



INTERNSHIP THESIS

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Diversity Management, when policies meet practices: the case study of CERN.

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Executive Summary

Diversity is a key managerial concept that is crucial to take into account when managing a company or organisation. From a societal standpoint, diversity is both a legal and moral aspect (with laws against discrimination, equality of individuals, etc.). From a human point of view, it is a source of intellectual enrichment, and also motivation through the aforementioned equality. From an economic standpoint, successful diversity management is a source of economic performance, from better talent acquisition and preservation, to reduced potential lawsuits and better public image.

CERN, the European Organization for Nuclear Research, is an organisation in which diversity has always been present; the Organization was created with core values of unity and diversity in mind, gathering together scientists from across Europe in the aftermath of the Second World War. However, diversity management was introduced at CERN only recently, evolving until its current state, finalized with the launch of the Diversity Programme in 2011.

This Internship Thesis seeks to understand how CERN tackles the challenges of sourcing and recruiting a diverse pool of candidates from its 22 Member States. To achieve this, an understanding of the expectations of the Member States concerning diversity within the Organization is necessary, and how those, fused with CERN values and vision translates into rules and practices applied to the domain of talent acquisition. The objective is to compare the current situation and practices at CERN with the present state of research on how to manage efficiently diversity in organisations, from talent sourcing to retention. In order to do this, data has been collected through interviews and an analysis of the rules and regulations enforced, as well as the official personnel statistics. This research should highlight whether there are discrepancies between various theories compared to the current practices within the Organization. If divergences are found, this paper will extend its scope in trying to provide a way to improve the present CERN sourcing strategy by suggesting recommendations based on academic literature. The focus of this research paper is on the dimension of nationality, to avoid diluting attention on too many dimensions of diversity.

The first part of this thesis includes an introduction to CERN: what it stands for, what it does, and how it came to be. Following this, a presentation of diversity at CERN, its policy and values is provided. Once a better understanding of the Organization is acquired, the theoretical framework is examined. This includes a general introduction to diversity and the recruitment associated to it. Three articles are then reviewed, and used as a basis for the theoretical analysis.

The second part of this thesis is an analysis of the data available at CERN. First, the relationship between CERN and its Member States regarding recruitment and diversity is examined. This thesis aims to highlight that diversity is more than a societal and motivational tool for the Organization: it is

also a powerful economic factor, as it includes elements of “return on investment” for the Member States. Then, the aforementioned theoretical analysis based on the articles of the theoretical framework is presented. In this subsection, one can observe that as the dimension of nationality is treated differently due to its economic aspect, its management differs slightly both from CERN’s policy and from the theoretical framework. Finally, the last part of the analysis contains an overview of the evolution of diversity of nationalities across CERN, its departments and professions over the past few years. One can observe here that diversity is not coherent across all dimensions of the Organization, suggesting that both exogenous and endogenous factors create differences between both departments and professions compared to the global workforce.

This thesis ends on recommendations at three levels: firstly, the concept of “diversity value”. As observed through the internal analysis, diversity is not achieved transversally across the Organization, creating clusters of nationalities at some level, partially reducing the positive impact of diversity in the workforce. Improvements can be made to ensure that the Organization benefits from its nationality diversity at all levels. Secondly, the involvement of management. It is necessary to create a bond between top-management and diversity, to show that diversity is not just an ideal but also a practice linked to values that transcend the roles within the Organization. Finally, the extension of outreach to blue collar professions. It has been observed that there is a significant imbalance and overrepresentation of CERN’s Host States population in “blue collar” professions. Thus, it could be assumed that extending outreach across other Member States about the opportunities at CERN for such jobs may encourage people to apply and therefore improve diversity across these professional categories.

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1. Introduction

Diversity is an unavoidable concept from a managerial standpoint in our current society. It is essential for it to be taken into account. From an individual point of view, it gives the possibility to people to enrich themselves intellectually. This need for cognition, if satisfied, can increase team performance (Milliken & Martins, 1996). It is also a strong factor of equality in the workplace. From an economic standpoint, diversity can foster strong benefits and ignoring its management can create unforeseen costs, such as loss of talent or lawsuits (Robinson & Dechant, 1997). However, an unsuitable management can easily sweep away the potential benefits of strong diversity in the workplace (Mannix & Neale, 2005). The objective is to find the proper way to convey diversity values while ensuring that it does not become a weight on team dynamics and workplace environment.

CERN is an international organisation located in Geneva, Switzerland. Its goal is to expand our knowledge on fundamental physics through cutting-edge science and gigantic experiments managed by thousands of international collaborators. It has always been nationally diverse, as it was part of its initial creation values to bring people together for scientific purposes. Interestingly, only recently has it turned to diversity management to tackle the different issues that can arise from heterogeneity in the workplace.

The Organization has diversity objectives, set up by the Director-General, and a policy enacted by the Diversity Office, creating a unique work environment. The Member States, countries financing the Organization, are also involved in the process, as they want to make sure that their interests are taken into account.

The goal of this thesis is to understand how diversity management is legislated at CERN, in particular who the stakeholders in the process are, how they interfere with diversity, its management and its policy, and how these interactions and decisions translate into recruitment practices. The focus will be on the nationality aspect of diversity.

The structure of this thesis will be the following: first, a comprehensive description of CERN will be presented: what it is, how the Organization is organised and how it came to be. An introduction to the stakeholders and the budget structure will also be presented here.

Then, once the historical and structural context is clear, I will develop the concept of “Diversity at CERN”, its policy and the practices the Organization wishes to enact.

The third part will be gravitating around a more academic perspective of diversity: a review of the literature will be introduced, with the potential benefits, but also the issues which arise from diversity

and its management. Three articles which will be used in the theoretical analysis of the organisation's diversity concept will be described in-depth to give the reader a more developed understanding of the current academic context.

The fourth part will be the aforementioned analysis. It will contain descriptions of the link between the Member States, national diversity, the recruitment and its processes, and then apply the theoretical framework presented above to see whether similarities and/or differences between what academic experts suggest and what the reality of diversity at CERN is can be observed. Afterwards, a statistical observation will be conducted, to evaluate the differences between the valued goals described in the policy, the practices enacted at recruitment, and the reality of the diversity of nationalities in the workplace. To do this evaluation, I will first look at CERN as a single entity, then dig deeper and observe the situation at the departments and groups level, as well as transversally inside the different professions present within the organisation. This will enable to confront what is desired by the Organization in term of diversity and how it translates into numbers for the representatives of the Member States, but also witness whether organizational diversity is transversal (across job categories and groups) or concentrated into clusters of nationalities. The evaluation will be conducted on staff members for two reasons: the first being that evaluating too many statuses might dilute the point of this thesis. The second is that other statuses except "Users" (users are visiting scientists, which are linked to institutes and not countries, their impact on national diversity would therefore bias the results) are small samples, making the variance of nationalities within them very high depending on the years.

The conclusion of this research paper will include recommendations on how the different points evaluated through both theory and statistics might be improved through research and practices for the professionals of recruitment at CERN, as well as for academicians interested in comparing diversity between international organisations and more common entities.

2. CERN

2.1 Description

CERN stands for “Conseil Européen pour la Recherche Nucléaire”, translated into European Organization for Nuclear Research (European Laboratory for Particle Physics also exists). It is one of the most important centre of research about fundamental physics worldwide. It hosts the Large Hadron Collider (LHC)¹, the World’s biggest and most powerful particle collider, a colossal 27 kilometres ring of magnets and detectors buried far beneath the ground under Geneva and its region. In the LHC, particles are clashed against one another at speeds close to the one of light itself, in an attempt to break them into smaller components and try to understand the fundamental laws that rule our Universe. In order to do so, the key machines used in those experiments are particle accelerators, detectors and computers.

A particle accelerator is a machine, which uses electromagnetic properties to accelerate particles at tremendous speeds and contain them in a beam². This beam is then directed in the different experiments to be intersected with other beams to create collisions between particles and study the outcomes. The detectors are located in the experiments³. There, they are used to observe the collisions and give a clearer view of what is happening when particles collide. There are no less than 25 experiments and facilities, which use the collisions, and the data recovered from those, to study different subjects and theories of fundamental physics⁴.

Figure 1 shows the Accelerator complex at CERN, with each of the names present on the graph representing one of the experiments mentioned above, underlined by the year they were put in place and their circumference (for the circular ones). One can see accelerators going from 31 meters of circumference for ELENA to the 27 kilometres of the LHC. The colours of the arrows represent the kind of particles that transit in the different experiments, as detailed underneath the image.

¹ The Large Hadron Collider | CERN. 2017. *Home.cern*. <https://home.cern/topics/large-hadron-collider>, August, 2017.

² How an accelerator works | CERN. 2017. *Home.cern*. <https://home.cern/about/how-accelerator-works>, August, 2017.

³ How a detector works | CERN. 2017. *Home.cern*. <https://home.cern/about/how-detector-works>, August, 2017.

⁴ Experiments | CERN. 2017. *Home.cern*. <https://home.cern/about/experiments>, August, 2017.

CERN's Accelerator Complex

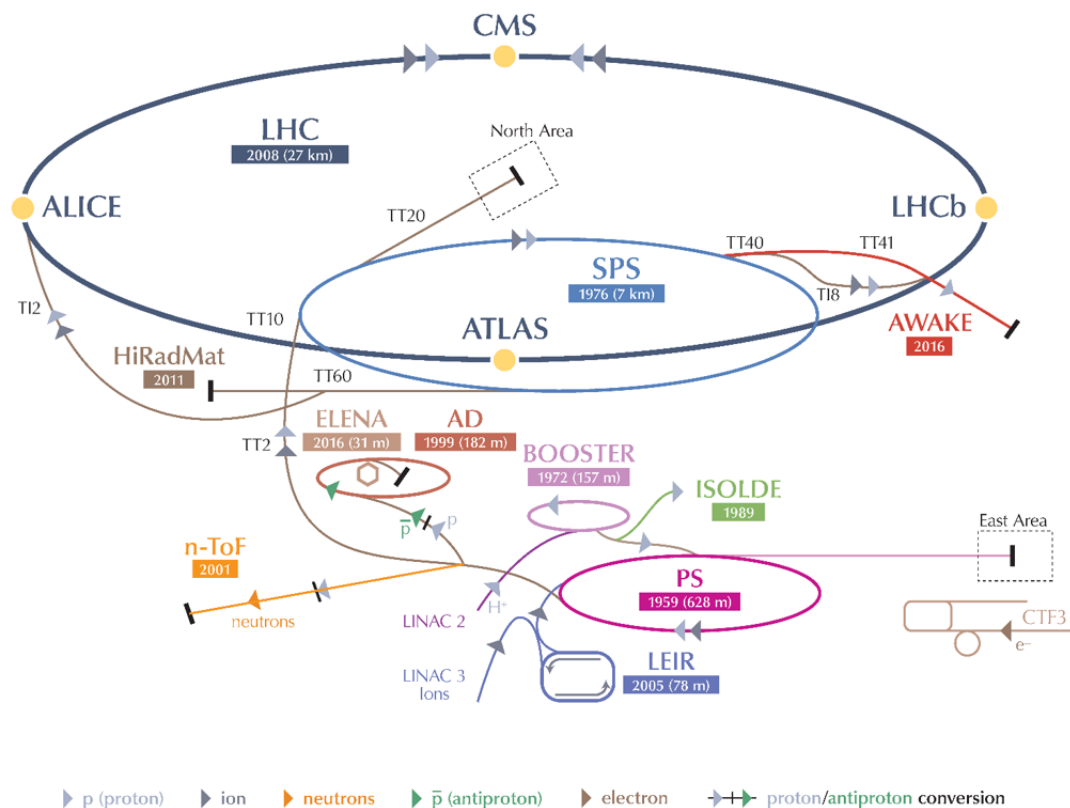


Figure 1: CERN accelerators and Experiments complex (<https://espace.cern.ch/acc-tec-sector/Pictures/CERN's%20accelerator%20complex2015bis.png>)

Computers are a key element of the process⁵, as they are used everywhere: they control the development of the experiments, they collect the data and send it around the globe in a complex worldwide network, the World Wide Grid, which filters, records and processes the information⁶. This system has been put in place because the computing ability within CERN would not be enough to hold and analyse such enormous amounts of data. To give an example of the quantity of information, the average load of data from the four experiments on the LHC (ALICE, ATLAS, CMS and LHCb) on December 14th 2017 was of 30 Gigabytes per second (WLCG, 2017).

