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The Economic Contribution of the IPR Intensive Industries in Chile

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Industry-level Analysis report

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Project Team

This study was coordinated by the IP Key LA Project and was developed by Analytica Consultora (Reflexión S.R.L.). The project team included Ricardo Delgado (project coordinator), Ezequiel Tacsir, Bernardo Díaz de Astarloa and Rodolfo Barrere.

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1. Executive summary

1.1. Main findings

- There are 237 IPR-intensive industries in the Chilean economy. 37% of industries are intensive in more than one IPR.

- IPR-intensive industries accounted for 34% of direct formal employment in Chile during the 2014-2019 period, which represents a little more than 3.1 million workers. Additionally, another 1.8 million jobs were generated indirectly in non-IPR-intensive industries in Chile, on average, per year, in this period. Considering both direct and indirect employment, IPR-intensive industries generated 53.8% of total formal employment in Chile, on average, during 2014-2019.

- During the same period, IPR-intensive industries contributed with 49.9% of GDP, worth CL$ 84,3 billion. In terms of international trade flows in goods, these industries represented 73% of exports and 56% of imports, generating a trade surplus of about US$ 12,898 million.

- Consistent with the fact that value added per worker is higher in IPR-intensive industries than in other industries, IPR-intensive industries showed a wage premium in the 2014-2019 period. Wages in these industries were 56% higher, on average, than in the rest of the industries. Patent-intensive industries showed the highest premium, 116%.

- As in other countries in the Southern Cone region, a salient feature of IPR filing in Chile is that the share of resident applicants is significantly low. Only around 12% of patent applications and 7% of industrial designs were made by residents in 2014-2019.

1.2. IPR-intensive industries in Chile

The IPRs covered in this study are patents, trade marks, industrial designs and copyrights[1]. IPR-intensive industries are defined as those showing an above-average number of filings of IPRs per employee compared with other IPR-using industries.[2] This means that an industry is identified as IPR-intensive in Chile if, for at least one of the IP rights under consideration, the number of IPRs per employee exceeds the employment-weighted average of IPRs per employee of all industries making use of that same IP right. IPR-intensive industries in Chile are concentrated in manufacturing, retail and wholesale activities, and services sectors, as shown in Chapter 6. 37% of industries combine two or more IP rights intensively.

The contribution of IPR-intensive industries to two main economic indicators, employment and output, is summarised in **Error! Reference source not found.** and Table 2. To minimise the

[1] Geographical indications and plant variety rights are not considered in this study.
[2] Due to data limitations, we cannot distinguish between IPRs that were applied for and IPRs that were subsequently granted.

impact of data gaps in economic statistics and avoid attaching undue importance to a particular year, the economic indicators were calculated as an average for the years 2014-2019.

As shown in **Error! Reference source not found.**, on average, on average per year, 33.7% of all formal employees in Chile were employed in IPR-intensive industries in the 2014-2019 period. This percentage exceeds the contribution to employment of 29.2% of IPR-intensive industries in the EU during the period 2014-2016 (EPO and EUIPO, 2019). Just over 3 million formal employees worked in IPR-intensive industries in Chile per year, on average, in 2014-2019. Trademark-intensive industries contributed the most to employment, with 31.0% of employees, followed by copyright-intensive (7.3%), patent-intensive (7.3%) and copyright-intensive industries. in designs (5.3%).

Additionally, IPR-intensive industries generated indirect employment in other non-IPR-intensive industries, for a total of 1.8 million workers per year. Together, the employment created by IPR-intensive industries directly and indirectly reached 53.8% of total formal employment on average per year in 2014-2019.

Table 1: Direct and indirect contribution of IPR-intensive industries to formal employment in Chile, 2014-2019

IPR-intensive industries, by type of IPR	Employment (direct)	Share of total employment (direct)	Employment (direct + indirect)	Share of total employment (direct + indirect)
Copyright-intensive	486,533	5.3%	778,359	8.4%
Design-intensive	229,361	2.5%	354,773	3.8%
Patent-intensive	669,893	7.3%	1,023,259	11.1%
Trade mark-intensive	2,858,704	31.0 %	4,569,395	49.6%
All IPR-intensive	**3,107,813**	**33.7%**	**4,956,955**	**53.8%**
Total formal employment in Chile				**9,218,793**

Notes: Due to overlapping use of IP rights, the sum of the shares of the individual IPRs exceeds the total share of IPR-intensive industries.

In terms of output, measured by gross domestic product (GDP), IPR-intensive industries generated 49.9% of GDP in Chile in the 2014-2019 period (Table 2). This represents a similar proportion to the contribution to GDP of IPR-intensive industries in the EU for the period 2014-2106 (44.8%). Trademark-intensive industries accounted for 45,4%, patent-intensive industries contributed 8.4%, and copyright-intensive industries contributed 6.3%. Design-intensive industries contributed 2.9%.

