries selected

Most frequent Nice Classes according to trademark use intensity by sector for this study	Category	Trademark-intensive classes in the countries selected				
		Chile	Colombia	Mexico	Panama	Peru
Goods						
1	Chemicals	-	-	X	X	X
2	Paints	X	-	-	-	-
3	Detergents	X	X	X	X	X
5	Pharmaceuticals	X	X	X	X	X
7	Machinery		X			
8	Hand Tools and Implements	-	X	X	-	X
9	Scientific Equipment	-	X	-	X	X
10	Surgical Equipment	-	X	X	X	X
12	Vehicles		X			
13	Firearms	-	X	-	-	X
14	Precious Metals	X	-	X	X	X
15	Musical Instruments	-	X	-	-	-
16	Paper Products	X	-	X	-	X
18	Leather	X	X	X	X	-
19	Construction		X			
20	Furniture	-	-	X	-	-
24	Textiles	X	-	-	-	-
25	Clothing	X	X	X	X	-
26	Dressmaking Supplies	-	-	X	-	-
27	Rugs	-	-	X	X	X
28	Toys	X	X	X	X	X
33	Alcoholic Beverages	X	X	-	-	-
34	Tobacco	-	X	-	-	-
Services						
35	Business Services	X	-	X	X	X
36	Financial and Insurance Services	-	-	-	-	X
38	Telecommunications	X	X	X	X	-
40	Treatment of Materials	X	X	X	X	X
41	Education	X	X	X	X	-
42	Scientific and Technological Services	X	X	X	X	X
43	Food Services	X	-	-	-	-
44	Medical Services	-	-	X	-	-

Note: the shaded categories are the most frequent according to WIPO (2015).

Applying the proposed methodology, the shares of trademark-intensive Nice Classes in employment and GPD of each economy were calculated. As for the share of employment and GDP, the shares vary between 8% and 26% in total employment and between 10% and 21% in GDP, depending on the country. These percentages equal 18.5 million jobs and US $2,390 of value added per capita per year for this group of countries. The findings are given in Table B.

Table B
Share of trademark-intensive sectors in total employment and in total value added in the Latin American countries selected

Contribution to value added – countries selected	Share of trademark-intensive sectors over total employment (%)	Share of trademark-intensive sectors over total value added (%)
Chile	26	21
Colombia	13	17
Mexico	20	15
Panama	13	16
Peru	8	10

The estimated contributions to employment are similar to those reported for the United States and the European Union in their studies. In the case of Value Added or GDP, the shares for Latin American economies range from 10% to 21%, which is lower than the two reference cases. Nevertheless, it should be kept in mind that there are significant differences in production patterns in these countries vis-à-vis the Latin American countries selected. Latin American countries are relatively specialized in products derived from natural resources (commodities), while the United States and the European Union are characterized by the production of manufactured and exportable services.

The contribution of trademark-intensive sectors to international trade is shown in Table C. The values range from 5% to 20% in the case of exports for the various countries and from 13% to 51% in the case of imports. For all five countries studied, US $15 of every US $100 exported corresponds to trademark-intensive products. Similarly, trademark-intensive products account for US $26 of every US $100 imported.

Table C
Share of trademark-intensive sectors in the internation trade of the Latin American countries selected

Contribution to foreign trade - countries selected	Share of trademark-intensive exports over total exports (%)	Share of trademark-intensive imports over total imports (%)
Chile	9	13
Colombia	9	51
Mexico	14	19
Panama*	20	21
Peru	5	21

*Does not include the Colón Free Trade Zone. If free trade zone activities are included, the values for Panama climb to 75% for exports and 78% for imports.

To interpret these findings for exports, it should be recalled that Latin American countries are among the largest commodities exporters in the world, and that those products are exported wholesale and therefore use trademarks as an identification mechanism to a lesser degree. In the case of imports, the contribution is higher than that of exports in all countries. The explanation for the greater impact of trademark-intensive sectors on imports lies in the fact that Latin American countries import end-consumer products that use trademarks more frequently. The impact recorded for Latin American countries is noticeably lower than in the case of the United States and the European Union.

The case of Panama is worthy of special mention, because part of its trade corresponds to the activities of the Colón Free Trade Zone (not included in Table C). When these activities are taken into account, the findings show that the impact of trademark-intensive sectors on Panama's total international trade is very high: 75% in exports and 78% in imports. In this sense, the activities of the free trade zone are more similar in their trademark frequency to the impacts seen in the United States and the European Union.

Finally, the analysis of relative salaries between trademark-intensive sectors and the economy's average shows that, just as occurs in the case of the United States and the European Union, salaries in intensive sectors are higher. The "salary premium" in Latin American economies varies in a wide range from 4.6% to 25%, depending on the country (see Table D, below). The variations between countries are the result of several factors related to their labor markets, and in particular to their differences in the degree of informality in employment.

Table D
Salary premium in trademark-intensive sectors in the Latin American countries selected

Salaries	Salary premium (salary in trademark-intensive sectors over salary in non-intensive sectors (%))
Chile	20
Colombia	14
Mexico	4.6
Panama	20
Peru	25

In sum, a comparative analysis of the findings shows that there are significant similarities between Latin American countries with regard to trademark-intensive activities and the degree of impact on their respective economies.

INTRODUCTION

The main objective of this report is to study the economic impact of trademark-intensive activities in five countries in Latin America: Chile, Colombia, Mexico, Panama, and Peru.

The study is the product of a joint initiative of the Inter-American Association of Intellectual Property (ASIPI) and the International Trademark Association (INTA). Precedents for this initiative are found in the respective reports by the offices of Protection of Intellectual Property in the United States and the European Union. These reports approach the study of the components of intellectual property (patents, trademarks, copyrights, industrial designs, and geographic designations) in relation to economic activities and the creation of value, linking them to the process of innovation in their economies.[1]

In our report, the analysis focuses on the case of trademarks, their distinguishing use by different sectors of production, and their ultimate impact on the economy for a set of selected countries in Latin America.

These countries were selected within the region according to criteria that took into account both territorial size and the representation of Latin America's geographic and economic diversity, in order to synthesize the different environments in the region. Also considered was the possibility of accessing the relevant data, the support and the interest of the respective Offices of Intellectual Property, the reliability of the data, and the possibility of extrapolating the results to other countries.

The international stage regarding trademark registration shows that starting in the mid-1970s the number of applications and registrations of trademarks has grown continuously and at high rates. In the 1980s, moderately developed countries like those in Latin America joined this growing trend, and as a result, a considerable increase has been seen in the relation between trademark registration and the economic activities represented by GDP of the economies (WIPO 2013a).

The positive change in trademark registration shows very diverse results among the various economic activities: some sectors or economic activities use trademarks to identify their products and services more frequently than others. Differences can also be seen in the intensity of use, that is, the investment made in developing and using trademarks in comparison with the companies' expenditure in other components of production, such as employment, or in relation to the sales of each company. This diversity raises interesting questions regarding the impact of trademarks and the economic sectors that use them most frequently or intensively in these economies. Among them, the following are especially noteworthy:

- What is the impact of sectors that use trademarks intensively to identify their products on the economic activity of their countries?
- What is their impact on employment and salaries?
- What are the effects on international trade in those countries?

To start to answer these questions, this study reviewed the specialized literature available, gathered the necessary statistics, and made estimations of the impacts of trademark-intensive brands on the countries selected.

1 See ESA - USPTO 2012 and EPO - OHIM 2013.

The international experience analyzed in the specialized literature[2] suggests that the use of commercial trademarks in developing countries like those of Latin American can be characterized as follows:

- Trademarks constitute an investment by companies in an "intangible" asset and a business instrument of demonstrated efficacy both for companies and for consumers.[3]

- Because of their low creation and registration costs compared to other components of intellectual property such as design or patents, trademarks are particularly accessible to medium-sized and small enterprises, which make up the majority in developing countries.

- Many middle-income economies are intensive in their use of trademarks, i.e., they register more trademarks per unit of GDP than the rest. In such economies, more than 50% of trademarks are registered by residents.[4] These economies have also succeeded in increasing the number of trademarks abroad, taking advantage of the process of trade globalization.[5]

- Enforcing trademark protection in developing countries has a positive impact that reinforces the general benefits of this protection, because it strengthens the promotion of exports and the participation of those countries in global value chains at the same time as it promotes the transfer of technology and know-how from relatively more developed countries.[6]

Taking the above as a starting point, the following sections outline the methodology and the data sources of this study (Section 1) in order to then estimate the impact of trademarks on the economy of the countries selected (Section 2). Section 3 concludes with a brief comparative analysis of the findings from the countries selected vis-à-vis international experience.

1. Study methodology

A trademark is a sign with distinguishing features which indicates that certain goods or services have been produced or provided by a given person or company, allowing them to be differentiated from those supplied by other economic actors (WIPO Glossary, EPO - OHIM [European Patent Office and the Office of Harmonization in the Internal Market] 2013).

Currently, in a wide variety of countries,[7] trademarks' status as industrial property is recognized, and therefore so is the need for their legal protection by way of registration in specialized offices. This mechanism confers on the owners the exclusive right to use their trademarks in the jurisdictions and for the goods and services for which these trademarks have been registered, and legally protects them from unauthorized use by third parties.

Broadly speaking, the methodology used in this study seeks to identify the economic activities in which trademarks are registered with a higher degree of intensity and to estimate the share of these sectors in the countries' economic activity, employment, and international trade.

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2 For a recent review of the effect of trademarks on the economy, see Schartschick and Greenhalgh 2013.

3 Companies have an interest in using trademarks to distinguish their products from those of other providers and to let consumers know that the goods or services they offer have certain characteristics and a certain quality. Consumers benefit from the lowered costs of searching for goods and services that they find satisfactory. Finally, the market generally offers goods of higher quality, since companies find that trademarks let them earn a business reputation that rewards them for the investment in the quality of their product. In this sense, Corrado and Hao (2013) characterize trademarks as production factors similar to investments in design, management development, or research and development, as all these investments are aimed at innovation in the company.

4 The concept of "resident" is the one used by the World Intellectual Property Organization (WIPO) to calculate its statistics, which show trademark registration applications in the offices of their own countries (see the Glossary at http://www.wipo.int/ipstats/en/help).

5 In this regard, see Baroncelli 2005, and Schatschick and Greenhalgh 2013.

6 See Fink and Smarzynska 2002.

7 Currently, 186 member countries of the United Nations (96% of all UN members) belong to WIPO.

An economic activity is defined as *trademark intensive* when the trademark registrations in this activity are higher than in other activities as measured by unit of employment or by unit of sales.[8]

This report follows the guidelines of two recent reports produced in the United States and the European Union:

- Economics and Statistics Administration and US Patent and Trademark Office, "Intellectual Property and the US Economy: Industries in Focus," March 2012 (ESA - USPTO 2012).

- European Patent Office and the Office for Harmonization in the Internal Market, "Intellectual Property Rights Intensive Industries: Contribution to Economic Performance and Employment in the European Union," September 2013 (EPO - OHIM 2013).

Given Latin American countries' status as developing countries and the varying availability of data, this report had to adapt its treatment of some methodological aspects of the studies taken as points of reference. Nevertheless, the nature of the measurement is consonant. The first step was to determine which economic sectors are trademark intensive. Second, the statistics available at the sectoral level for each economy were used to determine the employment, the sales, and the value added (GDP) generated by these industries. Third, the aggregate totals of trademark-intensive activities were compared to the total of the economy to determine their relative importance.

The basic unit of analysis is economic activity, as defined in the ISIC (United Nations International Standard Industrial Classification) Rev. 4, which is widely used in Latin America to calculate economic statistics and National Accounting.[9] In this classification, economic activities are subdivided into a hierarchical structure made up of four levels of categories. The categories in the higher level of classification are called sections and are identified by an alphabetic code. Within each section, increasingly detailed categories are identified by a numeric code, which is comprised of two digits for divisions, three digits for groups, and four digits for classes. Table 1 shows the general structure of the Classification.

8 Referencing the frequency of use of trademarks in employment or, alternatively, in sales in the sector, allows for a comparison between sectors on a homogeneous basis. The use of the term "intensive sector" is an extension of the definition of the economy's factor intensity. For example, a sector will be more capital intensive than another if it uses more units of capital per employee.

9 For details about the ISIC Classification Rev. 4, go to http://unstats.un.org/unsd/publication/seriesM/seriesm_4rev4e.pdf. Some countries selected, such as Mexico and Chile, use classifications similar to the ISIC and have tables of equivalency between their classifications and the ISIC Rev. 4. This issue is addressed in detail in the country sections.

Table 1
International Standard Industrial Classification (ISIC) Rev. 4: General structure

Section	Divisions	Description
A	01-03	Agriculture, animal husbandry, forestry, and fishing
B	05-09	Mining and quarrying
C	10-33	Manufacturing industries
D	35	Electricity, gas, steam, and air conditioning supply
E	36-39	Water supply; sewerage, waste management, and remediation activities
F	41-43	Construction
G	45-47	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	49-53	Transportation and storage
I	55-56	Accommodation and food service activities
J	58-63	Information and communication
K	64-66	Financial and insurance activities
L	68	Real estate activities
M	69-75	Professional, scientific, and technical activities
N	77-82	Administrative and support service activities
O	84	Public administration and defense; compulsory social security
P	85	Education
Q	86-88	Human health and social work activities
R	90-93	Artistic, entertainment, and recreational activities
S	94-96	Other service activities
T	97-98	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	99	Activities of extraterritorial organizations and bodies

Source: United Nations Statistics Division.

While statistics for employment, level of activity, and international trade in the countries studied are organized according to the ISIC Classification or something similar, the registration of trademarks uses a different classification system, the Nice Classification of the World Intellectual Property Organization (WIPO). This classification comprises a total of 45 classes (34 classes corresponding to industries and 11 classes corresponding to services), and each class includes a list of products and services, ordered alphabetically. Table 2 summarizes the Nice Classes.

Table 2
Nice Classification: General structure

Class	Products
1	Chemicals
2	Paints
3	Detergents
4	Industrial Oils and Greases
5	Pharmaceuticals
6	Metals
7	Machinery
8	Hand Tools and Implements
9	Scientific Equipment
10	Surgical Equipment
11	Illumination
12	Vehicles
13	Firearms
14	Precious Metals
15	Musical Instruments
16	Paper Products
17	Rubber
18	Leather
19	Construction
20	Furniture
21	Household Utensils
22	Ropes and String
23	Yarns and Threads
24	Textiles
25	Clothing
26	Dressmaking Supplies
27	Rugs
28	Toys
29	Meat, Fruit, Oil, and Other
30	Coffee, Sugar, and Other
31	Agriculture
32	Non-Alcoholic Beverages
33	Alcoholic Beverages
34	Tobacco

Class	Services
35	Business Services
36	Financial and Insurance Services
37	Construction
38	Telecommunications
39	Transportation and Travel
40	Treatment of Materials
41	Education
42	Scientific and Technological Services
43	Food Services
44	Medical Services
45	Legal services

Note: for convenience an abbreviated name for each class has been used. The complete definition for each class can be found at http://www.wipo.int/classifications/nivilo/nice9/index.htm?lang=EN#.

The selection of trademark-intensive activities[10] was determined according to two alternative criteria: (1) the number of registered trademarks per activity in relation to employment and (2) the number of registered trademarks in relation to sectoral sales (GDP). Trademark-intensive activities were defined as those whose "trademarks / employment" and "trademarks / sales" indicator was greater than the weighted average of the respective indicator. Subsection 1.1, concerning available data, lists the sources used.

The general methodological procedure and the mechanism for calculating the indicators of trademark-intensive activities are given in subsection 1.2. The task of identifying these activities required, as a prior step, linking the Nice Classification Classes to the sectors of economic activity described by the ISIC Classification. This processing entailed a series of adaptations that make it specific to this report and are presented in subsection 1.3.

1.1. Data and sources

Regarding the sources of the data used in this report, a distinction should be made between data for economic activities in the countries and data for trademark registration per country. While the data matches up primarily to national statistics sources, in the case of the number of trademarks, data comes from a WIPO database that receives and organizes information from all member countries. They are compiled in WIPO's Intellectual Property Statistics Data Center and can be found at http://ipstats.wipo.int/ipstatv2/index.htm?tab=trademark.[11]

Data for economic activities in each country (gross value of production, value added, employment, and salaries) come from the economic censuses, industrial surveys, and national accounts statistics, according to the availability in each case. The sources are the Departments of Statistics in each country and their central banks. Details about data and sources by country are given in each one of the subsections about country-level findings (see Section 2).

Finally, data about international trade in the countries selected are taken from the databases of the International Trade Center (INTRACEN - Trade Map http://www.trademap.org/index.aspx from UN Comtrade).[12]

For the analysis of the economic environment of the selected Latin American countries and the changes in trademarks registered over time, we used the period from 2004 to 2014. For the analysis of the economic importance of trademark-intensive activities, we concentrated on the period from 2010 to 2014. A longer period was chosen to describe general aspects because it is useful to sketch out the longer-term trends within which the findings of all the countries can be interpreted. In the case of studies by country, we used, within the most recent period (2010-2014), the available data from economic censuses or industrial surveys to reflect economic activities. In all cases, we used a sectoral snapshot of the economy for a period that was recent enough and close enough among all countries to allow for valid comparisons. Trademark registration data, which are an annual flow of information, were averaged for every country for the chosen period of 2010 to 2014 in order to soften the effects of variations outside the trend (for example, offsetting "good" and "bad" years in the economic cycle).

Finally, with regard to the periods used, it should be noted that the European study (EPO - OHIM 2013) used a lag of three years for the analysis of the number of trademarks registered with regard to economic activities, postulating that the effect of new trademarks on the market may take some time, since consumers need to gain confidence in a product or company in particular after learning about their brand (EPO - OHIM 2013, p. 29). In the case of Latin American countries, on the other hand, the vast majority of data about economic activities come from censuses or surveys that reflect the economic structure of the countries. Therefore, in this study we opted to relate these economic data to the averages of the number of trademarks registered, in order to come up with indicators that reflect the relative longer-term (structural) situation among trademark-intensive sectors and non-intensive sectors in the economy.[13]

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10 Throughout this study the terms "activities" or "sectors" of the economy are used interchangeably to refer to the industrial and service branches that make up a country's economic system.

11 See technical specifications in Appendix: Statistics.

12 INTRACEN data are classified according to the Harmonized Commodity Description and Coding System (HS) which has a converter to the ISIC Classification, which was used in this case.

The calculations include both domestic and foreign companies with production operations in the territory of each country or with only a commercial presence in the country. In similar fashion, trademark registrations include registrations by both nationals and foreigners.

1.2. Identifying trademark-intensive activities and their impacts

As previously stated, the measurement methodology used in the report follows the corresponding methodologies used in the studies cited on the United States and the European Union (ESA - USPTO 2012 and EPO - OHIM 2013).[14] Figure 1 summarizes the stages of analysis.

The stages are as follows:

a. The number of trademarks registered was gathered from the WIPO database (2010-2014) and the data provided by the Offices of Intellectual Property in the countries analyzed, with the trademarks registered by Nice Classification.
b. Data for employment and sales by economic activity were compiled from the countries' economic censuses / surveys, classified by sector according to the code of activities used in the respective countries.
c. The Nice Classification conversion table was applied to the countries' activity codes to obtain employment and sales data by Nice Classification.
d. The number of registered trademarks by Nice Classification was used to select the trademark-intensive sectors according to two alternative indicators: (1) the ratio of the number of registered trademarks to employment by Nice Class and (2) the ratio of the number of registered trademarks to sales by Nice Class.
e. Findings from the two classifications of trademark-intensive sectors were compared and their differences analyzed. The subset of sectors for which economic impacts would be calculated was chosen.
f. Economic impacts were calculated by adding up the following variables for the set of sectors chosen: gross product / value added in intensive sectors and its share of the total; employment in intensive sectors and its share of the total; exports and imports in intensive sectors and their share of the total.

1.3. Indicator estimate: data conversion and definition of trademark-intensive activities

As previously stated, in Latin America the United Nations International Standard Industrial Classification (ISIC) system is widely used to measure national accounts, economic surveys, and international trade. Therefore, making a conversion table between the Nice Classification and the ISIC Classification was a useful step for linking trademark registration activity in each country with economic activity. There are also precedents in the economic literature that use information about trademarks registered annually in which this concordance between classifications has already been applied.[15]

In our case, the ISIC Classification (Rev. 4) was matched to the Nice Classification, using the descriptions of each one of the Nice Classifications to determine how they aligned with each other. To do this, we started with the Nice Classification and matched each class to the divisions, groups, or classes in the ISIC Classification, referring both to extraction, manufacturing, and production, as well as to trade and some services associated with the goods in each class. The coverage was very broad, and 92% of the economic activities classified by ISIC were assigned to Nice Classes.[16]

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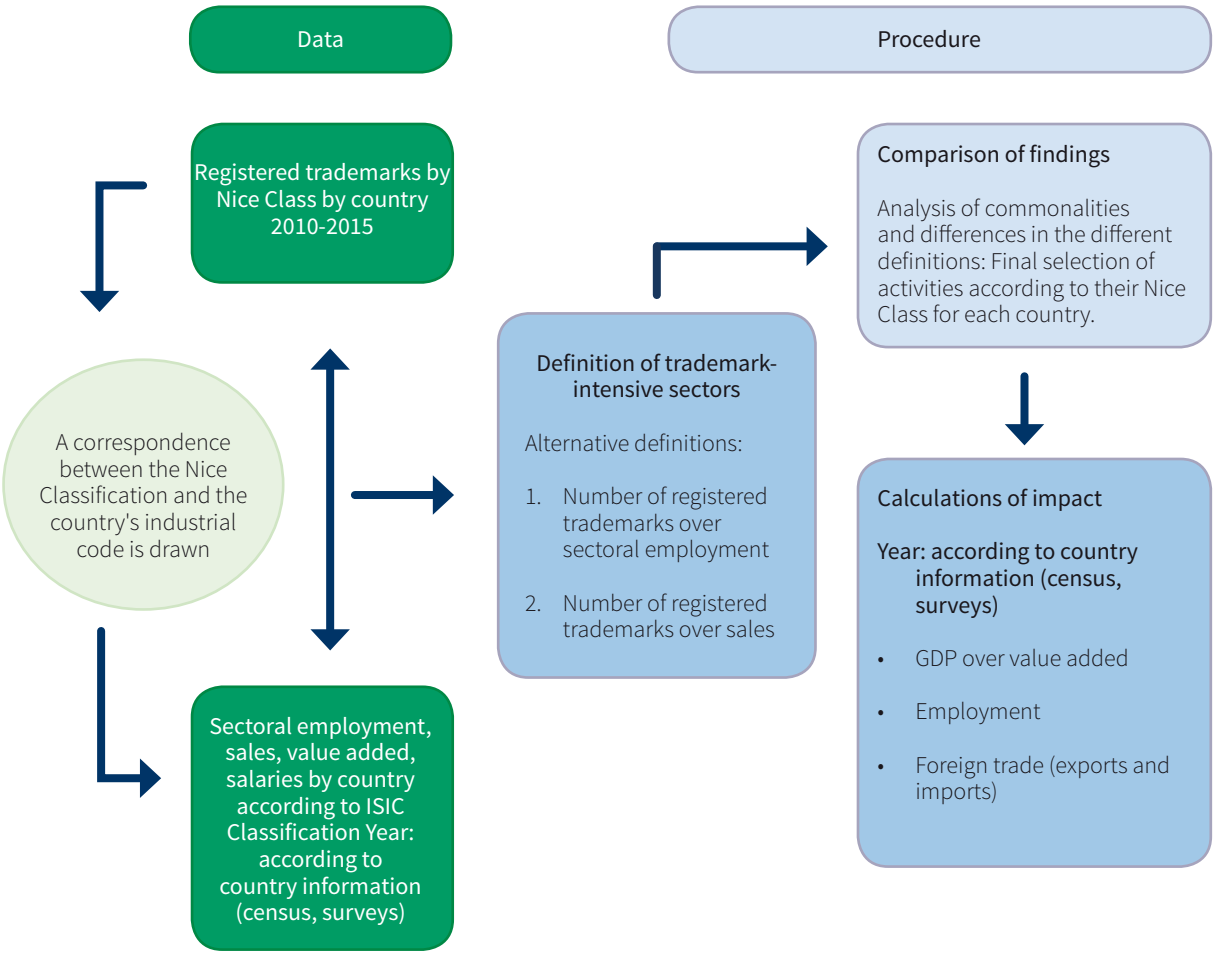
13 At the same time, around half of registered trademarks correspond to commodities or services that circulate internationally and therefore have an ability to penetrate the local public more quickly (they are existing, well-known brands).

14 In Appendix: Methodology, the methodologies of the studies mentioned are summarized and compared.

15 For example, Fink et al. (2003) explore commercial relations between countries using information about the international registration of trademarks. The authors seek to determine whether richer countries tend to import more from countries whose exports are of higher quality and show a higher degree of product differentiation (measured by the registration of non-residents in each country of destination for exports). The findings confirm their hypothesis for final products but not for the trade in inputs.

Figure 1
Summary of study methodology



One feature of the conversion is that the correspondence is not directly linked, that is, there are branches of economic activity in the ISIC that have been assigned to multiple Nice Classes. This is due to the fact that while the Nice Classification lists products and services, the ISIC Classification reflects economic activities that may include several products or services. A typical example is that of commercial distribution, which is shared by various products included in different Nice Classes.

An analysis of these cases indicates that, by and large and for the selected countries as a whole, these are economic activities that make up a smaller share of total value added and total employment, or that include products and services with a low rate of trademarks. The most significant exception is the pharmaceutical industry, whose economic activity is divided between Nice

16 Among the different ISIC Classes not included (8% of the total) are the mining of coal and lignite, mining support and service activities (Divisions 05 and 09 of ISIC Rev. 4, respectively); public administration and defense; compulsory social security (Division 84, ISIC Rev. 4); and activities of membership organizations (Division 94, ISIC Rev. 4). Likewise, activities of households as employers; undifferentiated goods- and services-producing activities of households for own use (Section T, ISIC Rev. 4) have not been included in any Nice Class either.