The missing element of this mix is human capital. Hundreds of scientists and engineers, but also technicians and administrative personnel thrive daily to make sure that everything is set up properly to enable the experiments to proceed as desired. Following the CERN Personnel Statistics of 2016 (Statistics for 2017 will be available mid-spring), CERN has 3'310 members of personnel employed, and 13'558 Members of Personnel Associate, totalling a population of 16'868. This however does not

⁵ Computing | CERN. 2017. *Home.cern*. <https://home.cern/about/computing>, September, 2017.

⁶ Welcome to the Worldwide LHC Computing Grid | WLCG. 2017. *Wlwg.web.cern.ch*. <http://wlwg.web.cern.ch/>, December, 2017.

correspond to the constant amount of people on site, as Associates are affiliated to other institutes. They are mostly “Users”, which are scientists from collaborating institutes participating in the experiments. A significant portion of them does not work at CERN full-time, coming and going depending on the needs of the different experiments. The other Members of Personnel Associate remain at CERN full-time: trainees, students and doctoral students work at CERN in the framework of their studies⁷. The numbers cited above do not include the personnel from sub-contractors.

Of the 3’310 employees, 2560 are Staff members and 750 are fellows, the latter being a program for young graduates with little experience. Knowing what CERN stands for, one might be tempted to assume that most of the people working here are focused on research. In reality, around 77% of the staff members are Engineers and Technicians who work on the different practical needs of CERN and its experiments. The rest is mostly administrative personnel, a fraction only fully dedicated to theoretical research. There is a significant number of research physicists at CERN. However, their vast majority are the Users mentioned earlier, coming from other institutions, and therefore not employed by CERN.

2.2 Structure

To be able to complete its objectives, the Organization opted for a segmented structure, delegating the authority of the Director-General to Directors across sectors, which are divided in departments and units. The Organization is segmented in four sectors: Accelerator and Technology (ATS), Finance and Human Resources (FHR), Research and Computing (RCS) and finally International Relations (IR)⁸.

2.2.1 Accelerator and Technology

This sector is divided into three departments and an office: Beams (BE), Engineering (EN), Technology (TE) and the Directorate Office (DO).

First, BE is responsible for *“beam generation, acceleration, diagnostics, controls and performance optimization for the whole CERN accelerator complex.”* The responsibility of the EN department is to *“provide CERN-wide engineering support for the technical infrastructure, the accelerators and the experiments.”* TE *“is responsible for technologies which are specific to existing particle accelerators, facilities and future projects.”* Finally, DO is a project office composed of several experiments who report directly to the ATS Director (CERN, 2017)⁹.

⁷ Categories of members of the personnel | CERN Guide for Newcomers. 2017. *Newcomersguide.web.cern.ch*. <http://newcomersguide.web.cern.ch/categories-members-personnel/>, September, 2017.

⁸ Directory | CERN. 2017. *Directory.web.cern.ch*. <http://directory.web.cern.ch/directory/>, June, 2017.

⁹ Home - Accelerators and Technology Sector. 2017. *Espace.cern.ch*. <https://espace.cern.ch/acc-tec-sector/mandate.aspx>, November, 2017.

2.2.2 Finance and Human Resources

This sector possesses four departments: Finance and Administrative Processes (FAP), Human Resources (HR), Industry, Procurement & Knowledge Transfer (IPT) and the Site Management and Buildings (SMB).

FAP's mandate is to manage the financial resources and commitments of the Organization while following the rules and procedures enacted at CERN. They are also responsible for the enterprise information systems and the accuracy of financial Data (accounting)¹⁰. HR mission is to accompany people throughout their career, manage the benefits, rights and obligations of the members of personnel and oversee the different aspects of life at CERN¹¹. IPT takes care of procuring the materials and services essential to the functioning of the departments and the experiments, enables the Knowledge Transfer from CERN to its contributors and collaborators and finally, manages CERN's participation in different scientific projects within the European Union¹². SMB is some sort of facilities management organ; its duties are to design and build the structures and infrastructures, and maintain the physical working conditions all across the Organization¹³.

2.2.3 Research and Computing

This sector has three departments: Experimental Physics (EP), Information Technology (IT), and Theoretical Physics (TH).

EP executes the research in experimental physics. It is the largest Department at CERN; Not only does it include around 500 of the 2560 staffs employed by CERN, it also hosts the 12'000 Users, who come and go to participate in the research across the different experiments¹⁴. The needs in information technology are fulfilled by the IT Department. They are also involved with external partners for research and industry purposes¹⁵. TH provides support to the experiments and uses them to fuel its own fundamental research. The department's objectives are to collaborate and go forward with the study of theoretical physics¹⁶. Two small units are also included in this sector, but are not big enough to be departments; the CERN Neutrino Platform¹⁷, doing research on neutrinos, and the Development

¹⁰ Our Mandate | Finance and Administrative Processes Department. 2017. *Fap-dep.web.cern.ch*. <http://fap-dep.web.cern.ch/content/our-mandate>, September, 2017.

¹¹ About HR | HR Department. 2017. *Hr-dep.web.cern.ch*. <http://hr-dep.web.cern.ch/content/about-hr>, August, 2017.

¹² Industry, Procurement & Knowledge Transfer | Industry, Procurement & Knowledge Transfer. 2017. *Ipt-dep.web.cern.ch*. <http://ipt-dep.web.cern.ch/>, September, 2017.

¹³ Welcome to the SMB Department | Site Management and Buildings Department. 2017. *Smb-dep.web.cern.ch*. <http://smb-dep.web.cern.ch/en>, November, 2017.

¹⁴ Experimental Physics Department | . 2017. *Ep-dep.web.cern.ch*. <http://ep-dep.web.cern.ch/>, October, 2017.

¹⁵ About the IT Dept | IT Department. 2017. *Information-technology.web.cern.ch*. . <http://information-technology.web.cern.ch/about>, November, 2017.

¹⁶ CERN Theoretical Physics | Theoretical Physics. 2017. *Th-dep.web.cern.ch*. <http://th-dep.web.cern.ch/cern-theoretical-physics>, November, 2017.

¹⁷ Welcome to CERN : CERN Neutrino Platform | . 2017. *Cenf.web.cern.ch*. <http://cenf.web.cern.ch/>, November, 2017.

and Innovation unit¹⁸, which goal is to contribute to the long-term development and benefits for CERN and society. The last body present within RCS is the Scientific Information Service; CERN's library. It provides books and articles to the different people within the Organization¹⁹.

2.2.4 International Relations

This sector is structured a bit differently as it is a Department (IR) by itself. Its duties are to deal with Stakeholders Relations, namely Member States, Associate and Non-Member States, and the public. There also are relations with other international organisations, partnerships and fundraising with different entities. The Department has a group in charge of Education, Communications & Outreach, whose duties are to communicate with actors going from policy-makers to the public in order to create engagement towards science and gather support for CERN's vision and mission²⁰.

2.2.5 Other Entities and Governance

Outside of the four main sectors, there are a few smaller actors, but not less important. HSE, the Occupational Health & Safety and Environmental Protection unit, ensures the safety of all people at CERN, from workers to visitors²¹. The Directorate General Units, are independent from the Departments so they can fulfil their duty autonomously (Internal Audit, Legal Service...) ²².

CERN's Governance²³, which is the highest instance of authority at CERN, is composed of several groups and committees who oversee the different management task required for such a wide organisation to operate. The main executive body is the Council. It is composed of 44 delegates, two per Member States; one representing the government and the other representing the scientific interests of each nation. Each delegate can vote and the majority validates decisions, even if the goal is to reach a consensus²⁴. The Finance Committee and the Scientific Policy Committee are here to advise the Council. The Director-General is appointed by the Council every 5 years, reports directly to it and is in charge of CERN's management. One could make an analogy with a Chief Executive Officer in a regular company, as its duties are equivalent in term of responsibilities and powers.

¹⁸ Welcome | Development and Innovation Unit. 2017. *Di.web.cern.ch*. <http://di.web.cern.ch/>, November, 2017.

¹⁹ CERN Scientific Information Service | Library - Archive - Open Access. 2017. *Library.cern*. <http://library.cern/>, November, 2017.

²⁰ International Relations. 2017. *International-relations.web.cern.ch*. <http://international-relations.web.cern.ch/>, November, 2017.

²¹ About us | Occupational Health & Safety and Environmental Protection Unit. 2017. *Hse.cern*. <http://hse.cern/content/about-us>, November, 2017.

²² CERN | DG units. 2017. *Dgu.web.cern.ch*. <http://dgu.web.cern.ch/dgu/>, November, 2017.

²³ The structure of CERN | CERN. 2017. *Home.cern*. <https://home.cern/about/structure-cern>, November, 2017.

²⁴ Welcome to the CERN Council | CERN Council. 2017. *Council.web.cern.ch*. <http://council.web.cern.ch/en>, December, 2017.

2.3 History

2.3.1 Creation²⁵

After the Second World War, Europe was in ruins. From a scientific point of view, the region was lagging behind, as 6 years of destruction and chaos slowed significantly the advancement of science. CERN was born with objectives to remediate this; create a European physics community to unite, reduce costs and go forward.

The first official proposal was brought forth by French physicist Louis de Broglie on the 9th of December 1949 at the European Cultural Conference in Lausanne. A number of political moves and international meetings later, in December 1951, a motion passed at a UNESCO meeting in Paris to establish the European Council for Nuclear Research.

At the end of June 1953, the 12 founding countries (Belgium, Denmark, France, the Federal Republic of Germany, Greece, Italy, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and Yugoslavia) signed the establishment of CERN. The Organization was officially born on the 29th of September 1954, after being ratified by the last two members of the new-born community, France and Germany.

Before that, in 1952, it was decided to build the Laboratory in Geneva, and the construction works started a few months before France and Germany ratified the treaty.

2.3.2 A New Beginning for European Physics

The first CERN particle accelerator was built in 1957. The Proton Synchrotron, another particle accelerator which is still in activity today, was started for the first time in 1959. Several scientific breakthroughs later the first underground ring accelerator, with a circumference of 7 kilometres, was inaugurated in 1976. It was then followed by the LEP, the Large Electron-Positron Collider, 13 years later. The tunnel that hosted this collider has a perimeter of 27 kilometres, which is not a coincidence; it is the same tunnel that is currently accommodating the LHC, as the LEP was dismantled in 2001 to make way for its successor.

In 1989, Tim Berners-Lee designed and tested at CERN one of the most important invention of the past few decades, shaping the world as we know it today: the World Wide Web. The first website went live by the end of December 1990, and the software was released to the public on the 30th of April 1993,

²⁵ The history of CERN | CERN timelines. 2017. *Timeline.web.cern.ch*. <https://timeline.web.cern.ch/timelines/The-history-of-CERN>, August, 2017.

allowing its spread across the world for it to become one of the founding elements of the Internet as it exists today²⁶.

The latest significant contribution to the expansion of modern Physics at CERN was the largely mediated discovery of the Higgs Boson. The experiments ATLAS and CMS identified a particle on the 4th of July 2012²⁷, which physical properties were consistent with what the Higgs Boson should be. This particle is the evidence of the existence of the Higgs field, which interacts with elementary particles and gives them mass.

Today, CERN keeps on pushing the boundaries of the unknown with its experiments, adding new ones or improving the existing ones.

2.3.3 Stakeholders

There are currently 22 **Member States**. Those are the ones represented at the CERN Council. After the 12 founding members introduced earlier, the Organization was joined by the following countries: Austria in 1959, Spain in 1961 (left in 1969, re-joined in 1983), Portugal in 1985, Finland and Poland in 1991, Czechoslovak Republic and Hungary in 1992, Bulgaria in 1991, Israel in 2014 and finally Romania in 2016. The Czech and the Slovak Republics re-joined separately after splitting up in 1993. Yugoslavia suspended its membership in 1961²⁸.

