



MONITOR OF CHINESE INFRASTRUCTURE IN LATIN AMERICA AND THE CARIBBEAN 2021

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The Monitor of Chinese Infrastructure in LAC in 2021—in what follows the *Monitor*—presents qualitative and quantitative insights with respect to its first version in 2020. Based on the various efforts made by the Latin American and Caribbean Academic Network on China (Red LAC-China) for more than five years, in qualitative terms the *Monitor* has sought to differentiate specific aspects between trade, financing, outward foreign direct investment (OFDI) and China’s infrastructure projects in Latin America and the Caribbean (LAC). As we will see below, the clear methodological definition of infrastructure projects—as opposed to OFDI, in particular—is a significant contribution of the *Monitor*, and also constitutes an explicit debate with other academic sources and regional and multilateral public and private institutions that do not make this differentiation. The qualitative definition of China’s infrastructure projects in LAC will also have an impact on the *Monitor*’s quantitative effort, since unlike the analysis of OFDI transactions up to 2020 (Dussel Peters 2021), the *Monitor* seeks to quantify China’s realized (and not just announced) infrastructure projects in LAC, with specific and timely characteristics. In this new issue we will include additional information on the geographic origin of the Chinese company carrying out the respective infrastructure project in LAC.

Based on the above, we believe that the *Monitor* provides clarification and improves the understanding of the relationship between LAC and China, also allowing the public and private sectors to have better information for their decision making.

The *Monitor* is divided into two sections. The first section includes the definition of infrastructure projects and a set of discussions on infrastructure projects in LAC and China; the growing disagreement between the United States and China will be relevant. The second section addresses the main aspects of China’s infrastructure projects in LAC up to 2020: amounts and employment generated, by country and group of countries within LAC, as well as the main Chinese companies and their ownership by amount and employment generated;

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the link between the geographic origin of Chinese companies and their association with other activities in LAC will be of particular interest.

1. Conceptual framework and international context of China's infrastructure projects in LAC

The *Monitor* insists, as in its 2020 edition, that a clear definition of infrastructure projects is fundamental: “*An infrastructure project is a service between a customer and a supplier through a contract—usually the result of a bidding process, although the process may be by direct designation—in which the ownership belongs to the customer*” (Dussel Peters 2020:2). The definition of infrastructure projects generates a group of implications—particularly in its differentiation with OFDI—that are presented in detail in the 2020 *Monitor*. It is surprising that so far most official sources in LAC and the United States continue to present statistics that confuse OFDI and infrastructure projects with significant impacts on statistics and their economic policy implications; the results of the OFDI *Monitor* (Dussel Peters 2021) and infrastructure projects in 2021, from this perspective, are supplementary.

In order to present the main results of the *Monitor* in 2021, three issues seem relevant to us. In LAC, the gap between demand for infrastructure projects and their implementation continues to widen. Historically, public investment in infrastructure projects represented 2.2% of GDP, during 1980-2015 (Chauvet et al. 2015), while for the most recent period (2015-2019) it fell to 2% (Infralatom 2021); given the impact of the COVID-19 pandemic, the ratio will certainly fall in 2020-2021. On the other hand, the coefficient should represent around 5% of GDP and up to 6.2% of GDP (ECLAC 2014), i.e., the gap has increased significantly in recent times, particularly in rural areas in terms of their quality², as well as in specific infrastructure sectors (Chauvet et al. 2020). Infrastructure projects will continue with significant regional dynamics in the future: the Development Bank of Latin America (CAF 2018) estimated, before the international pandemic, that infrastructure projects could encompass \$4.5 trillion in the next decade, most notably in sectors such as transportation and telecommunications, ports and airports.

Several aspects are relevant from a Chinese perspective. On the one hand, during 2020-2021, investment in fixed assets in infrastructure has presented growth rates of less than 5% (He 2021) as opposed to a double-digit annual dynamism in recent decades, which could generate important incentives for Chinese companies to internationalize and diversify their activities and clients. On the other hand, the People's Republic of China has reinforced its strategy of

² Harmes-Liedtke and Oteiza (2021) point out the relevance of the quality—based on a system of testing, inspection, certification and accreditation, as well as measurement and standardization—of infrastructure projects and its positive association with economic performance, with countries such as Germany, Korea, China and Japan standing out.