Classes 5 and 10.

Using the ISIC-Nice conversion table, a database was produced in which each average number of trademarks registered from 2010 to 2014 for each Nice Class was assigned a corresponding volume of employment and sales. Listed below are the indicators calculated for each Nice Class:

- Trademarks / employment indicator: number of trademarks per 1,000 employees
- Trademarks / sales indicator: number of trademarks per 1,000,000 units of local currency for each country

This first indicator identifies trademark-intensive activities (associated with each Nice Class) as the number of registered trademarks in a Nice Class divided by the total employment in the economy associated with that class. To identify intensive activities with regard to non-intensive activities, those classes were selected whose indicator "trademarks / employment" was higher than the average for the economy as a whole.

Similarly, the second indicator shows trademark-intensive activities (associated with each Nice Class) as the number of registered trademarks in a Nice Class divided by total sales in the economy associated with that class. To identify intensive activities, those activities were chosen whose "trademarks / sales" indicator was higher than the average for the economy as a whole.

As discussed in the Introduction, the use of these indicators in the case of developing countries should take into consideration some particularities of the structure and operation of those economies. One of the aspects to observe is that in the countries selected, around 50% of trademarks registered correspond to foreign companies, many of which do not have manufacturing operations in the countries studied. Therefore, the "trademarks / employment" indicator may distort the identification of trademark-intensive sectors, since in some cases the numerators of the indicator (the number of trademarks) would be high and the employment would be low. This fact may result in a high average for the economy as a whole that would limit the number of sectors selected. Additionally, the sectors included would tend to show a lower share of trademark-intensive sectors in the economy's employment and value added by lessening the weight of trademarks associated with local production. To compensate for this bias, the "trademarks / employment" indicator has been supplemented with a second indicator, “trademarks / sales,” which corrects the above distortion by comparing sectors regardless of whether the operation involves local production or imports.

The final selection of trademark-intensive sectors corresponds to the set of Nice Classes identified by one of the two indicators estimated.

2. Impacts of trademark-intensive activities in, and the characteristics and economic context of, the countries selected

This section gathers together the findings regarding the economic impact of trademark-intensive activities within each country. The first two introductory sections describe the characteristics and economic context of the Latin American countries selected and the changes in the activity of trademark registration over the period studied. The following sections focus on Mexico, Panama, Peru, Chile, and Colombia.

Latin America is a region of the world characterized by the diversity of its countries. Currently, the population of Latin America is 625 million people, which represents 10% of the world's population. The regional share of world economic activity measured by gross world product was 7% in 2014.

Between the years 2004 and 2010, a common boost (the increase in international prices for agricultural and mining commodities, which are the region's main output and exports) caused an expansive wave of growth in Latin American countries. Several countries in the region took advantage of this boost to promote economic changes and an increase in investment, including contributions from direct foreign investment. Furthermore, the international boom expanded the middle class, mitigating the sharp income inequality that had historically limited growth by restricting internal consumption.[17]

More recently, the deceleration of growth worldwide, and in particular in China, has led to less dynamism in the region. Between 2010 and 2015, rates of growth fell from 6% to less than 1%.

The selection of countries in this study seeks to represent the diversity of Latin America. Table 3 shows the general socioeconomic characteristics of these countries. As can be seen, Mexico is the largest economy measured in terms of economic activity (GDP), followed by Colombia and Chile. Panama and Peru have been the most dynamic economies over the period studied, from 2004 to 2014. Exports and imports also grew over the period, and in the case of Mexico, they grew more than GDP, which indicates a growth in its economy's international integration (i.e., Mexico exchanges more and more products with the world per unit of GDP). In all cases, imports grew more than GDP. A notable acceleration is also seen in capital inflow for direct investment from the rest of the world, particularly in Chile and Mexico.

In terms of population, Mexico is the largest country, followed by Colombia, Chile, Peru, and Panama. In terms of income levels per capita, Chile is the country with the highest level of income per inhabitant, followed by Panama. Mexico, Colombia, and Peru finish out the list of income per capita, in that order. In the case of Chile, a long-term convergence has been seen toward a level of development comparable to countries with a higher income per capita (Contreras and Pinto 2015).

17 Despite the boom years, Latin America has been losing economic weight since the 1980s. Today it accounts for less than 20% of the GDP of developing countries. In the 1980s, Brazil and Mexico were each one third larger than China. Currently, China exceeds the total GDP of Latin America as a whole by 50%. The level of income per capita in Latin America has been stuck at 13% of the average income in the United States for more than 40 years (there has been no convergence toward development). Some analysts attribute this behavior to the "middle-income trap," in which economies, having exhausted growth through the cheapest resources, have to produce innovative investment to grow. About this topic, see IDB 2014, ECLAC 2014, and CAF 2013.

Table 3
Socioeconomic Indicators: Select Countries in Latin America

Indicator	Chile	Colombia	Mexico	Panama	Peru	Latin America and the Caribbean (LAC)
Total population (in thousands, 2014)	17,899.0	47,793.0	122,978.0	3,867.0	30,983.0	626,270.0
Share of population of LAC (%)	2.9	7.6	19.6	0.6	4.9	100.0
GDP in 2014 (in millions of USD, at constant 2005 prices)	175,024.8	222,600.6	1,067,916.4	31,751.8	127,725.0	3,838,832.3
Share of GDP of LAC (%)	4.6	5.8	27.8	0.8	3.3	100.0
GDP per capita in 2014, Purchasing Power Parity (PPP) (in 2011 USD at constant international prices)	21,979.8	12,743.0	16,287.1	19,934.0	11,438.1	14,858.5
GDP growth 2004-2014 (annual %)	4.0	4.7	2.4	8.2	6.1	3.4
Total employment (people in 2014)[3]	7,903.0	21,048.0	49,275.0	1,617.0	4,646.0	no data
Exports of goods and services in 2014 (as % of GDP)[1]	34.1	16.2	31.7	69.8	19.9	25.0
Imports of goods and services in 2014 (as % of GDP)[1]	38.6	29.0	33.9	61.6	27.0	30.2
Real growth of exports 2004-2014 (annual %)[1]	2.7	4.5	4.5	7.8	3.9	3.2
Real growth of imports 2004-2014 (annual %)[1]	7.3	10.1	4.9	9.3	9.7	6.4
Direct foreign investment, net capital inflow in 2014 (balance of payment in USD at current prices)[2]	22,001.7	16,053.8	22,794.7	5,213.8	9,298.1	177,955.6
Direct foreign investment, net capital inflow in 2014 (as % of regional total[3])[2]	12.4	9.0	12.8	2.9	4.2	100.0

Source: the authors, based on ECLAC, ILO, UNESCO, and World Bank data.

[1] Panama 2012.

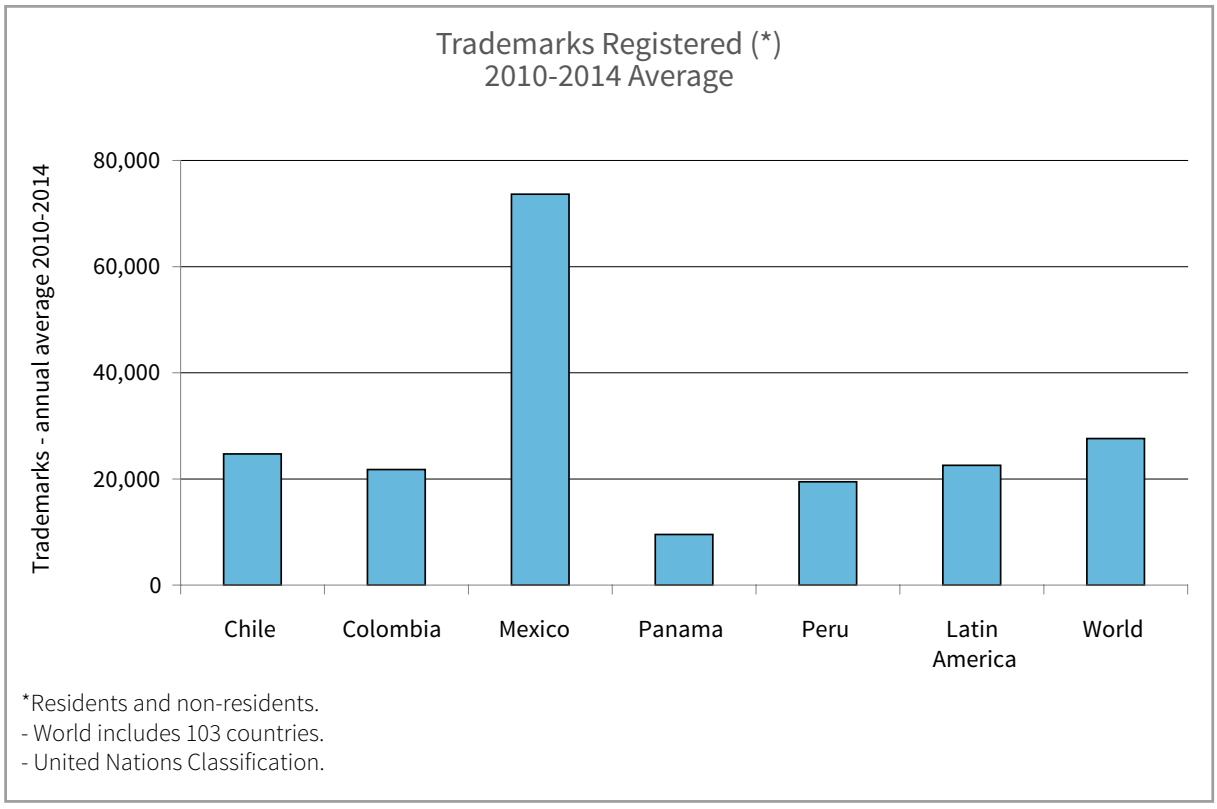
[2] Peru 2013.

[3] Colombia, Mexico 2013; Panama 2012.

2.1. Changes in trademark registration in the countries selected

The diversity of the cases studied also extends to trademark registration activities in the countries selected. Graph 1 shows a comparison of trademarks registered on average over the period from 2010 to 2014, including the regional and worldwide totals. The data correspond to the average of annual data from the database compiled by WIPO.[18] Trademark registration means trademarks registered by residents and non-residents.[19] The first thing that stands out is the case of Mexico, reaching an average of around 80,000 trademarks registered per year, much higher than the rest of the countries selected. At the other extreme is the case of Panama, with an average lower than all other countries selected. With regard to Chile, Colombia, and Peru, it can be seen that the average number of trademarks registered in these countries is very similar to the average for Latin America, slightly below the worldwide average (measured from the 103 countries recorded by WIPO).

Graph 1
Number of trademarks registered per year in the Latin American countries selected



Source: the authors, based on the WIPO database http://ipstats.wipo.int/ipstatv2/index.htm?tab=trademark.

18 The WIPO database on trademarks can be found at http://ipstats.wipo.int/ipstatv2/index.htm?tab=trademark

19 According to the WIPO Glossary, the term "resident" is used for applications submitted by applicants in their national office. The term "non-resident" denotes applications submitted in offices in other countries. In other words, when an office receives an application submitted by a foreign national, for that office it is considered an application submitted by a non-resident (see http://www.wipo.int/ipstats/en/help/).

All the countries selected show a positive trend in the number of trademarks registered in every year since 2004, and in the case of Mexico and Peru, trademarks have grown more quickly than GDP. In other words, there are more and more trademarks registered per unit of economic activity, showing an intensification in their use (see Appendix: Statistics).

Table 4
Share of residents and non-residents of trademark registration in the Latin American countries selected

Share of non-residents in trademark registration (%)		
Country	2010	2014
Chile	37.7	38.2
Colombia	41.2	34.2
Mexico	28.8	23.3
Panama	62.4	66.4
Peru	37.7	39.9

Source: the authors, based on WIPO data.

With regard to the share of registrations by residents and non-residents in the country of registration (Table 4), it has been found that in countries with higher incomes (like the United States or the countries that make up the European Union), most trademarks are registered by residents, while in poor countries the opposite occurs. For developing countries with intermediate economies, like those Latin American countries selected here, registration is split more evenly between residents and non-residents (Baroncelli et al. 2005).

Regarding the origin of those registering trademarks, the case of Mexico shows the highest proportion of residents, almost 80%. Colombia, Peru, and Chile show similar results among them, as approximately 60% of those registering trademarks are residents. In the case of Panama, trademarks are registered mostly by non-residents, at a rate of between 60% and 70%. As will be shown below, this finding is tied to the operation of the Colón Free Trade Zone in this country.[20]

Finally, it should be mentioned that the countries selected show significant agreement among themselves with regard to the Nice Classes with the most frequent registration of trademarks. Likewise, these registrations match the products and services (Nice Classes) as a whole that show higher frequency in annual registration worldwide. In the case of goods this is: 3) detergents; 5) pharmaceutical products; 9) scientific equipment; 25) clothing; 29) meats; and 30) food. In the case of services, the following are more frequent as users of trademarks: 35) business services; 41) education; 42) scientific and technological services; and 43) food services. This alignment also extends to the case of the United States and Europe, according to the available reports used for reference.[21] Indeed, this fact stands out in the European study, which postulates that frequency and intensity of trademark use is intrinsic to the characteristics of each industry regardless of its location (EPO - OHIM 2013, p. 11).

20 The Panama Agency of Investment Attraction and Export Promotion indicates that the Colón Free Trade Zone is the largest free trade zone in the Americas and the second largest in the world, as well as the largest container facility in Latin America. It covers services and centers for importing, storing, assembling, packing, and reexporting products from around the world, especially electrical appliances, pharmaceutical products, alcoholic beverages, tobacco, home and office furnishings, textile products, footwear, jewelry and toys.

21 A complementary analysis of registration frequency by sector for the countries selected can be found in the Appendix: Sectors and frequent use of trademarks.

2.2. Estimates of the impact of trademark-intensive activities on employment and salaries, value added, and international trade in the countries selected

For each country the following information is given:

a. the selection of trademark-intensive sectors;
b. the estimate of the impacts of intensive sectors on employment and salaries; the GDP or value added; and exports and imports.
c. the main conclusions about the case.

2.2.1. Chile

The Chilean economy has stood out in the context of Latin America for its growth and convergence with higher levels of economic development. This dynamism is also reflected in its activity in trademarks. In 2013, Chile held the 28th spot in the ranking of countries by trademark applications by residents and nationals abroad, which is a very high ranking in comparison with the size of its economy. Around 30% of the applications for new trademarks correspond to non-residents. Trademarks in force have an average age of approximately five years.

a. Intensive industries

Starting with the group of 45 Nice Classes, identifying trademark-intensive sectors as those whose "trademarks / sales" indicator is higher than the average gives a total of ***16 trademark-intensive classes***.

Economic data: economic data about the gross value of production (sales) and value added come from the 2012 National Accounts produced by the Central Bank of Chile. Chilean National Accounts use the Clasificación de Actividades Económicas [Economic Activities Classification system] (CAE). The CAE - ISIC Rev. 4 conversion conversion table was used to translate original ISIC Rev 4. data. Then the ISIC - Nice conversion table produced in this study was used to divide the economic sectors between each Nice Class. In the case of employment, information from the New National Employment Survey gathered by the INE was used for 2012. The information in this survey is shown by ISIC Major Branches of Activity. The level of employment by branch in the CAE classification was estimated using labor intensity in the gross production value of each major branch of ISIC activity.

Selection of intensive sectors: in this case, with the data available, the indicator sales / employment was created to select the trademark-intensive classes. For all classes the average of the indicator was calculated, including the sectors of goods and services, and excluding Classes 18 and 40. Both sectors are small within the economy, and their indicators of trademark intensity are very high compared with the total. Using this corrected average, classes with trademark-intensity indicators greater than the average were selected. The analysis of the selection in the case of services showed the advisability of using an average that excludes service classes as a cut-off value between intensive and non-intensive classes.[22] This modification of the general rule seeks to acknowledge the importance of services in some of the economies selected. In the case of Chile, services in 2014 represented 61.5% of the total value added (World Bank database).

22 Service sectors have an employment level that is higher than other sectors across the board, which lowers its indicators "trademarks per employment" and limits the validity of intersectoral comparisons.

Table Chile 1
Nice Classes corresponding to trademark-intensive activities

Average trademarks 2010-2014. Source: WIPO. Gross production value (sales) taken from 2012 National Accounts. Source: Central Bank of Chile. Employment: 2012 New National Employment Survey. Source: INE.

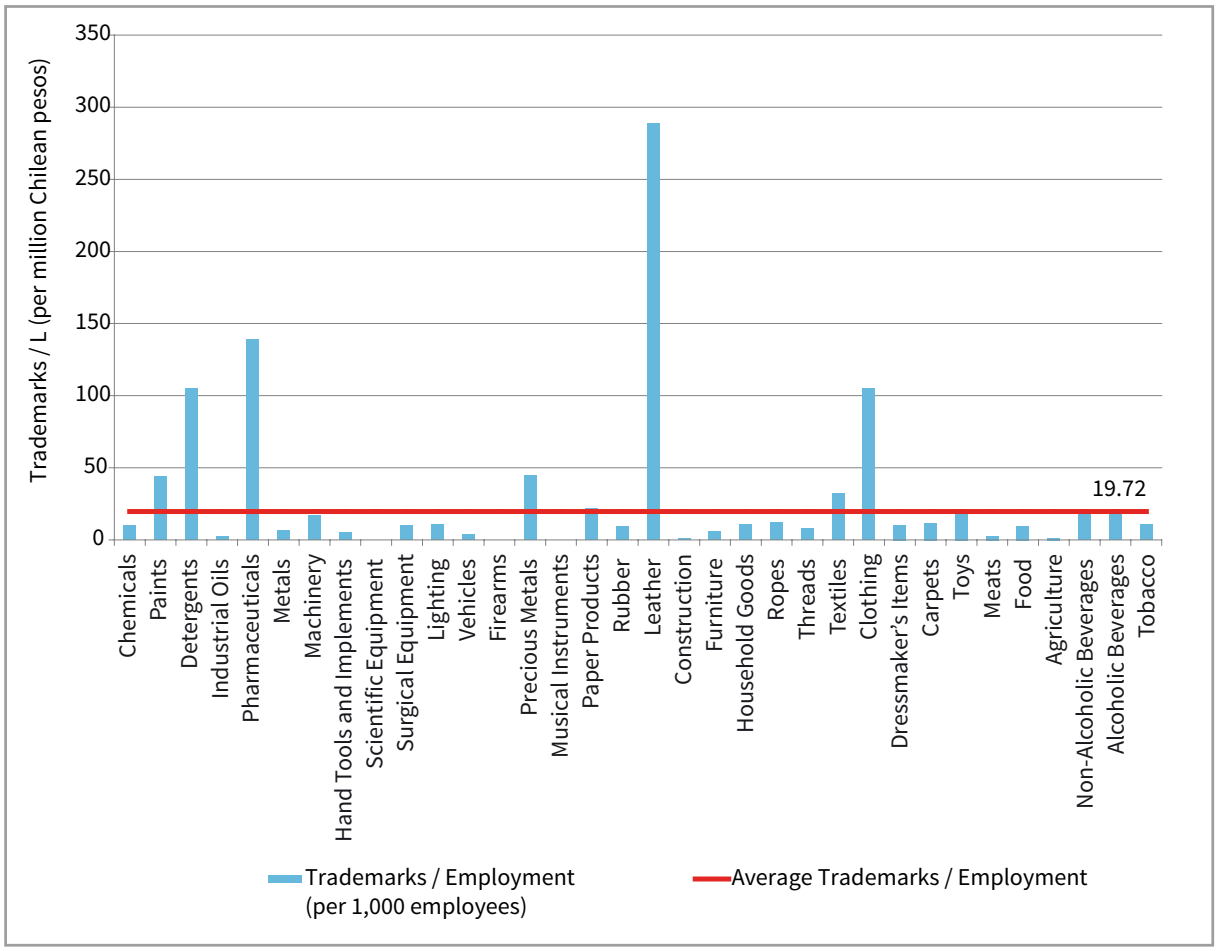
Nice Class	Class Name
Goods	
2	Paints
3	Detergents
5	Pharmaceuticals
14	Precious Metals
16	Paper Products
18	Leather
24	Textiles
25	Clothing
28	Toys
33	Alcoholic Beverages
Services	
35	Business Services
38	Telecommunications
40	Treatment of Materials
41	Education
42	Scientific and Technological Services
43	Food Services

Methodological note: the Nice Classes in Table Chile 1 were selected based on the indicators "trademarks per unit of employment" and / or "trademarks per unit of sales." In the case of goods, classes were selected whose indicators were higher than the average of the economy. In the case of services, classes were selected whose indicators were higher than the average among services. These sectors are considered trademark intensive.

Graphs Chile 1 to 4 below show the sectors chosen and their respective indicators of intensity. Figure Chile 1 groups the classes according to their selection criteria. Finally, Table Chile 1 lists the sectors selected and their share tied to value added and the generation of international trade to show the relative importance of the activities associated with each Class. Of the 16 classes selected, seven match the classes with highest registration internationally, according to WIPO data (2015). In the category of goods, these are: 3) detergents; 5) pharmaceutical products; and 25) clothing. In the category of services, these are: 35) business services; 41) education; 42) scientific and technological services; and 43) food services.

Graph Chile 1
Trademark registration in Chile corrected by employment, for goods by Nice Class

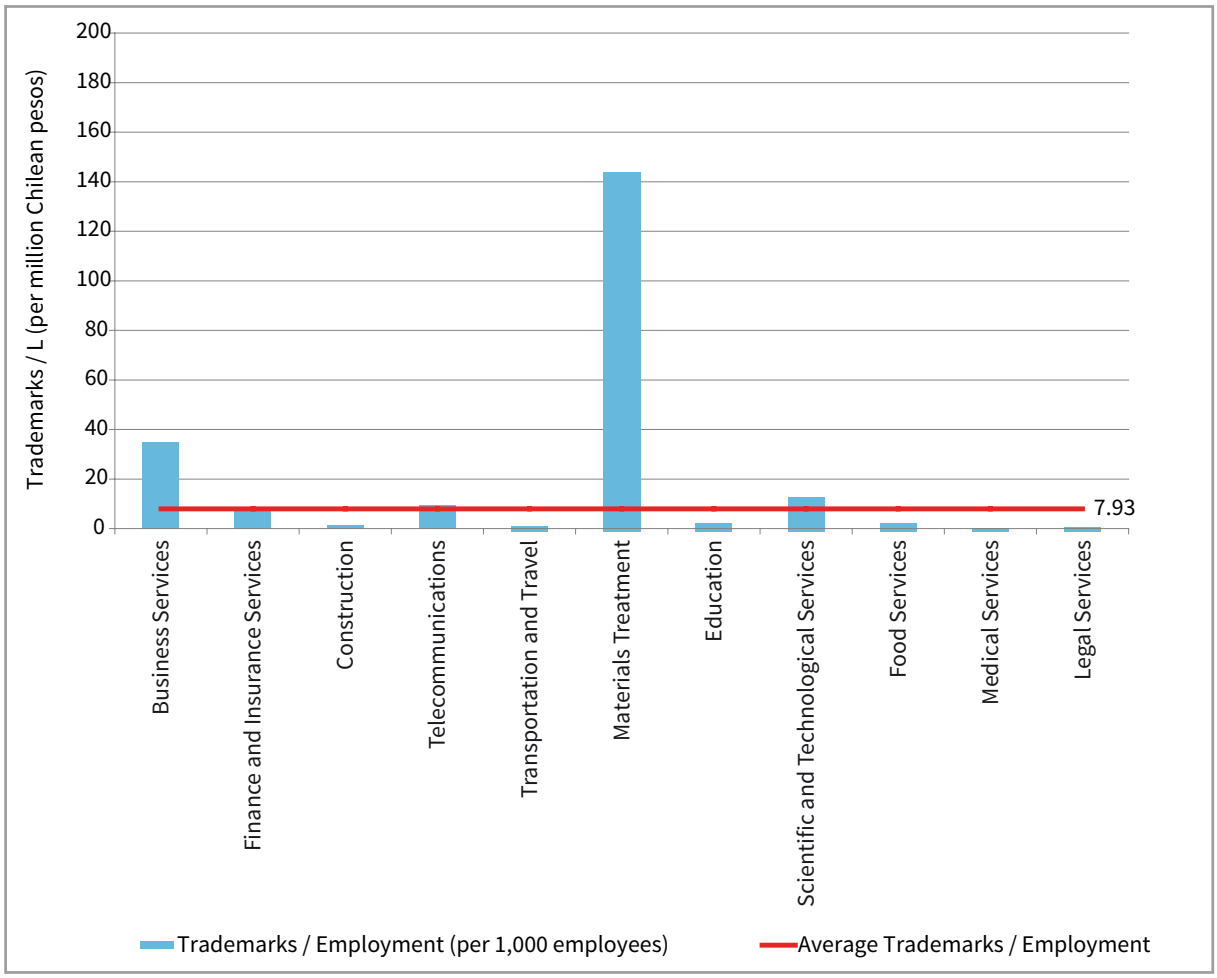
Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2012 National Economic Census. Source: INEC.