There are also seven **Associate Member States**. Those countries do not sit at the Council (it can happen that they attend sessions, but they cannot vote), have limited rights, but also provide limited funds to the Organization. Some are in a pre-stage to Membership: Cyprus, Serbia and Slovenia. Others are not yet there, and might apply for Membership in the future or remain Associates, depending on their desire to be included in CERN's experiments (and finance them). Those countries are India, Pakistan, Turkey and Ukraine.

Some countries and organisations qualify as "**Observers**", as the United States of America, Japan or the European Union. Those entities do not finance CERN through the annual budget, but through one-off or occasional financial participations which grants them access to the council sessions when the subject of their investment is discussed (usually LHC-related sessions).

On top of the categories of countries mentioned above, there is a last group, including 58 nations, which is "**Non-Member States Collaborating with CERN**". As the name suggests, those states

²⁶ The birth of the web | CERN. 2017. Home.cern. <https://home.cern/topics/birth-web>, September, 2017.

²⁷ The Higgs boson | CERN. 2017. Home.cern. <https://home.cern/topics/higgs-boson>, November, 2017.

²⁸ Member State Relations | International Relations. 2017. *International-relations.web.cern.ch*. <http://international-relations.web.cern.ch/stakeholder-relations/Member-State-Relations>, September, 2017.

participate in the functioning of the physics experiments at CERN, but do not necessarily invest directly in the collaborations²⁹.

The different statuses of the countries within the Organization greatly differentiate the influence they can have on the operations. Member States invest substantial amounts of their public expenses every year; they therefore need to have some sort of control over the way the money is spent. The objective is for the biggest possible proportion of the yearly investment to be returned. This can be done in different ways, which will be detailed further on.

The investment of each country is indexed to its Net National Income (NNI)³⁰. Associate Member States pay ten percent of what they would if they were Member States, with a minimum investment of one million CHF. When they apply for membership, the investment starts at 25 percent, and increases until it reaches 100 percent, where they become officially Member States of CERN. The exact percentage is not made public, but based on the numbers that are (contribution (CERN, 2017), population³¹, and NNI³²), it can be assumed that the contribution of each country is roughly situated between 0.0065 and 0.007 percent of the NNI of the Member States, which is non-negligible.

Map of CERN's collaborating countries

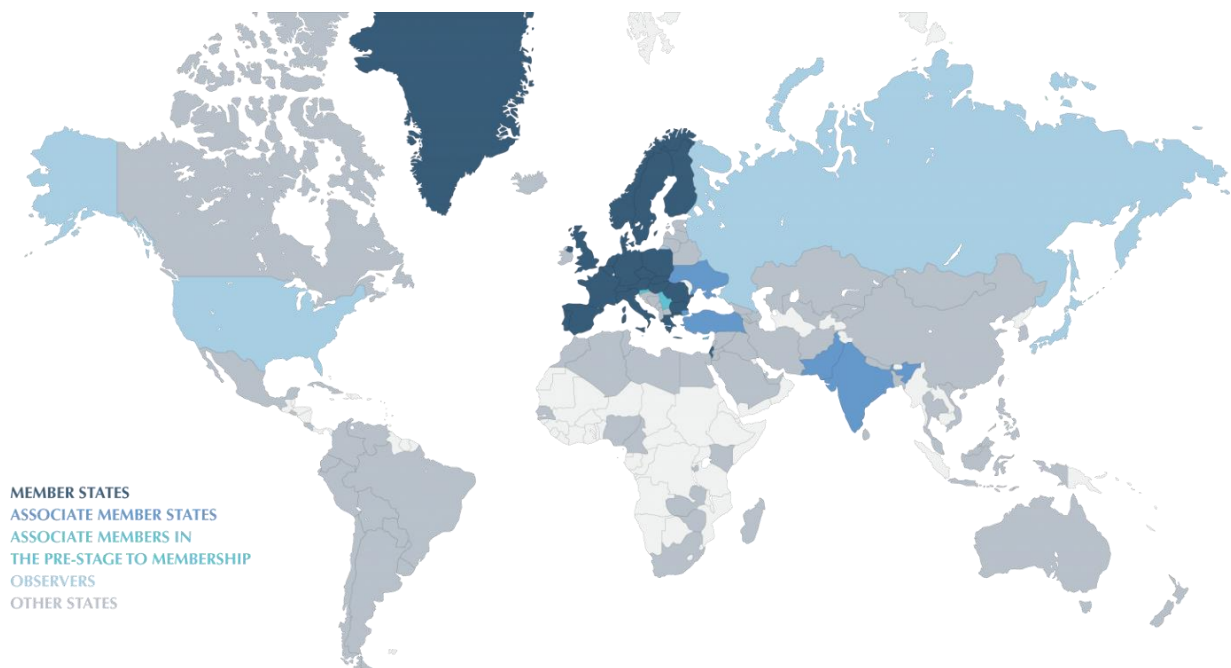


Figure 2: Map of CERN Member States as of 2017 (https://home.cern/sites/home.web.cern.ch/files/image/inline-images/cmenard/carte2017_en.png)

²⁹ Associate & Non-Member State Relations | International Relations. 2017. *International-relations.web.cern.ch*. <http://international-relations.web.cern.ch/stakeholder-relations/Associate-Non-Member-State-Relations>, September, 2017.

³⁰ Participation in CERN | International Relations. 2017. *International-relations.web.cern.ch*. <https://international-relations.web.cern.ch/stakeholder-relations/Participation-CERN>, December 13, 2017.

³¹ Population, total | Data. 2017. *Data.worldbank.org*. <https://data.worldbank.org/indicator/SP.POP.TOTL>, December, 2017.

³² National income - Net national income - OECD Data. 2017. *OECD*. <https://data.oecd.org/natincome/net-national-income.htm>, December, 2017.

2.3.4 Budget and Investment

The budget of the Organization is colossal; 1.1 billion CHF was spent yearly on average over the last 10 years³³, and it keeps increasing with the participation of new Associate Member States (The budget is annual, which means that both Member States and Associate Member States finance the Organization each year). It is important to remember that it is public money, contributed mostly by the Member States (some of it comes from other channels; Non-Member States, Research Institutes participating in the experiments, etc.). The biggest current project is the High-Luminosity Large Hardon Collider (HL-LHC), which goal is to increase the current power of the LHC. The budget that will be allocated to this project is 950 million CHF over the next 10 years, which will be financed through the annual budget and its potential future increase³⁴.

The following graph depicts the current contribution in percentage of the different Member States, totalling 1'119'900'050 CHF in 2017³⁵:

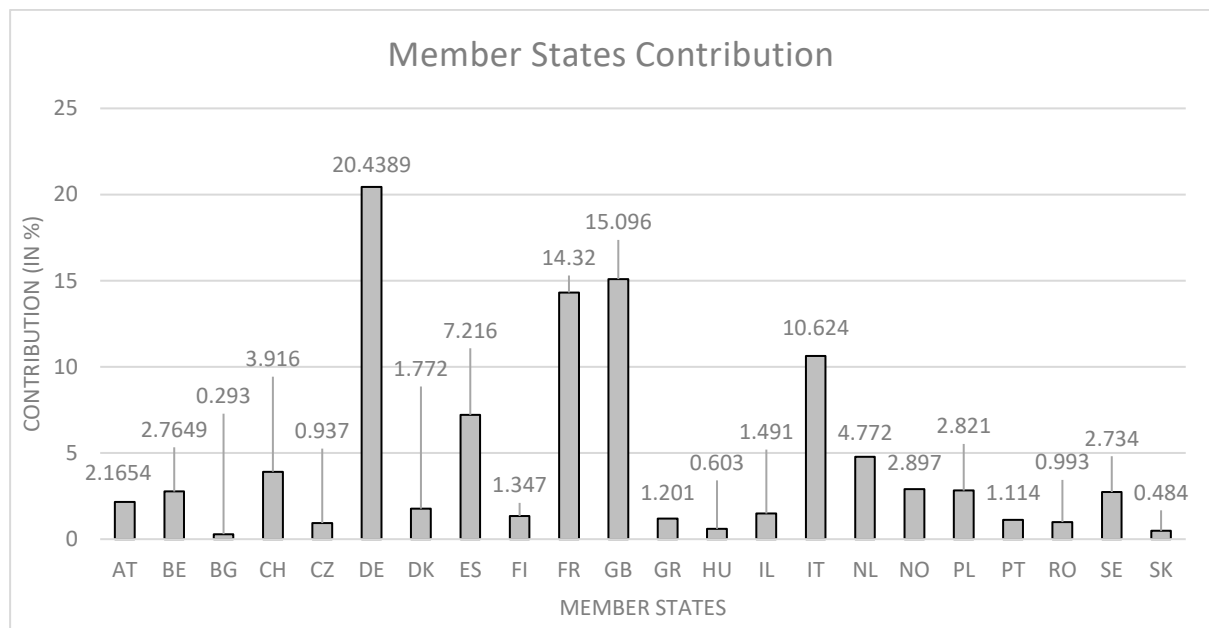


Figure 3: Member States contribution in percent of total Member States contribution in 2017

Associate Member States contributed for a total of 22 279 400 CHF, with India being responsible for slightly more than half of that number.

³³ Budget overview | Media and Press Relations. 2017. Press.cern. <https://press.cern/facts-and-figures/budget-overview>, September, 2017.

³⁴ The High-Luminosity LHC | CERN. 2017. Home.cern. <https://home.cern/topics/high-luminosity-lhc>, September, 2017.

³⁵ Member States' Contributions | Finance and Administrative Processes Department. 2017. Fap-dep.web.cern.ch. <http://fap-dep.web.cern.ch/rpc/member-states-contributions>, October, 2017.

3. Diversity at CERN

3.1 Diversity as a Value

Diversity is a key value at CERN. It is embedded in the Organization's culture, as one of the initial idea was to unite diverse nations under a common goal. CERN would not exist without the constant inflow of people from the Member States and beyond who bring their knowledge and expertise together for the experiences to prosper. CERN is built around the concept of recruiting people from the Member States, which will gain valuable knowledge through their stay within the Organization. Then, they will go back to their country, creating a return of the knowledge back to the Member States. This is the case for a part of the staff, as some remain indefinitely at CERN, but it is also the case for students. Several student programmes are in place to enable students across countries and disciplines to gain professional experience. Thus, once their contract is finished, they go back to their universities, effectively returning knowledge and competences to the countries. The same concept applies to fellows, the program for young graduates, which is both a potential talent pipeline for CERN and an opportunity for nationals of the Member States to gain first-hand experience in a professional environment.

Diversity is a key factor for the wealth of human capital which is attracted here. The Diversity Policy has been articulated around three main principles: *"appreciating differences, fostering equality and promoting collaboration"*³⁶. What is meant by those principles is to benefit from gathering many people with different backgrounds and individual differences, and allow them to contribute to CERN's projects to the full extent of their abilities. To do so, it is important to treat people fairly, equally and unbiasedly, which is reflected in the leadership culture. Collaboration is also a key concept, as once people are in an environment that enables them to flourish both intellectually and individually, having them work together is the best way for the Organization to capitalize on their combined abilities.

The CERN Code of Conduct itself defines Diversity as a strategic value to attain Excellence, in close collaboration with the four other axis of the code: Integrity, Commitment, Professionalism and Creativity. It states, *"CERN's excellence derives from an environment in which the knowledge and perspectives of a diverse workforce are valued and dialogue is encouraged at all levels"*³⁷.

However, even if it has always been present in a form or another, there was no one formally in charge of the diversity issue until quite recently. In 1993, an advisory group about women at CERN and their

³⁶ CERN Diversity Policy | Diversity at CERN. 2017. *Diversity.web.cern.ch*. <http://diversity.web.cern.ch/about/cern-diversity-policy>, September, 2017.