“globalization with Chinese characteristics”, especially via infrastructure projects within the framework of the Belt and Road Initiative (BRI) and in the context of the international pandemic (Sanborn 2021). As previously analyzed (Dussel Peters, Armony and Cui 2018), turnkey infrastructure projects are for the moment the most complex activities from a global value chain perspective: they not only require knowledge of trade, logistics, financing and investments, but also timely local, regional and national knowledge of customs, as well as of tenders and the respective labor and environmental regulations, among others. While it is important to recognize the progress of BRI and the Asian Infrastructure and Investment Bank (AIIB) in their lessons learned and in the explicit integration of social and environmental issues (Garzón 2020; Gransow and Price 2019), it is also important not to overestimate neither BRI nor AIIB in the case of LAC: as will be seen below, China has been undertaking an increasing number of infrastructure projects in LAC during the 21st century, even before the launch of BRI in 2013 and the establishment of the AIIB in 2015, besides the still small but growing number of infrastructure projects financed up to 2020. At the moment, the AIIB has only approved one project in LAC (for Ecuador) out of the 108 approved through April 2021 (AIIB 2021). The AIIB and the BRI, as will be seen below, reflect only a small part of the Chinese dynamics regarding infrastructure projects in the region.

Third, it is essential to consider, in the face of significant differences in trade, financing, OFDI and infrastructure projects, the growing tensions between the United States and China, explicitly under infrastructure projects. Since 2017 the United States has recognized its relationship with China as one of “a great power competition” and as an explicit threat in LAC: in one of the latest State Department analyses under the Trump administration (State Department 2020) they not only criticize Chinese Communist Party (CCP) undertakings in detriment to the “ruling and business elites” (State Department 2020:7), but they explicitly call for cautiousness towards Chinese infrastructure projects and in regards to a generalized “debt trap” and its predatory models. These U.S. concerns barely materialized in 2021, practically once the Trump administration ended, in Ecuador, one of the countries with the largest Chinese infrastructure projects (Garzón and Castro 2018; see 2.2.). The specific instruments offered by the United States and the negotiations have not yet been implemented. Without mentioning China, the agreement between Ecuador’s Ministry of Economy and Finance and the US International Development Finance Corporation of 14.1.2021 contemplates financing of up to US\$3.5 billion, but they aim to substitute Chinese external debt with an American one, although it is not clear whether the resources offered by the United States are sufficient to effectively substitute total Chinese financing in Ecuador. The issue is not only relevant from a macroeconomic perspective, but also in meso and microeconomic terms: if this debt swap actually takes place, will it also replace the control of China’s infrastructure projects? The technological and logistical challenges may be



enormous and will reflect an important precedent in LAC for understanding the potential for conflict in this “new triangular relationship” during the third decade of the 21st century.

2. Main results of Chinese infrastructure projects up to 2020

The following are the main characteristics of the infrastructure projects carried out by China in LAC during 2005-2020, considering that no projects had been registered by China prior to 2005. The 138 Chinese infrastructure projects were for an amount of US\$94.09 billion and generated 600,663 jobs for the period.

2.1. General characteristics

China’s infrastructure projects in LAC have been steadily increasing during the period 2005-2020, even in the most recent period, unlike OFDI (Dussel Peters 2021). In 2020 China carried out 24 infrastructure projects and the amount generated was US\$17,846 million with 210,180 jobs, which is a growth rate of 39.4% and 96.4% with respect to 2019. For the 2015-2020 period, likewise, infrastructure projects more than doubled their number, amount and jobs generated in relation to 2010-2014 (Table 1). Finally, it is important to note not only the growing employment generation of infrastructure projects, but also the increasing ratio of employment per project—of 8,758 jobs per project in 2020—and the reduction of the ratio of infrastructure project amount per job; these recent trends could indicate the beginning of a new phase of Chinese infrastructure projects and increased labor power intensity.