Methodological note: the bars of the two graphs (Graph Chile 1 and Graph Chile 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Chile 1 and for the average of service classes in Graph Chile 2. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Chile 2
Trademark registration in Chile corrected by employment, for services by Nice Class

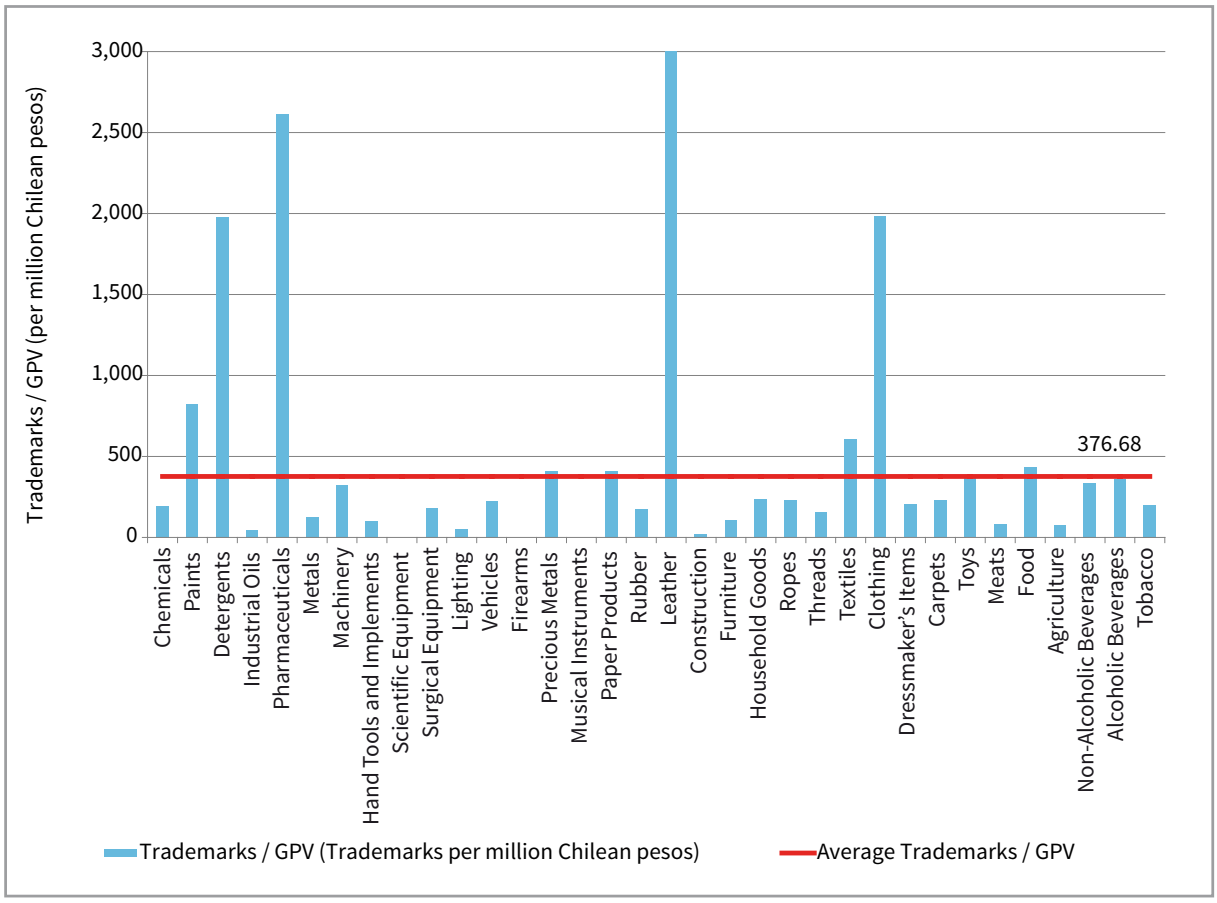
Average trademarks 2010-2014. Source: WIPO. Employment taken from 2012 New National Employment Survey. Source: INE.



Methodological note: the bars of the two graphs (Graph Chile 1 and Graph Chile 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Chile 1 and for the average of service classes in Graph Chile 2. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Chile 3
Trademark registration in Chile corrected by gross production value, for goods by Nice Class

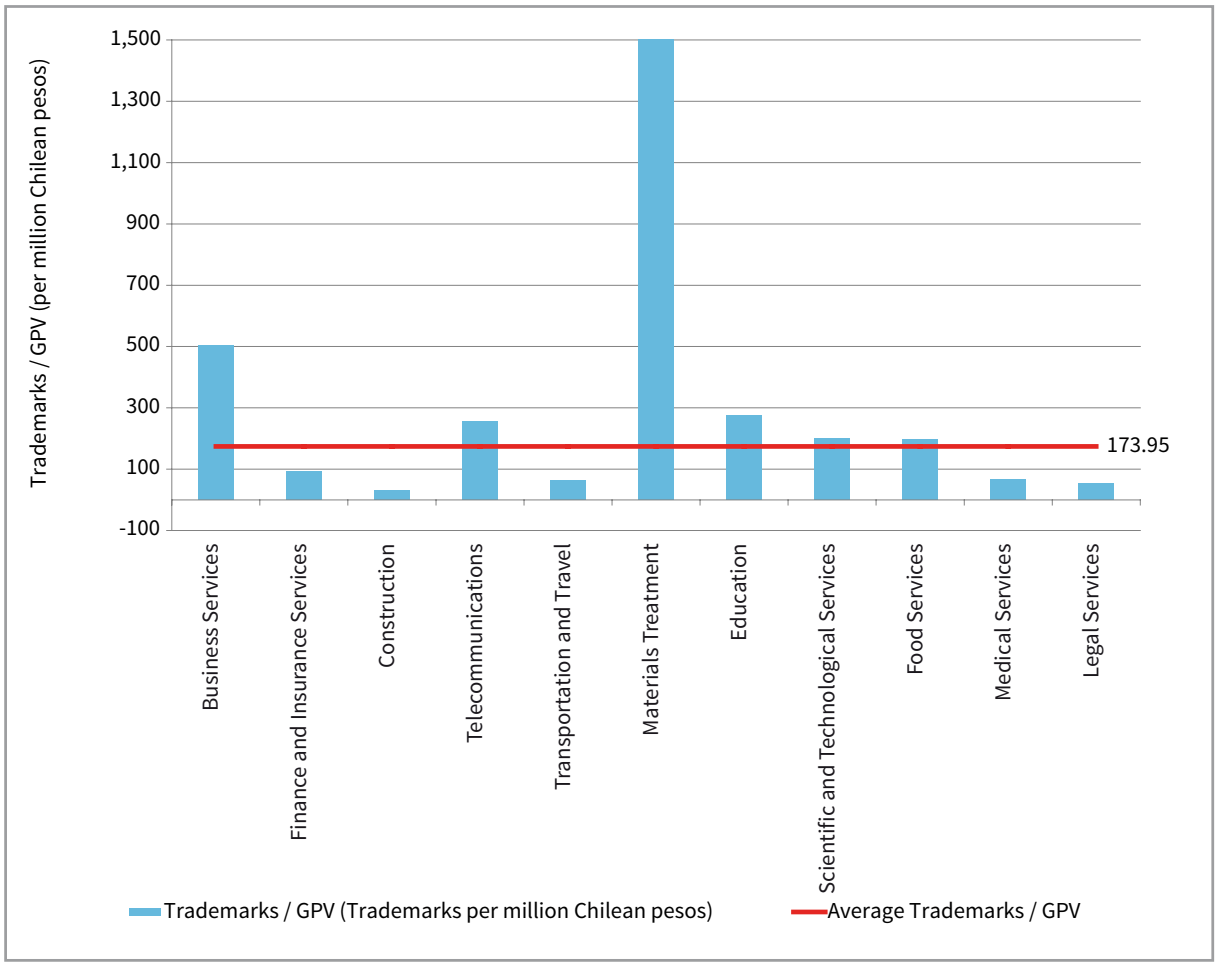
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from 2012 National Accounts. Source: Central Bank of Chile.



Methodological note: the bars of the two graphs (Graph Chile 3 and Graph Chile 4) measure the indicator "trademarks per unit of sales" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Chile 3 and for the average of service classes in Graph Chile 4. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Chile 4
Trademark registration in Chile corrected by gross production value, for services by Nice Class

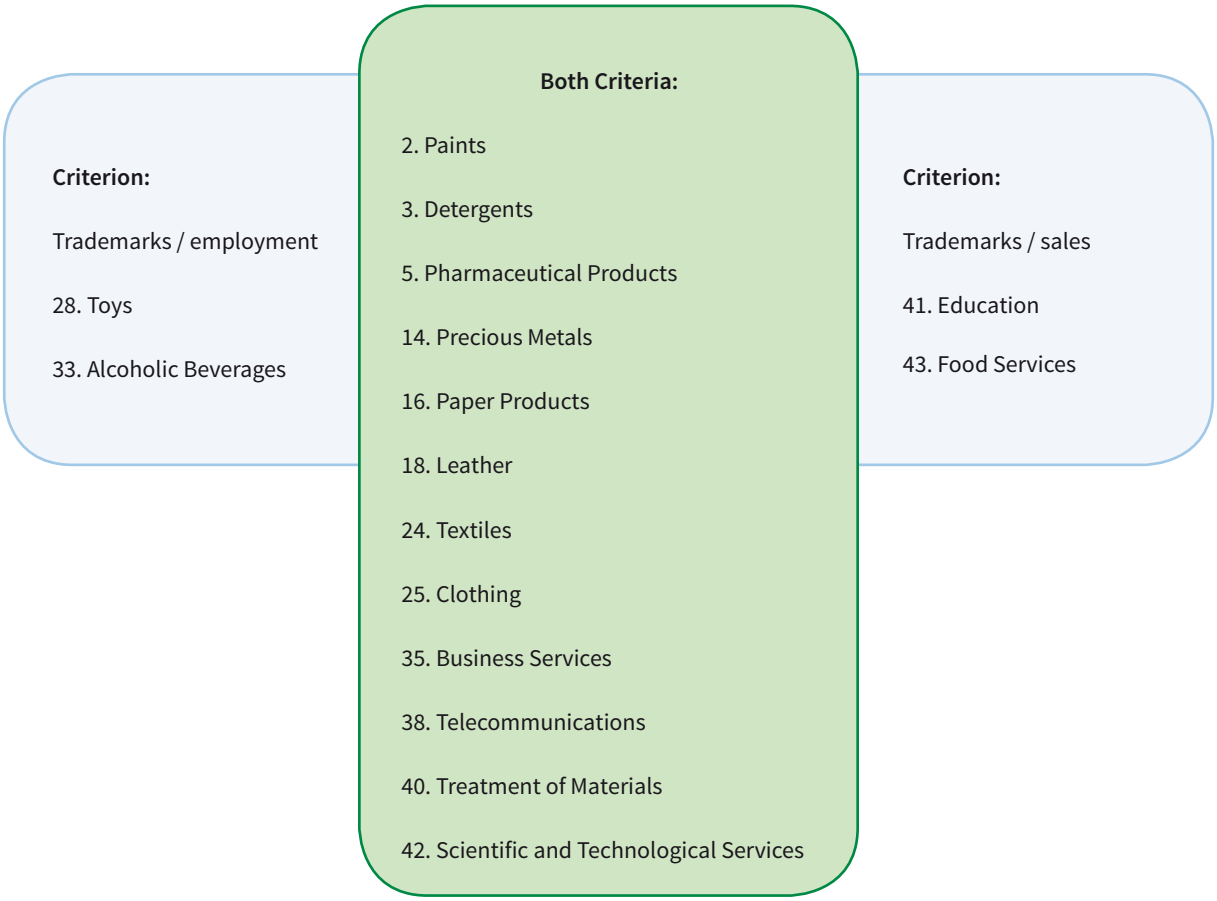
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from 2012 National Accounts. Source: Central Bank of Chile.



Methodological note: the bars of the two graphs (Graph Chile 3 and Graph Chile 4) measure the indicator "trademarks per unit of sales" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Chile 3 and for the average of service classes in Graph Chile 4. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Figure Chile 1
Nice Classes selected according to selection criteria

Average trademarks 2010-2014. Source: WIPO. Gross production value taken from 2012 National Accounts. Source: Central Bank of Chile.



Methodological note: the number of registered trademarks by Nice Classification is used to select the trademark-intensive sectors according to two alternative indicators: (1) the ratio of the number of registered trademarks to employment by Nice Class and (2) the ratio of the number of registered trademarks to gross production value (sales) by Nice Class. In this case there are 12 Nice Classes that meet both criteria (shaded subset). The rest meet just one of the criteria.

Table Chile 1
Size of economic sectors associated with selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment taken from 2012 New National Employment Survey. Source: INE. Value added taken from 2012 National Accounts. Source: Central Bank of Chile. Average international trade 2010-14. Source: INTRACEN.

Nice Class	Total Employment (as a % of the total selected)	Value Added (as a % of the total selected)	Exports of Goods (as a % of the total selected)	Imports of Goods (as a % of the total selected)
2	0.4	0.5	0.3	2.1
3	0.9	0.8	1.9	9.5
5	1.2	1.7	5.3	17.3
14	0.5	1.9	0.7	1.2
16	5.5	5.5	74.6	10.3
18	0.1	0.1	1.6	2.6
24	0.6	0.6	2.2	8.9
25	0.9	0.9	11.2	41.8
28	1.8	1.7	2.3	6.3
33	2.2	2.4	39.9	1.6
35	6.4	19.6	-	-
38	9.3	10.3	-	-
40	0.1	0.1	-	-
41	45.5	28.4	-	-
42	6.6	19.0	-	-
43	18.0	9.0	-	-
Total	100	100	100	100

b. Economic contribution of trademark-intensive sectors

b.1. Contribution to GDP

The trademark-intensive sectors associated with the corresponding Nice Classes have a share of 25% of the value added / GDP (see Table Chile 2). Service sectors make the largest contribution.

Table Chile 2
Contribution to value added from economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment taken from 2012 New National Employment Survey. Source: INE. Value added taken from 2012 National Accounts. Source: Central Bank of Chile.

Contribution to employment and value added	Share of employment of trademark-intensive classes over total employment (%)	Share of value added of trademark-intensive classes over total value added (%)
Goods (10 sectors)	4	3
Services (6 sectors)	22	18
Goods and services (16 sectors)	26	21

b.2. Contribution to international trade

In the case of Chile, the contributions of trademark-intensive sectors to international trade in exports and imports are 11% and 14%, respectively.

Table Chile 3
Contribution to Chile's international trade from economic sectors associated with trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Average international trade 2010-14. Source: INTRACEN.

Contribution to foreign trade	Share of trademark-intensive exports over total exports (%)	Share of trademark-intensive imports over total imports (%)
Goods (10 sectors)	9	13

b.3. Impact on salaries

The analysis of relative salaries between trademark-intensive sectors and the economy's average shows that, just as occurs in the case of the United States and the European Union, salaries in intensive sectors are higher. The salary "premium" between intensive and non-intensive sectors is 20% (see Table Chile 4).

Table Chile 4
Salary comparison of economic sectors associated with selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Salaries and employment taken from 2012 New National Employment Survey. Source: INE.

Salaries	Annual salaries (in thousands of Chilean pesos) over employment
Goods and services (16 classes)	8,819.0
Non-trademark-intensive sectors	7,342.2
Total average of activities	7,727.1

Note: the values of salaries are approximate because the level of employment by branch in the CAE classification was estimated using labor intensity in the gross production value of each major branch of ISIC activity. The first line of Table Chile 4 corresponds to the estimate of the average salary in those Nice Classes selected as trademark intensive in order to compare them to the average salaries in sectors corresponding to the rest of the Nice Classes and to the average of the economy, which is given in the two following lines in the table.

c. Summary of findings

Chile is one of the Latin American economies with the best economic performance in the last decade. One aspect worth noting in the analysis is the importance of the Service sector in this economy (61.5% of the total value added). Trademark application and registration activity is relatively high in absolute terms. When annual registration is compared to total employment, Chile occupies an intermediate place in the set of countries analyzed.

Of the 16 trademark-intensive classes selected, seven match the most frequent classes counted by WIPO (2015). Of all the countries studied, Chile is the one with the highest share of frequent classes among all the classes selected, both in employment and in value added. The contribution of trademark-intensive classes to employment is 26%, and the contribution to value added in the economy is 21%. Services make up the classes with the highest share (22% of employment and 18% of value added). As for the share of trademark-intensive sectors in Chile's international trade, intensive exports make up 10% of the total exported and intensive imports make up 14% of the total imported. As occurs in the case of the other countries selected, in Chile, too, exports are concentrated in commodities (copper and its derivatives), whose use of trademarks as a business tool is relatively lower than in other sectors, such as manufacturing. The salary "premium" between intensive and non-intensive sectors is 20%.

2.2.2. Colombia

Within the group of countries selected for this study, Colombia is the second largest in population and GDP, after Mexico. In the ten years from 2004 to 2014, its economy grew by more than the Latin American average. With regard to its use of trademarks, in 2014, Colombia ranked 35 in trademark applications, according to WIPO. Half of these applications were by non-residents. The trend toward growth in trademark registration has been positive from 2004 to 2014, in step with the trend in the economy.

a. Intensive industries

From among the group of 45 Nice Classes, ***19 Classes*** were identified as belonging to trademark-intensive sectors, according to either of the two intensity criteria (higher than average trademarks over employment or trademarks over sales).

Economic data: economic data about gross production value (sales) are taken from the 2014 National Accounts produced by the Syntheses Office (DSCN) of the National Administrative Department of Statistics (DANE). Data about value added were calculated using information shown in product Balances de Oferta y Utilización [Supply and Use Balances] (BOU) and produced by the same source for 2014. Using the ISIC - Nice conversion table made for this study, economic sectors were divided between

each Nice Class. In the case of employment, information about jobs at the national level by branch of activity were taken from the Integrated Household Survey (GEIH), gathered by DANE for 2014. The level of employment by ISIC Classification branch was estimated by labor intensity in the gross production value of each large branch of activities.

Selection of intensive sectors: the indicators trademarks over employment and sales over employment were used. For each group the indicator average was calculated, including the sectors of goods and services. In the case of Colombia, this average applied only to the Nice Classes of goods, as in the case of Chile and Panama. For services, a separate average was calculated and applied to the Nice Classes of Services (otherwise, sectors that are very important in Colombia would have been omitted).

The sectors that had higher values than the respective averages were classified as trademark intensive. The findings are shown in Table Colombia 1.

Table Colombia 1
Nice Classes corresponding to trademark-intensive activities

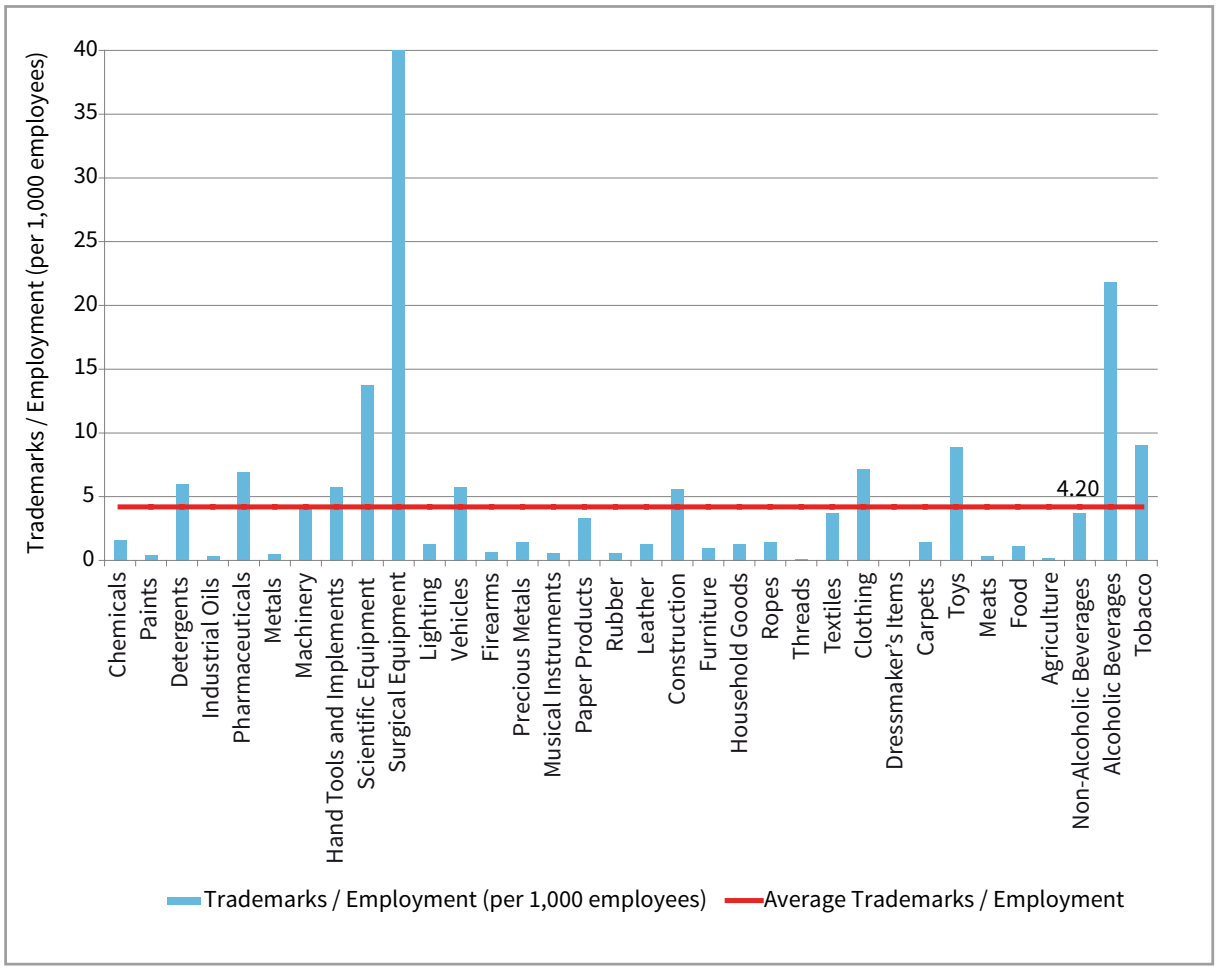
Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2014 Integrated Household Survey. Source: DANE. Gross production value taken from 2012 Colombian National Accounts. Source: DANE.

Nice Class	Class Name
Goods	
3	Detergents
5	Pharmaceuticals
7	Machinery
8	Hand Tools and Implements
9	Scientific Equipment
10	Surgical Equipment
12	Vehicles
13	Firearms
15	Musical Instruments
18	Leather
19	Construction
25	Clothing
28	Toys
33	Alcoholic Beverages
34	Tobacco
Services	
38	Telecommunications
40	Treatment of Materials
41	Education
42	Scientific and Technological Services

Graphs Colombia 1 to 4 below show the sectors chosen and their respective indicators of intensity. Figure Colombia 1 summarizes the classes according to their selection criteria. Finally, Table Colombia 1 lists the sectors selected and their share tied to value added and the generation of international trade, in order to show the relative importance of the activities associated with each Class. Of the 19 classes selected, four match the classes with highest registration internationally, according to WIPO data (2015). In the category of goods, these are: 5) pharmaceutical products; 9) scientific equipment; and 25) clothing. In the category of services, it is: 41) education.

Graph Colombia 1
Trademark registration in Colombia corrected by employment, for goods by Nice Class

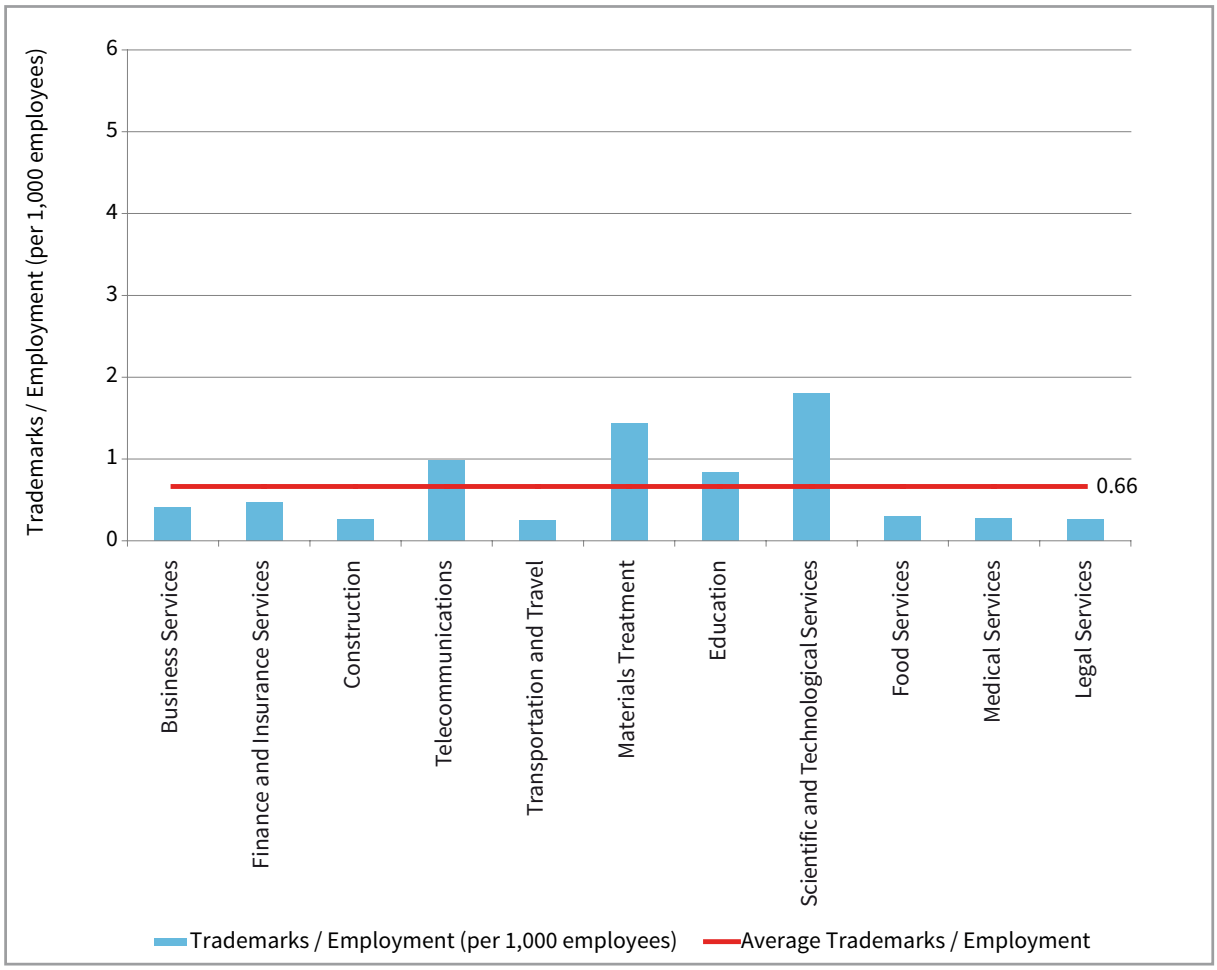
Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2014 Integrated Household Survey. Source: DANE.