³⁷ CERN Code of Conduct. 2017. *CERN Document Server*. <https://cds.cern.ch/record/2240689/files/BrochureCodeofConductEN.pdf?>, September, 2017.

situation was created. It was not before 1996 that a policy statement for equal opportunities was introduced, supported by the creation of a job of equal opportunity officer. The job was extended to an advisory panel in 1998, and Equal Opportunities started to transform into Diversity by 2010, with the Diversity Programme officially launched in 2011. It might be interesting to mention that the Diversity Office does not handle everything: in reality, the Equal Opportunities Panel was divided into three different entities. First, Ombuds, which handles the conflicts between people at CERN, then the Harassment Investigation Panel, which is self-explanatory, and finally the Diversity Office, which is in charge of all other matters (but is of course also working with the two other bodies to make sure their objectives are converging)³⁸. The idea behind the responsibilities' split was to professionalise Diversity Management (the panels used to be composed of delegates from within the Organization).

3.2 The Policy³⁹

This policy is defined across all dimensions of diversity; the most obvious ones such as gender, generations, nationality and profession, but also the differences that make each individual unique, such as belief, disability, ethnic origin and sexual orientations. Even opinions are accepted as a diversity criterion, as long as they respect the values of the Organization. The ultimate goal is to have a work environment reflecting those values, both in presence and behaviour, to benefit from this potential creativity and innovation brought by such differences, and make sure that the Diversity value of CERN is present at all level of the policies, procedures and practices.

For those values and goals to be implemented, the Diversity is integrated in the Human Resources Strategy on several levels: first, at the recruitment level. Internally, efforts are made to recruit based on diversity. However, Excellence remains the main recruiting criterion. Externally, outreach activities are organized to attract the widest range possible of candidates and therefore increase the chances of finding diverse and competent profiles. Then, the career development system has diversity values embedded into it. Equitable access to learning is arranged, leadership development is deployed to enable a maximum of people to access it, and diversity aspects are included in performance management (diversity is examined across various dimensions, at the minimum gender and profession are observed, to evaluate whether the different jobs have acceptable gender distribution across the Organization). The last level of integration is through monitoring the work environment. The goal is to raise the awareness of people about diversity issues through conferences and interactive workshops made for people to interact and understand the concepts building the diversity value of CERN.

³⁸ From Equal Opportunities to Diversity (1996 - today) | Diversity at CERN. 2017. *Diversity.web.cern.ch*. <http://diversity.web.cern.ch/2015/03/equal-opportunities-diversity-1996-today>, September, 2017.

³⁹ Datta Cokerill, S. 2014. CERN Diversity Policy. *Diversity.web.cern.ch*. <http://diversity.web.cern.ch/sites/diversity.web.cern.ch/files/DiversityPolicy.pdf>, September, 2017.

The policy also defines the roles and responsibilities of each actor connected to CERN; from the smaller Contributors, as member of personnel and collaborators, to the Member States, who shall assist CERN into sourcing the most diverse workforce possible.

A budget is defined every year for the Diversity Office to organise events and workshops, and enable the members of CERN to participate in the programme and events to raise awareness inside and outside the Organization.

It is important to note that the objectives of the Diversity Programme are defined by the Director-General, on the short but also long-term, and performance and thresholds are to be met on all dimensions of the Diversity value. The results of the different actions are monitored internally through surveys, interviews and studies.

3.3 From Values to Planning⁴⁰

One might wonder how those values translate into concrete practices. In 2012, seven strategic objectives have been defined by the Diversity Office and the Enlarged Directorate (which is composed of the Director-General, the sector's Directors and the Department Heads) to reinforce diversity within the Organization throughout the levels described in the policy. At recruitment, the first objective is to increase the proportions of under-represented nationalities in the selection process, with Excellence remaining the most important measure. This is to be done first, through concrete efforts at sourcing and shortlisting stages, and then by monitoring the evolution of the diversity within the new recruits. The second goal is to *"achieve optimal gender distribution in recruitment for all categories"*. Again, with Excellence ruling above all, and throughout the same actions. However, there is no mention of what is meant by "optimal gender distribution". On the career development level, the third strategic objective is to include more gender role models, and this is to be achieved in the Succession Planning and Leadership Development, but also through coaching and mentoring. The fourth goal is to offer parallel career development opportunities for scientists to managers, as CERN has prospects and talented members in both areas. This is to be done through planning and review of the different abilities of the people but also through the potential opportunities present within the Organization. The three last objectives are related to the Work Environment. The fifth is to exchange ideas to understand each other across generations and professions. Workshops are implemented for this specific purpose. The sixth is to help people in finding ways to improve their work/life balance, through organisation of working time (Part-time, Telework, etc.) and push people to also have contact outside

⁴⁰ Diversity Programme | Diversity at CERN. 2017. *Diversity.web.cern.ch*. <http://diversity.web.cern.ch/diversity-programme>, September, 2017.

of work to positively impact the relationships within the workplace. The seventh and last objective is to promote mutual respect and inclusiveness at CERN, through events and internal communication.

In conclusion, CERN has strong Diversity values and has elaborate services and schemes to ensure the application of those values. What remains to see is how reality is and how those values, translated into plans, are truly adapted and integrated into the everyday practices of recruitment at CERN and what are the resulting demographics in term of nationalities.

4. Theoretical Framework

4.1 Diversity

What is diversity exactly? Diversity is about composition; being made of different elements. In our case, what is of interest in this research is organisational diversity, which means heterogeneity of demographics within a group or entity (McGrath, Berdahl & Arrow, 1995). There are several factors leading to the acknowledgment of a need for diversity management. The first influence comes from the emancipation of minorities in our western society. The first half of the 20th century was marked by our past of colonisation and misogyny: white men did most technical and high-level jobs, ex-colonists did the lower level jobs and women were at home. This started to change with the Second World War, especially in the United States, as people that were discarded as unfit were massively used: women had a critically important role in the manufacturing processes during the war, giving them tools to start their quest for emancipation (McEuen, 2016). A similar phenomenon happened for coloured people: the analogy between racism at home and the Nazis' practices oversea fuelled the fight against oppression, pushing people to march for more rights on US soil (Delmont, 2017). This was the start of their journey towards equality. Today, equality is still to be achieved; discrimination lawsuits and gender stereotypes are still running rampant in our society (Heilman, 2008). However, more and more efforts are made to ensure equality of opportunity in a wide range of domains and industries to fill the gaps that are still existing between the different populations. The second key aspect, which shifts the populations within companies from rather homogeneous to potentially heterogeneous, is globalization. The opportunity to move around the globe to work is more present than it has ever been before, and is a significant factor in explaining why populations are more and more diverse in the developed world, and why it impacts diversity in the workplace. A third important aspect that generates diversity in our modern society is the ageing population, which creates more and more heterogeneous workforces due to generation differences, and therefore more sources of potential conflict. This can create issues such as higher turnover (Wagner, Pfeffer & O'Reilly, 1984).

From a European perspective, the free movement around Europe enacted by the Schengen Area, which gradually evolved since 1985⁴¹, gave many opportunities for people to travel and work abroad. This created an environment where it is more likely to find a diverse workforce, as people can easily migrate. People are protected by the European Commission laws against discrimination, and should therefore be treated equally, as would the nationals of the countries they reside in be⁴². In the current

⁴¹ Schengen Area - Migration and Home Affairs - European Commission. 2018. *Migration and Home Affairs - European Commission*. https://ec.europa.eu/home-affairs/what-we-do/policies/borders-and-visas/schengen_en, January, 2018.

⁴² Your rights and obligations - European Commission. 2018. *Ec.europa.eu*. http://ec.europa.eu/justice/discrimination/rights/index_en.htm, January, 2018.

years, migration within Europe has mainly happened due to economic reasons, from poorer countries to wealthier ones, but also due to political instability and wars, as for example the migration from Kosovo because of war⁴³.

The concept of diversity has become prevalent in all organisational structures. No company or public entity can leave this matter unhandled as the consequences might be significant for the competitiveness and reputation of the entity; public opinion is a very powerful tool, and diversity can have a big impact on it, for better or for worse. With the exploding power of information technologies, it has become very hard to hide those issues from the population. Another matter that arises is the diversity within diversity; research finds benefits in certain forms of diversity, but sometimes not in all. Nevertheless, why should companies invest in diversity and how should it be done?

4.2 Benefits

Many benefits are attributed to diversity. The first advantage comes from the idea that diversity creates difference in the thought process, derived from the fact that there are several factors, which make the mind of an individual, such as background, experience, etc. This creates a difference of approach and is therefore beneficial when a cognitive action is undertaken in a group, in particular problem solving (Hoffman, 1959). This has been reflected in the research on diversity since then. The creativity can also be extrapolated from the same idea. Differences in mind-sets under certain circumstances can lead to increased innovation; Østergaard et al. highlighted in 2011 the fact that diversity in education and gender had a chance to induce innovation.

Robinson and Dechant displayed an extensive argument in their *“Building a business case for diversity”* in 1997, highlighting the more practical and economic aspects of diversity. First, diversity tends to save costs, as turnover and absenteeism are very costly for organisations, and an improper diversity policy might tend to create those issues for minorities. There is also the subject of discrimination lawsuits, and failing to learn from one’s mistakes can be very costly for organisations (Wooten & James, 2004). Second, minorities are becoming increasingly significant in the talent pool, and being able to attract and retain the best within those minorities can be done through a proper diversity policy. Third, diversity can be a pure business tool; understanding the markets, building relationships with local customers, thinking differently and more are all reasons that support the diversity business case. If a pure performance standpoint is considered, some studies also find positive correlations between diversity and returns (Richard, 2000).

⁴³ Kosovar Refugees - Migration News | Migration Dialogue. 1999. *Migration.ucdavis.edu*. <https://migration.ucdavis.edu/mn/more.php?id=1801>, January, 2018.

4.3 Issues

If managed improperly, diversity can create issues, which will in the end have a negative impact on the general effectiveness of the company (Kochan et al., 2003). For all the advantages cited in the business case above, counter research has been made, finding that homogeneity has its perks when examining company performance. Jeffrey Pfeffer is a fervent advocate of this concept, and made extensive research in the 80s, associating with other professionals of the field of diversity. The argument of similarity is found in several of his papers, but also in the form of counter arguments for heterogeneity, as for example in Wagner, Pfeffer and O'Reilly's *"Organizational Demography and Turnover in Top-Management Groups"*, which concludes that diversity in tenures creates frictions and higher level of turnover.

From a performance standpoint, there seems to be mitigated results when gender and racial diversity are involved. Some studies show indifferent results, and sometimes even negative when looking into the impact of diversity. An emphasis is made on the fact that managing diversity is of paramount importance for it to succeed (Kochan et al., 2003).

4.4 Diversity Management

Diversity management is becoming increasingly necessary for organisations for them to remain attractive and therefore competitive on the talent acquisition market. This will be even more so as time passes, as it becomes a growing societal and legal matter, and it will soon be a necessity to manage diversity. The sooner the transition, the better (Bassett-Jones, 2005).

Research has illustrated the need for proper management of the diversity issue. It means an in-depth understanding of the concept, but also acceptance from all the parties involved, from top to bottom. Indeed, management needs the will to improve diversity, but also know the constraints associated to the concept (not to set quotas but goals, not to sacrifice quality to attain those, etc.) (Gilbert et al., 1999).

Gilbert et al. in 1999 developed a model including the different steps required to manage diversity properly. Their model highlights diversity as a top to bottom initiative, and that external benefits cannot be reaped before the internal mechanisms are well established. Appreciation of differences is key and the concept of multiculturalism through "colour-blindness" instead of recognition can create exclusion of certain minorities (Stevens et al., 2008).

The model gives a strategic rather than operational understanding on how to manage diversity. Indeed, at the team level, it is critical to ensure proper communication and acceptance for the policy to be enacted. Selecting properly team members based on who they are and how they work could be a key

aspect of finding similarities in dissimilar people, and therefore trying to get the best out of both worlds (Bassett-Jones, 2005).

4.5 Recruiting Diversity

Diversity management is about maximizing the added value of a diverse workforce and ensure that they remain in the organisation. However, if the candidates do not apply for the jobs, the benefits of a diversity management policy cannot be harvested. How can an organisation enhance its ability to attract certain minorities?