	Number of infrastructure projects (1)	Amount (million of \$US) (2)	Employment (number of employees) (3)	Amount (2) / project (1)	Amount / employment (2) / (3)	Employment (3) / project (1)	Projects (1), share	Amount (2), share	Employment (3), share
2005-2009	6	1,216	18,046	203	0.07	3,008	4.35	1.29	3.00
2010-2014	40	30,616	167,496	765	0.18	4,187	28.99	32.54	27.89
2015-2020	92	62,257	415,121	677	0.15	4,512	66.67	66.17	69.11
2005-2020	138	94,090	600,663	682	0.16	4,353	100.00	100.00	100.00
2016	13	10,780	65,019	829	0.17	5,001	9.42	11.46	10.82
2017	7	2,180	6,439	311	0.34	920	5.07	2.32	1.07
2018	11	9,121	12,890	829	0.71	1,172	7.97	9.69	2.15
2019	29	12,807	107,029	442	0.12	3,691	21.01	13.61	17.82
2020	24	17,846	210,180	744	0.08	8,758	17.39	18.97	34.99

Source: own elaboration based on *Monitor*.

2.2. By country

The wealth of the *Monitor*’s databank allows for multiple analyses of the results by country (Table 2). One group of aspects seems particularly relevant to us:



1. From a long-term perspective (2005-2020), not only have Chinese infrastructure projects grown, but there has also been a significant diversification by country in the various periods: during 2010-2014 Ecuador accounted for 11 of the 40 infrastructure projects, as well as 17.89% of the amount and 38.07% of the jobs generated; for the most recent period (2015-2020), countries such as Argentina, Bolivia, Brazil, Chile and Mexico, as well as Ecuador, have increased the implementation of Chinese infrastructure projects.
2. This diversification process is particularly evident during 2015-2020: Argentina and Brazil concentrated 23 and 11 of the 92 projects in the region, although with very different characteristics: in the case of Argentina, China's infrastructure projects were highly capital intensive—on average each project generated 3,017 jobs—while in Brazil each project created 8,367 jobs on average. In the same period, Bolivia and Jamaica, but especially Colombia, Chile and Mexico significantly increased their participation; Colombia, Chile and Mexico carried out infrastructure projects with Chinese companies for the first time in 2015-2020. The case of China Communications Construction Company (CCCC) in the Tren Maya project in Mexico—with an amount of US\$772 million and the creation of around 80,000 jobs—is emblematic for LAC and its growing job creation.
3. Considering the conflicts between the United States and China, in the case of Venezuela it is important to note that, unlike the regional trends of Chinese infrastructure projects, Chinese infrastructure projects in said country drop significantly from 5 projects (2010-2014) to 3 in 2015-2020. The values of projects and employment also plummet in the last period.