Methodological note: the bars of the two graphs (Graph Colombia 1 and Graph Colombia 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Colombia1 and for the average of service classes in Graph Colombia 2. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Colombia 2
Trademark registration in Colombia corrected by employment, for services by Nice Class

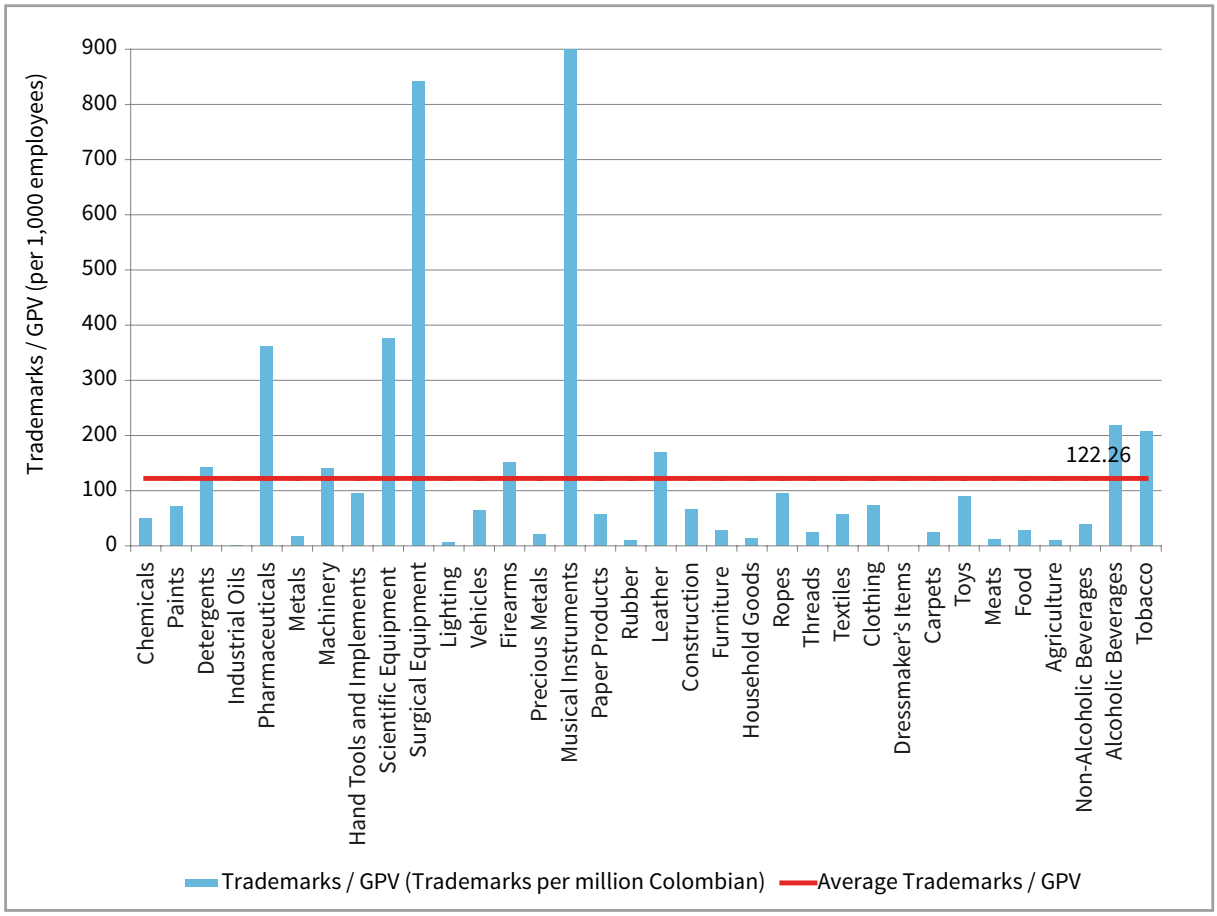
Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2014 Integrated Household Survey. Source: DANE.



Methodological note: the bars of the two graphs (Graph Colombia 1 and Graph Colombia 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Colombia 1 and for the average of service classes in Graph Colombia 2. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Colombia 3
Trademark registration in Colombia corrected by gross production value, for goods by Nice Class

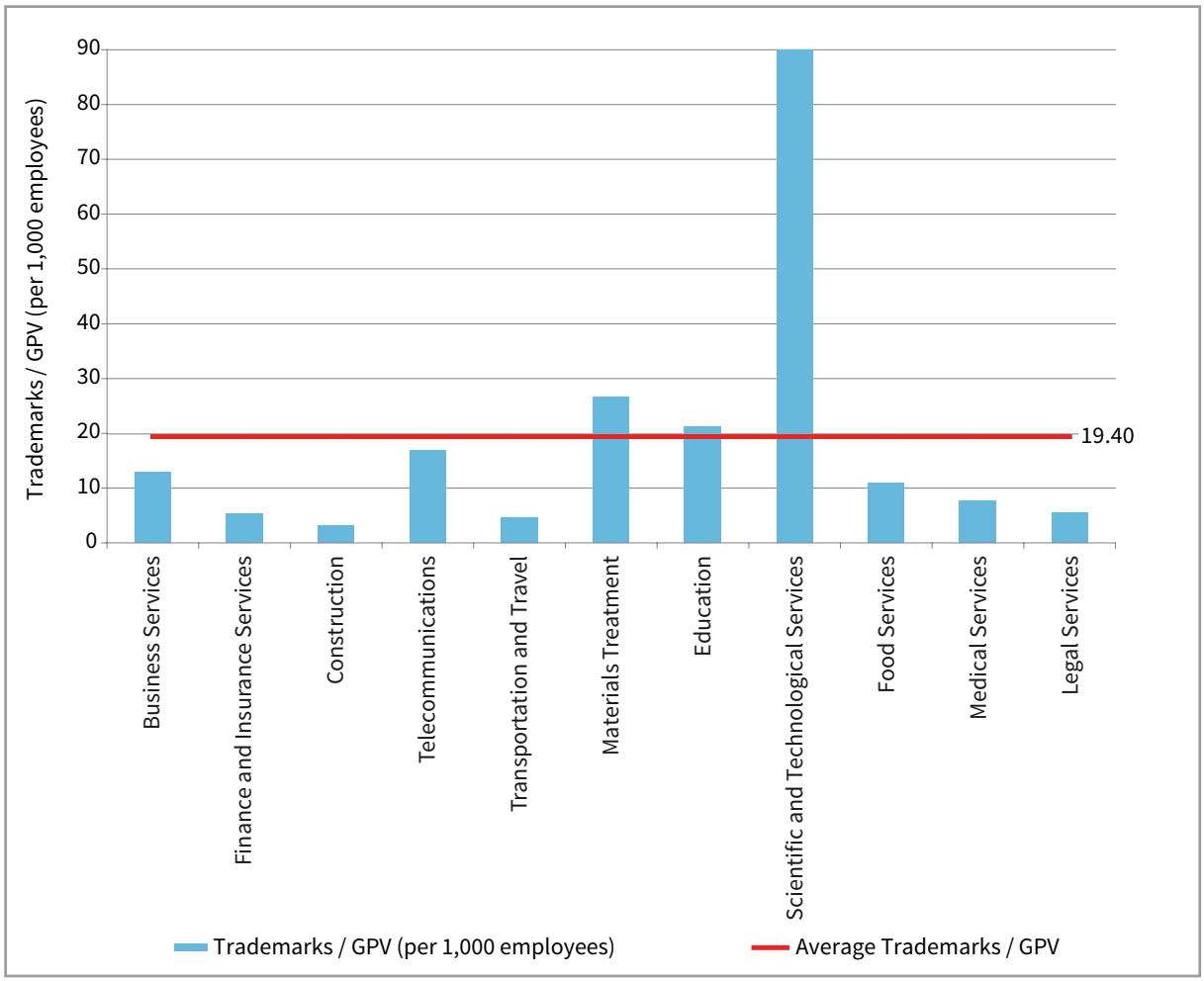
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from 2014 Colombian National Accounts. Source: DANE.



Methodological note: the bars of the two graphs (Graph Colombia 3 and Graph Colombia 4) measure the indicator "trademarks per unit of sales" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Colombia 3 and for the average of service classes in Graph Colombia 4. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Colombia 4
Trademark registration in Colombia corrected by gross production value, for services by Nice Class

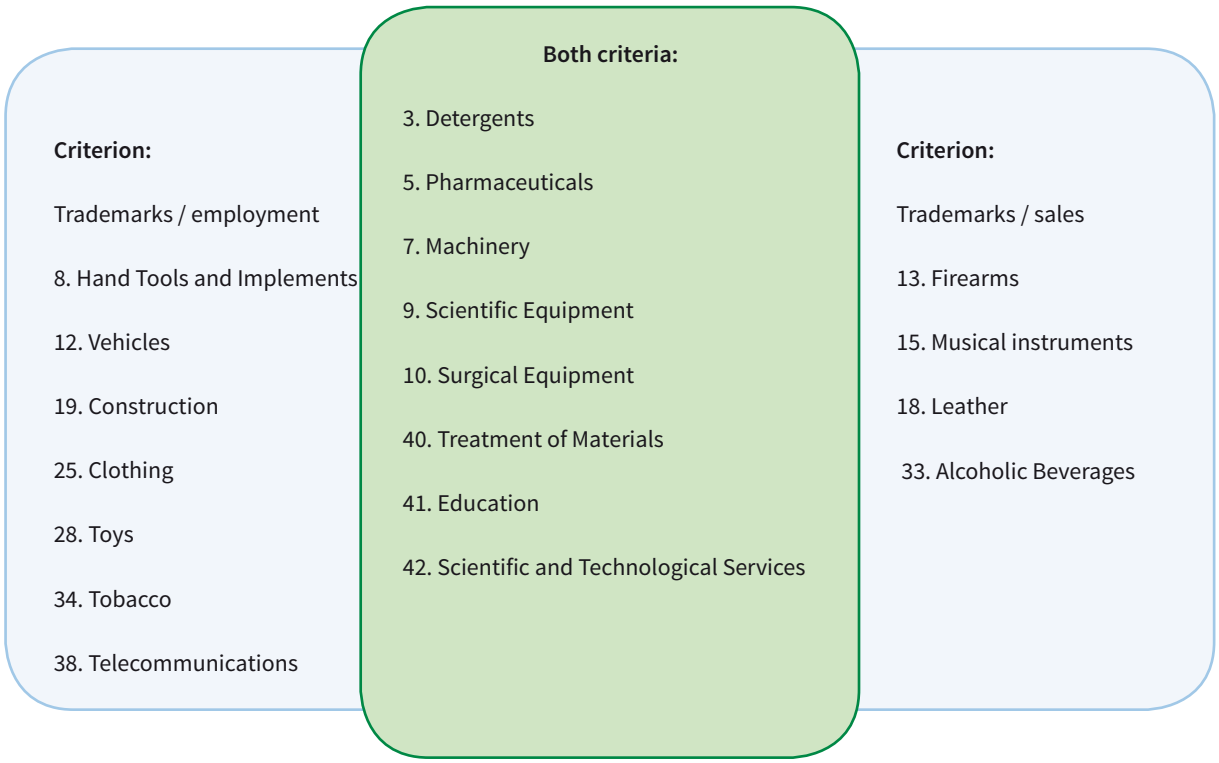
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from 2014 Colombian National Accounts. Source: DANE.



Methodological note: the bars of the two graphs (Graph Colombia 3 and Graph Colombia 4) measure the indicator "trademarks per unit of sales" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Colombia 3 and for the average of service classes in Graph Colombia 4. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Figure Colombia 1
Nice Classes selected according to selection criteria

Average trademarks 2010-2014. Gross production value taken from 2012 National Accounts. Source: Central Bank of Colombia.



Methodological note: the number of registered trademarks by Nice Classification is used to choose the trademark-intensive sectors according to two alternative indicators: (1) the ratio of the number of registered trademarks to employment by Nice Class and (2) the ratio of the number of registered trademarks to sales by Nice Class. In this case, there are eight Nice Classes that meet both criteria (shaded subset). The rest meet only one of the two criteria.

Table Colombia 1
Size of economic sectors associated with selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2014 Integrated Household Survey. Source: DANE. Gross production value taken from 2014 Colombian National Accounts. Source: DANE. Average international trade 2010-14. Source: INTRACEN.

Nice Class	Total Employment (as a % of the total selected)	Value Added (as a % of the total selected)	Exports of Goods (as a % of the total selected)	Imports of Goods (as a % of the total selected)
3	5.4	9.0	15.1	2.0
5	10.9	3.5	19.0	9.0
7	2.2	0.7	10.1	28.0
8	0.6	0.4	1.7	1.2
9	2.3	1.7	5.5	17.1
10	0.2	0.1	1.1	2.8
12	2.0	7.6	20.2	31.6
13	0.7	-0.2	0.2	0.5
15	0.9	0.0	0.0	0.1
18	6.6	0.9	5.3	0.6
19	1.2	-0.1	2.1	0.9
25	4.8	17.4	18.5	4.4
28	0.9	2.6	0.6	1.0
33	0.4	2.0	0.3	0.7
34	0.4	1.7	0.2	0.2
38	15.9	15.8	-	-
40	3.0	0.9	-	-
41	29.1	35.6	-	-
42	12.4	0.5	-	-
Total	100	100	100	100

Note: the negative value added of Classes 13 and 19 is due to the fact that net imports exceed local production.

b. Economic contribution of trademark-intensive sectors

b.1. Contribution to employment and value added

The trademark-intensive sectors associated with the corresponding Nice Classes have a 13% share of employment and a 17% share of value added (GDP) (see Table Colombia 2). In the case of employment, the service sectors have more than triple the impact of goods sectors. In the case of value added, the service sectors also have a bigger impact, twice as much as goods.

Table Colombia 2
Contribution to employment and value added from economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2014 Integrated Household Survey. Source: DANE. Gross production value taken from 2014 Colombian National Accounts. Source: DANE.

Contribution to employment and value added	Share of employment of trademark-intensive classes over total employment (%)	Share of value added of trademark-intensive classes over total value added (%)
Goods (15 sectors)	5	10
Services (4 sectors)	8	11
Goods and services (19 sectors)	13	20

b.2. Contribution to international trade

In the case of Colombia, as occurs with the rest of the countries analyzed, the impact of trademark-intensive sectors on imports is higher than that of exports. This finding is explained by the difference in the composition of foreign trade. As already mentioned, Latin American countries are intensive in exports of primary goods that use few trademarks for their commercialization, while they import end-consumer goods characterized by the use of trademarks. The share of imports of trademark-intensive classes is higher than that of the rest of the countries selected (excluding the Colón Free Trade Zone in Panama). This is very likely due to the extent and nature of the selection, which includes a wide array of manufactured products.

Table Colombia 3
Contribution to Colombia's international trade from economic sectors associated with trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Average international trade 2010-14. Source: INTRACEN.

Contribution to foreign trade	Share of trademark-intensive exports over total exports (%)	Share of trademark-intensive imports over total imports (%)
Goods (15 sectors)	9	51

Note: total exports and imports include extractive exports and imports, which are not classified in any Nice Class.

b.3. Impact on salaries

The analysis of relative salaries between trademark-intensive sectors and the economy's average shows that, just as occurs in the case of the United States and the European Union, salaries in intensive sectors are higher. In the case of Colombia, the salary premium between trademark-intensive sectors and non-intensive sectors is 14% (see Table Colombia 4).

Table Colombia 4
Salary comparison of economic sectors associated with selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Salaries from 2014 Colombian National Accounts. Source: DANE. Employment from the 2014 Integrated Household Survey. Source: DANE.

Salaries	Annual salaries (in thousands of Colombian pesos) over employment
Goods and services (19 sectors)	13,378.17
Non-trademark-intensive sectors	11,710.22
Economy average (trademarks total)	12,644.31

Note: the values of salaries are approximate due to the employment estimate that uses survey data (see economic data, above). The first line of Table Colombia 4 corresponds to the estimate of the average salary in those Nice Classes selected as trademark intensive in order to compare them to the average salaries in sectors corresponding to the rest of the Nice Classes and to the average of the economy, which is given in the two following lines in the table.

c. Summary of findings

The Colombian economy has been characterized by more growth than the Latin American average over the last ten years. Trademark registration has gone along with that growth. In international comparison, trademark registration activity in Colombia is situated above the mid-point on WIPO's ranking table.

With regard to the group of economic sectors that use trademarks intensively in their business, in Colombia, 19 Nice Classes of goods and services have been identified associated with their respective economic sectors. Of these, four match the classes with highest registration internationally, according to WIPO data (2015). This is lower than what is observed in the other countries studied.

The trademark-intensive sectors associated with the corresponding Nice Classes have a 13% share of employment and a 17% share of value added (GDP). In the case of employment, the service sectors have more than triple the impact of goods sectors. In the case of value added, the service sectors also have a bigger impact, twice as much as goods.

Finally, in the case of Colombia, as occurs with the rest of the countries analyzed, the impact of trademark-intensive sectors on imports is higher than that of exports (51% and 9%, respectively).

2.2.3. Mexico

In 2014, Mexico ranked 13th in trademark registration activity, according to WIPO and its Office of Intellectual Property, making it one of the top 20 in the world, along with Brazil, China, and Turkey (also developing countries). With 920,000 trademarks in force with an average age of 8.2 years, Mexico holds the sixth position in the world in the ranking, falling between India and South Korea. As a recent member of the Madrid Protocol, along with India and New Zealand, it has experienced a sizeable increase in trademark applications by non-residents from countries that are also party to this treaty. This is explained by the appeal that Mexico has as a country for doing business, and also by the growing trend of non-residents in using the Madrid System: in 2014 over half of the applications from non-residents worldwide used this mechanism (WIPO 2015).

The 2014 balance for Mexico was 121,683 new applications and 94,840 registrations. In the case of applications, 81,100 were from residents and 14,699 came from the United States, showing that proximity and market size influence transnational registrations.[23]

This number reflects the importance of trademark activity in Mexico compared to other countries in the world. The next sections go a step further by identifying the sectors where trademarks are intensively used and determining their impact on the country's economic activity.

a. Intensive industries

From among the group of 45 Nice Classes, ***19 classes*** were identified as belonging to trademark-intensive sectors, according to either of the two intensity criteria (higher than average trademarks over employment or trademarks over sales).

Economic data: the economic data used for the calculations of sectoral trademark intensity and impacts come from the 2014 Economic Census produced by INEGI. The census excludes religious or public sector establishments whose purpose is to provide educational, medical, or public administration services.[24] That is, the figures for employment, sales, and value added reflect the set of private and para-state activities.

The 2014 Economic Census uses the NAICS economic sector classification. Using the conversion table between the Mexican NAICS classification (2007) and the ISIC Rev. 4 provided by INEGI, the necessary data were obtained for employment, gross production value, value added, and salaries.

Selection of intensive sectors: the indicators "trademarks / employment" and "sales / employment" were used. For each indicator the average was calculated, including the sectors of goods and services. Sectors that were above this average were classified as trademark-intensive. The findings are shown in Table Mexico 1.

23 The description is from WIPO 2015.

24 See http://www.inegi.org.mx/est/contenidos/Proyectos/ce/ce2014/doc/folleto/frrdf_ce2014.pdf.

Table Mexico 1
Nice Classes corresponding to trademark-intensive activities

Average trademarks 2010-2014. Source: WIPO. Employment from the 2014 Economic Census. Source: INEGI. Gross production value taken from the 2014 Economic Census. Source: INEGI.

Nice Class	Category
Goods	
1	Chemicals
3	Detergents
5	Pharmaceuticals
8	Hand Tools and Implements
10	Surgical Equipment
14	Precious Metals
16	Paper Products
18	Leather
20	Furniture
25	Clothing
26	Dressmaking Supplies
27	Rugs
28	Toys
Services	
35	Business Services
38	Telecommunications
40	Treatment of Materials
41	Education
42	Scientific and Technological Services
44	Medical Services

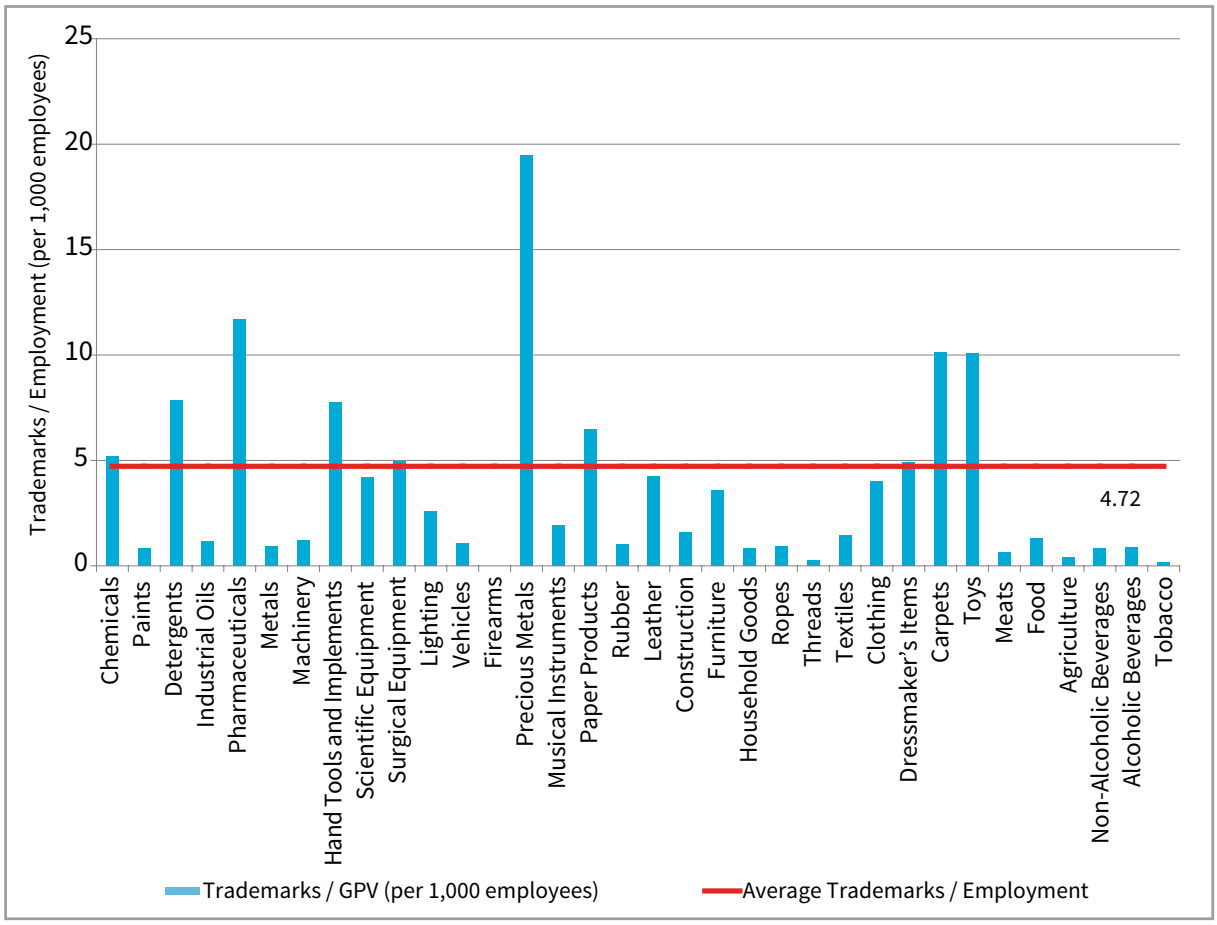
Methodological note: the Nice Classes in Table Mexico 1 were were selected based on the indicators "trademarks per unit of employment" and / or "trademarks per unit of sales." Classes whose average was higher than that of the economy were considered trademark intensive.

Graphs Mexico 1 to 4 show the Nice Classes selected for both subsets, goods and services, and their respective intensity indicators. Figure Mexico 1 summarizes the classes according to their selection criteria. Finally, Table Mexico 1 lists the sectors selected and their share of employment, value added and the generation of international trade to show the relative importance of the activities associated with each class.

Of the 19 classes selected, six match the classes with highest registration internationally, according to WIPO data (2015). In the category of goods, these are: 3) detergents; 5) pharmaceutical products; and 25) clothing. In the category of services, these are: 35) business services; 41) education; and 42) scientific and technological services.