Talent acquisition is of paramount importance. Its processes are some of the earliest contacts candidates have with the organisation, and this make them all the more critical. Taking the edge in recruitment is imperative. People seek companies who are a good fit to their own characteristics, and it is important to identify those and make sure they correspond to the ones of the company (Brazeel, 2010).

However, candidate characteristics can be very different, what they seek in one specific job might differ from one applicant to another and even one category of people to another. For example, some suggest that there are different gender expectations. This shows that a general marketing campaign about an organisation should focus on the general aspect, but also the specificities that make the targeted minorities feel that they can find what they are looking for in the organisation (Freeman, 2003).

A certain number of studies have been conducted to identify what really matters when choosing an employment place. Interesting findings were made by Chapman et al. in 2005 in their research paper titled *“Applicant Attraction to Organizations and Job Choice: A Meta-Analytic Review of the Correlates of Recruiting Outcomes”*. Using 667 coefficients from 71 studies, they cross-analysed the results to find correlation and hopefully causation in the reasons that made applicants choose one job over another. The results show that, as expected, the characteristics of the offer made by the recruiting organisation is strongly correlated with applicant attraction. However, an interesting finding is that even though it is important how the recruitment process went, the composition of the board was not particularly impactful when candidates had to make a decision about which company to integrate. It means that applicants do not feel particularly attracted to an organisation based on the person doing the interview. The perception of fit is a key factor, more important than the recruiter’s abilities. However, it is easier to increase the quality of the recruitment professionals (regardless of diversity characteristics) than attempting to enhance the fit factor for each potential candidate category.

The two main factors which have the most impact on attraction are therefore the external communication, both its mean and content, and the fit between the candidate and the organisation.

What should be communicated? It appears that in the case of diversity, on top of the other aspects mentioned, the content of the diversity management and the policies linked to it are important to the applicants. Indeed, minorities are concerned about their status and as such, want to make sure that organisations share their values on the subject. The practices in term of diversity are a factor of attraction and should therefore be used through the proper medium of communication to make sure it reaches its targeted audience (NG & Burke, 2007). The message should however match the intensity of the practices. Diversity policies and practices need to be of comparable strength, because creating unrealistic expectations can reduce job satisfaction and therefore increase turnover in the targeted population (Knouse, 2009).

4.6 Reviewed Articles

4.6.1 Diversity Perspective

Extensive research exists on the different rewards fostered by an organisation through the implementation of diversity measures. However, not all reach the conclusion that diversity is beneficial. Sometimes, results even indicate a negative correlation between diversity and performance. The following part of this paper will identify several theoretical tools present in the current diversity literature. Those ideas will then be applied to CERN throughout our analysis.

The first tool is extracted from the work of Ely and Thomas from Harvard University, who published an article called *“Diversity at Work: The Effects of Diversity Perspectives on Work Group Processes and Outcomes”* in 2001. In this paper, they investigate the implications of the different diversity strategies that can be implemented by companies. The perspectives as they call them, influence the perception of the group member about his/her difference and how it is incorporated into the company. This, together with the actual diversity of the organization, influence the way the groups function and how the people evolve within them. The authors identify three perspectives: Integration-and-Learning, Access-and-Legitimacy and Discrimination-and-Fairness.

Integration-and-Learning Perspective

This concept is based on the fact that people have different insights, skills and experiences. Those characteristics are different from one individual to another due to their diverse backgrounds and cultures. This leads to the idea that those features can be seen as potentially valuable for the organisation, to the point where they could influence its fundamental features; its markets, products, strategies and business practices. This means that the firm learns from its people and does not hesitate to make a strategic shift based on its learnings if it is identified as a prospective added value.

This strategy has a very strong impact on the company as it adapts and renews itself based on new information. The idea is that the more diversity there is, the more potentially valuable features are present, and the more possibilities for evolution exist for the organisation. This values cultural identity, which in turn makes people feel respected and recognized for what they can bring to the company. This implies that conflicts are solved openly and that diversity brings equality of status.

Access-and-Legitimacy Perspective

This notion is built upon the fact that there is a difference, partial or total, between the markets in which the company evolves and the people that constitute its workforce. The idea is that by recruiting people with characteristics common to the markets, one might gain access to it. This is different from the previous perspective in the sense that the added value does not come from a change in the company's functioning, only in its workforce.

This ideology affects the firm's workforce composition by increasing the presence of a given minority (based on the needs of the targeted market). This is however not a guarantee of creating a proper work environment as it can easily lead to association between job and culture, therefore enhancing discrimination. Indeed, conflicts will be recognized not as function vs function but as culture vs culture. The article presents examples of the sample they studied, where a firm recruited black people to access a lower income market in their city. This evolved into a situation where conflicts between the different statuses and jobs were immediately seen as racial issues.

Discrimination-and-Fairness Perspective

This perspective is based on an ideal where diversity is fair and represents justice and equality by mimicking within the company the society demographics, as they exist in the close environment. The key factors are equality of treatment and of opportunities.

This strategy implies that cultural differences are set aside and that people are all equal. The downside is that you cannot assimilate any conflict to culture, therefore making the issue impossible to discuss. Minorities might not feel respected and recognized, creating a feeling of powerlessness for minorities and apprehension for the majority (conflicts can easily be associated with racism).

Implications

Those perspectives have their specificities, and are ranked by how much diversity is put forward in the inner and outer communication of the company: the first depicts diversity as a source of value, the second as a tool to achieve a certain goal, and the last as a factor of norm.

This research paper makes three contributions: first, the diversity perspective shapes the way groups will interact with each other in the organization. When diversity is seen as a potential value, people

feel more respected and recognized. Second, how the organisation implements its strategy impacts greatly the results. The distribution of power between groups impacts their relationships and the general success of diversity measures. Third, lots of research is based on discrimination-and-fairness perspective. Therefore, it gives a lot of weight to the characteristics that people associate with others, which can be source of conflict. Evidence stresses the fact that those factors have also a significant weight for people themselves, as they value their own difference.

In the development of the analysis, an emphasis will be put on the adequacy of those perspectives related to the situation at CERN. An evaluation on whether aspects of one or several of those perspectives can be attributed to the Organization will be conducted, to see if they can be linked similarly to the policies and the practices.

4.6.2 Diversity Management

The second piece of research evidence comes from the *European Journal of Work and Organizational Psychology*, which published an article from Guillaume et al. in 2014, called “*Managing diversity in organizations: An integrative model and agenda for future research*”. The goal of this article is to understand why there exist differences between the results of the numerous research papers published about diversity. The authors then proceed to offer a model and guidance for future research. The development focuses on the identification and testing of factors that might affect the implementation of a diversity strategy in a company. Three levels are proposed: the work group, the organisation and the society. The aim is to understand how workplace diversity is perceived and how it translates into outcomes (performance, issues, etc.).

The model theorized in this article tries to understand how Innovation, Effectiveness and Well-Being are influenced by external factors. An individual reacts on a personal level. However, the reaction is based on the work group climate on diversity, which will define how differences are integrated, on how much equity there is in the employment practices and on the level of inclusion there is in the decision making process. This climate derives from the policies and procedure of the management towards diversity, which are transmitted through transactional or transformational leadership. Finally, this pseudo-legal framework is itself influenced by the beliefs of the top management or the stakeholders, which originates in their own legislation, socioeconomic and cultural backgrounds.

The model develops several propositions. The first one is that personal identity concerns are important to individuals, and that there is a positive relationship between dissimilarity and group identification if those concerns are taken into account in the group. The second one is that performance principle acceptance is key to motivate employees, but depending on their relationship to the group, they will see it differently. If the individual has a strong identity link with the group, they will see the

performance standard of the group as their own, whereas if they do not identify to the group they will feel obliged to comply due to external pressure. The third proposition of the model advocates that self-efficacy is pivotal in the individual relationship to his motivation and well-being, but also that the motivation intrinsic to the group will be higher than the extrinsic motivation. Thus, the more identity there is as suggested in the first proposal, the more self-efficacy will result in motivation, performance and well-being of the individual. The fourth proposition suggests that the positive outcomes of work relations between dissimilar employees will be higher within a climate of inclusion. The fifth one proposes that diversity management done through transactional and transformational leadership will lead to a stronger climate of inclusion. The sixth and last proposal advocates that external factors in the direct environment of the firm such as society, culture, politics and legal framework affect management and policies.

This model raises research questions that might be applied to CERN. First, are the identity concerns of individuals taken into account? Second, is there a climate of inclusion of some sort that is developed and enables the flourishing of individuals within it? Third, what are the intricacies of the involvement of top management concerning diversity and its management? Fourth and last, how do elements external to the Organization impact the development of diversity at CERN? Those questions will come to aliment further the theoretical analysis of the situation of diversity of nationalities at CERN.

4.6.3 Differences

The last article that will be used as a comparison measure between our studied organisation and the theoretical framework characterizing diversity is *"What Differences Make a Difference"*, written by Mannix and Neale in 2005.

The authors state that there is a difference between what is expected from diversity in terms of positive outcomes and performance compared to what is observed in most cases. This discrepancy of results comes from the belief that diversity brings instant and tangible value through the difference in points of view, knowledge and creativity. The issue comes from the management of diversity, as some conditions in the work environment are required to foster the benefits of those differences. This article tries to reconcile the two views on diversity, called optimistic and pessimistic, one arguing that heterogeneity creates value, while the other defends that dissimilarities tend to have a negative impact on performance, and that homogeneity is a factor of better understanding and communication leading to less conflicts.

A supportive case to the pessimistic view is made through the concepts of Social-Identity and Self-Categorization. These notions revolve around the idea that people make comparisons between each other and create categories where they put people around them and themselves, as it is easier to

apprehend their environment and to create self-esteem. This results in the construction of classes, mainly in and out-group members, inducing heterogeneity within and homogeneity without, which leads to stereotyping and judgment of the unknown.

On the brighter side of the research done on diversity, corroborating the optimistic view, are the models based on Information-Processing and Problem-Solving. Indeed, those two notions support the idea of broader information access in diverse groups, through backgrounds, experience, skills or networks. Those perspectives emphasize the value added by the difference brought in, and are supported by numeral sources.

Both views seem to be part of the reality and co-exist in the organizational world. The idea is to maximize the advantages while reducing the issues created by diversity. Introducing diversity is not sufficient. It needs to be integrated in the environment in a way that every stakeholder sees it as a potential benefit, and that everyone is valued for their difference. The idea is to bring people together through homogeneity (common values, goals and organizational culture), and at the same time give importance to their heterogeneity. There is a real need for efficient management, communication and decision-making, to avoid creating a disruption in this fragile equilibrium. As mentioned earlier, change must be introduced and integrated, but also supported by top management. This can be done through incentives, monitoring and communication.

The views of this article will be confronted to the situation at CERN; what are the advantages and disadvantages created by diversity and how the management supports the initiatives will be the main aspects of the evaluation.

ANALYSIS

5. CERN, Member States and Recruitment

An overview of the organisational structure of CERN, its diversity value, and policy and how the Organization wishes to enact those was presented earlier in this research paper. The following analysis will cross the current knowledge of CERN with the theoretical framework described above, further exploration of the public data available from CERN, and information obtained from the interviews of professionals within CERN with a strategic position in the International Relations sector and the Talent Acquisition unit.

The analysis will be conducted in the following way: first, the position of Member States on the diversity issue and how their relationship with the Organization might dictate or influence its policies will be questioned. Then, an evaluation will be done of whether some aspects of the theoretical framework can be applied to CERN, and what are the implications of our findings. Finally, a comparison of the policy of CERN between the current recruiting practices, qualitatively and quantitatively, and the information obtained from Talent Acquisition and the Personnel Statistics will be performed.

5.1 Diversity and the Member States

Diversity is a very strong value for CERN. What remains to clarify is whether Member States influence diversity at CERN and its policy.

Policies are designed internally. The concept of the Diversity Office was presented to the Council before its introduction in 2011, but what the office has been doing since then is decided within CERN in agreement with the Director-General. However, it does not mean that Member States cannot influence diversity in other ways. Reports on diversity indicators within the Organization are regularly shared with CERN Member States delegates.