	2005-2009	2010-2014	2015-2020	2005-2020	2016	2017	2018	2019	2020
TOTAL									
Number of infrastructure projects (1)	6	40	92	138	13	7	11	29	24
Amount (million of \$US) (2)	1,216	30,616	63,660	94,090	10,780	2,180	9,121	12,807	17,846
Employment (number of employees) (3)	17,896	167,496	415,121	600,663	65,019	6,439	12,890	107,029	210,180
Amount (2) / project (1)	203	765	692	692	829	311	829	490	744
Amount / employment (2) / (3)	0.07	0.18	0.15	0.16	0.17	0.34	0.71	0.13	0.08
Employment (3) / project (1)	2,983	4,187	4,512	4,352	5,001	920	1,172	3,691	8,758
ARGENTINA									
Number of infrastructure projects (1)	0	2	23	25	4	2	4	5	5
Amount (million of \$US) (2)	0	3,090	22,136	25,226	4,961	500	1,453	590	5,832
Employment (number of employees) (3)	0	4,540	69,397	73,937	13,450	2,410	4,105	3,100	38,032
Amount (2) / project (1)	---	1,545	962	1,009	1,240	250	363	118	1,166
Amount / employment (2) / (3)	---	0.68	0.32	0.34	0.37	0.21	0.35	0.19	0.15
Employment (3) / project (1)	---	2,270	3,017	2,957	3,363	1,205	1,026	620	7,606
BRAZIL									
Number of infrastructure projects (1)	2	4	11	17	2	0	1	1	6
Amount (million of \$US) (2)	669	2,020	10,085	12,773	3,186	0	600	580	5,619
Employment (number of employees) (3)	7,350	57,726	92,036	157,112	20,800	0	2,000	1,600	67,372
Amount (2) / project (1)	335	505	917	751	1,593	--	600	580	937
Amount / employment (2) / (3)	0.09	0.03	0.11	0.08	0.15	--	0.30	0.36	0.08
Employment (3) / project (1)	3,675	14,432	8,367	9,242	10,400	--	2,000	1,600	11,229
COLOMBIA									
Number of infrastructure projects (1)	0	0	5	5	0	0	1	2	2
Amount (million of \$US) (2)	0	0	6,507	6,507	0	0	1,304	3,488	1,715
Employment (number of employees) (3)	0	0	84,100	84,100	0	0	2,000	60,000	22,100
Amount (2) / project (1)	--	--	1,301	1,301	--	--	1,304	1,744	858
Amount / employment (2) / (3)	--	--	0.08	0.08	--	--	0.65	0.06	0.08
Employment (3) / project (1)	--	--	16,820	16,820	--	--	2,000	30,000	11,050
ECUADOR									
Number of infrastructure projects (1)	0	11	8	19	4	0	0	3	0
Amount (million of \$US) (2)	0	5,477	2,544	8,020	914	0	0	1,616	0
Employment (number of employees) (3)	0	63,764	17,472	81,236	8,679	0	0	5,793	0
Amount (2) / project (1)	--	498	318	422	228	--	--	539	--
Amount / employment (2) / (3)	--	0.09	0.15	0.10	0.11	--	--	0.28	--
Employment (3) / project (1)	--	5,797	2,184	4,276	2,170	--	--	1,931	--
JAMAICA									
Number of infrastructure projects (1)	0	3	2	5	0	1	0	1	0
Amount (million of \$US) (2)	0	6,730	463	7,193	0	110	0	353	0
Employment (number of employees) (3)	0	8,700	21,505	30,205	0	1,505	0	20,000	0
Amount (2) / project (1)	--	2,243	231	1,439	--	110	--	353	--
Amount / employment (2) / (3)	--	0.77	0.02	0.24	--	0.07	--	0.02	--
Employment (3) / project (1)	--	2,900	10,753	6,041	--	1,505	--	20,000	--
MEXICO									
Number of infrastructure projects (1)	0	0	6	6	0	0	0	1	5
Amount (million of \$US) (2)	0	0	3,015	3,015	0	0	0	120	2,895
Employment (number of employees) (3)	0	0	80,739	80,739	0	0	0	400	80,339
Amount (2) / project (1)	--	--	502	502	--	--	--	120	579
Amount / employment (2) / (3)	--	--	0.04	0.04	--	--	--	0	0.04
Employment (3) / project (1)	--	--	13,457	13,457	--	--	--	400	16,068
VENEZUELA									
Number of infrastructure projects (1)	2	5	3	10	0	0	0	2	0
Amount (million of \$US) (2)	478	5,157	2,428	8,063	0	0	0	2,238	0
Employment (number of employees) (3)	10,196	3,350	2,690	16,236	0	0	0	2,390	0
Amount (2) / project (1)	239	1,031	809	806	--	--	--	1,119	--
Amount / employment (2) / (3)	0.05	1.54	0.90	0.50	--	--	--	0.94	--
Employment (3) / project (1)	5,098	670	897	1,624	--	--	--	1,195	--
CENTRAL AMERICA									
Number of infrastructure projects (1)	0	2	4	6	0	0	1	3	0
Amount (million of \$US) (2)	0	925	3,572	4,497	0	0	1,100	2,472	0
Employment (number of employees) (3)	0	11,442	5,000	16,442	0	0	2,000	3,000	0
Amount (2) / project (1)	--	463	893	750	--	--	1,100	824	--
Amount / employment (2) / (3)	--	0.08	0.71	0.27	--	--	0.55	0.82	--
Employment (3) / project (1)	--	5,721	1,250	2,740	--	--	2,000	1,000	--

Source: own elaboration based on *Monitor*.