Graph Mexico 1
Trademark registration corrected by employment, for goods by Nice Class

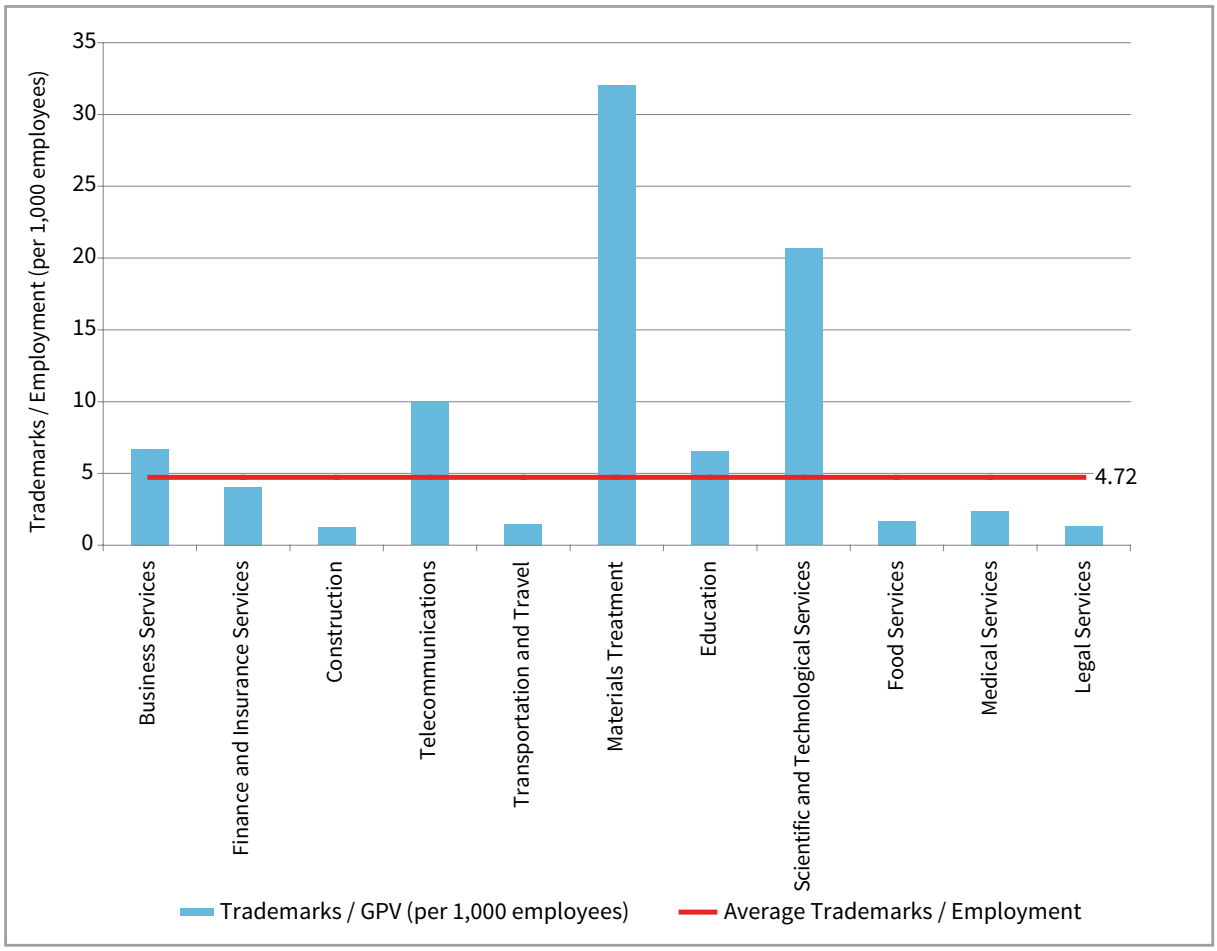
Average trademarks 2010-2014. Source: WIPO. Employment from the 2014 Economic Census. Source: INEGI.



Methodological note: the bars of the two graph (Graph Mexico 1 and Graph Mexico 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Mexico 2
Trademark registration corrected by employment, for services by Nice Class

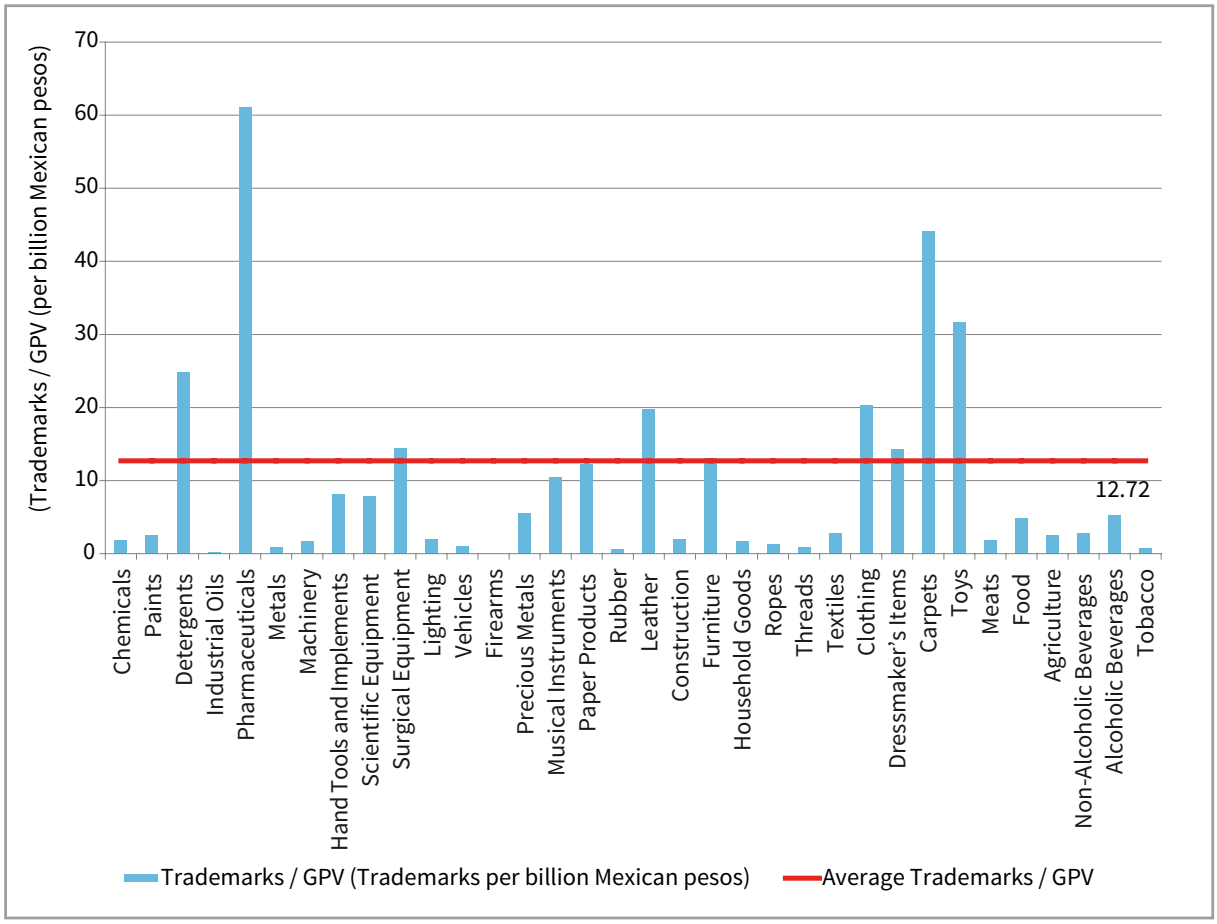
Average trademarks 2010-2014. Source: WIPO. Employment from the 2014 Economic Census. Source: INEGI.



Methodological note: the bars of the two graph (Graph Mexico 1 and Graph Mexico 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Mexico 3
Trademark registration in Mexico corrected by gross production value, for goods by Nice Class

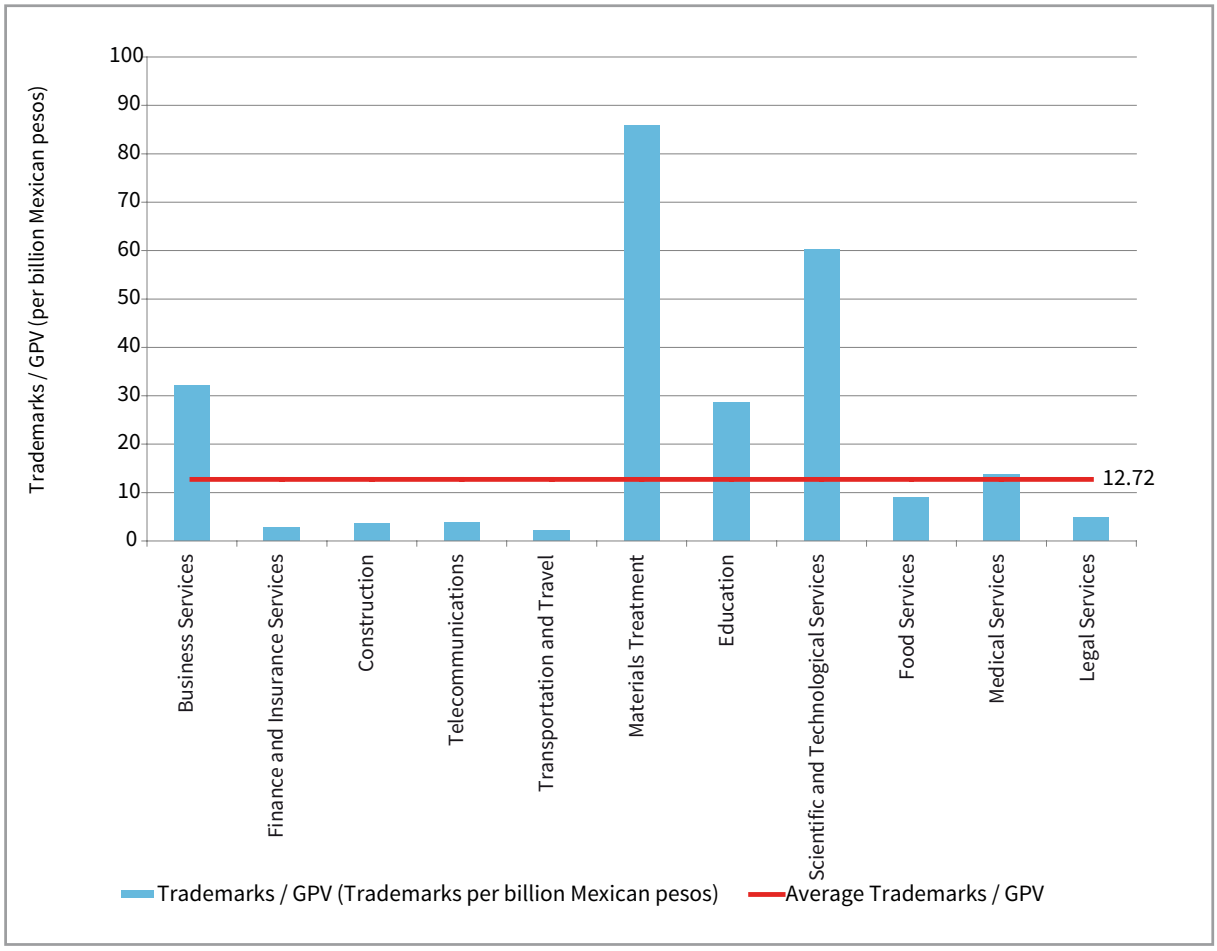
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from the 2014 Economic Census. Source: INEGI.



Methodological note: the bars of the two graphs (Graph Mexico 3 and Graph Mexico 4) measure the indicator "trademarks per unit of sales" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Mexico 4
Trademark registration in Mexico corrected by gross production value, for services by Nice Class

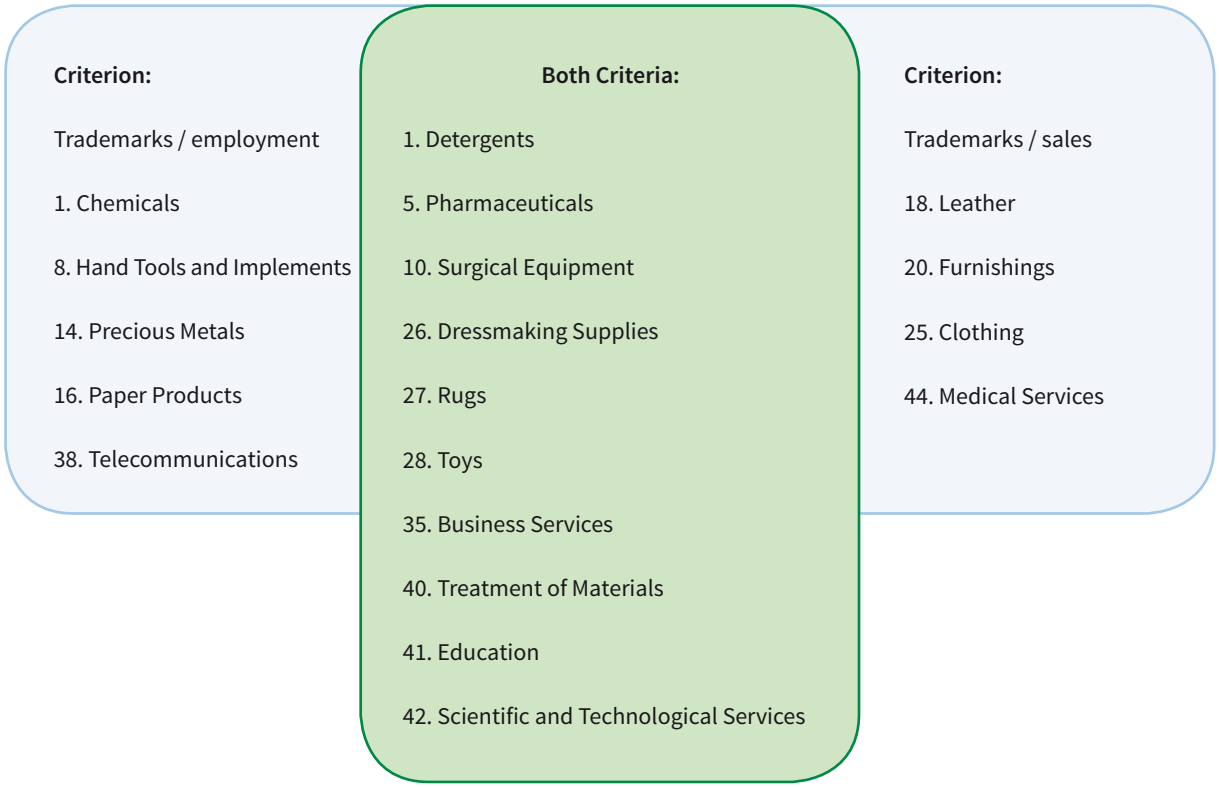
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from the 2014 Economic Census. Source: INEGI.



Methodological note: the bars of the two graphs (Graph Mexico 3 and Graph Mexico 4) measure the indicator "trademarks per unit of sales" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Figure Mexico 1
Nice Classes selected according to selection criteria

Average trademarks 2010-2014. Source: WIPO. Employment from the 2014 Economic Census. Source: INEGI.



Methodological note: the number of registered trademarks by Nice Classification was used to choose the trademark-intensive sectors according to two alternative indicators: (1) the ratio of the number of registered trademarks to employment by Nice Class and (2) the ratio of the number of registered trademarks to gross production value (sales) by Nice Class. In this case there are ten Nice Classes that meet both criteria (shaded subset). The rest meet just one of the criteria.

Table Mexico 1
Size of the economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment and value added taken from the 2014 Economic Census. Source: INEGI. Average international trade 2010-14. Source: INTRACEN.

Nice Class	Total Employment (as a % of the total selected)	Value Added (as a % of the total selected)	Exports of Goods (as a % of the total selected)	Imports of Goods (as a % of the total selected)
1	4	20	13	32
3	5	3	5	2
5	5	3	5	10
8	1	1	5	6
10	2	2	13	5
14	1	3	29	13
16	6	6	4	11
18	3	2	1	3
20	3	2	12	6
25	15	7	10	8
26	0	0	1	2
27	0	0	0	0
28	2	2	3	3
35	22	19	-	-
38	3	11	-	-
40	0	0	-	-
41	14	11	-	-
42	2	2	-	-
44	10	5	-	-
Total	100	100	100	100

Note: the totals for employment and value added do not include religious or public sector establishments whose purpose is to provide educational, medical, or public administration services. They made up 27% of total employment in 2014.

b. Economic contribution of trademark-intensive sectors

b.1. Contribution to employment and value added

The trademark-intensive economic activities associated with the corresponding Nice Classes have a 20% share of employment and a 15% share of Value Added / GDP (see Table Mexico 2). In the case of employment, trademark-intensive goods sectors and service sectors split the impact in half. In the case of impact on value added, goods sectors have a slightly higher share (8%, compared to 7% for the service sector).

The estimated contributions are lower than those reported for relatively more developed countries like the United States or the members of the European Union. However, the significant difference in the economic pattern (and the rest of the Latin American countries selected) should be kept in mind as regards the significance of commodities sectors, which are less intensive in the use of trademarks as they produce homogeneous goods for international trade. Something similar occurs in infrastructure and storage services, which are very important in developing economies relative to more advanced economies, and which also

lack a diversity of trademarks. In the case of Mexico, mining (oil) and infrastructure and storage services represent nearly 25% of the GDP. In the estimate of trademark-intensive classes, these sectors increase the denominator of the impact indicator but do not contribute to the numerator with any intensive sector.

Finally, the set of services, including the government sector, makes up 63.1% of Mexico's GDP, indicating the importance of the service sector in its economy. In this regard, it should be noted that internationally, trademark registration is more frequent for classes of goods (64.6% of the total in 2014) than for classes of services (35.4% of the total in 2014). This fact also contributes to explaining the smaller share of trademark-intensive classes in the Mexican economy vis-à-vis the United States or the members of the European Union. Just as occurs in the Nice Classes of goods, these sectors increase the denominator of the indicator but do not contribute with any intensive sector to the numerator. Something similar occurs with the indicators of the intensive sectors' share of employment.

Table Mexico 2
Contribution to employment and value added from economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment and value added taken from the 2014 Economic Census. Source: INEGI.

Contribution to employment and value added	Share of employment of trademark-intensive classes over total employment (%)	Share of value added of trademark-intensive classes over total value added (%)
Goods (13 sectors)	10	8
Services (6 sectors)	10	7
Goods and services (19 sectors)	20	15

Note: the totals for employment and value added correspond to private and para-state activities.

b.2. Contribution to international trade

Table Mexico 3
Contribution to Mexico's international trade from economic sectors associated with trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Average international trade 2010-14. Source: INTRACEN.

Contribution to foreign trade	Share of trademark-intensive exports over total exports (%)	Share of trademark-intensive imports over total imports (%)
Goods (13 sectors)	14	19

Note: total exports and imports include extractive exports and imports, which are not classified in any Nice Class.

In the case of exports, the same observations should be made about their total impact on employment and value added, since a significant portion of Mexican exports comes from primary commodities (oil). In the case of imports, which have a higher contribution, it should be remembered that while Latin American countries import end-consumer goods that use trademarks to identify their products, a very significant part of their imports correspond to intermediary goods to be integrated into manufacturing output, which do not share these characteristics.

b.3. Impact on salaries

The analysis of relative salaries between intensive sectors and the average for the economy shows that, just as happens in relatively more developed countries, salaries in intensive sectors are higher. The salary "premium" between intensive and non-intensive sectors is 4.6% (see Table Mexico 4).

Table Mexico 4
Salary comparison between trademark-intensive activities and non-intensive activities

Average trademarks 2010-2014. Source: WIPO. Salaries and employment from the 2014 Economic Census. Source: INEGI.

Salaries	Annual salaries (in thousands of Mexican pesos) over employment
Goods and services (19 classes)	67.25
Non-trademark-intensive sectors	64.26
Total average of activities	65.1

Methodological note: the first row of Table Mexico 4 gives the estimated average salaries in the Nice Classes selected as trademark intensive in order to compare them to the average salaries of the sectors corresponding to the rest of the Nice Classes and to the average of the economy given in the following two rows of the table.

c. Summary of findings

Mexico is one of the main countries in the world by annual trademark registration (placing 13th in the international ranking, according to WIPO (2015)). The selection of trademark-intensive sectors included manufacturing sectors (manufacturing is 29% of total private product) and a significant number of services (in Mexico, services, including government, make up 62% of the GDP).

Even though the contribution of trademark-intensive sectors to the Mexican economy is smaller than what is seen in the relatively more developed countries taken as a reference point here, it should be kept in mind that Mexico, as a developing country, has a very different pattern of production and foreign trade than those countries. In Mexico's production pattern, the importance of commodities sectors stands out, since they are less intensive in the use of trademarks, as they produce homogeneous goods (sold wholesale). This fact is also reflected in the make up of international trade. Something similar occurs in service sectors in general, and in particular in infrastructure and storage services. Service sectors show, internationally, a lower frequency of trademark use, and Mexico has a high share of services in its economy (63.1% of GDP in 2014), which helps explain the lower impact of intensive sectors on GDP.

Comparing relative salaries gives a result in a similar direction to those in the United States and the European Union: trademark-intensive sectors pay salaries higher than the economy average and the salary premium between intensive and non-intensives sectors reaches, in the case of Mexico, nearly 5%. This salary premium can be explained by various factors. Among the most important for developing countries is the higher relative productivity of activities tied to trademark-intensive sectors that lead to higher salaries. A second likely cause is the link between trademark-intensive activities and export sectors in the economy, which, in the case of developing countries, are also associated with a higher relative productivity.

2.2.4. Panama

Panama is a small economy with very good economic performance that over the last decade grew at a rate more than twice the regional average for Latin America and the Caribbean, and climbed positions, transforming itself into a country with medium-high incomes. Its economy has a high share of service because of the effect of the Panama Canal (in operation since 1914) and the system of free trade zones, among them the Colón Free Trade Zone. In recent years, the expansion of the Canal led to a significant investment in infrastructure, which contributed to the growth process.[25]

Among the countries selected, it shows the smallest annual registration of trademarks in absolute terms. As WIPO (2015) points out, in 2014, considering the total applications originating in Panama, 39% of them were made in offices in other countries, indicating an important demand for trademark protection on the international market. In 2014, 62% of trademark applications were by non-residents, confirming the previously mentioned high share of non-residents in the application and registration of trademarks in countries in the region. Trademarks in effect have an average age of 13 years.

a. Intensive industries

From among the group of 45 Nice Classes, ***15 classes*** were identified as belonging to trademark-intensive sectors, according to either of the two intensity criteria (higher than average trademarks over employment or trademarks over sales).

Economic data: the economic data used for sectoral trademark intensity and for impacts come from the 2012 Economic Census produced by INEC. Census data include the Colón Free Trade Zone and exclude government services, financial brokerage, and the agricultural sector.

The 2012 Economic Census uses the ISIC Rev. 4 economic classification, which makes it possible to identify economic sectors with Nice Classes by using the conversion table made for this report.

Selection of intensive sectors: as in the case of the other countries, the indicators "trademarks / employment" and "trademarks / sales" were used. For each group the indicator average was calculated, including the sectors of goods and services. In the case of Panama, this average was applied only to the Nice Classes of goods. Given the importance of the service sector in this economy, for this sector a separate average was calculated and applied to the Nice Classes of services (otherwise, sectors that are very important in Panama would have been omitted). The sectors that had higher values than the respective averages were classified as trademark intensive.

25 On the recent development of the Panamanian economy, see ECLAC 2015 and IDB 2016.

Table Panama 1
Nice Classes corresponding to trademark-intensive activities

Average trademarks 2010-2014. Source: WIPO. Employment from the 2012 Economic Census. Source: INEC.

Nice Class	Class Name
Goods	
1	Chemicals
3	Detergents
5	Pharmaceuticals
9	Scientific Equipment
10	Surgical Equipment
14	Precious Metals
18	Leather
25	Clothing
27	Rugs
28	Toys
Services	
35	Business Services
38	Telecommunications
40	Treatment of Materials
41	Education
42	Scientific and Technological Services

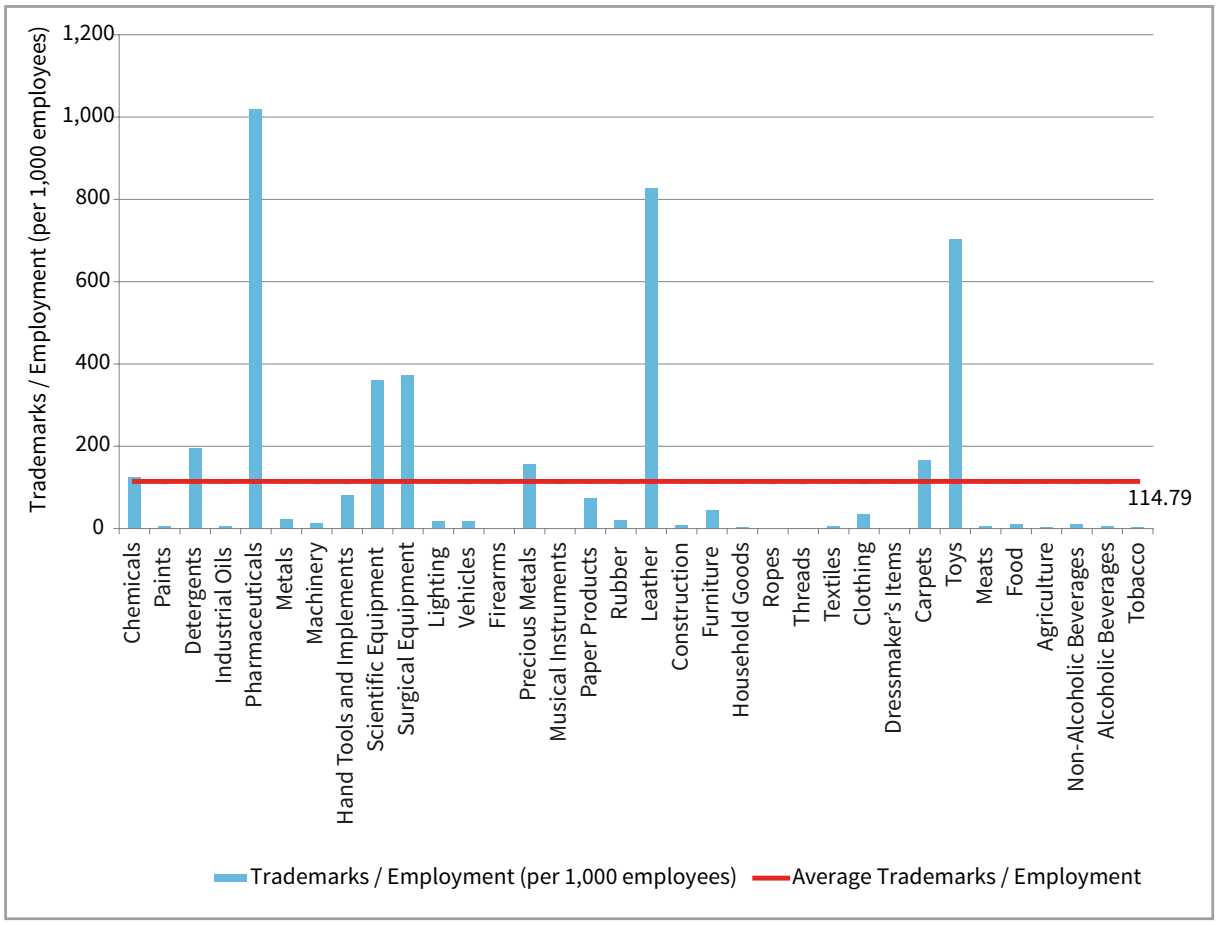
Methodological note: the Nice Classes in Table Panama 1 were selected based on the indicators "trademarks per unit of employment" and / or "trademarks per unit of sales." In the case of goods, these classes have indicators higher than the economy average, and in the case of services, these classes have indicators higher than the average for services. These sectors are considered trademark intensive.

