Collaborating as peers or targeted by science diplomacy? The participation of Latin American researchers in the European Framework Programme for Research and Innovation

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ABSTRACT

In this paper, we discuss whether Latin American researchers participate in the European Research and Innovation Framework Programme (FP) by joining European colleagues as peers, or by being targeted as part of a science diplomacy initiative. We analyse the participation of Argentina, Brazil, Chile, Colombia and Mexico (LAC) in the 7th (2007–2013) and 8th (2014–2020) programs, based on CORDIS data and the Open Aire repository. We determine the scope of these countries’ participation and the variables that intervene. Results show that funding received by LAC organizations decreased significantly from the 7th to the 8th FP due to an increase in projects with no EU monetary contribution. Co-authoring with European partners or by domestic authors in publications issued from these projects by LAC researchers represented an average 12% of all publications in both FPs, and it was marginal in some projects and decisive in others, depending on the topic of research. We conclude that the participation of these countries due to EU science diplomacy actions was important in the 7th FP and less so in H2020 and that this involvement has become less dependent on their being targeted as a region, or by Spain’s brokerage as coordinator.

KEYWORDS

European Union; Latin America; Research and Innovation Framework Programme; H2020; Science Diplomacy

PALAVRAS-CHAVE

União Europeia; América Latina; Programa Quadro de Investigaçao e Inovação; H2020; Diplomacia da Ciência

PALABRAS CLAVE

Unión Europea; América Latina; Programa Marco de Investigación e Innovación; H2020; Diplomacia Científica

Colaborar como pares ou visados pela diplomacia científica? A participação de investigadores latino-americanos no Programa Quadro Europeu de Investigação e Inovação

RESUMO

Neste artigo analisamos se os investigadores latino-americanos participam no Programa-Quadro de Investigação e Inovação (PQ) juntando-se aos seus colegas europeus como pares ou sendo objecto de diplomacia científica. Analisamos a participação da Argentina, Brasil, Chile, Colômbia e México (LAC) nos 7º (2007–2013) e 8º (2014–2020) programas, com base em dados do CORDIS e do repositório Open Aire. Determinamos a extensão da sua participação...
e as variáveis envolvidas. Os resultados mostram que o financiamento recebido pela LAC diminuiu significativamente de 7 para 8PQ devido a um aumento dos projectos sem contribuição monetária da UE. A co-autoria com parceiros europeus ou autores nacionais em publicações emitidas a partir destes projectos por investigadores da ALC representou em média 12% de todas as publicações em ambos os PQ, e foi marginal em alguns projectos e decisiva noutros, dependendo do tema de investigação. Concluímos que a participação destes países devido às acções de diplomacia científica da UE foi importante no 7º PQ e menos no H2020 e que se tornou menos dependente de serem visados como região ou através da intermediação da Espanha como coordenador.

¿Colaboración entre iguales u objetivo de la diplomacia científica? La participación de los investigadores latinoamericanos en el Programa Marco Europeo de Investigación e Innovación

RESUMEN
En este artículo analizamos si los investigadores latinoamericanos participan en el Programa Marco de Investigación e Innovación (PM) uniéndose a sus colegas europeos como pares o siendo objeto de la diplomacia científica. Analizamos la participación de Argentina, Brasil, Chile, Colombia y México (LAC) en el 7º (2007–2013) y 8º (2014–2020) programa, a partir de los datos de CORDIS y del repositorio Open Aire. Determinamos el alcance de su participación y las variables que intervienen. Los resultados muestran que la financiación recibida por LAC disminuyó significativamente del 7º al 8º PM debido a un aumento de los proyectos sin contribución monetaria de la UE. La coautoría con socios europeos o de autores nacionales en las publicaciones emitidas a partir de estos proyectos por investigadores de LAC representó en promedio el 12% de todas las publicaciones en ambos PM, y fue marginal en algunos proyectos y decisiva en otros, dependiendo del tema de investigación. Concluimos que la participación de estos países debido a las acciones de diplomacia científica de la UE fue importante en el 7º PM y menos en H2020 y que se ha hecho menos dependiente de que sean objetivo como región o por la intermediación de España como coordinador.

1. Introduction

The Framework Programme for Research and Innovation (FP) is the European Union’s strategy to boost research and innovation across member states and support association among them. It aims at fostering the European Research Area (ERA), a pan-European space for sharing research and technology infrastructure and promoting the free circulation of researchers, ideas and projects based on collaboration. Started in 1984, the FP has had eight rounds, and in 2021 launched its ninth (Horizon Europe).

Besides Member Countries (MC), the FP is open to Associated Countries (AC) which sign an agreement with the European Commission (EC) and, thanks to a contribution, are allowed to participate in FP calls and are eligible for funding. During H2020 there were 16 AC countries, some of which were EU candidates or Mediterranean neighbors, two
European non-EU countries (Switzerland and Norway) and Israel. Nonmembers or associated ones are Third Countries (TC), of which only some are eligible for automatic funding. To date, the European Commission (EC) is seeking agreements for new AC membership to HE. Among aspiring AC members is Great Britain, no longer a MC after its formal exit from the Union in December 2020.

Extension of the research space beyond European boundaries was one of the goals of the Framework Programme since its inception in 1984: Evolving from a Science and Technology for Development Program (STD) in the 1980s, to a “Cooperation with Third Countries and International Organizations” (INCO) programme since the 4th FP in the 1990s. This ceased after the 6th FP, but other targeting mechanisms were put in place. In H2020, FP topics particularly relevant for international cooperation represented around 25% of all Work Programs; yet, attracted around 75% of international participation (European Commission 2018, Annex 8: 99).

Opportunities are made public through open competitive calls for proposals derived from biennial Work Programs approved by the European Commission, based on the deliberation of 19 different scientific advisory groups. Calls are published through the EU Participant’s Portal, each call specifying if it is open only to EU members, to them and to associated members, or to them and third countries. Most projects are designed to be implemented by at least three EU or AC members through the creation of a consortium, with one institution acting as coordinator. Organizations from TC rarely act as consortium coordinators and count only towards the three-country rule.

The large number of projects (over 35,000 grant agreements signed during H2020) and the amount of resources involved (a 67 billion euro EU contribution in H2020) make participating in the FP an appetizing opportunity for global researchers and their organizations. However, the quantity of institutions and countries involved, the numerous legal and formal procedures, the diversity of country institutional settings, and the requisite to conform and manage consortia, make participation in FP difficult, especially for first-time applicants and for nonmember participants. This has led to oversubscription, an issue that has been signaled as a waste of talent and a deterrent to wider participation (European Commission 2017b, 71).

According to the European Commission, nonmember and developing countries are welcome to participate in the Framework Programme (FP) under two policy guidelines: science diplomacy (Moedas 2016) and the Open to the World initiative (European Commission 2017c). The Open to the World policy “means that participants from all over the world, regardless of their place of establishment or residence, can participate in most of the calls of Horizon 2020.” In addition to consortia, individuals from nonmember countries can compete as researchers or staff members in the two most popular actions: Marie Curie and European Research Council (ERC).

This paper deals with the involvement of the five largest countries in Latin America, Argentina, Brazil, Chile, Colombia, and Mexico – LAC henceforward – in the 7FP and H2020. In the mid 2010s these countries accounted for 81% of the region’s GDP, 70% of its population, and about 80% of its scientific output, as measured by publications, h-indices of citation and patent granting (Lemarchand 2015, 188). The five accounted for 76% of all Latin American participations and funding in FP7 and 82% of participations and 73% of funding during H2020 (CORDIS database).

Although 7FP lasted from 2007 to 2013 and H2020 from 2014 to 2020, several 7FP projects were implemented during the H2020 years and many H2020 ones are still ongoing
during the 9FP programme, HE. Our analysis encompasses both the 14 years of the two programs, as well as the months that have followed since the end of H2020. Formally, both are over and data from them is readily available and will change only marginally. This is not the case for publications. Publishing is a process that continues well beyond the formal end date of projects. By observing the 14 year period from both the 7FP and H2020 we were also able to analyse the evolution of LAC’s involvement.

With the exception of Kreimer and Levin (2013), Gaillard, J. & Arvanitis (2013), Feld et al. (2013), and Feld and Kreimer (2019a and 2019b), there is a lack of scholarly analysis on LAC participation in the FP, to which this work intends to contribute. These articles point to the pressing issue of the asymmetry between the two parties. Feld & Kreimer find that this interaction is embedded in relations of subordination (2019, 16 and 2019b, 18).

Our research problem was to analyse the factors intervening in LAC involvement in the FP and the role of science diplomacy (SD) in it. We venture the hypothesis that most of this involvement is attributed to SD actions, i.e. actions targeted to those countries or to the region as a whole, more than to LAC researchers being involved on account of their scientific capacity to compete as world peers. We compared LAC’s involvement with that of the other TCs to understand their rank and we used data from the overall FP participants as benchmark.