CERN, by virtue of its public status, possesses a rare characteristic when it comes down to diversity of nationalities: on top of the moral and political drives of diversity, the Organization possess a third driver: an economic one.

Member States and Associate Member States invest in CERN. “Invest” is the key word; it is not only a gift for the sake of science: it is a public expenditure, expected to profit the country in one way or another. At CERN, this investment’s returns are quantified in two ways: Materials and Personnel. Those two categories are split approximatively equally in terms of returns at the organizational level. They are uneven among Member States. Some get more than their fair share. France and Switzerland have ratios of return several times bigger than other countries due to the presence of the infrastructure on their territory, making it easier to furnish services, supplies and workforce. Other countries, as the

Scandinavian ones, are having a harder time to achieve return on investment. The stability of their economies, the amount of their wages and standards of living are making CERN less attractive to their nationals than to other countries in Europe (for example, Norway average wage in 2016 was 53 643 USD, compared to 23 722 USD in Portugal (OECD, 2018)).

Return on investment is not the sole motivator on Member States. Scientific breakthroughs, reputation and intellectual property also benefit greatly the countries, even if those factors are harder to quantify.

5.1.1 Materials

Materials are services and supplies that CERN needs for its operations and experiments to operate. They come in diverse forms: electronics supplies, civil-engineering contracts, cars, computers, and many more. 90 percent of CERN's expenses in Materials and services are contracted within the Member States. The remaining 10 percent are contracts for items or services which could not be attributed to Member States for technical reasons; because of the specificity of their nature, they had to be bought somewhere else.

Contracts are distributed based on a bidding concept: contractors from Member States make offers, and the most competitive one is chosen over the others. As it can be observed in the table below, expenses are followed up closely, to make sure countries get back as much as possible, and trying to favour countries with poorly balanced returns over the others.

Procurement follow-up table

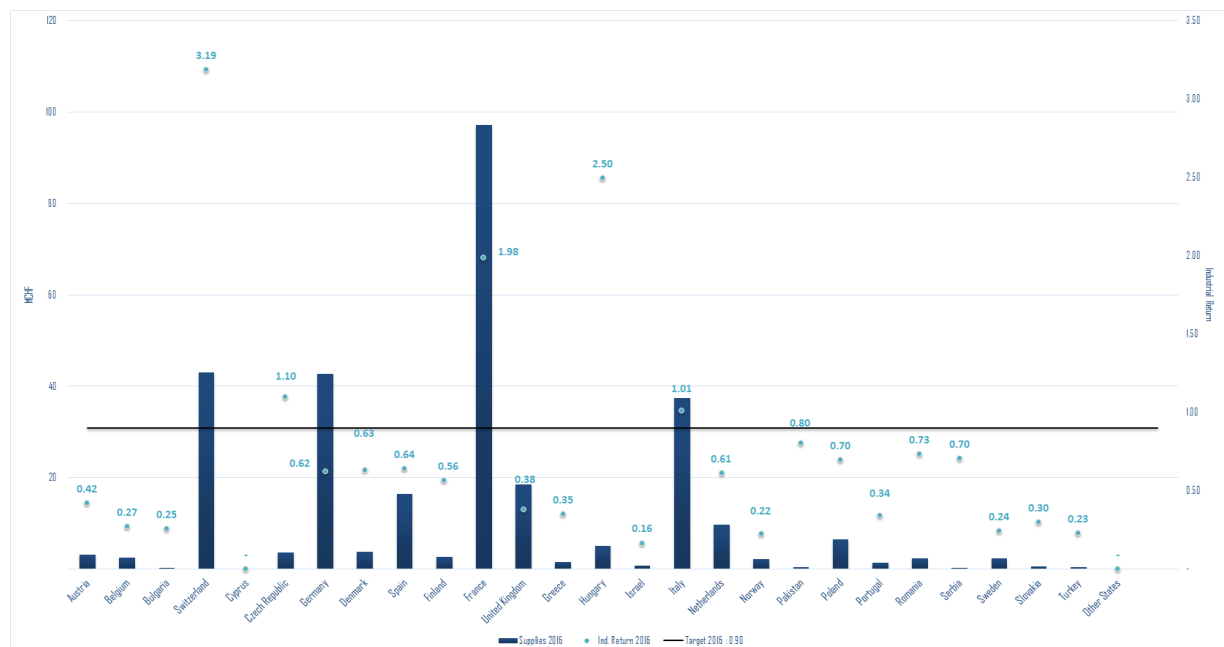


Figure 4: Payments and outstanding commitments in 2016 for Supplies

(http://procurement.web.cern.ch/sites/procurement.web.cern.ch/modules/fp_procurement_report/img/2016/table_1.png)

The black line represents the optimal threshold, separating well-balanced and poorly-balanced countries as defined by the Procurement Department.

The way expenditures are attributed to the countries is quite advanced. The following image was extracted from a data file from the website of IPT (full report to be downloaded, table 9⁴⁴).

Example of a CERN expense

DE	404,178.24
CN	111,430.18
ES	95,635.01
IT	72,228.77
CH	54,680.40
JP	50,514.49
TW	32,624.85
AT	23,122.06
CZ	23,029.49
SE	17,790.73
FR	17,036.70

Figure 5: Example of a transaction made by CERN's procurement department

It shows an expenditure incurred by CERN over the past 10 years for a total of 5,833,392.91 CHF. The contracting party is the SFS Group, a Swiss-based company specialised in mechanical components. The two columns presented represent the costs for 2016. One can see that the charges are not all attributed to Switzerland, where the company is based, but to 11 countries, 3 of them being Non-Member States (China, Japan and Taiwan). This mechanism was put in place to reflect where the materials and services actually come from. This enables more flexibility when attributing the contracts, as a Swiss contractor can create return on investment for other Member States for example.

5.1.2 Personnel

The other way for Member States to recover their investment is through personnel. Each student, fellow and Staff member has a cost for the Organization, which is taken into account when evaluating the return on investment for the Member States. The idea behind it is that there is a return for the economies of the Member States as their nationals come to CERN and acquire training or develop skills, and in return will transfer the knowledge back, as added value for their home country upon their return. This is one of the reasons that CERN has a policy of offering limited duration contracts of typically 5 years⁴⁵, maximizing the opportunities for nationals of the Member States.

⁴⁴ Procurement Report: Contents | Procurement and Industrial Services Group. 2017. *Procurement.web.cern.ch*. <http://procurement.web.cern.ch/en/procurement-report-contents#table-1>, November, 2017.

⁴⁵ Your Career | Careers at CERN. 2017. *Jobs.web.cern.ch*. <https://jobs.web.cern.ch/content/your-career>, November, 2017.

Some indefinite contracts are awarded to the most meritorious and depending on the budget and posts available⁴⁶. One could ask the question about what is the real return on investment for the countries, as it can be assumed that a part of the people will not return to work there and will settle somewhere else. In fact, 70 percent of the staff population at CERN is on an Indefinite Contract, which means that it is unlikely that they will return to their country and work for their nation's economy. Even if the supposition was made that all the Limited Duration Contracts holders would go back to their country, this represent a small part of the personnel costs that the Member States have to pay for CERN to operate.

From information given by recruitment professionals, they do not intend to monitor whether people return to their country, as it is not the Organization's responsibility. The Alumni programme launched in 2016 will be a framework in which it will be possible to assess this to a degree, depending on the sign up of the people to the programme.

The issue of the accuracy of reporting the return on investment was raised during one of the interviews; the process to extract a given nation's investment in terms of workforce is cumbersome given the complexity of the context. Each individual has a salary, which is function of his/her entry salary, the number of years worked for CERN and the level of performance during those years. Furthermore, over the past decade, CERN has changed twice its performance measure system, salary advancement method and salary grid⁴⁷. This creates a very challenging tracking environment. After discussing with a Talent Acquisition representative, the approach taken to monitor return on investment for the Member States is as a function of the countries' representation in the different staff, student and graduate programmes with respect to the percentage contribution to the Global budget. More specifically, it is the ratio of percentage of nationals from a given country in a given personnel category which receives a salary/stipend or allowance from CERN (staffs, fellows and students) divided by the percentage of contribution financed by the said country. This enables a comparison between population and contribution, evaluating whether a country gets adequate return on personnel or not.

This is an interesting evaluation, because it shows that in theory, CERN measures its national diversity as a function of Member States' investment. Ideally, the proportion of nationalities within each programme and category would correspond to the percentage of the total budget provided by each contributing country. In practice, it is a lot more complex because the attractiveness of CERN, before

⁴⁶ Indefinite contract | HR Department. 2017. *Hr-dep.web.cern.ch*. <http://hr-dep.web.cern.ch/procedures/indefinite-contract>, November, 2017.

⁴⁷ Purvis, J. 2016. *Indico.cern.ch*. <https://indico.cern.ch/event/537711/attachments/1300248/1942031/PublicMeetingslides28June2016v16.pdf>, December, 2017.

even presenting its recruiting strategy, is very different for one Member State to another. As mentioned earlier, Nordic countries are further away geographically, may not be aware of CERN as a potential employer in a wide variety of domains, have wages quite close to the ones offered at CERN (which are around those that might be found in Switzerland for similar profiles), and equivalent standards of living. This makes the attractiveness of CERN considerably lower than for example France, which is much closer and has wages significantly inferior. Those factors are not the only ones taken into account by a candidate when considering an application in a company (for example the self-initiated expatriation factor, where people need to leave their national system and also find work for their partner), but economic factors are still key components of attractiveness for an organisation.

An observation that might be relevant in this situation is that CERN-wide demographics are taken into account, but at the departmental and job levels they are not. The underlying issue is that when you do the reporting based solely on population and contribution, you miss the part of what the person actually does, and therefore what the actual salary is. A seemingly well-balanced country could have workforce only composed of lower level jobs, making its returns in term of population seem fine. However, if the comparison was made regarding the salary mass, it would rank lower. The same phenomenon might happen on the other end of the scale; a country might seem to have lower return on personnel when it actually would be properly balanced if the comparison was in terms of remuneration, if its nationals were working mainly at high-end jobs with corresponding higher salaries.

CERN is trying its best to compete with other factors when trying to appeal to underrepresented nationalities from its wealthier and further Member States: for example, the Organization puts forward the excellent work conditions, and the quality of life benefits offered through the numerous advantages offered to the Members of Personnel in order to appeal to all Member States⁴⁸.

Furthermore, CERN is trying to appeal to through attractive family conditions. There is an effective spouse/partner support system to enable people to integrate as fast and as well as possible. Welcome events, work permits, language courses, International Dual Career Network; several channels are offered to ensure that accompanying partners can find satisfactory professional opportunities in the area around CERN⁴⁹.

⁴⁸ Benefits and Perks | Careers at CERN. 2017. *Jobs.web.cern.ch*. <https://jobs.web.cern.ch/content/benefits-and-perks>, November, 2017.

⁴⁹ Spouse/partner support | Diversity at CERN. 2017. *Diversity.web.cern.ch*. <http://diversity.web.cern.ch/spousesupport>, November, 2017.

5.2 Recruitment at CERN

Talent Acquisition is a relatively young unit with respect to CERN's lifetime. It was designed in 2009⁵⁰ and launched in 2010 to answer the growing pressure from Member States to address the efficiency of recruitment. Before that, recruiting was managed between the departments and the Human Resources Advisors (HRA), which had several functions on top of recruitment. To have a better understanding of what it implied, I looked at a vacancy that was published to recruit a HRA in 2017. The functions are very similar to what they used to be, except for the recruitment aspect:

“Advise & support supervisors in their HR and people activities. Deal with concerns related to members of personnel's day to day work. Operationalize HR strategy. Support change management and organizational development activities. Drive HR processes into practice and provide feedback to Centres of Expertise. As an HRA, you will be part of the Frontline team and in this context, you may also contribute to specific projects.” As it can be observed, they have a versatile role. The goal of the creation of a Talent Acquisition unit was to create a dedicated centre of expertise with the associated centralised recruitment function as a more comprehensive HR service. Furthermore, this meant that the HRAs could focus on their advisory role. Potential synergies were to be established between them as experts within their departments and the centralised recruitment function with an organizational focus.