Graphs Panama 1 to 4 show the Nice Classes selected and their respective intensity indicators. Figure Panama 1 summarizes the classes according to their selection criteria. Finally, Table Panama 1 lists the sectors selected and their share tied to value added and the generation of international trade to show the relative importance of the activities associated with each class.

Among the classes selected, seven of them match the ten classes indicated as most frequent in WIPO 2015. These are: 3) detergents; 5) pharmaceuticals; 9) scientific equipment; 25) clothing; 35) business services; 41) education; and 42) scientific and technological services.

Graph Panama 1
Trademark registration in Panama corrected by employment, for goods by Nice Class

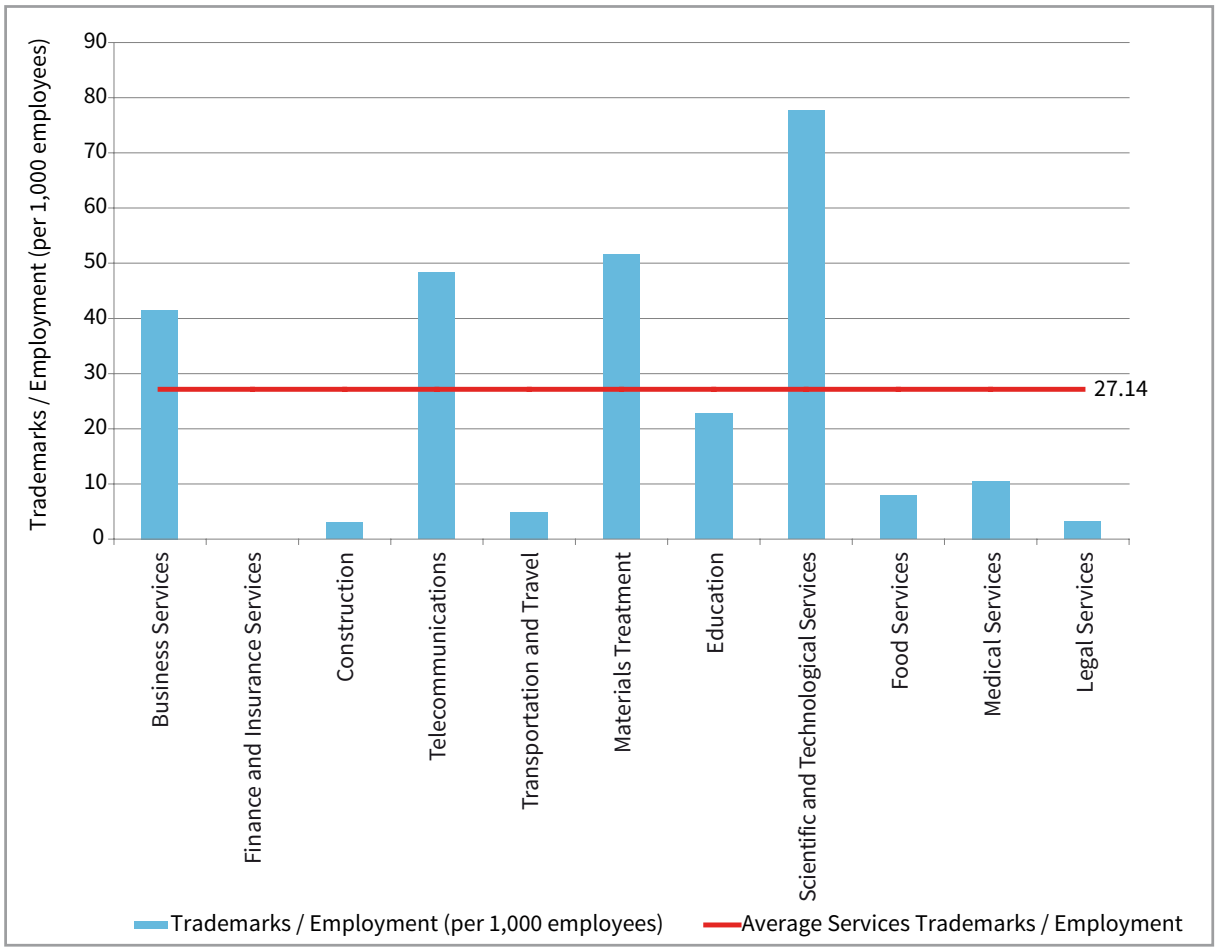
Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2012 National Economic Census. Source: INEC.



Methodological note: the bars of the two graphs (Graph Panama 1 and Graph Panama 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Panama 1 and for the average of service classes in Graph Panama 2. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Panama 2
Trademark registration in Panama corrected by employment, for services by Nice Class

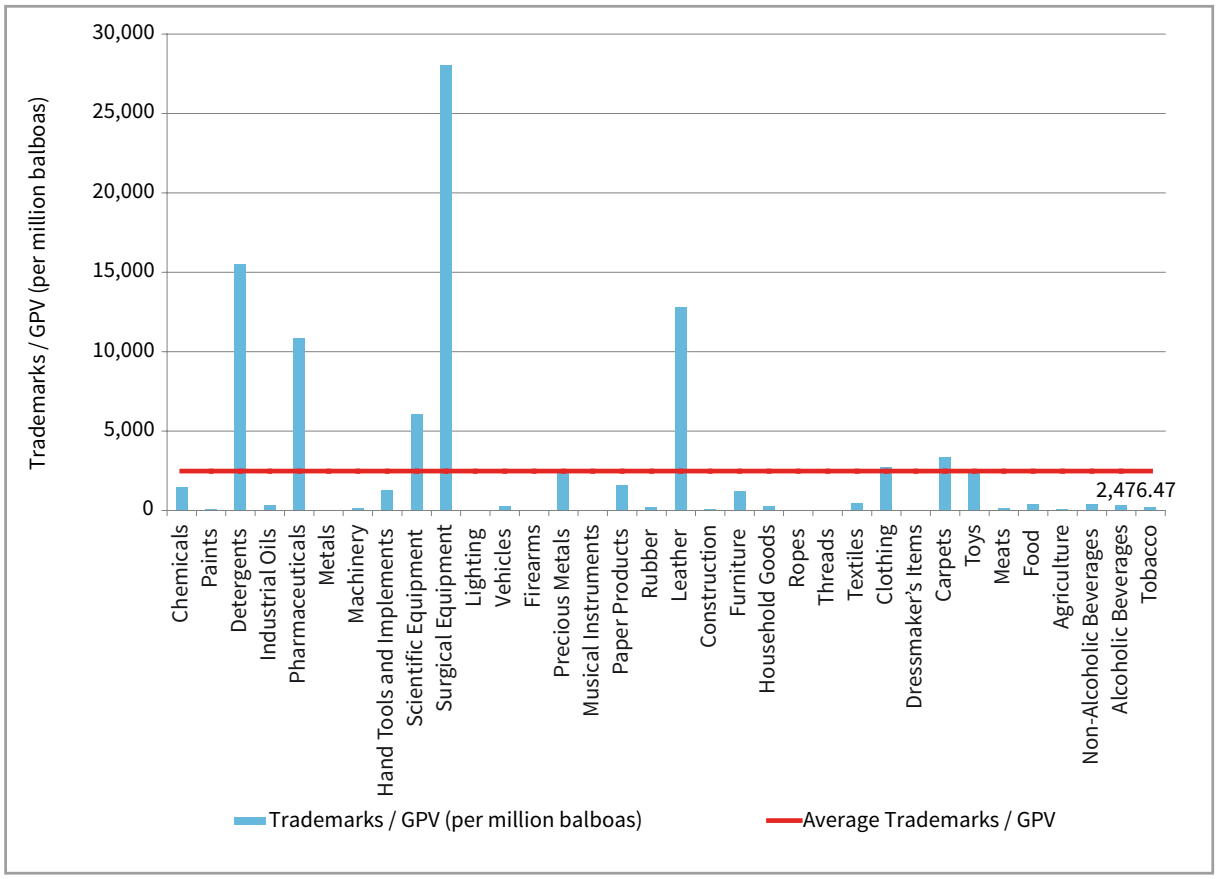
Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2012 National Economic Census. Source: INEC.



Methodological note: the bars of the two graphs (Graph Panama 1 and Graph Panama 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Panama 1 and for the average of service classes in Graph Panama 2. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Panama 3
Trademark registration in Panama corrected by gross production value, for goods by Nice Class

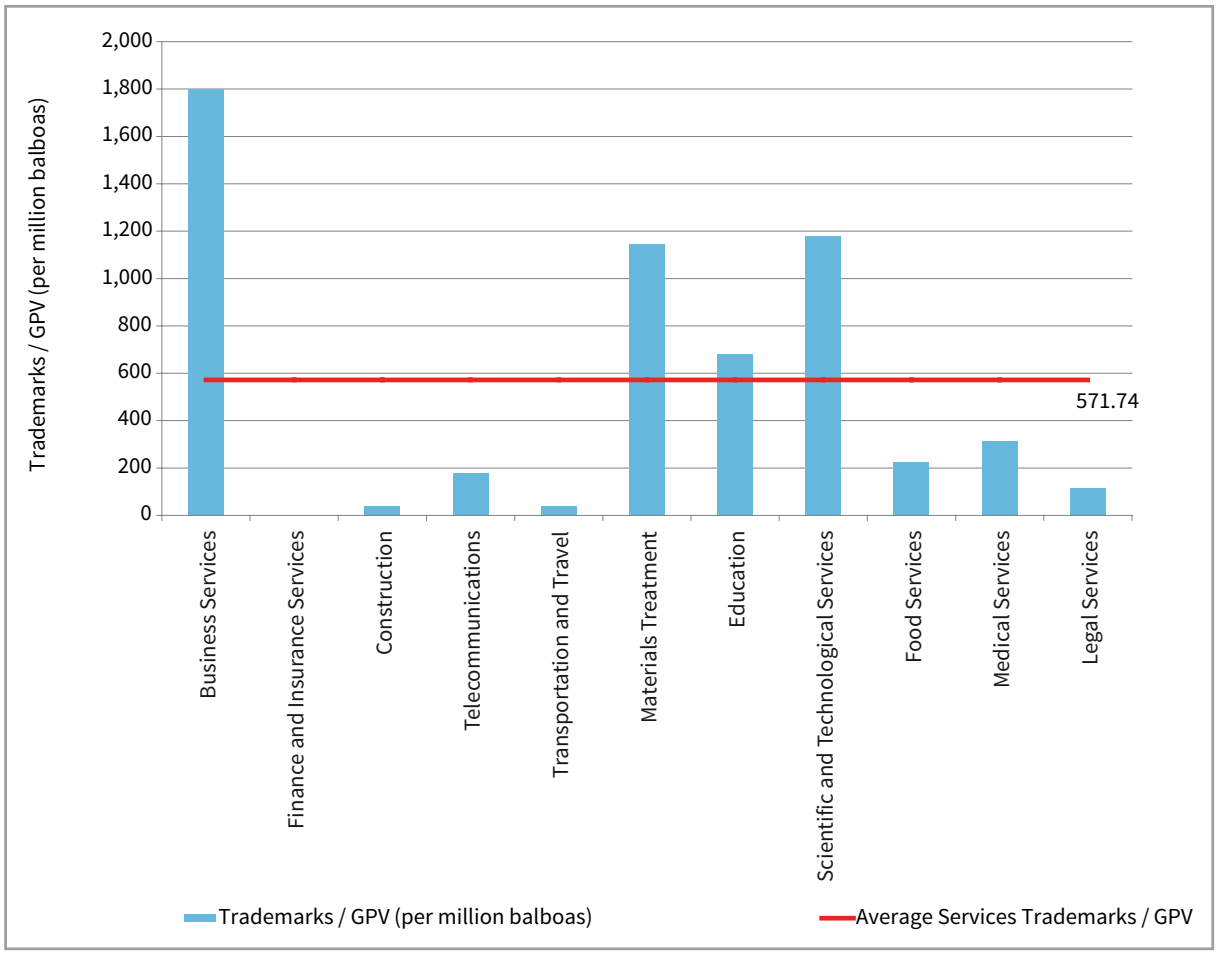
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from the 2012 National Economic Census. Source: INEC.



Methodological note: the bars of the two graphs (Graph Panama 3 and Graph Panama 4) measure the indicator "trademarks per unit of sales" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Panama 3 and for the average of service classes in Graph Panama 4. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Panama 4
Trademark registration in Panama corrected by gross production value, for services by Nice Class

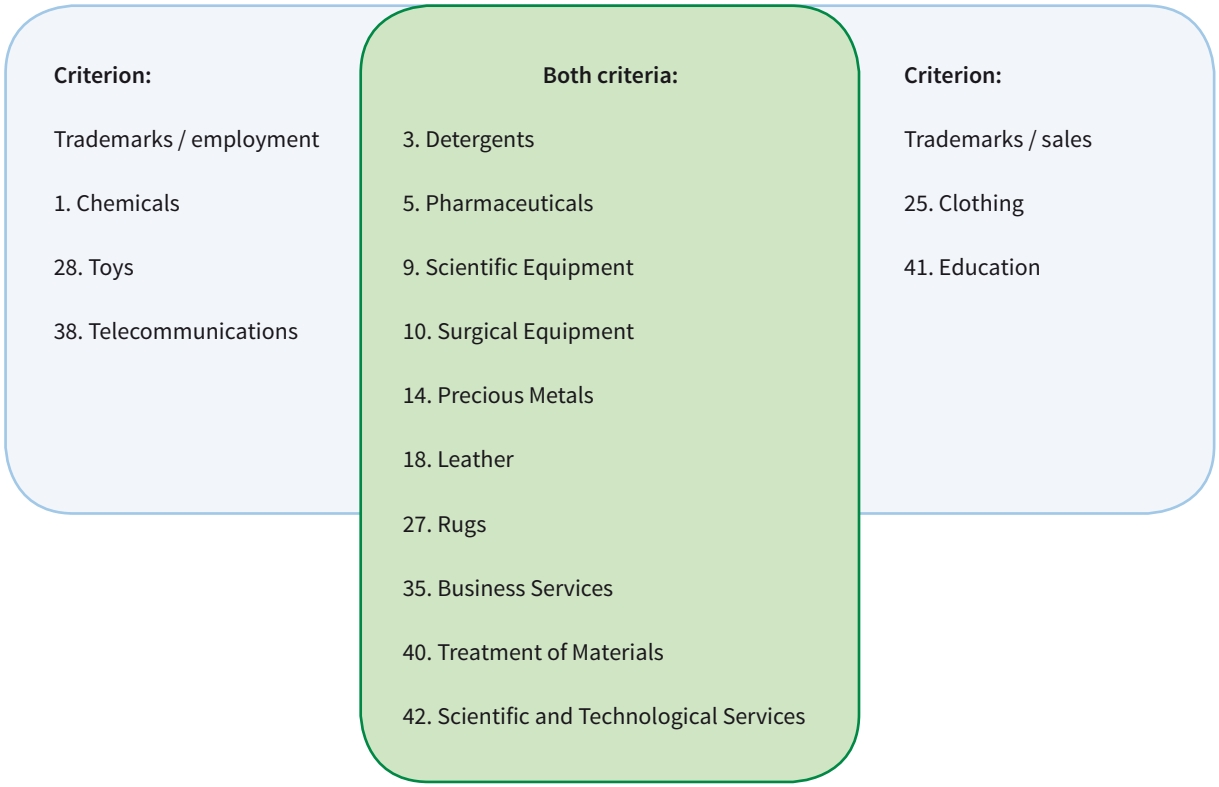
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from the 2012 National Economic Census. Source: INEC.



Methodological note: the bars of the two graphs (Graph Panama 3 and Graph Panama 4) measure the indicator "trademarks per unit of sales" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy in Graph Panama 3 and for the average of service classes in Graph Panama 4. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Figure Panama 1
Nice Classes selected according to selection criteria

Average trademarks 2010-2014. Source: WIPO. Employment and gross production Value taken from the 2012 National Economic Census. Source: INEC.



Methodological note: the number of registered trademarks by Nice Classification was used to choose the trademark-intensive sectors according to two alternative indicators: (1) the ratio of the number of registered trademarks to employment by Nice Class and (2) the ratio of the number of registered trademarks to gross production value (sales) by Nice Class. In this case, there are ten Nice Classes that meet both criteria (shaded subset). The rest meet just one of the criteria. The sectors of financial brokerage and agriculture are not included.

Table Panama 1
Size of the economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2012 National Economic Census. Source: INEC. Average international trade 2010-14. Source: INTRACEN.

Nice Class	Total Employment (as a % of the total selected)	Value Added (as a % of the total selected)	Exports of Goods 2009-2011 (as a % of the total selected)	Imports of Goods 2009-2011 (as a % of the total selected)	Exports of Goods 2012-2014 (as a % of the total selected)	Imports of Goods 2012-2014 (as a % of the total selected)
Goods						
1	2	1	2	3	2	11
3	4	1	5	4	2	9
5	1	1	42	25	13	17
9	2	3	13	11	0	23
10	0	0	1	30	0	4
14	1	0	4	3	67	4
18	0	0	2	2	12	3
25	32	10	29	21	5	25
27	0	0	0	0	0	0
28	0	2	1	2	0	4
Services						
35	21	13	-	-	-	-
38	6	42	-	-	-	-
40	1	1	-	-	-	-
41	25	21	-	-	-	-
42	3	5	-	-	-	-
Total	100	100	100			100

Note: 2009-2011 exports and imports include the operation of the Colón Free Trade Zone. **Note:** 2012-2014 exports and imports exclude the operation of the Colón Free Trade Zone. Total employment and value added excludes the sectors of financial brokerage, agriculture, and government activities.

b. Economic contribution of trademark-intensive sectors

b.1. Contribution to employment and value added

The trademark-intensive economic activities associated with the corresponding Nice Classes have a 13% share of employment and a 16% share of value added over GDP (see Table Panama 2). In the case of employment, trademark-intensive goods sectors and service sectors split the impact almost in half. In the case of the impact on value added, service sectors dominate the contribution (13%, compared to 3% in the goods sector). This effect is tied to the strong share of services in Panama's production pattern.

Table Panama 2
Contribution to employment and value added from economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment taken from the 2012 National Economic Census. Source: INEC.

Contribution to employment and value added	Share of employment of trademark-intensive classes over total employment (%)	Share of value added of trademark-intensive classes over total value added (%)
Goods (10 sectors)	6	3
Services (5 sectors)	7	13
Goods and services (15 sectors)	13	16

Note: excludes financial brokerage, agricultural, and government activity sectors.

b.2. Contribution to international trade

In the case of Panama, the contribution of trademark-intensive sectors in international trade takes into account the fact that free trade zones[26] generate particular commercial activity in this economy, insofar as the merchandise enters the zone and is reexported, but does not enter the customs territory of the local market. This feature of the free trade zone's operations makes it advisable for our analysis to separate the two systems. We analyze, on the one hand, trade totals including reexports, and on the other hand, the totals for internalized trade, that is, the domestic trade whose exports and imports involve operations in Panama's customs territory.

Table Panama 3
Contribution to Peru's international trade from economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. 2009-2011 average international trade (including free trade zone operations) and 2012-2014 average (without free trade zone operations). Source: INTRACEN.

Contribution to Foreign Trade	Share of exports from trademark-intensive classes over total exports including free trade zone operations (%)	Share of imports from trademark-intensive classes over total exports including free trade zone operations (%)	Share of exports from trademark-intensive classes in total national exports (%)	Share of imports from trademark-intensive classes over total national imports (%)
Goods (10 sectors)	75	78	20	21

The findings show that the impact of trademark-intensive sectors on Panama's total international trade is very high: 61% in exports and 51% in imports. By comparison, the shares of trademark-intensive activities in international trade activities directly associated with internal activities (exports of domestic products and imports for consumption and domestic production) are lower: 19% in the case of exports and 30% in the case of domestic imports.

26 Among Panama's free trade zones, the Colón Free Trade Zone stands out. It is a service center for importing, storing, assembling, packing, and reexporting products from around the world, especially electrical appliances, pharmaceutical products, alcoholic beverages, tobacco, home and office furnishings, textile products, footwear, jewelry, and toys. The main imports come from Hong Kong, Japan, and the United States, and are sent to countries in South America, Central America, and the Caribbean.

b.3. Impact on salaries

The analysis of relative salaries between trademark-intensive sectors and the economy's average shows that, just as occurs in the case of the United States and the European Union, salaries in intensive sectors are higher. The salary premium between trademark-intensive sectors and non-intensive sectors is 20% (see Table Panama 4).

Table Panama 4
Salary comparison of economic sectors associated with selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Salaries and employment taken from the 2012 Economic Census. Source: INEC.

Salaries	Annual salaries (in thousands of balboas) over employment
Goods and services (15 classes)	12.67
Non-trademark-intensive sectors	10.52
Total average of activities	10.82

Methodological note: the first row of Table Panama 4 gives the estimated average salaries in the Nice Classes selected as trademark intensive in order to compare them to the average salaries of the sectors corresponding to the rest of the Nice Classes and to the average of the economy given in the following two rows of the table.

c. Summary of findings

Panama stands out as a case of a service economy (service sectors make up 73% of its GDP). A third of trademark-intensive sectors correspond to Nice Service Classes. In keeping with this high share, trademark-intensive service sectors make a higher contribution to the economy's GDP and have a slight advantage in the contribution of intensive sectors to total employment. It should be kept in mind that financial brokerage is not part of the analysis, since it is not included in the Economic Census.[27]

The most noteworthy aspect is the contribution of trademark-intensive sectors to international trade, due to Panama's special situation in the operation of the Colón Free Trade Zone, one of the largest free trade zones in the world. The impact on trademark-intensive sectors in foreign trade is over 70% when reexport operations are included. When they are excluded, the share of trademark-intensive sectors in exports and imports is similar to those of the other cases studied.

Finally, just as occurs in the case of the United States and the European Union, salaries in intensive sectors are higher. In particular, the difference between salaries in the service sectors and the general average stands out.

27 This omission very likely does not alter the results, since in all the countries studied the number of trademarks registered annually in the financial sector is at an intermediate level (see Graph A-2 on page 83 of this report). Of the five countries studied, it is only a trademark-intensive sector in Peru, where the sector is relatively small. In the studies used as a reference, it was included in the case of the United States, but not in the case of Europe.

2.2.5. Peru

In 2014, Peru recorded 25,864 trademark registrations. In comparative terms, the country is 41st in the work ranking of applications (both domestic and abroad) out of a total of 123 countries (WIPO 2015).

a. Intensive industries

From among the group of 45 Nice Classes, ***15 classes*** were identified as belonging to trademark-intensive sectors, according to either of the two intensity criteria (higher than average trademarks over employment or trademarks over sales).

Economic data: economic data for employment, gross production value (sales), value added, and salaries are taken from the 2008 Economic Census, which uses the ISIC Rev. 4 economic sector classification. This classification makes it possible to show a direct comparison with Nice Classes using the conversion table created for this study.

Selection of intensive sectors: as in the other cases, the indicators trademarks over employment and sales over employment were used. For each group the indicator average was calculated, including the sectors of goods and services. This calculation omitted the firearms sector due to problems of reliability in the sectoral employment information.

Table Peru 1
Nice Classes corresponding to trademark-intensive activities

Average trademarks 2010-2014. Source: WIPO. Employment and gross production value (sales) taken from the 2008 Economic Census. Source: INEI.