For this, we looked at the following topics and variables:

- **Performance in the FPs.** Variables: number of projects and participations, total, average and per capita; funds received from EU contribution; beneficiary and partner participation; success rates.
- **Type of projects and organizations.** Variables: projects per type; type of organizations; rank among top TC participants.
- **Consortia coordinators and LAC within Third Countries.** Variables: countries acting as consortia coordinators and TC ranking as participants and as coordinators.
- **LAC intra-collaboration, role of STI agencies and SD targeting.** Variables: projects in which LAC jointly participate; projects by STI agencies; science diplomacy targeting.
- **Publications issued from projects.** Variables: total and share of publications, collaboration as co-authors and publications by type of project.

2. **Concept and practice of science diplomacy**

The Royal Society, in partnership with the American Association for the Advancement of Science (AAAS), defined science diplomacy as a concept that can usefully be applied to three dimensions of policy:

- Informing foreign policy objectives with scientific advice (science in diplomacy).
- Facilitating international scientific cooperation (diplomacy for science).
- Using scientific cooperation to improve international relations between countries (science for diplomacy) (Royal Society & AAAS 2010).

Embedded in the realm of public policy, the concept has been characterized as fuzzy and vague by scholars (Flink and Schreiterer 2010; Penca 2018; Rüffin 2019 and Rungius
A EU author in a paper on the conceptualization of SD states that “from an analytical point of view, science diplomacy does not provide a clear-cut definition or conceptual framework yet” (Rungius 2018, 35). The 1st Global Meeting on Science Diplomacy held in Madrid in 2019 defined SD as “a series of practices at the intersection of science, technology and foreign policy.” This is our choice for the concept in this article.

Practitioners of SD include both Institutionalized and non-institutionalized positions. The former include science attachés, science advisors, agency and public research organization representatives in positions abroad. The latter include civil society representatives, managers and administrators in research organizations and higher education institutions, as well as scientists (Degelsegger-Márquez, Flink, and Rungius 2019, 8). On the innovation side, it includes innovation attachés/delegates and tech ambassadors, some of which have been named by their governments, some by the private sector (Melchor 2020).

A H2020 project (S4D4C), aimed at analysing the state of the art of SD in the EU and providing guidelines for a strategy, was launched in January 2018 and ran through 2021. The project consortium maintains that the discourse needs to be distinguished “from the broad variety of activities, processes and structures that could be subsumed under its heading” (Rungius 2018, 10). The two most frequent uses of European SD, according to the project team, was strengthening EU competitiveness and advancing knowledge (Degelsegger-Márquez, Flink, and Rungius 2019).

Some authors propose Science Diplomacy as a key element for Multilateralism (Van Langenhove 2017), describing it as “soft power” for promoting alliances among countries (Almeida and Ribeiro 2017), with the potential for affecting the global dimension of diplomacy (Copeland 2016).

The 2012–2019 EU commissioner for research, science and innovation defined science diplomacy as

> using the universal language of science to maintain open channels of communication in the absence of other viable foreign policy approaches, ensuring the EU maintains its presence at the highest level of international scientific endeavour, and ensuring the EU has access to research performed outside Europe. (Moedas 2016, para. 4)

Some authors are critical of a conceptual framework that tilts toward European interests. Its ambiguity is noticed by some as having a triple-prong purpose: promoting EU science internationally, enlarging markets for European technology and science, and employing science in favor of development or peace (López de San Román and Schunz 2017). Penca argues that international scientific relations “are both cooperative and, increasingly, also competitive (…) cooperation in science is a tool for another foreign policy goal, e.g. dominance” (Penca 2018). Feld and Kreimer describe the participation of Latin American researchers in FP both as forms of cosmopolitanism and subordination (Feld and Kreimer 2019a) and immersed in a center–periphery dynamic (Feld and Kreimer 2019b).

### 3. The context of EU-Latin America science diplomacy

SD implies a two-way agency: practices and actions from the EU towards Latin America and vice versa. But Latin America is not a regional body in the same sense as the EU,
so actions are channeled, shaped and harnessed by each country in the region according to their singular capacity.

The most frequent instrument for SD cooperation are STI agreements. This includes both bilateral and multilateral agreements. EU-country STI agreements were signed between the EU and Argentina (1999), Brazil (2004), Chile (2005) and Mexico (2005), but none with Colombia. These agreements are supervised by Joint Steering Committees that meet periodically. After signing these agreements, the four countries created liaison offices within their STI agencies to supervise this cooperation. They also obtained, since the 6th Framework Programme, funded FP projects to enhance or seal cooperation: ABEST I, II and III for Argentina, CEST-I for Chile, BB. BICE in Brazil and UEMEXCYT I and II in Mexico.

Multilateral agreements were also signed between the Community of Latin American and Caribbean States (CELAC) and the EU. After a meeting in 2010 of most Latin American heads of state with the EU, a Joint Initiative for Research and Innovation (JIRI) was launched. The ERA NET LAC, a 7FP project running from 2013 to 2018, was created as a EU-CELAC cooperation instrument to implement JIRI. Its focus research topics were energy, biodiversity/climate change, health, ICT and bioeconomy, which were organized into thematic networks. ERA NET LAC included three joint calls led by the STI agencies, resulting in 51 funded projects, unlisted in the formal list of FP project data. Its activities included researcher mobility, international outreach of research infrastructures and increased thematic cooperation.

Another bi-regional initiative, ALCUE NET, was joined by thematically focused ones such as EU-LAC HEALTH, ENSOCIO LAC and NMP-DELA. ALCUE-Net, also a 7FP project, was coordinated by the Argentinian Liaison Office at its Ministry of STI. Aimed at enhancing the EU and CELACs international cooperation, it included Colombia’s STI agency (then Colciencias) as well as other Latin American countries.

In 2017 Brazil signed a multilateral agreement with the EU and a second partner ally, South Africa, the Belem Statement on Atlantic Research and Innovation Cooperation, for research on the Atlantic Ocean. It is also a member of multilateral fora such as the Global Alliance on Chronic Disease (GACD), of which the USA is also an associate, and Mission Innovation, for research on clean energy.

Institutional positions of SD include formal science diplomats in Brussels. Mexico’s official delegation in Brussels has a science diplomat paid by CONACYT. The other countries use Ministry of Foreign Affairs diplomats to cover science and innovation matters. SD diplomats in Brussels very closely follow the implementation of STI agreements and help organize meetings between liaison offices and EC staff.

But SD is not only the task of governments. Universities and research centers have also their own internalization strategy and have signed agreements with peer institutions in European countries for education and research cooperation.

On the part of the EU, the DG Research and Innovation as responsible for the FP within the EC, is the custodian of STI bilateral agreements, and the EU Research & Innovation Counsellors deployed in EU Delegations around the world report to them. Another unit, the European External Action Service (EEAS), is in charge of defining international cooperation actions. Both units coordinate their activities.

National Contact Points (NCPs) are supported by the DG Research and Innovation to help countries participate in FP. In most member countries, they are full-time staff
members appointed and paid by their own governments to help would-be participants to access information and grasp call content and procedures. In Latin America, besides staff members in charge of internationalization at the STI agency, NCPs are well-known researchers and other organizations, unpaid for their assistance in the FPs. DG Research and Innovation provides support to non-EU NCPs or the non-EU members of the Euraxess network. Latin American NCPs have been involved frequently in coordination and support calls for the NCP network, along program lines.

Up to 2013, Brazil and Mexico could fully participate in 7FP projects as third countries, but because of their relative high-income level, were declared ineligible for automatic funding since the onset of H2020. Both Brazil and Mexico’s governments compensated by allocating their own resources. For the 9FP, three additional Latin American countries have been declared ineligible for automatic funding: Uruguay, Panama and Chile, due to their income level as reported by the World Bank. However, there are exceptions to the ineligibility criteria: organizations from those emerging, middle-income countries funding can exceptionally be provided if they are identified in the relevant work program as essential for implementing the action, in view of their outstanding competence/expertise, access to particular research infrastructures, access to particular geographical environments, or access to particular data (European Commission 2021, 14).

But science and technology are not the main SD actions between LAC and the EU. Mobility actions and scholarships are the predominant ones. This is the case for the Erasmus + and Erasmus Mundus programmes, as well as joint doctoral and master’s diplomas. Students and university staff constitute most of the beneficiaries of such actions. Between 2007 and 2013 a total of 6,780 students and academics from almost 220 different Latin American higher education institutions traveled to Europe. Even if these programs are open to all 33 CELAC countries, three countries – Brazil, Argentina, and Mexico – benefit most from them (Selleslaghs 2018).