In addition, another objective was to enhance the sourcing capabilities of CERN and to position the Organization as an employer of choice on the market: to this end, a complete Employer Value Proposition was developed⁵¹. This has been achieved through effective online and Social Media presence, in line with the current digital times, to raise awareness of the many and diverse opportunities on offer at CERN. Indeed, the misconception that CERN is a place where only elite physicists and engineers are hired is hard to break, and the population most sought (technicians, support functions and some specific engineering domains) are more difficult to reach.

It could be said that in terms of sheer numbers, it was definitely a success. Before the instigation of this unit, sourcing was an issue and a lot of it was done through informal and internal channels (students, fellows, ...). To give a more concrete view of the issue, there were roughly 4'600 applications for 189 jobs to fill in 2009. In 2016, 152 people were recruited from over 12'000 applications.

⁵⁰ Anna Cook, head of recruitment, Cern | Financial Times 2017. *Ft.com*. <https://www.ft.com/content/51ad7ae0-f7e5-11e4-8bd5-00144feab7de>, December, 2017.

⁵¹ Why join us | Careers at CERN. 2018. *Jobs.web.cern.ch*. <https://jobs.web.cern.ch/content/why-join-us>, November, 2017.

Process

The next image is a courtesy of the Talent Acquisition Unit (property of HR-TA at CERN):

CERN Recruitment Process Chart

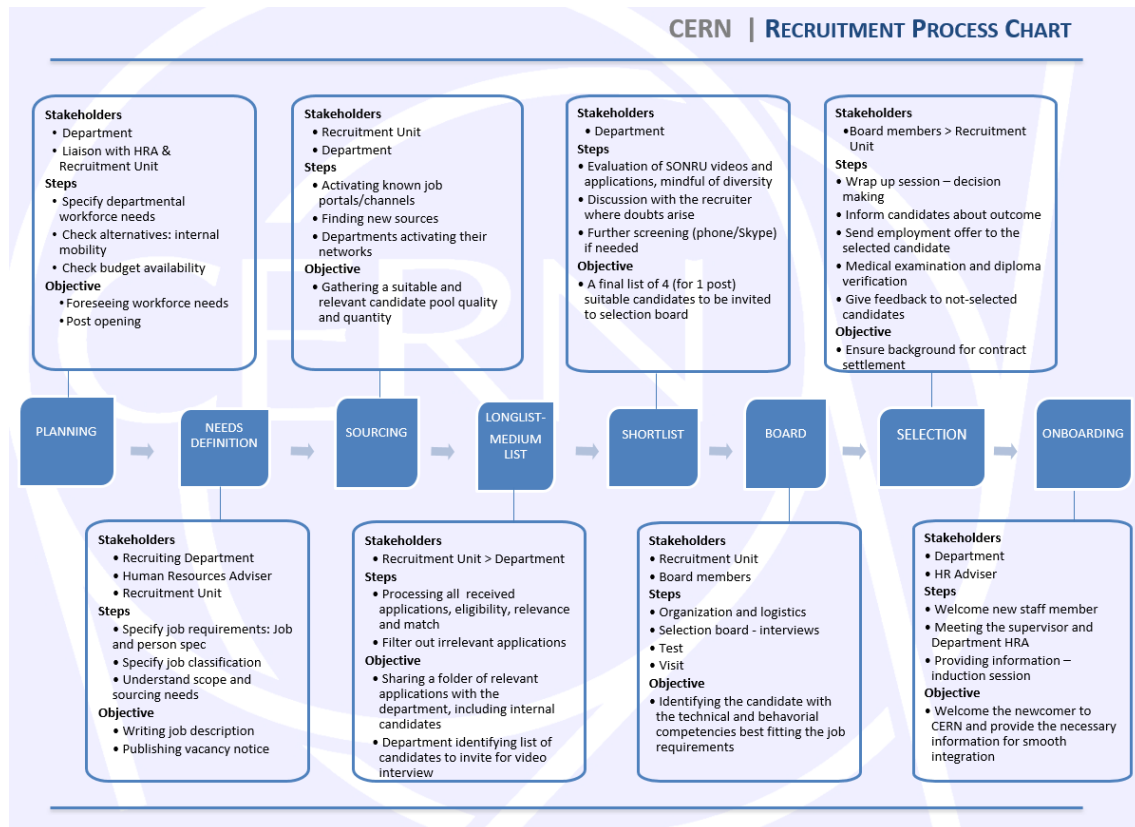


Figure 6: CERN's Recruitment Process Chart

A vacancy notice typically receives between 100 and 150 applications, but can go up to nearly a thousand on specific vacancies. As it can be seen in the process chart, the hiring process is refined to around four candidates, who will be invited for the final interview.

During the selection board, questions are tailored to the job specific skills and competencies to best evaluate candidates' fit for the position. The questions are intended to seek answers both about the technical skills developed during previous experiences and the behavioural competencies depicted in the CERN Competency Model and derived from CERN's core values (the latter being presented in the Code of Conduct mentioned in the "Diversity at CERN" part). Those pieces of information coupled with the more informal part of the board, namely the lunch and a visit at the future place of employment, as well as eventual tests and evaluations depending on the job, enables the recruitment unit to have a very good idea of what the candidates' practical and interactive abilities are⁵². A misfit between the

⁵² Recruitment Process | Careers at CERN. 2017. *Jobs.web.cern.ch*. <https://jobs.web.cern.ch/recruitment-process#slideshow-3>, December, 2017.

newcomer and the team is rare, and usually a result of unforeseen underlying dynamics between team members, which might create a philosophical and social gap. There has not been a satisfaction inquiry since the change to the recruitment centre of expertise, but the process has improved significantly, is faster and more efficient than before.

The sourcing is done both externally and internally. The external channels are CERN's own website⁵³, media (both conventional and social⁵⁴) and specific websites (job portals). The internal channels are the departments' own networks and internal mobility. The use of informal channels (such as departments' networks) is common nowadays as it decreases the agency costs and even if the pool of candidates is somewhat reduced, the probability of finding a better fit in terms of experience and competencies is higher than in conventional recruitment channels (Gërzhani & Koster, 2015).

A particularity at CERN is the significant amount of recruitment opportunities for students. There are internships, technical, administrative, summer and, doctoral student positions, etc. On top of those main channels, several nations have their own programmes that help their students obtain a project or a position at CERN (as for example Germany and the Wolfgang Gentner Scholarship⁵⁵). In addition, some programmes finance or co-finance the students. When a need for a student is identified, the fact that the group or section does not need to pay a salary and that the student is coming from a certain programme (which means there has been a pre-selection made by the university), gives a lot more chances to the person concerned to be accepted at CERN. One might wonder how this is relevant for staff selection at CERN. This gives those people an edge as they are already within the Organization and potentially in the teams where there will be a need in the future. Thus, when a vacancy is published, they will come in with existing knowledge of CERN's tools, technology, culture and practices. This means that some countries have more talent pipelines to funnel their nationals within the Organization than others do. Another way of seeing this is that those students might afterwards stay at CERN and will be in a position to also recruit people from the same programs and nationalities.

The general shortage of skills in STEM (Science, Engineering, Technology and Mathematics) in the past few decades did not spare CERN. However, in the recent years, the trend has shifted and the impact of sourcing is being felt: the general recruitment marketing and communication strategy at CERN coupled with its excellent reputation as an employer appears to bear fruits and the recruitment professionals look at the future with optimism.

⁵³ Advanced Job Search | Careers at CERN. 2017. *Jobs.web.cern.ch*. <https://jobs.web.cern.ch/job-adv-search>, December, 2017.

⁵⁴ CERN. 2017. *Facebook.com*. <https://www.facebook.com/cernjobs/>, December, 2017.

⁵⁵ German Doctoral Student Programme | Careers at CERN. 2017. *Jobs.web.cern.ch*. <https://jobs.web.cern.ch/join-us/german-doctoral-student-programme>, December, 2017.

5.3 Diversity Recruiting Strategy

5.3.1 Externally

CERN engages in outreach activities several times per year to try and appeal to the population and make the Organization known. Those activities are planned with the synergetic capabilities of the International Relations sector and the Talent Acquisition unit, in order to show the Organization, its activities and values to the outer community. Outreach is not organised everywhere as CERN does not have the personnel nor the budget to go to each single university in its Member States to present itself. Instead, key locations are chosen to represent CERN, where it wants to appeal to potential future candidates. This is where outreach meets diversity; universities in underrepresented countries will be targeted to try and increase the amount of applicants from those nations.

5.3.2 Internally

CERN creates a climate of diversity from within; several communities and group evolve within the Organization to support and represent their minorities. For example, Women in Technology @ CERN is a community that was started at CERN in February 2017, with the objective to help support women in the technology fields to be recognized not as a minority but as equals⁵⁶.

Coming back to the main topic of this research, national diversity, it can also be observed that monitoring is put in place at CERN to ensure that a maximised diversity (still based on the contribution as explained earlier) is set up. The number of applicants and their rate of success at the recruitment stage is observed for each Member State, and a particular attention is given to the ones which are under the ideal representation thresholds.

The International Relations Department and the Talent Acquisition Unit are also working together on that aspect. For example, underrepresented nations are “flagged” during recruitment, to ensure that a particular attention is given to the profile of their representatives. Excellence stays the overarching factor of recruitment, but awareness is created to guarantee that the interests of the Member States are taken into consideration.

⁵⁶ Home | Women in Technology @ CERN. 2017. *Women-in-technology.web.cern.ch*. <https://women-in-technology.web.cern.ch/>, December, 2017.

6. Theory Meets Policies and Practices

6.1 Perspectives

6.1.1 Policy

The research of R. Ely and D. Thomas on diversity perspectives seems to find echoes in CERN's policy. Indeed, the framework developed in the policy appears to contain elements of the perspectives developed in the research paper mentioned above. The Integration-and-Learning Perspective has a very strong and integrative approach to minorities, trying to foster as much value from their differences as much as possible. The policy of CERN takes some of those ideas, and without pushing them to the extent of radically changing the Organization to adapt its structure and objectives based on the value added of diversity, it still is based on the concept of *"appreciating differences, fostering equality, promoting collaboration"*. This resonates with several aspects of the theoretical framework of the Integration-and-Learning perspective, showing a genuine desire to develop the value added that could be gained through the teamwork of dissimilar people.

6.1.2 Practices

In reality, observations differ slightly. First, the Diversity Policy at CERN is not legally binding the Organization; some teams might be composed of very similar people and even though there might be a desire for change from a strategical point of view, it will not necessarily create a shift on a tactical level. Second, the diversity practices at CERN seem to be more aligned with the two other approaches of the framework. The Access-and-Legitimacy is a very specific concept which applies to precise environments. However in the case of CERN, one might extend slightly the definition and see that by promoting diversity, CERN is in reality appealing to potential new Member States by showing that they can have desirable Return on Personnel if they invest in the experiments. The Organization is also securing its position with its existing Member States that way: in 2009, Austria made a political statement in which it suggested that it might stop funding CERN as they had a hard time evaluating the return for their country⁵⁷. The Austrian scientific community both at CERN and within their homeland lobbied to show the virtues brought back to Austria by its participation in this collaboration⁵⁸.

⁵⁷ Austria to quit CERN particle physics laboratory. 2017. *Reuters*. <https://www.reuters.com/article/us-science-collider-austria/austria-to-quit-cern-particle-physics-laboratory-idUSTRE54721N20090508>, December, 2017.

⁵⁸ The voice of Austrians at CERN. 2017. *CERN Document Server*. <http://cds.cern.ch/journal/CERNBulletin/2009/25/News%20Articles/1180855?ln=en>, December, 2017.

It is not exactly the situation depicted in the perspective, but some similarities can be found in the approach. Member States could be seen as potential markets, as they provide income through their contribution, and in this context, diversity would represent a tool to access potential new markets through showing healthy Returns on Personnel to external observers. Recruiting diversity at CERN therefore has some characteristics of the Access-and-Legitimacy perspective.