Nice Class	Class Name
Goods	
1	Chemicals
3	Detergents
5	Pharmaceuticals
8	Hand Tools and Implements
9	Scientific Equipment
10	Surgical Equipment
13	Firearms
14	Precious Metals
16	Paper Products
27	Rugs
28	Toys
Services	
35	Business Services
36	Financial and Insurance Services
40	Treatment of Materials
42	Scientific and Technological Services

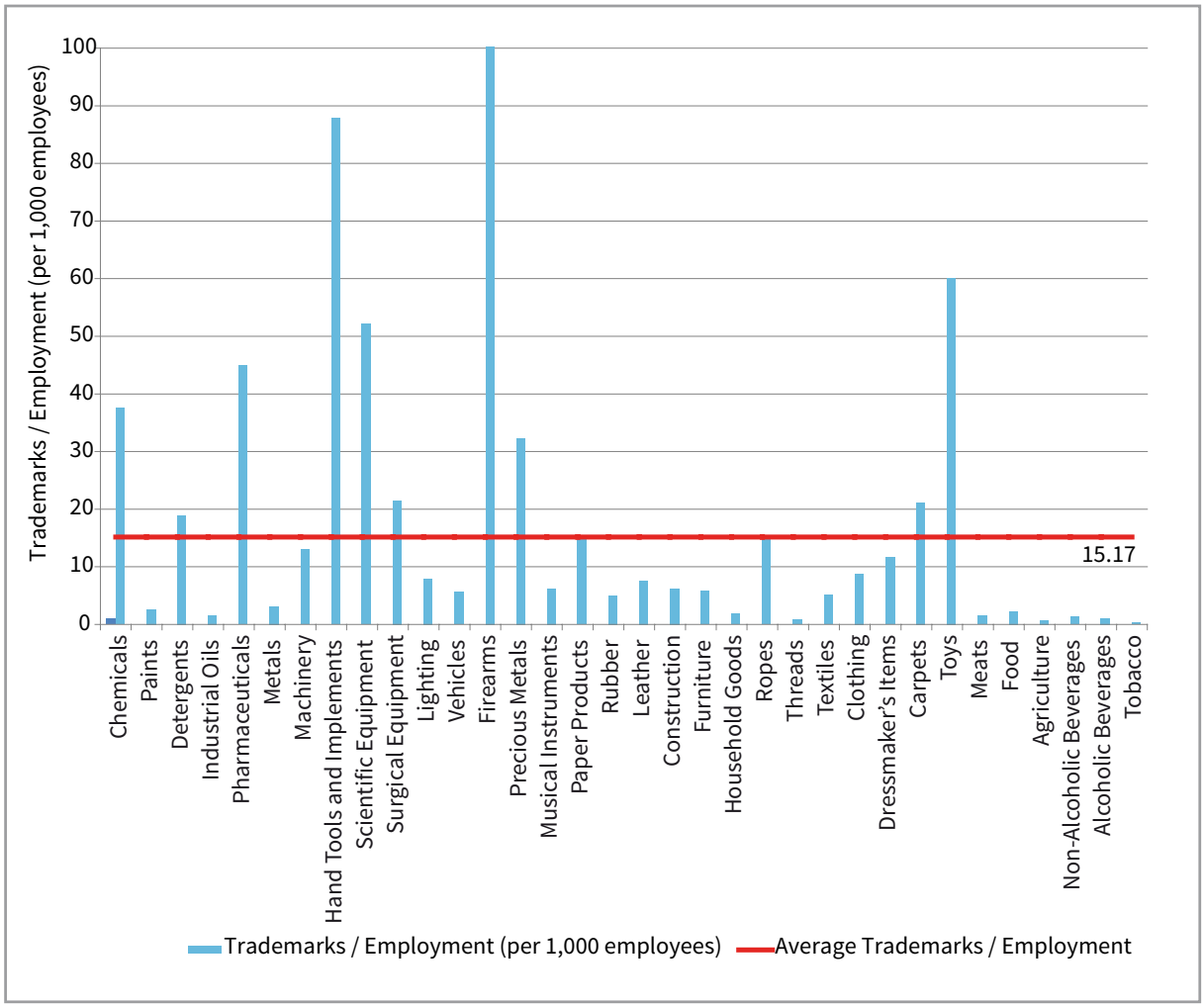
Methodological note: the Nice Classes in Table Peru 1 were selected based on the indicators "trademarks per unit of employment" and / or "trademarks per unit of sales." Classes whose average was higher than that of the economy were considered trademark intensive.

Graphs Peru 1 to 4 below show the sectors chosen and their respective indicators of intensity. Figure Peru 1 groups the classes according to their selection criteria. Finally, Table Peru 1 lists the sectors selected and their share tied to value added and the generation of international trade to show the relative importance of the activities associated with each class.

Of the 15 classes selected, five match the classes of most frequent registration internationally, according to data from WIPO 2015. In the category of goods, these are: 3) detergents; 5) pharmaceutical products; and 9) scientific equipment. In the category of services, these are: 35) business services and 42) scientific and technological services.

Graph Peru 1
Trademark registration in Peru corrected by employment, for goods by Nice Class

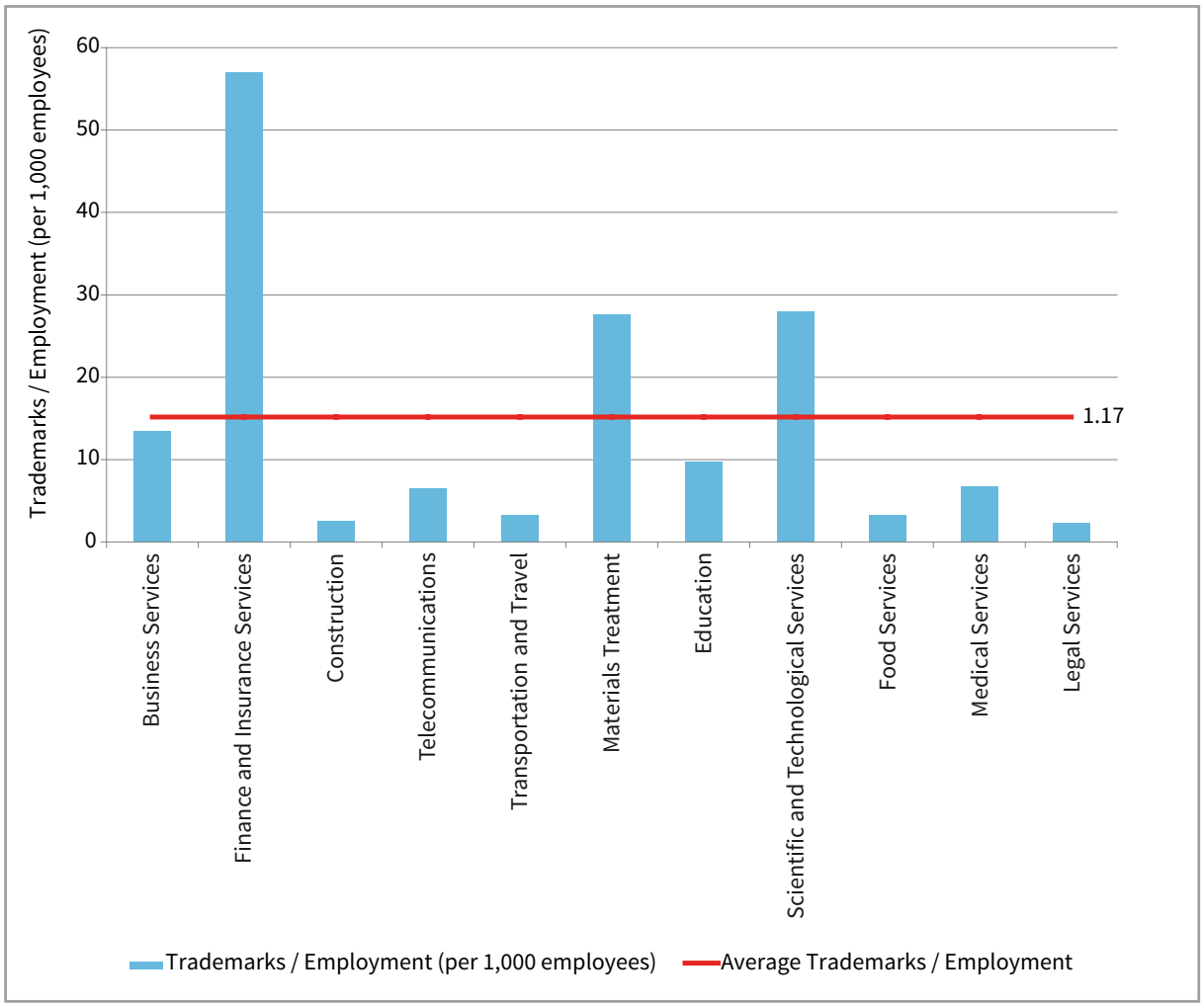
Average trademarks 2010-2014. Source: WIPO. Employment taken from 2008 National Economic Census. Source: INEI.



Methodological note: the bars of the two graphs (Graph Peru 1 and Graph Peru 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Peru 2
Trademark registration in Peru corrected by employment, for services by Nice Class

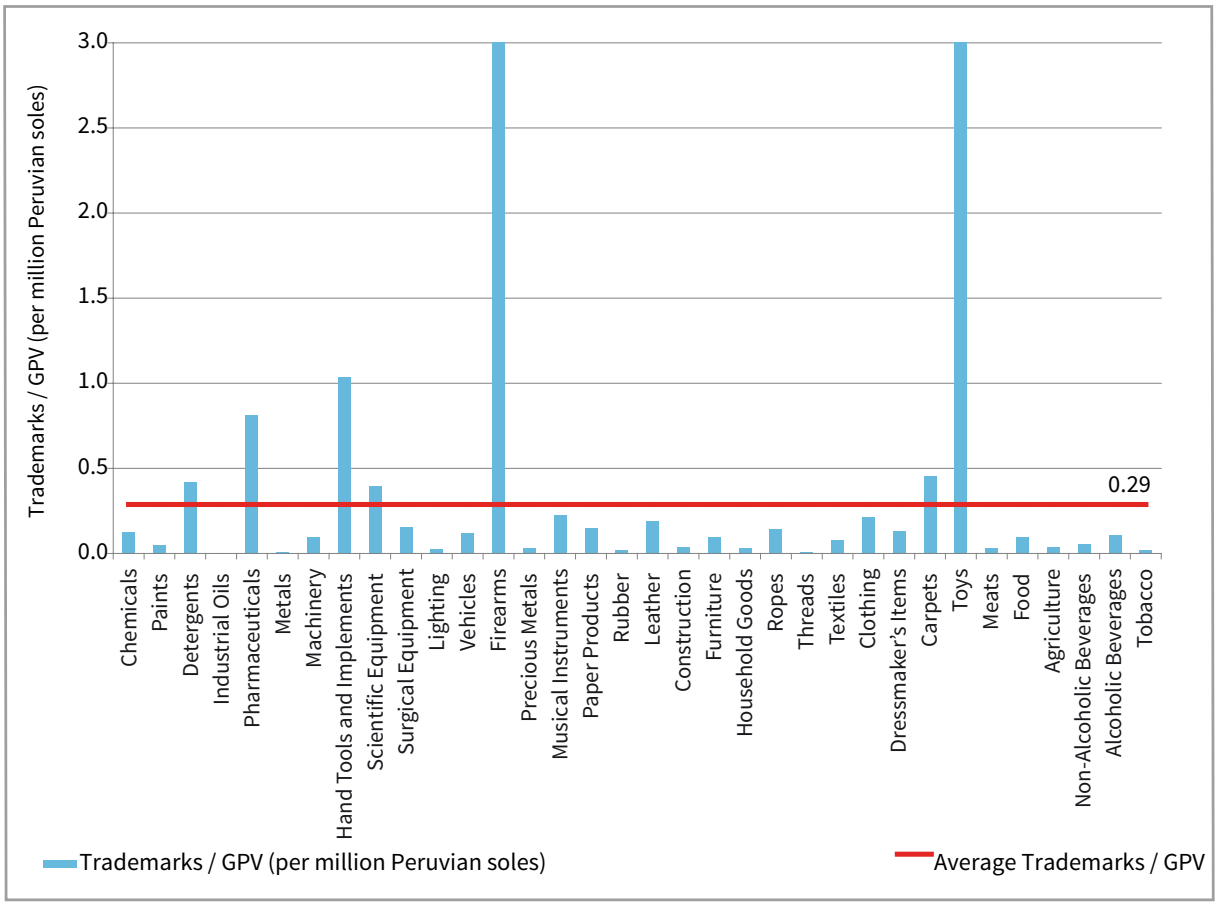
Average trademarks 2010-2014. Source: WIPO. Employment taken from 2008 National Economic Census. Source: INEI.



Methodological note: the bars of the two graphs (Graph Peru 1 and Graph Peru 2) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Peru 3
Trademark registration in Peru corrected by gross production value, for goods by Nice Class

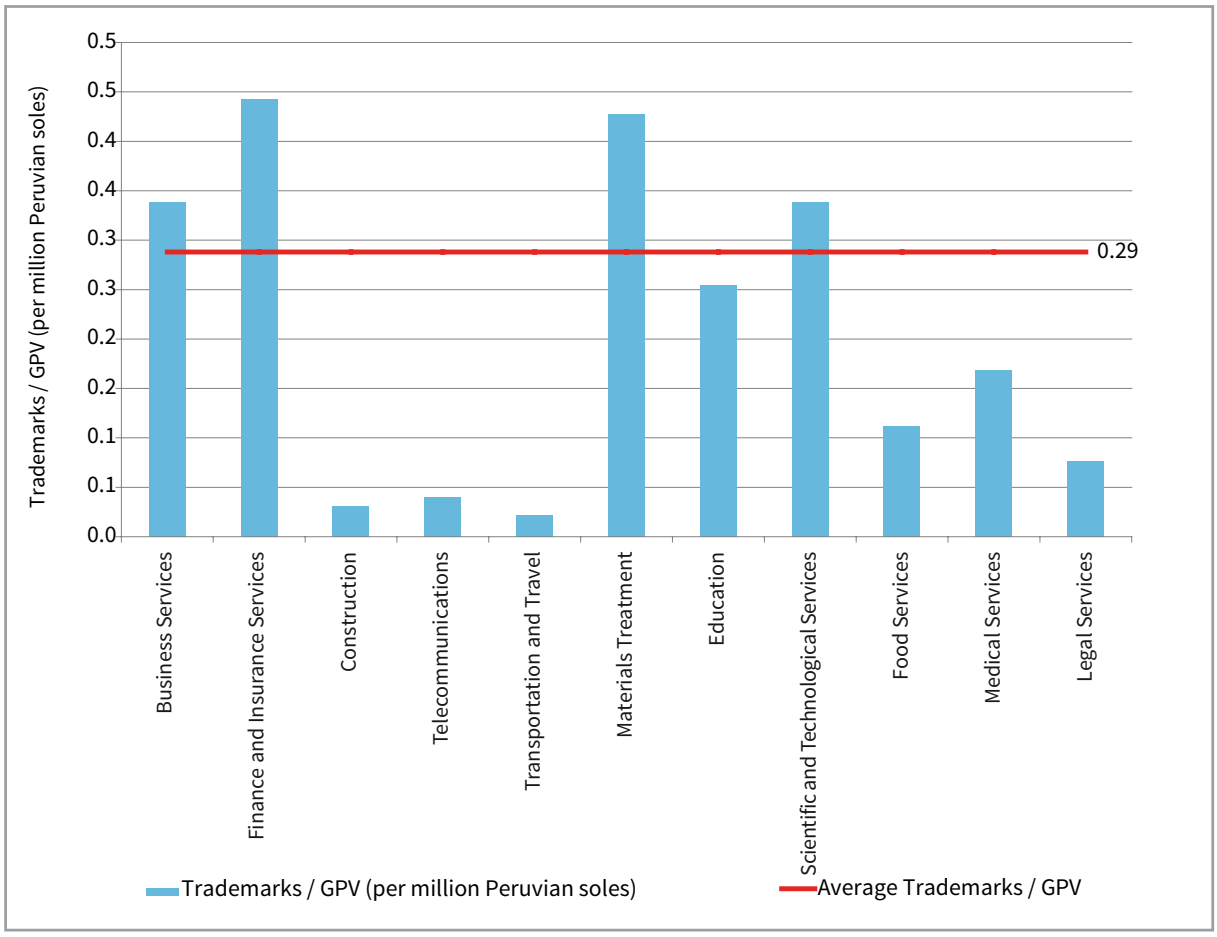
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from the 2008 National Economic Census. Source: INEI.



Methodological note: the bars of the two graphs (Graph Peru 3 and Graph Peru 4) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Graph Peru 4
Trademark registration in Peru corrected by gross production value, for services by Nice Class

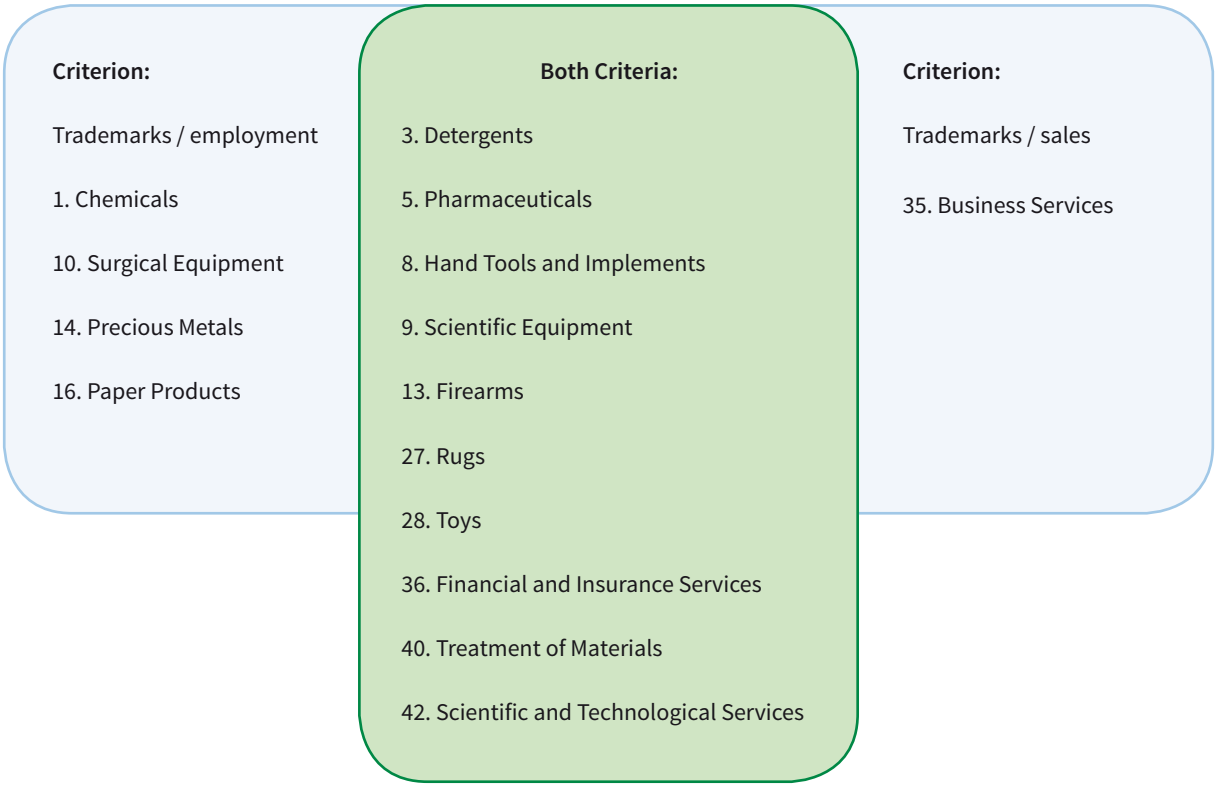
Average trademarks 2010-2014. Source: WIPO. Gross production value taken from the 2008 National Economic Census. Source: INEI.



Methodological note: the bars of the two graphs (Graph Peru 3 and Graph Peru 4) measure the indicator "trademarks per unit of employment" for goods and services, respectively. The red line corresponds to the average of this indicator for the economy. The Nice Classes whose values are above the line are considered trademark-intensive classes.

Figure Peru 1
Nice Classes selected according to selection criteria for average trademarks 2010-2014, according to WIPO

Gross production value taken from the 2008 National Economic Census. Source: INEI.



Methodological note: the number of registered trademarks by Nice Classification is used to select the trademark-intensive sectors according to two alternative indicators: (1) the ratio of the number of registered trademarks to employment by Nice Class and (2) the ratio of the number of registered trademarks to gross production value (sales) by Nice Class. In this case there are ten Nice Classes that meet both criteria (shaded subset). The rest meet just one of the criteria.

Table Peru 1
Size of the economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment and value added taken from the 2008 National Economic Census. Source: INEI. Average international trade 2010-14. Source: INTRACEN.

Nice Class	Total Employment (as a % of the total selected)	Value Added (as a % of the total selected)	Exports of Goods (as a % of the total selected)	Imports of Goods (as a % of the total selected)
1	5	11	62	28
3	14	8	10	5
5	15	9	5	11
8	0	0	1	3
9	7	7	4	34
10	3	5	0	3
13	0	0	0	0
14	2	17	4	1
16	15	13	13	11
27	0	0	0	0
28	1	0	1	4
35	27	16	-	-
36	3	6	-	-
40	1	1	-	-
42	6	6	-	-
Total	100	100	100	100

Note: total employment and value added exclude government activities.

b. Economic contribution of trademark-intensive sectors

b.1. Contribution to employment and value added

The trademark-intensive sectors associated with the corresponding Nice Classes have an 8% share of employment and a 10% share of value added over GDP (see Table Peru 2). In the case of both employment and value added, the sectors of goods are those that make the largest contribution.

Table Peru 2
Contribution to employment and value added from economic sectors associated with the selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Employment and value added taken from the 2008 National Economic Census. Source: INEI.

Contribution to employment and value added	Share of employment of trademark-intensive classes over total employment (%)	Share of value added of trademark-intensive classes over total value added (%)
Goods (11 sectors)	5	7
Services (4 sectors)	3	3
Goods and services (15 sectors)	8	10

b.3. Contribution to international trade

In the case of Peru, the contributions of trademark-intensive sectors to international trade are 5% and 21%, respectively.

Table Peru 3
Contribution to Peru's international trade of economic sectors associated with trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Average international trade 2010-14. Source: INTRACEN.

Contribution to foreign trade	Share of trademark-intensive exports over total exports (%)	Share of trademark-intensive imports over total imports (%)
Goods (11 sectors)	5	21

b.4. Impact on salaries

The analysis of relative salaries between trademark-intensive sectors and the economy's average shows that, just as occurs in the case of the United States and the European Union, salaries in intensive sectors are higher. The "premium" between salaries in trademark-intensive sectors and non-intensive sectors is 25%, which suggests that these sectors use more human capital and have higher productivity than the non-intensive ones (see Table D on page 77).

Table Peru 4
Salary comparison of economic sectors associated with selected trademark-intensive classes

Average trademarks 2010-2014. Source: WIPO. Salaries and employment taken from the 2008 Economic Census. Source: INEGI.

Salaries	Annual salaries (in thousands of Peruvian soles) over employment
Goods and services (15 classes)	14.93
Non-trademark-intensive sectors	11.93
Total average of activities	12.25

Methodological note: the first row of Table Peru 4 gives the estimated average salaries in the Nice Classes selected as trademark intensive in order to compare them to the average salaries of the sectors corresponding to the rest of the Nice Classes and to the average of the economy given in the following two rows of the table.

c. Summary of findings

Peru has an annual activity in trademark application and registration that, in absolute terms, places it at the end of the first third of the world ranking, considerably lower than other Latin American countries like Brazil, Mexico, and Argentina. An analysis of annual trademark registration per 1,000 job holders shows that trademark-intensive activity is more significant, since Peru registers more trademarks per 1,000 job holders than Mexico, Chile, or Colombia. Furthermore, it should be noted that the dynamic of trademark registration has intensified since 2004 with regard to GDP, a characteristic that Peru shares only with Mexico, among the countries studied. In this period, Peru experienced an auspicious period of growth that was accompanied by even higher growth in annual trademark registration.

Looking in more detail and identifying the economic sectors that are more trademark intensive, these make up a core that is still small in the economy, covering 8% of total employment and 10% of GDP. These share values are lower than the sample of selected countries. Something similar occurs with regard to international trade. In contrast, the salary premium in these sectors is significantly high, since salaries in trademark-intensive sectors are 25% higher than in non-intensive sectors, showing the greater human capital used by the former.

3. Main conclusions of this study

The conclusions of this study come from a comparative analysis of the findings of these countries. Moreover, to complete the comparison, the findings for Latin America were related to those of the two reports used as a reference for this one, which study the case of the United States and the European Union.

In the countries selected, the trademark-intensive sectors identified by this report, according to the indicators "trademarks over employment" and "trademarks over sales," show a significant alignment across countries and with the sector identified by WIPO as having the highest frequency of registration internationally. Table A summarizes the list of intensive sectors selected by country, indicates the sectors with the highest frequency of trademark registration according to WIPO, and shows the consistencies in the cases studied.

As can be seen in Table A, taking into account the Nice Classes that WIPO considers more frequent, in the case of the countries studied, there is more matching in the classes of pharmaceutical products, detergents, and clothing, under the heading goods. In services, most of the findings match, notably the class of scientific and technological services. The meat and food classes, which are frequent according to WIPO, are not intensive classes for the countries selected. By contrast, some classes have frequent registration in the countries studied, but are not identified by WIPO. In the case of goods, these are: chemicals, surgical equipment, precious metals, leathers, and toys; and in the case of services, these are: telecommunications and treatment of materials in the case of services. Regarding the share of employment and of GDP of the classes considered intensive with respect to the economy as a whole in the countries selected, these shares vary between 8% and 26% of total employment and 10% and 21% of GDP, depending on the country. These percentages equal 18.5 million jobs and US $2,390 of value added per capita per year for this group of countries (see Table B).

Table A
Selected intensive classes by country and their consistency with classes of highest registration frequency according to WIPO in the Latin American countries selected

Most frequent Nice Classes according to trademark use intensity by sector for this study	Category	Trademark-intensive classes in the countries selected				
		Chile	Colombia	Mexico	Panama	Peru
Goods						
1	Chemicals	-	-	X	X	X
2	Paints	X	-	-	-	-
3	Detergents	X	X	X	X	X
5	Pharmaceuticals	X	X	X	X	X
7	Machinery		X			
8	Hand Tools and Implements	-	X	X	-	X
9	Scientific Equipment	-	X	-	X	X
10	Surgical Equipment	-	X	X	X	X
12	Vehicles		X			
13	Firearms	-	X	-	-	X
14	Precious Metals	X	-	X	X	X
15	Musical Instruments	-	X	-	-	-
16	Paper Products	X	-	X	-	X
18	Leather	X	X	X	X	-
19	Construction		X			
20	Furniture	-	-	X	-	-
24	Textiles	X	-	-	-	-
25	Clothing	X	X	X	X	-
26	Dressmaking Supplies	-	-	X	-	-
27	Rugs	-	-	X	X	X
28	Toys	X	X	X	X	X
33	Alcoholic Beverages	X	X	-	-	-
34	Tobacco	-	X	-	-	-
Services						
35	Business Services	X	-	X	X	X
36	Financial and Insurance Services	-	-	-	-	X
38	Telecommunications	X	X	X	X	-
40	Treatment of Materials	X	X	X	X	X
41	Education	X	X	X	X	-
42	Scientific and Technological Services	X	X	X	X	X
43	Food Services	X	-	-	-	-
44	Medical Services	-	-	X	-	-

Note: the shaded categories are the most frequent according to WIPO (2015).