4. Materials and methods

Data from funded projects are available through the H2020 dashboard for both 7FP and H2020 programmes. The dashboard uses the Single Electronic Data Interchange Area (SEDIA) from CORDIS to display the data from every single project and participant to the two FPs, but it is also possible to use filters to see data for groups such as MC, AC, TC and CELAC.

Each project has its own CORDIS page containing a Fact Sheet, Results in brief, Reporting and Results. In the latter appear publications, matched to the project through Open Aire. We collected data from 463 projects in 7FP and 574 in H2020. Each Project Basic Sheet includes the subprogram to which it belongs, title, acronym, start date; end date; total cost; EC contributions; funding scheme; coordinator institution and country; participant countries and organizations. In the Results section, publications are linked to the Open Aire repository. They include peer reviewed articles, books and book chapters, conference papers and presentations. We only used the data from publications in peer

1https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-dashboard.
reviewed articles. We looked into each published article to scout for authors from LAC countries according to their affiliations. This was done with 7769 publications in 7FP and 5708 in H2020.

The EC adopted an Open Access policy since the onset of H2020, mandating open access to all publications issued from FP projects. These publications are listed on the CORDIS platform and are then deposited in the Open Aire repository, linked to the respective EU project. Some projects include in Open Aire databases and patents issued from projects, but this component is still being developed and posting them was not compulsory until recently.

Additionally, we interviewed the diplomats in charge of STI at the official representations of Mexico, Argentina and Brazil in Brussels during the second semester of 2019, and of Colombia in October 2020. They were critical informants for our understanding of science diplomacy from LAC countries.

5. Results

5.1. Performance in the FPs

During the entire 7FP and 8FP period, LAC countries participated – or are still participating – in 1,037 projects. This is a sizable amount and includes overlaps between the five countries, given that a significant proportion was shared by at least two of them. There was an increase of 24% in projects and 40% increase in participations from one program to the next (Table 1). Participation by more than one organization per country in a project is a common feature of FPs and collaboration between several countries is embedded in the program. All LAC countries increased their participation between 7FP and H2020 except for Mexico’s, which decreased. The predominance by Brazil, which has featured in all FPS until now, was less evident in H2020. Brazil was involved in 2 out of 5 LAC participations in 7FP, but less than 1 out of 3 in H2020.

Participation of more than one organization per country in a project was not significant for LAC, compared to the rest of participants. The average number of participations was 4 times larger for overall participants than for LAC in 7FP, and 3.4 times larger in H2020 (Table 1). It was also smaller than for all third country participants. The smaller proportion indicates a fragility in their involvement.

Third countries can be invited to join a consortium both as beneficiaries and as partners. In the first case, they may receive a monetary contribution from the EU. In the second, they may not. Data exists only for H2020, and it shows that the percentage of projects in which LAC organizations were partners was high, at around 40% of them (Table 1). Brazil is, among LAC, the country with the lesser prevalence as project partner, with only a third.

A key performance indicator in any research program is the success rate in obtaining grants by participants. FP calls are available in an open contest, so signing a grant agreement comes after fierce competition. Success rate for overall programs in 7FP was 18.4% and it went down to 11.9% in H2020 (European Commission 2017a, figure 8 for 7FP and the H2020 dashboard for the 8FP). The success rate for TC participants in H2020 was larger than for overall participants, but it was even larger for LAC (Table 1). We argue that the
Table 1. Number of projects and participations in 7FP and H2020, partners and success rates in H2020, LAC, TC & all FP participants.

|                      | 7PM (2007–2014) | H2020 (2014–2020) |
|----------------------|-----------------|-------------------|
|                      | No. projects    | No. participations| No. projects | No. participations | Aver. participations per project | Aver. participations per project | % projects as partner | Success rate |
| Argentina            | 100             | 117               | 168          | 237               | 1.17                           | 1.41                           | 45%          | 23.7%        |
| Brazil               | 172             | 228               | 158          | 251               | 1.33                           | 1.59                           | 33%          | 19.9%        |
| Chile                | 60              | 68                | 110          | 148               | 1.13                           | 1.35                           | 49%          | 17.0%        |
| Colombia             | 44              | 51                | 79           | 94                | 1.16                           | 1.19                           | 39%          | 18.7%        |
| Mexico               | 87              | 120               | 59           | 89                | 1.38                           | 1.51                           | 37%          | 16.4%        |
| Five LACs total/average | 463             | 584               | 574          | 819               | 1.26                           | 1.43                           | 41%          | 19.1%        |
| All Third countries  | 2079            | 5039              | 3156         | 6977              | 2.42                           | 2.22                           | NA           | 16.3%        |
| All FP participants  | 25,809          | 138,859           | 35,239       | 173,712           | 5.39                           | 4.93                           | NA           | 11.9%        |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021. The number of projects and participations differ because several organizations from the same country can be involved in one project. Success rate: Ratio of approved over eligible proposals.

Number of LAC projects and participations per 100K population, 7FP and H2020

|                      | 7FP  | H2020 |
|----------------------|------|-------|
|                      | Projects | Participations | Projects | Participations |
| Argentina            | 0.24   | 0.28   | 0.38    | 0.54    |
| Brazil               | 0.09   | 0.12   | 0.08    | 0.12    |
| Chile                | 0.35   | 0.40   | 0.60    | 0.80    |
| Colombia             | 0.10   | 0.11   | 0.16    | 0.19    |
| Mexico               | 0.08   | 0.11   | 0.05    | 0.07    |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021
reason for this larger success rate compared to TC and overall program participants is their being targeted by SD, and because of the type of projects in which they were involved. We shall discuss this in later sections.

Participation, however, must be considered in per capita terms. According to Figure 1, Chile is the LAC with better indicators of per 100 K population participation in both programs, followed by Argentina. This is consistent with Chile’s standing on scientific publications per million inhabitants, which between 2011 and 2019 was the highest among all Latin American countries (UNESCO 2021, 215).

Among the reasons to participate in FP, receiving funds for additional research or innovation is a powerful motive. During the 7 year period of 7FP, LAC organizations received a EU contribution that ranged from 32.3 million euros for Brazil to 6.1 million for Colombia (Table 2), for an average of 15 million euros for the five LAC. In H2020 the amount ranged from 15.5 million euro for Brazil to 0.9 million for Mexico. Funding is granted to participating organizations in accordance to their role in the project, so the actual amounts received by them are not evenly distributed and may vary enormously.

A net decrease between 7PF and H2020 both in the total contribution and in the average amount per project was observed for all five LAC. This happened while the number of projects increased (Table 1). As projects with no EU monetary contribution went from being marginal in 7FP (5% on average for LAC) to being the majority in H2020 (59%), it affected the majority of projects from Argentina and Brazil, almost half from Colombia and an astonishing 92% from Mexico (Table 3). Chile, on the other hand, was spared this fall: its share of unfunded projects in H2020 was only 21%.
Excluding projects for which no funds were received, the average amount per project was 154 thousand euros in 7F and 248 thousand euros in H2020 (Table 2). But for funded projects from Brazil, only a third of them received contributions that are 1.8 times larger than for the other LAC countries (Table 2). We attribute this to Brazil’s larger STI capacity, a feature that is consistent in the two FPs.

Compared to all Third Countries, LAC received a significantly smaller amount per project in both FPs. It was twice the amount of LAC in funded projects in both FPs, and five times larger in H2020. It is evident that the modalities of LAC involvement in the FP are such that they entail less funding than for other participants from Third Countries. The reasons for this should be explored by further research.

Kreimer and Levin, analysing the involvement of Latin American countries during 7FP, state that “Argentina, Brazil and Mexico together are involved in as many projects as Germany and France, the leaders (along with UK) in European research” (2013, 103). CORDIS data show that this was not the case for either 7FP or H2020. In H2020 the

Table 2. Funds received by participating organizations, LAC, TC and overall participants, 7FP & H2020.

| Country   | 7FP                  | H2020                |
|-----------|----------------------|----------------------|
|           | Total EU contribution (mill euros) | Aver. per project (Th euros) | Aver. per funded project* (Th. Euros) | Total EU contribution (mill euros) | Aver. per project (Th euros) | Aver. per funded project* (Th. Euros) |
| Argentina | 14.5 € | 145 € | 146 € | 9.2 € | 55 € | 155 € |
| Brazil    | 32.3 € | 188 € | 194 € | 15.5 € | 98 € | 457 € |
| Chile     | 9.2 €  | 153 € | 159 € | 8.7 €  | 79 €  | 235 €  |
| Colombia  | 6.1 €  | 139 € | 139 € | 8.7 €  | 110 € | 207 €  |
| Mexico    | 12.5 € | 144 € | 145 € | 0.9 €  | 16 €  | 183 €  |
| Five LAC total/aver | 74.6 € | 154 € | 157 € | 43.0 € | 72 €  | 248 €  |
| All Third countries | 603.5 € | 290 € | 353 € | 1520 € | 388 € | 402 €  |
| All FP participants | 46,090 € | 1,786 € | 1,786 € | 66,960 € | 1,900 € | 1,900 €  |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021. *Projects in which the beneficiary organization received a EU contribution > 0 euros.