2.3. By sectors

Table 3 delves deeper into the above diversification process, now by sector: if, during 2005-2009, 100% of the projects were concentrated in the energy sector, in 2015-2020 this was only true in 42.30% and 20.10% of the amount of projects and employment generated; even within the energy sector itself, more and more private infrastructure projects of sustainable energies (wind and solar farms) are perceived. In the 2015-2020 period, Chinese infrastructure projects were concentrated in the transportation sector, with 39 projects accounting for 47.71% and 72.38% of the amount and employment generated; infrastructure projects in the transportation sector additionally reflected a significant intensification in labor power: not only did they generate 300,472 jobs during 2015-2020, but the employment ratio per project was 7,704, well above the average for infrastructure projects (of 4,512 jobs).

	Number of infrastructure projects (1)	Amount (million of \$US) (2)	Employment (number of employees) (3)	Amount (2) / project (1)	Amount / employment (2) / (3)	Employment (3) / project (1)
2005-2009	6	1,216	18,046	203	0.07	3,008
Energy	6	1,216	18,046	203	0.07	3,008
Ports	0	0	0	--	--	--
Telecommunications	0	0	0	--	--	--
Transportation	0	0	0	--	--	--
Other	0	0	0	--	--	--
2010-2014	40	30,616	167,496	765	0.18	4,187
Energy	20	16,842	114,709	842	0.15	5,735
Ports	3	425	10,900	142	0.04	3,633
Telecommunications	1	302	78	302	3.87	78
Transportation	9	10,993	25,987	1,221	0.42	2,887
Other	7	2,055	15,822	294	0.13	2,260
2015-2020	92	62,257	415,121	677	0.15	4,512
Energy	27	26,336	83,429	975	0.32	3,090
Ports	7	2,056	5,078	294	0.40	725
Telecommunications	8	853	6,750	107	0.13	844
Transportation	39	29,705	300,472	762	0.10	7,704
Other	11	3,307	19,392	301	0.17	1,763
2005-2020	138	94,090	600,663	682	0.16	4,353
Energy	53	44,394	216,184	838	0.21	4,079
Ports	10	2,481	15,978	248	0.16	1,598
Telecommunications	8	1,155	6,828	144	0.17	854
Transportation	48	40,698	326,459	848	0.12	6,801
Other	19	5,361	35,214	282	0.15	1,853

Source: own elaboration based on *Monitor*.

2.4. By ownership of Chinese companies

The “omnipresence of the public sector” (Dussel Peters 2015) in the ownership of companies that have undertaken Chinese infrastructure projects in LAC has been significant in historical terms: table 4 reflects that, until 2014, 100% of infrastructure projects had been public, only in 2017 was the first privately owned infrastructure project undertaken. A group of trends are relevant in this regard. On the one hand, public ownership continues to be predominant: both for the period 2005-2020 and for the most recent of 2015-2020, the public sector participated



with 85.51% and 78.26% of the amount of infrastructure projects and 93.89% and 90.76% of the employment generated. Second, and notwithstanding the above, in the most recent period, from 2015-2020, for the first time private and municipally-owned public companies participate; although their presence is still nascent, they evidence a significant growth dynamism: there were 20 infrastructure projects of privately-owned companies during 2015-2020, representing 21.74% and 9.24% of the amount and employment generated. Private projects reflect additional characteristics: they are much smaller projects—in amount and jobs—than infrastructure projects of public companies: during 2015-2020, public companies averaged \$749 million and 4,978 jobs per project vs. \$288 million and 664 jobs from private projects. These new trends could be of particular interest for public policies aimed at attracting infrastructure projects and generating employment, for example.