Table B
Share of trademark-intensive sectors in total employment and in total value added in the Latin American countries selected

Contribution to value added – countries selected	Share of trademark-intensive sectors over total employment (%)	Share of trademark-intensive sectors over total value added (%)
Chile	26	21
Colombia	13	17
Mexico	20	15
Panama	13	16
Peru	8	10

The estimated contributions to employment are similar to those reported for the United States and the European Union in their studies. In the United States, the contribution of trademark-intensive sectors to employment is 16%, and in the European Union, it is 21%.

In the case of value added or GDP, the shares for Latin American economies range from 10% to 21%, which is lower than the two reference cases. In effect, in the United States the estimated share is 31%, and in the European Union, 34%. Nevertheless, it should be kept in mind that there are significant differences in production patterns in these countries vis-à-vis the Latin American countries selected. Notably, in Latin American countries, commodities are a significant part of output. These products are homogeneous goods that come from the development of natural resources (agricultural and mining products) and are mainly for export. Because of their nature, they are sold wholesale, so they are less intensive in their use of trademarks than manufacturing sectors.

Something similar occurs in infrastructure and storage services, which are very important in developing economies relative to more advanced economies, and which also lack a diversity of trademarks.

Furthermore, as regards the service sector, it should be kept in mind that their relative importance is high in the countries selected. In this regard, it should be noted that internationally, trademark registration is more frequent for the classes of goods (64.6% of the total in 2014) than for the classes of services (35.4% of the total in 2014). In other words, the service sectors that generally have more variety of trademarks are relatively important in the countries selected.

The contribution of trademark-intensive sectors to international trade is shown in Table C. The values range from 5% to 20% in the case of exports for the various countries and from 13% to 51% in the case of imports. For all five countries studied, US $15 of every US $100 exported corresponds to trademark-intensive products. Similarly, trademark-intensive products account for US $26 of every US $100 imported.

Table C
Share of trademark-intensive sectors in the International Trade of the countries selected

Contribution to foreign trade - countries selected	Share of trademark-intensive exports over total exports (%)	Share of trademark-intensive imports over total imports (%)
Chile	9	13
Colombia	9	51
Mexico	14	19
Panama*	20	21
Peru	5	21

*Does not include the Colón free trade zone. If free trade zone activities are included, the values for Panama climb to 75% for exports and 78% for imports.

For exports, the same observations about the total impact can be made, which in the case of employment and value added is due to the fact that a significant portion of the exports of the countries selected corresponds to commodities (primary products such as oil, copper, and other mining products, and agricultural products, which are not trademark intensive).

In the case of imports, the contribution is higher in all countries. The explanation for the greater impact of trademark-intensive sectors on imports lies in the fact that Latin American countries import end-consumer products that use trademarks much more frequently.

The impact recorded for Latin American countries is not as high as in the case of the United States and the European Union. In the United States, the impact of intellectual property component-intensive industries is 61% for exports and 70% for imports (in this case, the disaggregated information is not counted for trademark-intensive industries). For the European Union, the share of trademark-intensive sectors in exports is 75% and in imports is 76%. In the latter case, it should be remembered that the values reported are not directly comparable to those of this study, since they include exports and imports of services that are not available for Latin American countries at this level of disaggregation. Still, the European report indicates that the core of this share is concentrated in manufacturing.

Another reason that may explain the lower impact of trademark-intensive economic activities on trade in Latin American countries is that a very important part of their imports are intermediary goods to be integrated into manufacturing production, where the impact of trademarks is relatively lower than in the end-consumer goods.

The case of Panama warrants a special mention, because part of its trade corresponds to the activities of the Colón Free Trade Zone (not included in Table C). When these activities are taken into account, the findings show that the impact of trademark-intensive sectors on Panama's total international trade is very high: 75% in exports and 78% in imports. This effect is linked to the diversity of operations in this free trade zone, which is the second in the world by volume traded. In this sense, the free trade zone system is more similar in the nature of its trademark content to the impacts seen for the United States and the European Union.

Finally, the analysis of relative salaries between trademark-intensive sectors and the economy's average shows that, just as occurs in the case of the United States and the European Union, salaries in intensive sectors are higher. The "salary premium" in Latin American economies varies in a wide range from 4.6% to 25%, depending on the country (see Table D, below). By comparison, in the European Union this premium is 42%, and in the United States it is 36%. Nevertheless, in this report the comparisons are less precise, because in Latin American countries, the informal economy has a significant presence (55% of workers do not contribute to the social security system, according to recent estimates by the Inter-American Development Bank).[28] These activities are hard to capture in official statistics, although it is known that they are characterized by low productivity and low salaries. Therefore, in the calculation for the Latin American countries selected, the lowest salaries in the economies, which in all likelihood belong to non-intensive sectors, would not be included, skewing the results toward a lower salary premium.

Table D
Salary premium in trademark-intensive sectors in the Latin American countries selected

Salaries	Salary premium (salary in trademark-intensive sectors over salary in non-intensive sectors (%))
Chile	20
Colombia	14
Mexico	4.6
Panama	20
Peru	25

28 In this regard, see Alaimo et al. 2015.

In sum, a comparative analysis of the findings shows that there are significant similarities between Latin American countries with regard to trademark-intensive activities and the degree of impact on their respective economies. In the five countries, economic activities that register and use trademarks intensively generate 18.5 million jobs and, on average, make up 15% of the GDP, 15% of exports, and 26% of imports. Furthermore, trademark-intensive sectors pay higher salaries than the rest of the economy, which indicates their greater productivity. At the same time, their experiences are comparable and in line with those of the United States and the European Union, taking into account the differences between the patterns of production and development between the two groups.

Appendix: Methodology

Table A-1 compares the methodologies of two recent case studies produced on the United States and the European Union (ESA - USPTO 2012 and EPO - OHIM 2013).

In the study on the United States, the authors mention the novelty of the topic and their approach, since at the time it was developed in 2012, there were no examples of similar reports. The studies of the United States and the European Union are similar in their objectives and in their definition of the effects that they wish to measure (impact on activity, employment, and foreign trade, mainly), but they vary in their methodology because of differences in the availability of the data. Both studies select sectors that they consider trademark intensive, based on the annual registration (USA) or the existence of registered trademarks (EU) in relation to sectoral employment.[29]

Among the notable differences between the methodologies of the studies reviewed and that of this report are the starting point data of the analysis. In the reports on the United States and the European Union, trademark-intensive sectors are identified by way of company statistics (trademarks and employment per company). In the first case, since the companies identified are, in general, the largest in the economy, some ad hoc methods are used to incorporate small and medium-sized enterprises into the analysis. The European case has a wider sample of companies, but in both cases, the companies must be identified with sectors of the economy, taking into account their main production.

In the case of this study, the use of a convergence table between ISIC Rev. 4 and the Nice Classification, makes it possible to take advantage of the total information about number of trademarks registered by sector and their relation to economic variables.

29 Another reference is a Spanish study: University of Alicante, Marketing Department, "Impact of trademarks on the Spanish economy and society," from November 2012. In this case, the same impacts are defined for measurement, but a different focus is used, since the authors do not distinguish between intensive and non-intensive sectors, but rather identify, in each sector, the set of companies that use trademarks and determine the share for each of the impact variables studied (activity, employment, etc.).

Table A-1
Comparison of studies of the United States and the European Union used as a methodological reference (ESA - USPTO 2012 and EPO - OHIM 2013)

Country of study	Unit of measurement of trademarks	Count (frequency) of trademarks	Definition of trademark-intensive sectors	Relation between trademarks and sectors of the economy	Impact measurement
United States[1]	Each registration by class. The same trademark can appear in several classes. The vast majority are only in one class because there is an obligation of use. Between 2000 and 2009, 16% were in multiple classes.	Counts registering firms.	Trademark registrations / staff of the companies for each economic sector. Assumes that the trademark and the company have the same frequency. Adds companies and employment by sector. Calculates coefficient of trademarks / company per 1,000 job holders. Sectors falling above the average (1.8) are trademark intensive.	First focus: intensive sectors chosen by the companies / trademarks that could be identified for their sectors. Corresponds to the universe used to define trademark-intensive sectors (around 4,000 companies / holdings).	- Direct employment and change - Self-employment - Total employment, including the supply chain - Share of value added - Average salaries - Salary premium - Average staff education - Exports
			The sectors which have the highest frequency of appearance (five times or more) in the top 50. Not normalized by employment.	Second focus: top 50 registrants classified by sector.	
			The sectors that have five or more companies in the sample. Not normalized by employment.	Third focus: definition of intensive sectors applied to a representative random sample of registrations for 2004-2008, classified by sector to have SME representation.	
European Union [2]	Each registration by class.	Counts registering companies that have residence in one of the EU countries because of the available company database.	Similar to study of United States (2012). Adds up companies / trademarks by sector and divides by employment in the sector. Those higher than the weighted average are intensive.	159,020 companies assigned by sector. Does not include public services such as education, because they have a large amount of employment and would reduce the average, making too many sectors trademark intensive.	Same as for the study of the United States (2012).

Source: the authors, based on the following bibliography:

1. Economics and Statistics Administration and US Patent and Trademark Office (2012), "Intellectual Property and the US Economy: Industries in Focus."
2. European Patent Office and the Office for Harmonization in the Internal Market (2013). "Intellectual Property Rights Intensive Industries: Contribution to Economic Performance and Employment in the European Union," September 2013 (EPO - OHIM 2013).

Appendix: Statistics

Technical specifications of trademark data gathered by WIPO

2007-2014

WIPO Intellectual Property Statistics Data Center:
http://ipstats.wipo.int/ipstatv2/index.htm?tab=trademark

Indicator 3a: Direct applications by class (Nice Classification)

Residents and non-residents

Chile 2007-2014

Colombia 2007, 2010, 2011, 2014

Mexico 2007-2014

Panama 2008-2014

Peru 2007, 2008, 2010, 2012

Indicator 4a: Registration for direct applications by class (Nice Classification)

Residents and non-residents

Chile 2007-2014

Colombia 2007, 2010, 2014

Mexico 2007-2014

Panama 2010-2014

Peru 2007, 2008, 2010, 2012

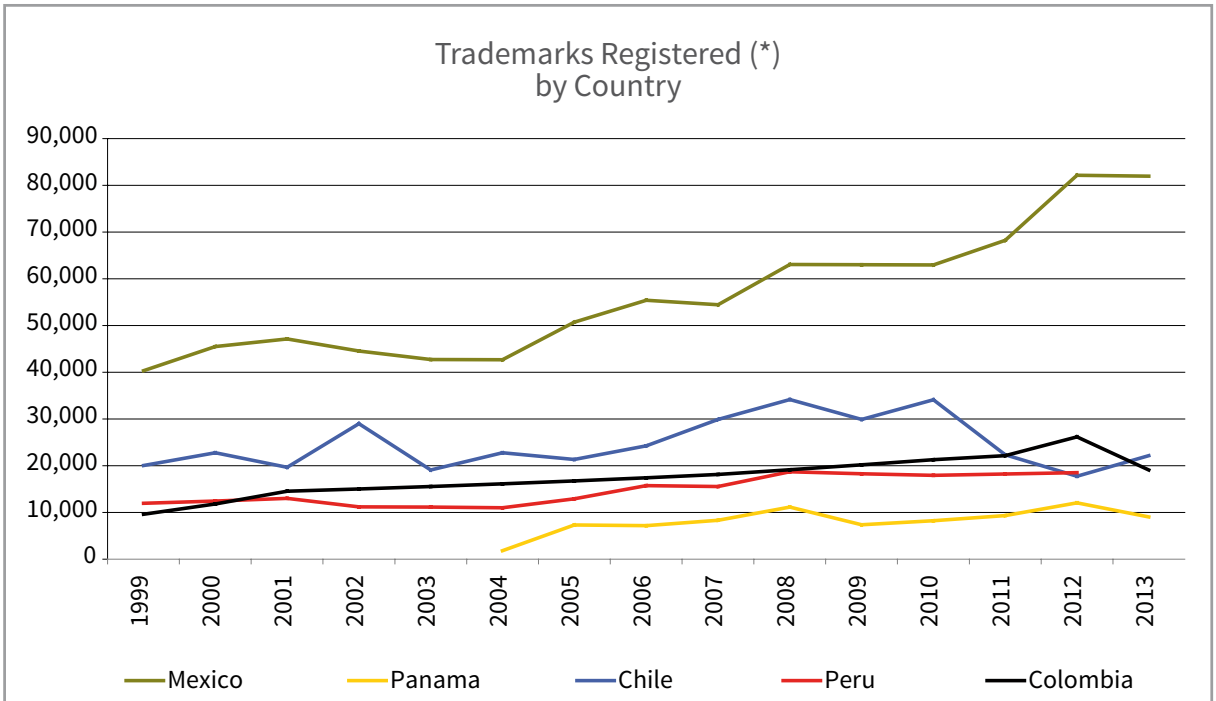
Statistics are based on data collected from the Intellectual Property Offices and are extracted from the PATSTAT database (for statistics for the technological sector).

Applications submitted by residents are those that have been submitted in a country by a resident, while applications submitted by non-residents are those that have been submitted by a foreign applicant. Applications submitted abroad are those that have been submitted by the resident of one country in an office in another.

When an office provides the total number of applications submitted, without breaking them down between applications submitted by residents and non-residents, WIPO divides this total applying the historical proportion of applications submitted by residents in that office.

Source: the authors, based on WIPO.

Graph A-1
Change in annual trademark registration (number of trademarks per year) for selected Latin American countries



*Residents and non-residents.

	Chile	Colombia	Mexico	Panama	Peru
Growth rate (1999-2013)	11%	99%	103%	393%	55%
Average number of trademarks registered per year	24,615	17,534	56,329	8,184	14,759
Standard deviation	5,402	4,133	13,644	2,764	3,106

Source: the authors, based on WIPO data.

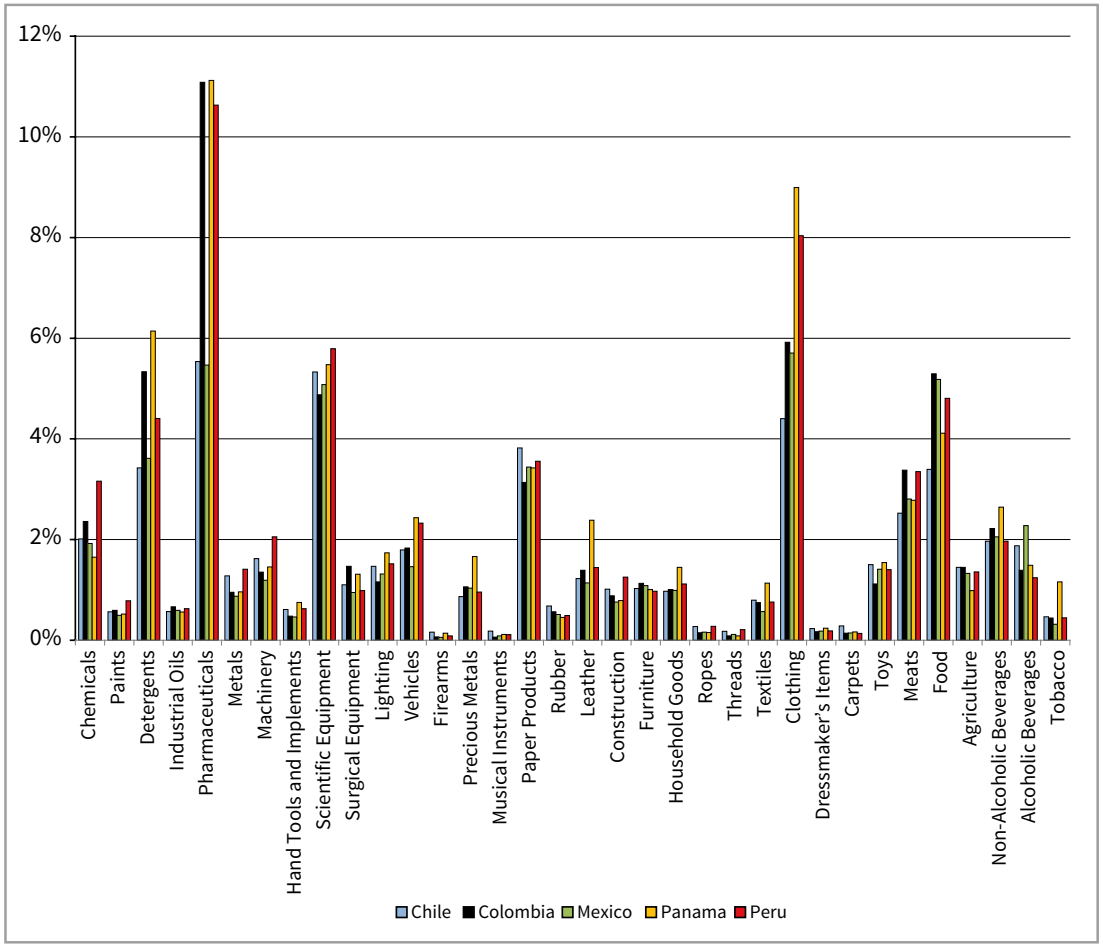
Graph A-2
Growth in trademark registration and economic growth
Index of number of trademarks and GDP Index, base 2004 = 100
Selected Latin American countries

Source: the authors, based on WIPO data.

Appendix: Sectors and use trademark frequency

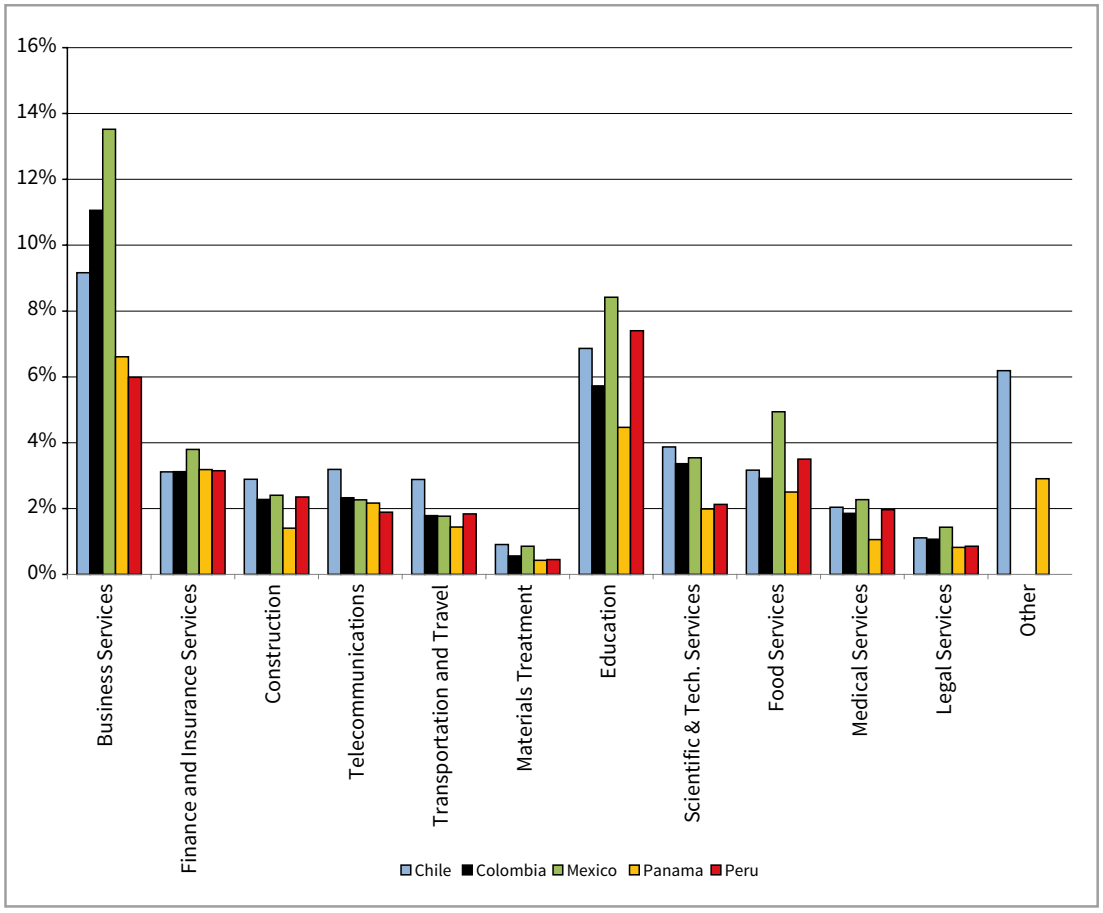
As a prior step to calculating indicators of trademark intensity by employment and sales value, data about trademark registration by sector were analyzed for the five Latin American countries selected. To this end, WIPO indicates the number of trademarks registered by year and Nice Class for each member country. Findings are presented in Graphs A-3 and A-4.

Graph A-3
Trademarks registered by class (as a % of the total for goods and services) for residents and non-residents, classified by goods (2010-2014)



Source: the authors, based on WIPO data.

Graph A-4
Trademarks registered by class (as a % of the total for goods and services) for residents and non-residents, classified by services (2010-2014)



Source: the authors, based on WIPO data.

As can be seen from the graphs in this appendix, trademark registration activity by sector shows similar frequencies for the countries selected, with the share of some sectors standing out in goods (detergents, pharmaceutical products, scientific equipment, paper goods, clothing, meats, and foods) and services (business services, finance and insurance, education, and food services).

Baroncelli et al. (2005) indicate that there is a high degree of similarity among countries regarding the sectors that are trademark-intensive, regardless of income levels in those countries. According to these authors, Scientific Equipment and Pharmaceutical Products are the most trademark-intensive sectors worldwide (because of their frequency of appearance in national trademark and patent registration). These are followed by paper products, detergents, and clothing. Table A-2, below, illustrates this phenomenon for an earlier period, trademark registrations from 1994 to 1998. As can be seen, of the first ten Nice Classes that appear most frequently, nine match across the three groups of countries. In high-income countries, education appears on the list, but it does not appear in middle-income and low-income countries. In the latter, the sector of chemicals appears.

Almost two decades after this measurement, the selection of countries in our study (middle-income Latin American countries) keeps the same goods but adds two services to the trademark-intensive sectors.

Finally, the most frequent sectors in the Latin American countries selected can be compared with those identified in the available studies of the European Union and the United States.

The sectors in gray in Table A-3 for EU countries match the sectors of highest intensity in the countries selected in this study. It should be noted that the data presented by the EU study are more disaggregated than those that would correspond to a Nice Classification, since in their methodology, they work with companies that register trademarks, and not with direct trademark registration by activity sector. Nevertheless, the pharmaceutical, scientific equipment, food, and beverage sectors once again have high intensity. The appearance of sectors related to computing, such as websites and video games, should also be noted.

The case of the United States is given in Table A-3. It shows the sectors according to their importance by frequency of appearance, showing an almost total match with the most frequent sectors in Latin American countries, although in a slightly different order.

Table A-2
Sectors with the highest share of trademark registration in the countries that report to WIPO, classified by level of income (1994-1998)

Groups of countries by level of income		
High income	**Medium income**	**Low income**
Scientific Equipment	Pharmaceuticals	Pharmaceuticals
Paper Products	Scientific Equipment	Detergents
Other services	Detergents	Scientific Equipment
Pharmaceuticals	Other Services	Other Services
Clothing	Clothing	Food
Business Services	Food	Clothing
Detergents	Paper Products	Paper Products
Education	Chemicals	Chemicals
Food	Business Services	Business Services
Meat	Meat	Meat

Source: Baroncelli et al. 2005.

Table A-3
European Union: Trademark-intensive sectors according to each country's industrial classification

NACE Code	Sectors
77.40	Leasing of intellectual property and similar products, except copyrighted works
21.10	Manufacture of basic pharmaceutical products
11.02	Manufacture of wine from grapes
72.11	Research and experimental development on biotechnology
20.42	Manufacture of perfumes and toilet preparations
26.60	Manufacture of irradiation, electromedical, and electrotherapeutic equipment
30.99	Manufacture of other transport equipment n.e.c.
32.40	Manufacture of games and toys
32.30	Manufacture of sports goods
61.90	Other telecommunications activities
58.21	Publishing of computer games
11.01	Distilling, rectifying, and blending of spirits
59.13	Motion picture, video, and television program distribution activities
63.12	Web portals
17.24	Manufacture of wallpaper
24.45	Other non-ferrous metal production
32.99	Other manufacturing n.e.c.
10.73	Manufacture of macaroni, noodles, couscous, and similar farinaceous products
18.11	Printing of newspapers
59.20	Sound recording and music publishing activities

Source: European Patent Office and the Office for Harmonization in the Internal Market, "Intellectual property rights intensive industries: contribution to economic performance and employment in the European Union," September 2013 (EPO - OHIM 2013).

Table A-4
United States: Sectors with the highest frequency of trademarks according to Nice Classification with a share higher than 2%

Nice Code	Sector
9	Electrical and scientific apparatus
35	Advertising and business
41	Education and entertainment
42	Computer and scientific
16	Paper goods and printed matter
36	Insurance and financial
25	Clothing
5	Pharmaceuticals
28	Toys and sporting goods
3	Cosmetics and cleaning preparations
30	Staple foods
37	Building construction and repair
7	Machinery

Source: Economics and Statistics Administration and US Patent and Trademark Office, "Intellectual Property and the US Economy: Industries in Focus," March 2012.

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