Table 3. Projects in which no funding was received by LAC organizations, 7FP & H2020.

| Country   | No. projects | % of total projects |
|-----------|--------------|---------------------|
| Argentina | 2            | 2%                  |
| Brazil    | 6            | 3%                  |
| Chile     | 2            | 3%                  |
| Colombia  | 0            | 0%                  |
| Mexico    | 15           | 17%                 |
| Five LACs total/aver. | 25 | 5% | |
| All Third countries | 368 | 18% | |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021. Zero euros projects include all those in which countries are partners and some in which they are participants.

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2We use amounts per project instead of per participation because group data are available for the former and not for the latter. However, funding by participating organisation is available in the CORDIS database. We are aware, however, that our choice meant a certain degree of bias.
three LAC countries combined were involved in 577 participations against 20,310 for Germany and 16,766 for France.

When observing the evolution of the individual participation by LAC countries between 7FP and H2020, a mixed picture emerges: Mexico fell, Brazil stagnated and Argentina, Chile and Colombia improved. The receding influence of the first two was evident in the already decreased presence of the five LAC within all Latin American countries. Indeed, during the H2020 years, two countries, Uruguay and Ecuador, displaced Mexico as participants in the FP.

The picture that emerges from the changes between the two FPs is that all five benefited from a larger number of projects and participations but all, except Colombia, received for them a smaller contribution of funds. This is not only due to the ineligibility rule for Brazil and Mexico, because it is also the case for Argentina and Chile. The region additionally has diminished presence compared to overall TC, which increased their number of projects, participations and funding throughout the period (Table 4). We shall explore the reasons for this performance throughout the other sections.

5.2. Type of projects and type of organizations

Collaboration has fallen in all FP projects, but its dynamic follows program rules. Most calls are aimed at tackling European challenges and problems, a normal fact given that the FP is the European strategy for fostering research and innovation. Would-be participants meet in EU-organized meetings and through platforms created for finding matching partners, according to topics. Info Days meetings - both in presence and online - are organized when new calls are launched and Work Programmes are known, after which those scouting for them and NCPs get to work. European organizations wishing to act as consortium coordinators or wishing to be partners start planning their strategy to compose the proposal, which has to be collaborative. Some calls are targeted at specific countries, regions or topics, as we shall see in the next section. For a Third Country organization, the driver for collaboration comes from outside, meaning that the organization needs to be invited to participate.

Actions, as the type of projects are called, belong to two groups according to their origin. The first one stems from a top-down flow and are present in all three components of the programmatic structure: the three Pillars in both FPs. The agenda is defined in Work Programmes by the different scientific advisory groups. The second group has a bottom-up direction and is part of the first Pillar called Excellent Science.3 It includes European Research Council (ERC) grants and the Marie Curie4 actions. In these two programs, the research topic is defined by the researchers themselves or, in the case of Marie Curie actions, fellows or staff members. ERC grants were introduced in 2007 after complaints from the scientific community about the researchers being unable to accommodate to the Commission’s agenda. If coming from outside the EU, researchers participating in Marie Curie or ERC grants have to find a MC or AC host organization to conduct their project. The Excellent Science rationale for ERC and Marie Curie projects translates into awarding the grant to the best proposals, not to the most needy researchers or from

3The SME Instrument and the FET (Future and Emerging Technology) also follow the bottom-up direction, but we shall not look at them here.
4In this article we use Marie Curie as a shortcut to the official name, Marie Skłodowska-Curie.
the most underserved areas. ERC grants are highly regarded and the modality of the ERC Advanced Grant is among the most prestigious research prizes there exists. ERC grants are, unsurprisingly, concentrated among the best known research centers and universities in the EU.

In both 7FP and H2020 there were non-research actions called Coordination and Support Actions (CSA) for activities such as standardization, dissemination, awareness raising and communication, networking, support services, and policy dialogues. Along with ERC and some Marie Curie actions, CSAs were the only actions unchanged between the 7FP and H2020. Beginning in H2020, priority was given to innovation through the development and deployment of applied technology and services, including their introduction and scaling up in markets. Most programs channeled their needs for basic and applied knowledge through Research and Innovation and Innovation actions. For Innovation actions, both SMEs and for-profit entities were invited to join.

The type of projects in each FP differ so much that they are not comparable. But by contrasting them we can tell that in 7FP Collaborative Projects were the most usual type of actions (51% on average for the five LAC), whereas in H2020 Marie Curie actions were the majority (58%; Tables 5a and 5b). This is a remarkable change because Marie Curie actions were a mere 5% of LAC projects in 7FP, (12% for Argentina and none for Colombia). On the other hand, CSAs went down from 37% in 7FP to only 9% in H2020.

The fact that in all Marie Curie actions LAC organizations can only be partners and not beneficiaries has enormous implications for them, i.e. that they cannot receive funding. This affects Argentina and Chile more than the other three countries, with Colombia having the lowest proportion of this type of projects. In the section about Publications we will explore the link between type of project and publishing. If funding is not the reason why these countries chose MSCA actions, the answer must be in teaming up and co-authoring articles together.

A welcoming trend between the two programs is more participations in ERC grants in H2020 than in 7FP. Even if only an organization from Chile was awarded an ERC grant as principal investigator, all five, except Mexico, have been invited to join a grantee in its research project. Participating organizations in ERC grants can receive funds, as it was the case for Universidad de Concepcion, twice recipient of an astronomy ERC grant in H2020.

Most basic research is found in Research and Innovation actions in H2020. LAC organizations can be both partners or beneficiaries in RIAs, and most are the latter. For this, they

Table 4. Percent change between 7FP and H2020 in projects, participations and funding, LAC and TC.

| Country     | No. projects  | No. participations | Total EU contribution | EU contribution per project | EU contribution per funded project |
|-------------|---------------|--------------------|-----------------------|-----------------------------|----------------------------------|
| Argentina   | 68%           | 103%               | −37%                  | −62%                        | 6%                               |
| Brazil      | −8%           | 10%                | −52%                  | −48%                        | 135%                             |
| Chile       | 83%           | 118%               | −5%                   | −48%                        | 48%                              |
| Colombia    | 80%           | 84%                | 42%                   | −21%                        | 49%                              |
| Mexico      | −32%          | −26%               | −93%                  | −89%                        | 26%                              |
| Five LAC    | 38%           | 58%                | −29%                  | −54%                        | 53%                              |
| All Third countries | 24% | 40% | 152% | 34% | 14% |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021.
can either receive funding or not. Most beneficiaries in RIAs from LAC received a contribution. 1 out of 4 projects in which they participated were of this kind, with Brazil and Mexico having the largest share of such projects among the five LAC. As for Innovation actions, the proportion of them was 6% on average for the five countries, but Colombia had a 13% proportion of them. Given that participation by industry, private for profit entities and SMEs is a feature of these actions, it means that the respective organizations from LAC did not have a large participation.

As for the type of organizations involved (Tables 6a and 6b) the EC classifies them as research organizations, higher of secondary education institutions, public bodies, private for profit and other. We can see their participation by EU funds received in Figures 2 and 3.