Table 3
Latin America and the Caribbean: Chinese infrastructure projects by type of property (2005- 2020)

	Number of infrastructure projects (1)	Amount (million of \$US) (2)	Employment (number of employees) (3)	Amount (2) / project (1)	Amount / employment (2) / (3)	Employment (3) / project (1)
2005-2009	6	1,216	18,046	203	0.067	3,008
Public property	6	1,216	18,046	203	0.067	3,008
Central government	6	1,216	18,046	203	0.067	3,008
Other	0	0	0	--	--	--
Private property	0	0	0	--	--	--
2010-2014	40	30,616	167,496	765	0.183	4,187
Public property	40	30,617	167,496	765	0.183	4,187
Central government	39	30,467	165,496	781	0.184	4,243
Other	1	150	2,000	150	0.075	2,000
Private property	0	0	0	--	--	--
2015-2020	92	62,257	415,121	677	0.150	4,512
Public property	72	56,505	401,837	785	0.141	5,581
Central government	70	56,104	400,637	801	0.140	5,723
Other	2	401	1,200	201	0.334	600
Private property	20	5,754	13,284	288	0.433	664
2005-2020	138	94,090	600,663	682	0.157	4,353
Public property	118	88,338	587,379	749	0.150	4,978
Central government	115	87,787	584,179	763	0.150	5,080
Other	3	551	3,200	184	0.172	1,067
Private property	20	5,754	13,284	288	0.433	664

Source: own elaboration based on *Monitor*.

2.5. Geographical origin of the Chinese company

The “omnipresence of the public sector” discussed above would appear to be closely associated with the geographic location of Chinese companies carrying out infrastructure projects in LAC: during 2005-2020, Beijing-based companies concentrated 89.93% and



93.87% of the amount of infrastructure projects and employment generated, although it fell to 89.22% of the amount of infrastructure projects in 2015-2020 (Table 4); for the 2005-2009 period, 100% of infrastructure projects were carried out via Chinese companies based in Beijing. It is only since 2018 that the presence of Chinese companies established outside Beijing began to gain prominence, particularly those established in Guangdong, Shanghai, Hubei and Heilongjiang. In 2019, for example, Chinese infrastructure projects with Chinese companies based in Beijing accounted for 76.62% of the amount of infrastructure projects and 90.71% of the employment created, and companies from Shanghai and Guangdong were the ones that increased their presence under these headings.

Based on the preliminary statistical information provided by the *Monitor*, future analyses will be able to conduct case studies and econometric tests to correlate the location of Chinese companies, their ownership, as well as the amount of infrastructure projects and employment generated.



	2018	2019	2020	2005-2009	2010-2014	2015-2020	2005-2020
Total							
Number of infrastructure projects (1)	11	29	24	6	40	92	138
Amount (million of \$US) (2)	9,121	12,807	17,846	1,216	30,616	62,257	94,090
Employment (number of employees) (3)	12,890	107,029	210,180	17,896	167,496	415,121	600,663
Amount (2) / project (1)	829	442	744	203	765	677	682
Amount / employment (2) / (3)	0.71	0.12	0.08	0.07	0.18	0.15	0.16
Employment (3) / project (1)	1,172	3,691	8,758	2,983	4,187	4,512	4,352
Beijing							
Number of infrastructure projects (1)	9	16	17	6	34	69	109
Amount (million of \$US) (2)	7,421	9,813	16,032	1,216	27,847	55,548	84,611
Employment (number of employees) (3)	8,890	97,089	208,841	18,046	146,878	398,942	563,866
Amount (2) / project (1)	825	613	943	203	819	805	776
Amount / employment (2) / (3)	0.83	0.10	0.08	0.07	0.19	0.14	0.15
Employment (3) / project (1)	988	6,068	12,285	3,008	4,320	5,782	5,173
Guangdong							
Number of infrastructure projects (1)	0	3	5	0	0	8	8
Amount (million of \$US) (2)	0	142	1,625	0	0	1,767	1,767
Employment (number of employees) (3)	0	240	1,000	0	0	1,240	1,240
Amount (2) / project (1)	-	47	325	-	-	221	221
Amount / employment (2) / (3)	-	0.59	1.62	-	-	1.42	1.42
Employment (3) / project (1)	-	80	200	-	-	155	155
Shanghai							
Number of infrastructure projects (1)	0	6	1	0	1	8	9
Amount (million of \$US) (2)	0	2,441	155	0	150	2,796	2,946
Employment (number of employees) (3)	0	4,700	339	0	2,000	5,939	7,939
Amount (2) / project (1)	-	407	155	-	150	350	327
Amount / employment (2) / (3)	-	0.52	0.46	-	0.08	0.47	0.37
Employment (3) / project (1)	-	783	339	-	2,000	742	882
Hubei							
Number of infrastructure projects (1)	0	4	0	0	0	4	4
Amount (million of \$US) (2)	0	411	0	0	0	411	411
Employment (number of employees) (3)	0	5,000	0	0	0	5,000	5,000
Amount (2) / project (1)	-	103	-	-	-	103	103
Amount / employment (2) / (3)	-	0.08	-	-	-	0.08	0.08
Employment (3) / project (1)	-	1,250	-	-	-	1,250	1,250
Heilongjiang							
Number of infrastructure projects (1)	0	0	0	0	3	0	3
Amount (million of \$US) (2)	0	0	0	0	1,207	0	1,207
Employment (number of employees) (3)	0	0	0	0	17,387	0	17,387
Amount (2) / project (1)	-	-	-	-	402	-	402
Amount / employment (2) / (3)	-	-	-	-	0	-	0
Employment (3) / project (1)	-	-	-	-	5,796	-	5,796
Other							
Number of infrastructure projects (1)	2	0	1	0	2	3	5
Amount (million of \$US) (2)	1,700	0	35	0	1,412	1,735	3,147
Employment (number of employees) (3)	4,000	0	0	0	1,231	4,000	5,231
Amount (2) / project (1)	850	-	35	-	706	578	629
Amount / employment (2) / (3)	0.43	-	-	-	1.15	0.43	0.60
Employment (3) / project (1)	2,000	-	-	-	616	1,333	1,046