Table 2: Contribution of IPR-intensive industries to GDP in Chile, 2014-2019 average

IPR-intensive industries	Value-added / GDP (Chilean billion pesos)	Share of total GDP
Copyright-intensive	10.673	6,3%
Design-intensive	4.864	2,9%
Patent-intensive	14.197	8,4%
Trade mark-intensive	76.707	45,4%
All IPR-intensive	**84.262**	**49,9%**
Total GDP	**168.921**	

Notes: Due to overlapping use of IP rights, the sum of the shares of the individual IPRs exceeds the total share of IPR-intensive industries.

The contributions of IPR-intensive industries to employment and GDP imply that value added per worker was slightly higher in IPR-intensive industries than in other industries during the study period in Chile. In theory, then, IPR-intensive industries should show a wage premium compared to other non-IPR-intensive industries. In fact, as Table 3 shows, IPR-intensive industries paid their employees 10% higher wages than other industries, almost a fifth of what EPO and EUIPO (2019) found for the EU. The average salary in IPR-intensive industries was UF 265.88 compared to UF 170.42 in non-IPR-intensive industries, implying a wage premium of 56% for IPR-intensive industries in 2014-2019. Patent-intensive industries ranked first in terms of wage premium (116%), followed by trademark-intensive industries (51.7%), auto rights-intensive industries (47.7%), and intensive industries. in designs (32.1%).

Table 3: Average wages in IPR-intensive industries, 2014-2019

IPR-intensive industries	Average wage (UF per month)	Premium (compared to non-IPR-intensive industries)
Copyright-intensive	251.73	47.7%
Design-intensive	225.18	32.1%
Patent-intensive	368.05	116.0%
Trade mark-intensive	258.46	51.7%
All IPR-intensive	**265.88**	**56.0%**
Non-IPR-intensive	**170.42**	
All industries	**202.60**	

Chapter 7 includes an analysis of the contribution of IPR-intensive industries to international trade in goods and services. As shown in Table 4**Error! Reference source not found.**, during 2014-2019, IPR-intensive industries in Chile accounted for 73.3% and 56.5% of goods exports

and imports, respectively, generating a trade surplus of approximately US $ 12,898 million. In the case of exports, trademark-intensive industries account for the largest share, followed by patent-intensive industries. In the case of imports, the most relevant share corresponds to patent-intensive industries.

Table 4: External trade in IPR-intensive industries, 2014-2019

IPR-intensive industries	Exports (US$ million)	Share of total exports	Imports (US$ million)	Share of total imports
Copyright-intensive	994.9	1.5%	2,296.8	3.5%
Design-intensive	1,911.3	2.8%	7,700.1	11.8%
Patent-intensive	25,698.0	37.8%	30,015.7	46.0%
Trade mark-intensive	48,472.9	71.3%	18,233.7	27.9%
All IPR-intensive	**49,820.1**	**73.3%**	**28,398.4**	**56.5%**
Total for Chile	**68,009.5**		**65,320.1**	

Notes: Due to overlapping use of IP rights, the sum of the shares of the individual IPRs exceeds the total share of IPR-intensive industries.

1.3. Methodology and data

The methodology to identify IPR-intensive industries and estimate their contribution to the Chilean economy used in this study follows EPO and EUIPO (2019) as closely as possible to achieve maximum comparability. Its principles are essentially the same: first, determine IPR use across industries and identify those industries that use IPR more intensively; second, use industry-level economic data to characterize IPR-intensive industries in terms of employment, wages, value added (GDP), and international trade; third, compare industry-level aggregates to the overall economy to estimate the weight of IPR-intensive industries in the economy. Chapter 5 includes a detailed description of the methodology and sources of data used in this study.

A wide variety of databases and other data sources were used to determine which industries are IPR-intensive and to assess the contribution of these industries to employment, GDP and other economic indicators. To decide which industries are IPR-intensive, the starting point is the IPR registry databases of the National Institute of Industrial Property of Chile (INAPI). These records were compared with the directory of companies of the Chilean Internal Revenue Service (SII), which provides information on the economic activity registered by each company. This information was used to calculate the number of trade marks, designs, and patents per employee for each industry. Industries with IPR per employee with values above an employment-weighted average among industries with IPR were considered intensive in that respective IPR.

In order to identify the companies in the records, a text string matching algorithm was used to merge the IPR records and the business record, as well as a manual review process to improve the proportion of records that could be matched. Depending on the type of IPR, between 60% and 70% of the IPRs granted to Chilean residents were assigned to a company in the SII's board of directors and to its corresponding economic activity. Once the economic activities were assigned, information from the SII (formal employment), the Central Bank of Chile (national accounts), and the UN-COMTRADE foreign trade base (foreign trade in merchandise) were used to estimate the contribution of the sectors. intensive in IPR to economic activity.

Similar to what happens in other countries in the region, such as Uruguay or Argentina, a relevant characteristic of IPR holders in Chile is that they are predominantly foreign residents: only 12% of patents and 7% of industrial designs were granted to Chilean residents in 2014-2019.