Higher education organizations from LAC are the most important participating entities in both FPs. They are followed by research organizations. This, of course, is a reflection of the structure of the countries’ STI system. The exception to the dominance of universities

| Table 5a. Types of projects in which LAC were involved, 7FP. |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|
| Type of project                 | Argentina      | Brazil         | Chile          | Colombia       | Mexico         |
|                                 | No. projects   | %              | No. projects   | %              | No. projects   | %              | No. projects | %              | No. projects | %              | No. projects | %              |
| Collaborative Projects (CP)     | 47             | 47%            | 100            | 58%            | 26             | 43%            | 23             | 52%            | 39             | 45%            |
| Coordination & Support Actions  | 35             | 35%            | 56             | 33%            | 25             | 42%            | 18             | 41%            | 39             | 45%            |
| Combination of CP-CSA           | 3              | 3%             | 7              | 4%             | 6              | 10%            | 2              | 5%             | 3              | 3%             |
| Marie Curie actions (MSCA)      | 12             | 12%            | 5              | 3%             | 2              | 3%             | 0              | 0%             | 2              | 2%             |
| Benefit of Specific Groups (BSG)| 2              | 2%             | 3              | 2%             | 1              | 2%             | 1              | 2%             | 2              | 2%             |
| European Research Council grant | 1              | 1%             | 1              | 1%             | 0              | 0%             | 0              | 0%             | 1              | 1%             |
|                                 | 100            | 100%           | 172            | 100%           | 60             | 100%           | 44             | 100%           | 86             | 100%           |

Source: H2020 Dashboard, CORDIS.

| Table 5b. Types of projects in which LAC were involved, H2020. |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|
| Type of project                 | Argentina      | Brazil         | Chile          | Colombia       | Mexico         |
|                                 | No. projects   | %              | No. projects   | %              | No. projects   | %              | No. projects | %              | No. projects | %              |
| RISE (MSCA)                     | 91             | 54%            | 61             | 39%            | 62             | 56%            | 34             | 43%            | 25             | 42%            |
| Research & Innovation actions   | 18             | 11%            | 17             | 11%            | 9              | 8%             | 3              | 4%             | 8              | 14%            |
| Other MSCA actions              | 34             | 20%            | 46             | 29%            | 21             | 19%            | 20             | 25%            | 17             | 29%            |
| Innovation actions              | 6              | 4%             | 8              | 5%             | 7              | 6%             | 10             | 13%            | 5              | 8%             |
| Coordination and support actions| 11             | 7%             | 16             | 10%            | 8              | 7%             | 10             | 13%            | 4              | 7%             |
| ERA-NET Cofund                  | 7              | 4%             | 7              | 4%             | 1              | 1%             | 0              | 0%             | 0              | 0%             |
| European Research Council grants| 1              | 1%             | 3              | 2%             | 2              | 2%             | 2              | 3%             | 0              | 0%             |
|                                 | 168            | 100%           | 158            | 100%           | 110            | 100%           | 79             | 100%           | 59             | 100%           |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021.
Table 6a. Percent distribution of LAC organizations involved in 7FP by type.

| Type                                  | Argentina | Brazil | Chile | Colombia | Mexico | Five LAC aver. | Third Countries | All 7FP participants |
|---------------------------------------|-----------|--------|-------|----------|--------|----------------|------------------|---------------------|
| Research organizations                | 38%       | 33%    | 13%   | 28%      | 14%    | 25%            | 34%              | 22%                 |
| Higher or secondary education         | 26%       | 44%    | 58%   | 59%      | 59%    | 49%            | 49%              | 36%                 |
| Public body (excl. research & education) | 21%       | 4%     | 19%   | 5%       | 14%    | 13%            | 8%               | 2%                  |
| Private for profit (excl. education)  | 12%       | 15%    | 6%    | 5%       | 11%    | 10%            | 13%              | 21%                 |
| Other & Unknown                       | 12%       | 4%     | 5%    | 2%       | 1%     | 5%             | 4%               | 18%                 |

Source: H2020 Dashboard CORDIS. Organizations ranked based on EU contributions.

Table 6b. Percent distribution of LAC organizations involved in H2020 by type.

| Type                                  | Argentina | Brazil | Chile | Colombia | Mexico | Five LAC aver. | Third Countries | All H2020 participants |
|---------------------------------------|-----------|--------|-------|----------|--------|----------------|------------------|------------------------|
| Research organizations                | 43%       | 27%    | 6%    | 23%      | 32%    | 26%            | 25%              | 25%                    |
| Higher or secondary education         | 26%       | 54%    | 69%   | 54%      | 48%    | 50%            | 43%              | 40%                    |
| Public body (excl. research & education) | 12%       | 1%     | 13%   | 4%       | 8%     | 8%             | 8%               | 3%                     |
| Private for profit (excl. education)  | 14%       | 4%     | 8%    | 7%       | 4%     | 7%             | 12%              | 28%                    |
| Other                                 | 5%        | 14%    | 4%    | 11%      | 8%     | 8%             | 12%              | 4%                     |

Source: H2020 Dashboard CORDIS. Organizations ranked based on EU contributions.

in LAC is Argentina and is largest in Chile, where 58% in 7FP and more than two thirds of funds received in H2020 went to universities.

This particularity of Argentina in 7FP was accentuated in H2020. The leading position of Argentina’s research organizations in this comparison is largely due to CONICET’s proactivity. Along with the Ministry of STI (counted as a public body), CONICET (counted as research organization) captured a good proportion of FP projects and funding. Being the target of SD agencies, this implies that Argentina is bound to benefit from them more than the other LAC countries.

But this predominance of higher education organizations in both FPs is similar for all TC and all program participants. What is not similar is the role of private for-profit entities. It was 28% for all H2020 participants, 12% for all TC, but only 7% for LAC. This is correlated with a very reduced involvement by LAC’s organizations in Innovation Actions aimed at engaging industry and SME organizations. Argentina, among the other LAC, had the highest share of private for-profit participating organizations (14%) in H2020.

Among “other” organizations there are foundations, associations, NGOs and unidentified entities. They make up 14% and 11% of Brazil’s and Colombia’s organizations in H2020. And among research centers, there are international organizations which account for a small amount of projects but receive sizable contributions: the International Center for Tropical Agriculture (CIAT) in Colombia, International Maize and Wheat Improvement Center (CIMMYT) in Mexico, the International Potato Center in Peru and the United Nations Economic Commission for Latin America and the Caribbean (ECLAC). They count, however, as organizations from the country where they are established.
The following were the top participant organizations in H2020 according to funding received. In Argentina, as noted, CONICET and the Ministry of STI; Universidad de Buenos Aires was first in terms of funding received, but third in terms of number of participations. In Chile, three universities were the top three: Universidad de Chile, Pontificia Universidad Católica de Chile and Universidad de Concepción. In Brazil, the top one in both FPs was Fundação Oswaldo Cruz, a research center specializing in health. Second
was the Universidade De São Paulo and third the Universidade Federal do Rio de Janeiro. In Colombia, Universidad Industrial de Santander, CIAT and Pontificia Universidad Javeriana were the top three. In Mexico, the Instituto Tecnologico de Monterrey was first, followed by the Universidad Nacional Autonoma de Mexico and CONACYT; CIMMYT was the top organization in 7FP. This ranking reflects the countries' STI structure. Top organizations have gained experience in the dynamics of the FPs, overcoming the costs of learning to participate. Most organizations from LAC, however, have had only one participation.

5.3. Consortia coordinators and LAC amid Third Countries

Being invited to join a consortium is the most usual way to participate in the FP for a LAC organization. We inquired into the nationality of the consortium coordinator and came with the data on Table 7. We used data for all FP participants as benchmark. The data are shown in the graphs below (Figure 4).

In the 7FP a clear pattern emerges, a dependency of the five LAC on Spain as coordinator. This was the case in 43% of Colombia’s and 35% of Chile’s projects and an average 30% for the five LAC. Although Brazil had a lesser dependency on Spain as coordinator (only 17% of projects), the Iberian nation is still its most frequent country coordinator. Portugal, which could be invoked for language and cultural affinities with Brazil, was coordinator in only 3% of them. Among all 7FP participants Spain was coordinator of only 9% of projects whereas the United Kingdom had the largest share (20%). For a LAC organization, acting as coordinator was unusual, but still occurred in 10% of projects in which Argentina was involved, 3% of those from Chile and Mexico, 2% from Brazil and none from Colombia (Figure 5).

Things changed slightly in H2020 and the dependency on Spain decreased for all five LAC except for Chile, but the Iberian country remained the most frequent coordinator for the five countries. Acting as coordinator for the five LAC stopped, with only Chile coordinating 1% of its projects. Spain increased its share as coordinator for overall H2020 participants compared to 7FP at the same time that the United Kingdom retreated, mostly

| Table 7. Share of coordinator countries in projects with LAC participation, 7FP & H2020. |
|---------------------------------|---|---|---|---|---|---|
|                                 | Spain | UK | Germany | Italy | France | Own country |
| **7FP**                        |      |    |         |      |        |             |
| Argentina                      | 29%  | 14%| 10%     | 11%  | 8%     | 10%         |
| Brazil                         | 17%  | 12%| 12%     | 10%  | 13%    | 2%          |
| Chile                          | 35%  | 8% | 12%     | 7%   | 7%     | 3%          |
| Colombia                       | 43%  | 11%| 11%     | 5%   | 9%     | 0%          |
| Mexico                         | 28%  | 10%| 11%     | 9%   | 9%     | 3%          |
| Five LAC average               | 30%  | 11%| 11%     | 9%   | 9%     | 4%          |
| All 7FP projects               | 9%   | 20%| 12%     | 8%   | 11%    | void        |
| **H2020**                      |      |    |         |      |        |             |
| Argentina                      | 25%  | 10%| 11%     | 21%  | 10%    | 0%          |
| Brazil                         | 15%  | 14%| 12%     | 14%  | 11%    | 0%          |
| Chile                          | 37%  | 11%| 13%     | 8%   | 6%     | 1%          |
| Colombia                       | 28%  | 13%| 10%     | 9%   | 10%    | 0%          |
| Mexico                         | 27%  | 10%| 14%     | 7%   | 12%    | 0%          |
| Five LAC average               | 27%  | 12%| 12%     | 12%  | 10%    | 0%          |
| All H2020 projects             | 12%  | 15%| 11%     | 9%   | 9%     | void        |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021. For Brazil, Portugal was coordinator in 3% of participating projects in the 7FP and 8% in H2020.
due to the increasing retreat from new actions after the 2016 Brexit referendum. Argentina, still being coordinated by Spain more than any other large EU country, saw Italy almost double its share as coordinator from one FP to the other.