Source: own elaboration based on *Monitor*.



2.6. Top Chinese companies by project size and employment created

The database created for the *Monitor* at the infrastructure project level allows for a detailed analysis by Chinese company of ownership. Beyond the selection criteria, in general there is a high concentration of Chinese companies: up to 2020, only 37 Chinese companies accounted for all Chinese infrastructure projects in LAC.

Under the category of the amount of the infrastructure project during 2005-2020, five Chinese companies—all publicly owned by the central government—stand out, accounting for 68.01% of the total amount for the period: China Communications Construction Company (CCCC), China Railway Construction Company (CRCC), Power Construction Corporation of China (PowerChina), China National Nuclear Corporation (CNNC) and China National Petroleum Corporation (CNPC). There are multiple characteristics and differences between the companies themselves—which are related in great measure to their particular activities—, like the high amount per project, of US\$ 2,436 million for CNPC and US\$ 7,900 million for CNNC on average, as well as the significant number of infrastructure projects carried out by companies such as CCCC (22 projects) and PowerChina (23) (Table 6).



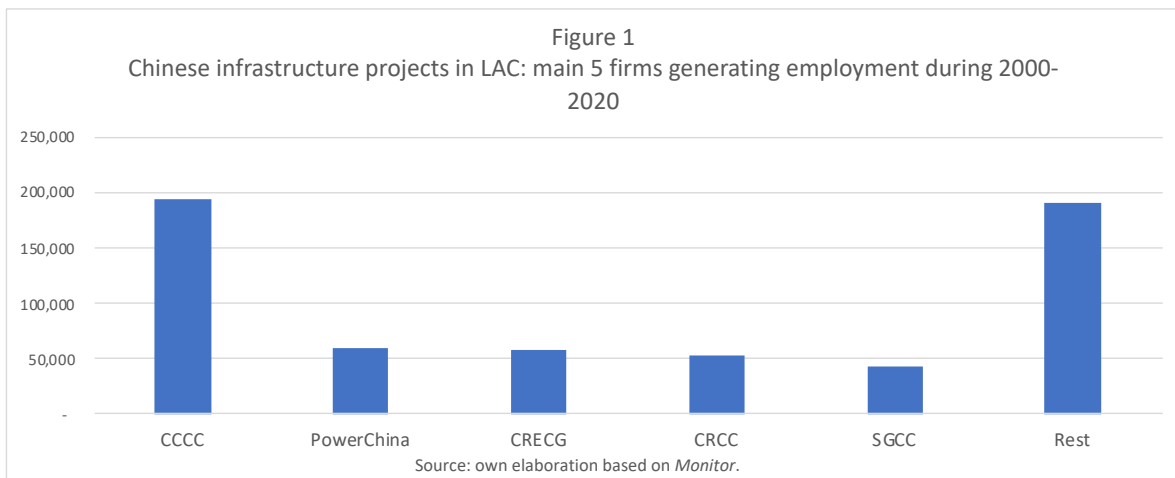
Table 6
Latin America and the Caribbean: main 5 Chinese infrastructure projects (according to the amount of projects during 2005-2020)