The dependency on Spain as a consortium coordinator is consistent with the trend of this country being, after the USA, the most frequent partner in scientific co-authorship for LAC countries during the 2017–2019 period, as noted in the UNESCO Science Report;

![Figure 4](image_url)

**Figure 4.** Share of coordinator countries in projects with LAC participation, 7FP.

![Figure 5](image_url)

**Figure 5.** Share of coordinator countries in projects with LAC participation, H2020.
except for Brazil for which the United Kingdom was the second most frequent partner (UNESCO 2021, 215).

As for the performance by LAC compared with other Third Countries, they are not on top in absolute terms, but still significant. Brazil’s leading position can be attributed both to the capacity of its STI system and its efforts to seek partnerships through multilateral agreements and multilateral research fora. But LAC face strong competition from world players such as the USA, Russia and China. The country with most participation and EU funding was the United States in both FPs, with 564 participations in 7FP and 2011 in H2020, and 86.4 million euro in 7FP and 129.4 million in H2020 (H2020 dashboard). On account of the opening of the US National Institutes of Health’s programmes to European researchers, it was agreed that any legal entity established in the US was eligible to receive EU funding for its participation in calls under the Societal Challenge “Health, demographic change and well-being” in H2020.

Ranking by absolute numbers according to funds received for the top 5 TC countries in 7FP is the following: United States, Russian Federation, China, India and South Africa. In H2020: United States, South Africa, Kenya, Brazil and Canada. Per million population, ranking in 7FP participations places the following top 5 countries in descending order: South Africa, Australia, Chile, Russian Federation and Morocco. In H2020, Sierra Leone, South Africa, Kenya, Chile and Australia. Chile’s place among TC rank is consistently high in both FPs.

Whereas LAC acted as consortia coordinators in 13 projects (Argentina) and 0 (Colombia) in 7FP, it occurred in 44 projects for China, 22 for the Russian Federation and 18 for India. For its role as coordinator in 7FP, Egypt was the country receiving the largest amount of funds (1.8 million), whereas the US and Brazil received each the second largest amounts (1.6 million). In H2020 TC as coordinators came almost to a halt, with only 6 projects being coordinated by the top 15 TC participants.

5.4. Intra-LAC collaboration, role of STI agencies and SD targeting

When looking at projects in which LAC were involved, we notice a clear pattern: they often stick together in the same project. This happens not always between the five of them, but with at least another Latin American country (most often, Uruguay, but also Ecuador and Peru). Shared participation with another LAC country was the case in almost half of 7FP projects and almost a third of H2020 ones (Table 8), with Brazil a solid magnet in both FPs. All five LAC were together in 12% of projects in 7FP and in 4% of H2020 projects, many derived from CELAC and Liaison Offices meetings. We see in the decrease of shared participation from the 7th to the 8th a lesser influence of the targeting of Latin America as a region. We also notice that Spain is not only the most frequent coordinator for all five LAC, but is also often the coordinator of projects targeted to the region as a whole.

Formal diplomacy in science between Latin America and the EU is carried out between the DG Research and Innovation unit of the EC and the STI public agencies in the region. A good means of promoting the policy role of STI agencies is earning FP grants. The agencies can then use collaboration with EU organizations and funds to enhance

5This country, with no participations in 7FP, was involved in only 5 of them in H2020 with a contribution of 20.3 million. It is, evidently, an outlier.
networking, increase the country’s research capacity or channel the funds to the individual researchers or to research centers accredited to them. But the number of participations from STI agencies for the five LAC was 72 in 7FP and 67 in H2020 so their share fell from 15 to 12 of all projects (Table 9). In terms of funding, the fall is larger, pointing to a decreasing role as participants.

As for individual country agencies, Argentina’s CONICET and the Ministry of STI stand out: they are highly active and continued to be so from one FP to the next. CONICET had an increase of 169% in the number of participations between the 7th and the 8th programmes in spite of a 44% decrease in funds received by the country. Meanwhile, the role of the two major Brazilian STI agencies was not very prominent in any of the two FPs. With only 9 participations in 7FP and 2 in H2020, it is evident that Brazil engages in the program directly through its research institutes and universities. Colombia’s Colciencias/Ministry of STI had few participations in both FPs and received meager funds, a reflection of its reduced use of formal SD instruments (no STI agreement, no Liaison Office, no SD diplomat in Brussels and high turnover of its International Office staff). Chile’s CONICYT was actively involved in FP projects in 7FP but had a significant reduction in both participations and funding in H2020. Mexico’s CONACYT had the largest fall in participations and funding by the five LAC. This adds to the overall fall in Mexico’s presence in the FP.

We also inquired into the different forms of science diplomacy. We gather the different sorts of SD in Tables 10a and 10b for the following variables, derived from project titles: targeting Latin America as a region, being in the geographic or socio-economic region (South America, Atlantic, Andes, a specific LAC city), international cooperation, research on an endemic/emerging illness, or cooperation between the EU and a specific country, and EU-CELAC cooperation. We considered some of the health projects as SD targeted ones. They don’t make up the whole of projects in health topics, but those specifically aimed at tackling endemic or emerging illnesses were mostly implemented by more than one Latin American country given their presence in the region. They dealt with Chagas disease,6 dengue,7 tuberculosis,8 diabetes,9 cancer,10 Zika11 and Covid-19.12

| Table 8. Share of projects in which another Latin American country was involved, 7FP and H2020. |
|-----------------|-----------------|-----------------|-----------------|
|                  | 7FP             | H2020           |                  |
|                  | At least one LA* with Brazil** | All 5 LACs | At least one LA* with Brazil** | All 5 LACs |
| Argentina        | 55%             | 43%             | 10%             | 24%             | 19%             | 2%             |
| Brazil           | 27%             | 23%             | 5%              | 21%             | 21%             | 3%             |
| Chile            | 35%             | 35%             | 13%             | 35%             | 22%             | 4%             |
| Colombia         | 59%             | 59%             | 20%             | 30%             | 25%             | 4%             |
| Mexico           | 48%             | 46%             | 10%             | 39%             | 34%             | 7%             |
| All five LACs average | 45%             | 41%             | 12%             | 30%             | 24%             | 4%             |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021. * At least one LA: any Latin American country. ** Most frequent LAC for Brazil is Mexico in 7FP and Argentina in H2020. Involvement as participants and as partners.

6BERENICE and CHAGASEPINET in 7FP and CRUZIVAX in H2020.
7DENGUETOOLS and IDAMS in 7F.
8FAST-XDR-DETECT and NOSTRESS in 7FP and INNOVA4TB and STOPLATENT-TB in H2020.
9DIABFRAIL-LATAM and STANDUP in H2020.
10LEGACY, ELEVATE, ESCALON, GLYCANC, HEADSpAcE, CLOSER and VOGAS in H2020.
11ZIKAction, ZIKAlliance and ZikaPLAN in H2020
12Uncover in H2020.
| Country     | Acronym                        | 7FP                  |          | H2020                  |          | Change          |          |
|-------------|--------------------------------|----------------------|----------|------------------------|----------|-----------------|----------|
| Argentina   | CONICET                        | 16                   | € 1,895,511 | 43                    | € 1,056,016 | 169%            | −44%     |
| Argentina   | Ministerio CT e I prod.        | 19                   | € 2,669,486 | 17                    | € 305,702  | −11%            | −89%     |
| Chile       | Comision Nal. de Invest.       | 10                   | € 1,637,205 | 3                     | € 190,070  | −70%            | −88%     |
| Colombia    | Colciencias/Minciencias        | 6                    | € 296,714   | 1                     | € 36,250   | −83%            | −88%     |
| Mexico      | CONACYT                        | 12                   | € 1,349,991 | 1                     | € 86,250   | −92%            | −94%     |
| Brazil      | CNPQ                           | 5                    | € 576,485   | 2                     | € 143,750  | −60%            | −75%     |
| Brazil      | Ministerio CT                  | 4                    | € 257,450   | 0                     | € 0       | −100%           | −100%    |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021. All organizations are considered Public Bodies by CORDIS except for CONICET, considered REC.
SD targeting is manifest in 42% of 7FP projects and in 29% of H2020 projects, but the group average stems from two extremes. Whereas Colombia’s involvement in 7FP was due to one of these forms of SD targeting in almost two thirds of its projects, it was only 28% for Brazil. Explicit SD targeting, thus, was important in the 7FP for the five LAC except for Brazil, specially among those countries with lesser participation. Its decreased role in H2020 points to a larger independent participation of their researchers outside the targeting SD mechanisms to promote their inclusion.