	2005-2009	2010-2014	2015-2020	2005-2020
TOTAL				
Number of infrastructure projects (1)	6	40	92	138
Amount (million of \$US) (2)	1,216	30,616	62,257	94,090
Employment (number of employees) (3)	17,896	167,496	415,121	600,663
Amount (2) / project (1)	203	765	677	682
Amount / employment (2) / (3)	0.07	0.18	0.15	0.16
Employment (3) / project (1)	2,983	4,187	4,512	4,353
China Communications Construction Company (CCCC)				
Number of infrastructure projects (1)	0	7	15	22
Amount (million of \$US) (2)	0	7,463	10,295	17,757
Employment (number of employees) (3)	0	29,394	166,093	195,487
Amount (2) / project (1)	-	1,066	686	807
Amount / employment (2) / (3)	-	0.25	0.06	0.09
Employment (3) / project (1)	-	4,199	11,073	8,886
China Railway Construction Corporation (CRCC)				
Number of infrastructure projects (1)	0	3	8	11
Amount (million of \$US) (2)	0	902	11,888	12,790
Employment (number of employees) (3)	0	2,556	49,942	52,498
Amount (2) / project (1)	-	301	1,486	1,163
Amount / employment (2) / (3)	-	0.35	0.24	0.24
Employment (3) / project (1)	-	852	6,243	4,773
Power Construction Corporation of China (Powerchina)				
Number of infrastructure projects (1)	0	9	14	23
Amount (million of \$US) (2)	0	5,345	7,241	12,586
Employment (number of employees) (3)	0	32,240	27,564	59,804
Amount (2) / project (1)	-	594	517	547
Amount / employment (2) / (3)	-	0.17	0.26	0.21
Employment (3) / project (1)	-	3,582	1,969	2,600
China National Nuclear Corporation (CNNC)				
Number of infrastructure projects (1)	0	0	1	1
Amount (million of \$US) (2)	0	0	7,900	7,900
Employment (number of employees) (3)	0	0	5,000	5,000
Amount (2) / project (1)	-	-	7,900	7,900
Amount / employment (2) / (3)	-	-	1.58	1.58
Employment (3) / project (1)	-	-	5,000	5,000
China National Petroleum Corporation (CNPC)				
Number of infrastructure projects (1)	0	1	2	3
Amount (million of \$US) (2)	0	5,000	2,307	7,307
Employment (number of employees) (3)	0	868	3,090	3,958
Amount (2) / project (1)	-	5,000	1,154	2,436
Amount / employment (2) / (3)	-	5.76	0.75	1.85
Employment (3) / project (1)	-	868	1,545	1,319

Source: own elaboration based on *Monitor*.



Figure 1, under the category of employment generation from infrastructure projects in LAC during 2000-2020, also reflects the concentration described above: the top 5 companies accounted for 68.23% of the more than 600,000 jobs generated via Chinese infrastructure projects, and China Communications Construction Company (CCCC) alone created 195,487 jobs for the period (or 32.55% of the total). The information is fundamental for decision making and for future analyses on the quantity and quality of employment generated by Chinese companies (Salazar-Xirinachs, Dussel Peters and Armony 2018): a relatively small group of companies—in this case linked to infrastructure projects—are fundamental in the field and could well generate a learning and dissemination process in other Chinese companies established in LAC.



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