### 5.4. Publications issued from FP projects

Even if an organization is targeted by an SD mechanism, the fact that one group is contacted and not another one in the same country is due to the thematic focus, the scientific excellence or visibility, and prior involvement by the chosen organization. Surveys and interviews with researchers show that LAC researchers’ previous relationships with European researchers is a common reason for being involved in a project. A study by BBICE based on a survey of 9 Brazilian organizations participating in 7FP projects concluded that “The partnership from the FP7 projects considered for this analysis comes mainly from the institution’s existing network from previous interactions in collaborative research projects” (BBICE 2015, 55). This was corroborated by the survey made by Feld & Kreimer among 17 LAC groups participating in 7FP research projects (Feld and Kreimer 2019b, 14).

Prestige is gained through publications and citations and trust is earned through repeated successful participation in FP projects. The latter is captured in our data

### Table 10a. Projects with explicit forms of Science Diplomacy (SD) targeting, 7FP.

| 7FP       | Latin America as a region | Geographic zone | International cooperation | Endemic/emerging illness | EU-country or CELAC coop. | All forms of SD | Total projects | % of projects |
|-----------|---------------------------|-----------------|----------------------------|--------------------------|---------------------------|-----------------|---------------|--------------|
| Argentina | 29                        | 2               | 7                          | 2                        | 2                         | 42              | 100           | 42%          |
| Brazil    | 24                        | 7               | 6                          | 7                        | 5                         | 49              | 172           | 28%          |
| Chile     | 15                        | 1               | 4                          | 2                        | 5                         | 27              | 60            | 45%          |
| Colombia  | 2                         | 5               | 3                          | 3                        | 15                        | 28              | 44            | 64%          |
| Mexico    | 8                         | 6               | 15                         | 1                        | 19                        | 49              | 87            | 56%          |
| Five LAC  | 78                        | 21              | 35                         | 15                       | 46                        | 195             | 463           | 42%          |

Source: H2020 Dashboard, CORDIS. Geographic or Socioeconomic zone (South America, Atlantic, Andes, city) / Emerging or low income country/Tropics, Amazon.

### Table 10b. Projects with explicit Science Diplomacy (SD) targeting, H2020.

| H2020     | Latin America as a region | Geog./SE zone | International cooperation | Endemic/emerging illness | EU-country or EU-CELAC coop. | All forms of SD | Total projects | % of projects |
|-----------|---------------------------|---------------|----------------------------|--------------------------|-----------------------------|-----------------|---------------|--------------|
| Argentina | 11                        | 4             | 8                          | 3                        | 5                          | 31              | 165           | 19%          |
| Brazil    | 10                        | 24            | 8                          | 9                        | 4                          | 55              | 155           | 35%          |
| Chile     | 5                         | 6             | 7                          | 3                        | 9                          | 30              | 110           | 27%          |
| Colombia  | 8                         | 5             | 4                          | 4                        | 3                          | 24              | 79            | 30%          |
| Mexico    | 1                         | 5             | 5                          | 3                        | 7                          | 21              | 54            | 39%          |
| Five LAC  | 35                        | 44            | 32                         | 22                       | 28                         | 161             | 563           | 29%          |

Source: H2020 Dashboard, CORDIS. Cut-off date for H2020 is August 31, 2021. Geographic or Socioeconomic zone (South America, Atlantic, Andes, city) / Emerging or low income country/Tropics, Amazon.
about participations, while here we focus on publications. We looked at publications to make sense of the growing trend among LAC organizations to be involved in MSCA projects, which implied receiving no funds and being partners instead of beneficiaries.

Publications are an indicator of research excellence and FP publications have been found to have a significant impact; Veugelers and Baltensperger (2019, 48) from the Bruegel Institute, found that FP-associated publications were at least twice, even three times, more cited than world average.

As seen in Table 11, most FP projects in which LAC organizations were involved produced no publications. This happened in almost two thirds of projects in both programs. Their European partners, at the same time, did not publish in a third of projects in 7FP and almost in half of them in H2020 (Table 12). The high incidence of zero-publication projects is due to the type of projects in which they engaged. CSA, Marie Curie and BSG projects produced very few publications in 7FP (Table 13a). It was also the case with Innovation Actions, CSA and ERA-NET Cofund actions in H2020 (Table 13b).

The percent share of publications issued from participating LAC organizations ranged from 2.7 per project for Colombia to 0.9 for Mexico and an average 1.9 for LAC in 7FP. This fell in H2020, with a range from 2.0 for Brazil down to 0.6 for Colombia per project, and an average of 1.2 for the five LAC in H2020. In absolute terms, LAC authors published less papers in the latter than in the former. This is due to the increase in their involvement in projects resulting in zero publications. On average, they authored 12% of total publications, with a minimum increase from 9% to 10% as co-authors in H2020 with respect to 7FP. Co-authoring was three times more frequent than only-domestic authoring, more so for Brazilian and Chilean authors. Chile was the only LAC increasing the ratio of publications per project between the two FP. The decrease in the absolute number of publications in H2020 is also explained by many projects still being implemented.

Some projects had a particularly large proportion of total publications authored by LAC researchers. This was the case with the Zika projects, of which Brazilian authors contributed a third (ZIKAlliance) and half (ZikaPLAN) of total publications. Researchers from Chile’s U. de Concepcion in CepBin, grantees of an ERC Advanced Grant, published in all of the 28 publications issued. Colombia’s authors produced most of the publications derived from the EQUITY-LA and EQUITY-LA II projects. Argentinian authors had the largest participation as co-authors in CLARIS LPB and Mexico in the BISNANO and PROTINUS projects. All five LAC did so in LACEGAL. As noted, publications issued from H2020 projects can change given that some of them are still being implemented, some beginning as late as early 2021.

In H2020, publications from LAC authors are largely issued from RISE MSCA projects, larger than the share of such projects among all actions (Table 5b). We attribute this change towards more MSCA actions to a wish for a research agenda that better accommodates LAC’s researchers. This trend is not followed by Brazilian authors, for which almost half of publications stem from RIA projects (Table 13b). These are the projects for which basic research is involved and in which Brazilian organizations have participated. In some of them, they have received funds in spite of the non-funding eligibility rule. Brazil benefited from an exception to this rule when they were deemed essential to the project due to their outstanding competence/expertise, access to particular research infrastructures, access to particular geographical environments, or access to particular data. Also, because they supplied resources for participating in some projects. The
|                | LAC authors in projects in which they were involved | All authors from projects in which LAC were involved |
|----------------|---------------------------------------------------|---------------------------------------------------|
|                | 7FP                                               | H2020                                             | 7FP                                               | H2020                                             |
|                | No. publications | Pub. per project | % projects with no publ. | No. publications | Pub. per project | % projects with no publ. | No. publications | Pub. per project | % projects with no publ. | No. publications | Pub. per project | % projects with no publ. |
| Argentina      | 199       | 2.0          | 64%                | 156       | 0.9          | 77%                | 1732       | 17.1         | 32%                | 1253       | 7.5          | 49%                |
| Brazil         | 453       | 2.6          | 60%                | 322       | 2.0          | 69%                | 3235       | 18.8         | 23%                | 2191       | 13.9         | 40%                |
| Chile          | 78        | 1.3          | 63%                | 163       | 1.5          | 68%                | 1412       | 23.5         | 28%                | 905        | 8.2          | 49%                |
| Colombia       | 119       | 2.7          | 57%                | 48        | 0.6          | 46%                | 674        | 15.3         | 27%                | 698        | 8.8          | 56%                |
| Mexico         | 76        | 0.9          | 73%                | 50        | 0.8          | 78%                | 716        | 8.3          | 38%                | 661        | 11.2         | 47%                |
| All five LAC   | 925       | 1.9          | 64%                | 739       | 1.2          | 68%                | 7769       | 16.6         | 30%                | 5708       | 9.9          | 48%                |

Source: Open Aire. Cut-off point August 31, 2021. Only peer-reviewed articles in Open Aire.
fall in such funds from Mexico, noted by the CONACYT diplomat in our interview, can explain its general fall in its participation in H2020. Further research is needed to understand the very unequal situation of the two countries amid the same ineligibility rule for EU funds.

6. Discussion

LAC participation in the last two FPs as Third Countries is moderate compared to other Third Countries, but is increasing. Together, they represented a fifth of all participations from Third Countries in 7FP and a fourth in H2020. Their participation is the result of a combination of elements: the individual countries’ STI capability, their internalization policy and science diplomacy effort, the Framework Programme rules, and the European Commission’s policies for science diplomacy.
Some issues affecting all FP participants affect LAC as well. Among these, we can list oversubscription, a falling success rate, and complex rules of participation such as the required formation of consortia. These issues are somehow overcome by European and Associated members thanks to their geographic proximity, and a constant presence in Brussels of diplomats, associations, university offices, governmental agencies, national contact points and the use of consultants. Their learning effort to overcome obstacles has thus been compensated with a larger project granting and financial contributions. Repeatedly being a consortium coordinator reinforces this predominant position, something that is not generally allowed for LAC countries. LAC participation has been affected due to their being Third Countries, the geographic distance, and the norms in place that determine their participation. Despite the “open to the world” policy by the European Commission in recent years, projects with zero-euro contributions for LAC participants went from marginal (5%) in 7FP to dominant (59%) in H2020.

The European Commission’s decision that after 2014 Mexico and Brazil would not be automatically eligible for funding has impacted the participation of these two countries and thus, that of LAC. They used their own funds to continue participating, but this has been subject to budgetary availability. In the new scenario of limited funding, Brazil fared better than Mexico and the former’s decrease in total funding is smaller than Mexico’s. In the whole of H2020, 44 Brazilian organizations received EU funding, against 7 from Mexico. We argue that this is due to Brazil being exempted from the ineligibility rule more often than Mexico, on account of being declared essential in a series of projects. This was the case for some topics dealing with regional (Latin American) issues, geographically targeted studies or tackling endemic and emerging illnesses such as dengue, tuberculosis, malaria and Zika.

The success rate for overall program participants, defined as the rate of approved over eligible proposals, fell from 37% in FP to 11.95% in H2020. Surprisingly, in H2020 LAC had larger success rates than the average for Third Countries and overall participants. We attribute this to their being targeted by SD actions and to the type of projects they become involved in, but more research is needed to explain this.

It is a common feature of LAC participation that the individual countries stick together. In almost half of 7FP projects in which LAC participated, there was another Latin American country involved. This fell in H2020 to almost a third. Brazil acts as the anchor member of these consortia, being present in almost half of 7FP projects. Even falling to a fourth in H2020, it is still significant. We attribute this to SD actions, such as Europe targeting Latin America as a region and the implementation of bilateral and multilateral STI agreements.

The role of universities as the most important producers of knowledge in the region is also evident in their involvement in the FP, as they are the largest proportion of participants in the FPs, responsible for half of the projects in both. Argentina differs from this pattern as its STI agencies (Ministry of STP and CONICET) were able to capture almost a fourth of all projects, and find themselves among the top participating organizations. LAC’s private for-profit institutions represented only a tenth of all organizations involved in 7FP but fell to 7% in H2020. This correlates with a low participation in Innovation Actions in H2020, in which industry and SME involvement is expected. We attribute this to a weak interaction between academia and industry in the region as noted by Confraria and Vargas (2017).
Cultural affinity with the country from the consortium coordinator has been key when inviting an organization from Latin America to participate. For the five LAC countries, Spain was the most frequent consortium coordinator of projects in which they were involved. It is also the main coordinator of Brazilian projects, but in a lesser proportion as its projects are coordinated more evenly distributed among the main European countries. The preponderance of Spain as coordinator of LAC fell in H2020, but it is still disproportionate to its role for overall participants.

Publications by LAC participating organizations in FP projects expected to produce academic publications are unevenly distributed: they are high in some topics and low in others. LAC co-authoring with European/AC partners was present on a tenth of all papers issued from the projects in both programs and an additional 2–3% came from local authors. In absolute terms, there are less papers published in H2020 than in 7FP, but this is due to the fact that many H2020 projects are still underway and numbers are expected to rise. Co authoring with European/AC partners is larger for Chilean (16%) and Brazilian authors (14%) and lowest for Colombian and Mexican ones (5% each) in H2020.

Brazil stands out among the other four LAC. It had the largest number of projects and participations, received the largest amount of EU contributions and was responsible for the largest number of publications issued from those projects. It also has the largest share of publications issued from RIA projects, the H2020 projects aimed at basic research. But in per capita terms, Chile is the LAC with best indicators for projects, participations, funds, and publications. It is the only of the five having earned a prestigious ERC Advanced Grant. Brazil’s involvement in the FP differs from that of the other LAC and mirrors that of Southern Third Countries such as the South Africa and Kenya.

Argentina stands out among LAC as the one with most participations in H2020, overcoming Brazil. It also has the most proactive STI agencies which are champions at earning projects. It was able to obtain the role of coordinator in several 7FP projects and was thus able to act as leader among the region’s STI agencies. But Argentina’s participation has evolved towards becoming the highest recipient among LAC of Marie Curie actions. This involvement is so important that 95% of Argentinian publications issued from H2020 projects come from these actions, for which the respective organizations received no funds.

Colombia shows a mixed evolution: it improved its participations and funds received between the 7FP and H2020. It is the only LAC experiencing a positive growth in EU contributions between the two programs. At the same time, it had the highest percentage of projects in which another LAC country was involved, the highest dependency on Spain as coordinator, the highest proportion of projects that resulted from SD targeting and the largest decrease in the number of publications per project. This bidirectional evolution can be explained by an institutional frailty of its STI structure (the decreases) and the proactive involvement of its universities and researchers (the gains). The weakness of its STI institutions regarding the FP is patent from several indicators: its R&D expenditure is the lowest among the five LAC, its government has not signed a science and technology agreement with the EU, it has no specialized science diplomats abroad, and there is a high turnover of its internationalization staff at the STI agency. Until early 2017, Colombia lacked the very useful network of National Contact Points and none have been appointed for HE.
Mexico is the clear loser among the five LAC. Along with a reduction in number of projects and participations, the fall in EU monetary contributions received was catastrophic. However, the share of projects by type shows a more diversified picture than in other LACs, with a third of them being RIA and almost a tenth, Innovation Actions. The retreat of Mexico in the 8th FP can be explained by this country not having availability for funds that the new rule introduced in H2020 entailed. Though being subject to the same rule, Brazil received a better treatment than Mexico. Whereas 44 Brazilian organizations received funds in H2020, only 7 of Mexican ones did, one of them being an international agricultural research center. More research is needed to explain if this asymmetry is due to a thematic/scientific capacity or to political factors.

Specific efforts by LAC’s STI agencies to collaborate with the European Union resulted in a larger number of projects obtained for themselves and for acting as broker for its domestic organizations. Brazil was not affected by a lesser role of its STI agencies in the FP because of the ability of its universities and research centers to capture projects.

Participation in the FP occurs via the initiative of European researchers or innovation units and consortium coordinators looking for counterparts in Latin America; only in a few cases was there successful participation of Latin American researchers in calls that they found interesting, for which they reached out to be included. Previous contacts of Latin American researchers with their European counterparts and prestige as well as previous experience with FP projects are crucial for being considered adequate partners.

If participation by LAC organizations is due to their expertise and prestige, it is not always the case that their research agendas are concordant with the EU’s. We argue that the increasing trend in their participation in Marie Curie actions is explained by the increasing wish to find partners with a freer research agenda than the one defined by the EC, logically tilted to European needs and challenges. This needs to be tested by further research.

The contribution of science diplomacy to LAC participation was uneven in the two FPs. Invitation to participate by EU science diplomacy actions was a significant factor in their involvement in 7FP (2007–2013) and became less so in H2020 (2014–2020). We also observed a decreased dependency on their inclusion as members of the Latin American group and Spain’s brokerage.

**Declaration of interests**

I hereby declare that the article I am submitting is an original work, that I have the rights in the work, that I am submitting the work for first publication in this journal, that it is not being considered for publication elsewhere and has not already been published elsewhere.

**Data availability statement**

Data used on projects: CORDIS database for each project [https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-dashboard](https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-dashboard).

Data used on publications issued from projects: Open Aire linked through the CORDIS page for each project.
Disclosure statement

This work is the result of research conducted by the author as director of Prosearch Europe, aimed at helping Latin American research organizations to participate in the European Framework Programme for Research and Innovation. There is no financial interest or benefit from the direct applications of this research.

Notes on contributor

Consuelo Uribe-Mallarino was a professor of social policy, dean of social sciences and vice rector for research at Pontificia Universidad Javeriana in Bogota from 1998 to 2016. She then founded Prosearch Europe, an organization aimed at helping Latin American researchers to participate in the European Union’s Framework Programme for Research and Innovation and internalization. She has published on social policy, interdisciplinarity, social stratification and social mobility.

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