The last idea developed in the research paper of R. Ely and D. Thomas, the Discrimination-and-Fairness Perspective, possesses similar aspects with the current situation at CERN. Diversity belongs to the different organisational bodies discussed earlier, as Ombuds or the Diversity Office. It is not discussed openly as a potential source of value as suggested in the Integration-and-Learning Perspective. It is a tool, which is pushed top-down on the staff members through the policy and through recruitment and career development practices. Cultural diversity is a given at CERN based on its original objectives and the required returns from the Member States. However, it does not appear to create a feeling within minorities that they are not recognized. The majority of the workforce is French, but it is not an overall majority; it represents less than 40 percent of the total population. Even if speaking French is a solid advantage to exchange with the different people at CERN, it still means that most people are in fact not French. This creates communities that cooperate and as most people speak English at CERN, it is easy to interact with other people. National diversity at CERN is probably the easiest to live, as most people are not from the region and are expatriates. This creates very special systemic dynamics where the difference actually unite people, as all are different anyway. Difference is not discussed openly and yet leads to value added.

To conclude, policies and practices diverge in their affiliation to the perspectives developed in the research paper studied here, policies being more Integration-and-Learning oriented, whereas the practices are more linked to the two remaining perspectives. However, CERN has this particularity that difference is cultured and nurtured through its intrinsic values and has been for a long time. This makes the Organization diverge from the model in the sense that some of the benefits attributed to the Integration-and-Learning perspectives, even though not enacted in the everyday practices, can be fostered due to the unique work environment and mind-set developed at CERN.

6.2 Diversity Management

Based on the model of Guillaume et al. developed in the article *"Managing diversity in organizations: An integrative model and agenda for future research"*, we extracted four questions; Are the identity concerns of individuals taken into account? Is there a climate of inclusion of some sort that is developed and enables the flourishing of individuals within it? What are the intricacies of the involvement of top management concerning diversity and its management? How do elements external to the Organization impact the development of diversity at CERN?

From the nationality standpoint, it does seem that particular individual needs are taken into account. Scientific objectives transcend the personal identities, creating a climate where diversity is a norm. This however is not necessarily true for all jobs. Indeed, not every team has the same diversity dynamics. The higher the level of education required for a certain job the more diversity is observed. On the lower end of the educational scale, we see a predominance of French nationals, ultimately questioning whether someone without the knowledge of French language could integrate there. In places where there is a need to interact with local contractors, one without the language could hardly work independently as well. Those concerns are considered at the recruitment stages. This shows that even if diversity is part of the identity of CERN, factors of integration are carefully thought through to maximize the chances of a successful incorporation into a team.

Concerning the climate of inclusion, a fellow who worked at the Diversity Office in 2016 conducted a study about the diversity climate at CERN. When comparing people from different nationalities, people seemed positive/neutral about diversity. People were open to differences, but seemed rather neutral (or not willing to talk about it openly) about the general diversity climate⁵⁹. It could be inferred that people do not feel that much is done about the diversity climate at CERN but that they do not judge it as a necessity (as they are positive about diversity in general yet neutral about the climate). This would concur with one of the core historical ideas of CERN's identity that science goes beyond nations, that innovation and collaboration are collective concepts, and that therefore inclusion is shaped through the creation of an environment where nationality does not matter and everyone is equal.

How does top management interacts with diversity at CERN? Here top management would be the Enlarged Directorate. As seen earlier, nationality is a dimension of diversity which is treated differently than the others. On top of being a social concept, it also is an economical one. From that standpoint, we can assume that the ability of top management to influence this variable is rather shallow. Indeed, as they report to the Council, they would have issues to go against the will of the Member States.

This brings the development to the last question from the article of Guillaume et al.: what influences diversity from outside the Organization? Societal occurrences play their roles; diversity management was put in place in 2011, which is rather late compared to the magnitude of the phenomenon. However, we can assume that it was a necessary strategical move due to the extension of diversity outside of CERN. Indeed, Member States delegates act as representatives of the extended European society. Furthermore, by their desires to see return on personnel, Member States also pressure CERN to palliate the imbalance in national distribution throughout the Organization.

⁵⁹ Kaltenhäuser, K. 2016, Assessing the Perception of Workplace Diversity. A case Study on Diversity Climate at CERN, <https://cds.cern.ch/record/2262048/files/CERN-THESIS-2016-286.pdf>, December 2017.

In conclusion of the evaluation of this article, several points were highlighted and our findings would suggest that if the model would be tested at CERN, some of the results would definitely corroborate with the suppositions of the research paper of Guillaume et al.

6.3 Differences

The postulate of the article of *"What Differences make a difference"* was that diversity has value, but common ground needs to be found between dissimilar people for this value to be collected. Throughout the analysis of the previous literature, it was observed that CERN does it quite efficiently, and creates a climate where people can strive to thrive, finding intellectual challenges for the greater good of science. Where reality at CERN seems to differ compared to the findings of the article is in the idea that diversity management is a key component of this success. From what was found in the previous analyses, performance at CERN and nationality diversity management do not seem to have a strong relation. Nationality management is basic monitoring and highlighting at recruiting. There is no follow-up made after that and no tie between nationality diversity and performance measure. The absence of a synergy between those two features comes from the unique environment created at CERN: by creating an ultimate common goal, CERN has partially transcended the boundaries of national diversity. In the end, by uniting people under a powerful objective, the Organization has created homogeneity in mind-set and is still fostering the value of differences with minimal management.

6.4 Theoretical Implications

From what was found in the abundant literature on diversity, CERN seems to be a quite peculiar case when it comes down to the dimension of nationalities. It cannot be fully explained by a conventional diversity model. The fact that the focus of this paper is on nationalities is important, as there is a high chance that the results are linked to its specific goals and investor relationship situation. Diversity as a whole at CERN is managed differently, and therefore should be analysed separately.

The analysis of the perspectives highlighted that there is a subtle difference between policies and practices, which make them relate to different perspectives. The policy is more aligned with the Integration-and-Learning Perspective while the practices tend to show more similarities with the two other aspects presented in the article of Ely and Thomas. From the questions formulated following the analysis of the model of Guillaume et al., it seems that individual needs are taken into account. The diversity feeling is positive, yet the climate is rather neutral, corroborating the idea that CERN is diverse but that the concern for the phenomenon of diversity is quite new. The final article, written by Mannix and Neale, it was observed that homogeneity was created through objectives, but that diversity management was not as primordial as elsewhere to create the proper synergies.

The situation at CERN seems to show that diversity management has a superficial influence on internal national demographics (International Relations and Talent Acquisition exchange together in association with the Member States to find solutions, but the Diversity Office does not interfere at the strategic level). Thus, we see a clear differentiation between diversity management and nationality management within the Organization.

However, it does not seem to create relationship issues internally. Indeed, nationality is part of the norm at CERN. There is a deep bond between people and the objectives and values of the Organization, enabling it to enjoy its diversity, profit from it and continue to go on its path of scientific innovation and discoveries. An interesting fact is that CERN has a very socially oriented structure; there is plenty of support offered, both tangibly and mentally, which in a way benefit diversity; this might not be common in the organisations and firms studied in the articles used in the analysis, as studies are mainly conducted in the United States of America. Work cultures are very different and this might partially explain why some aspects of the models did not fit with a European Organization (Alesina, Glaeser & Sacerdote, 2005).

7. Recruitment and Statistics

7.1 Diversity and the Organization

Policies and practices, and the way they link up with the general theory of diversity management have been analysed and understood. The question that remains to be answered is the theory to practice translation: what is desired and said to be done, to numbers of nationals throughout the Organization.

To evaluate this question, statistical evidence extracted from CERN's Annual Personnel Statistics covering the years 2007 to 2016 was used (Annual Personnel Statistics for 2016 available at: <https://cds.cern.ch/collection/CERN%20Annual%20Personnel%20Statistics?ln=en>). The goal was to have a better view of the distribution of nationalities at CERN and how this distribution has evolved over the past 10 years, especially considering the creation of the Talent Acquisition Unit and the launch of the Diversity Programme (did it actually impact diversity?). The focus population is the Staff Member population, due to the limited size of the samples of other categories of personnel. The abbreviations and numbers for staff and contributions are available in the annexes.

The first graph represents the population of the different Member States in 2016, for a total of 2560 Staff Members:

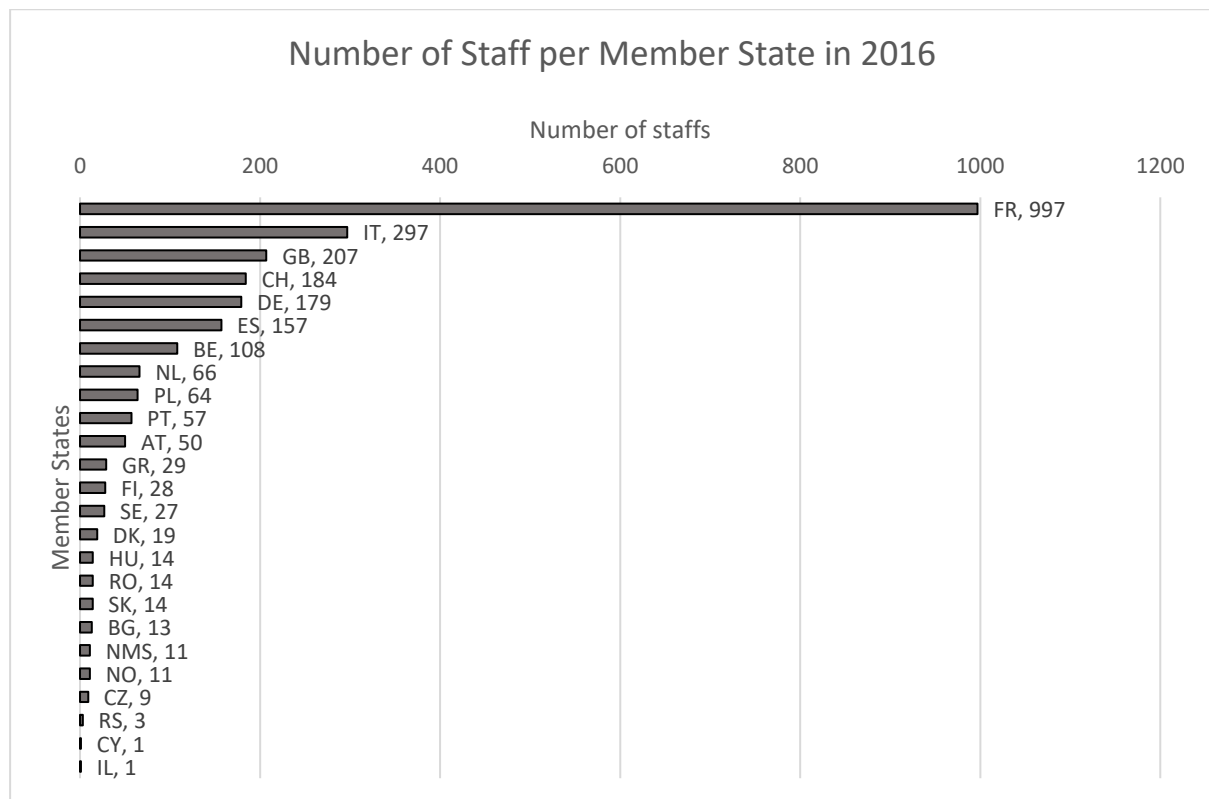


Figure 7: Population at CERN, per Member State in 2016

As expected, France is predominant in the pool with nearly 40 percent of the staff population. This can be easily explained by its status of Host State, creating various advantages (accessibility, language, etc.) and the very competitive wages that CERN offers compared to France (which would also explain why Switzerland does not rank second, as wages are not as different in comparison). One might assume that it is resulting from a better quality of French candidates. Thus, Figure 8 shows the percentage of selected candidates with respect to the number of applicants for a given nationality for 2016 in grey, and the number of actual applications per country (152 selected candidates for 12'193 applicants). Blue lines represent properly balanced countries and orange lines poorly balanced ones (see explanation later):

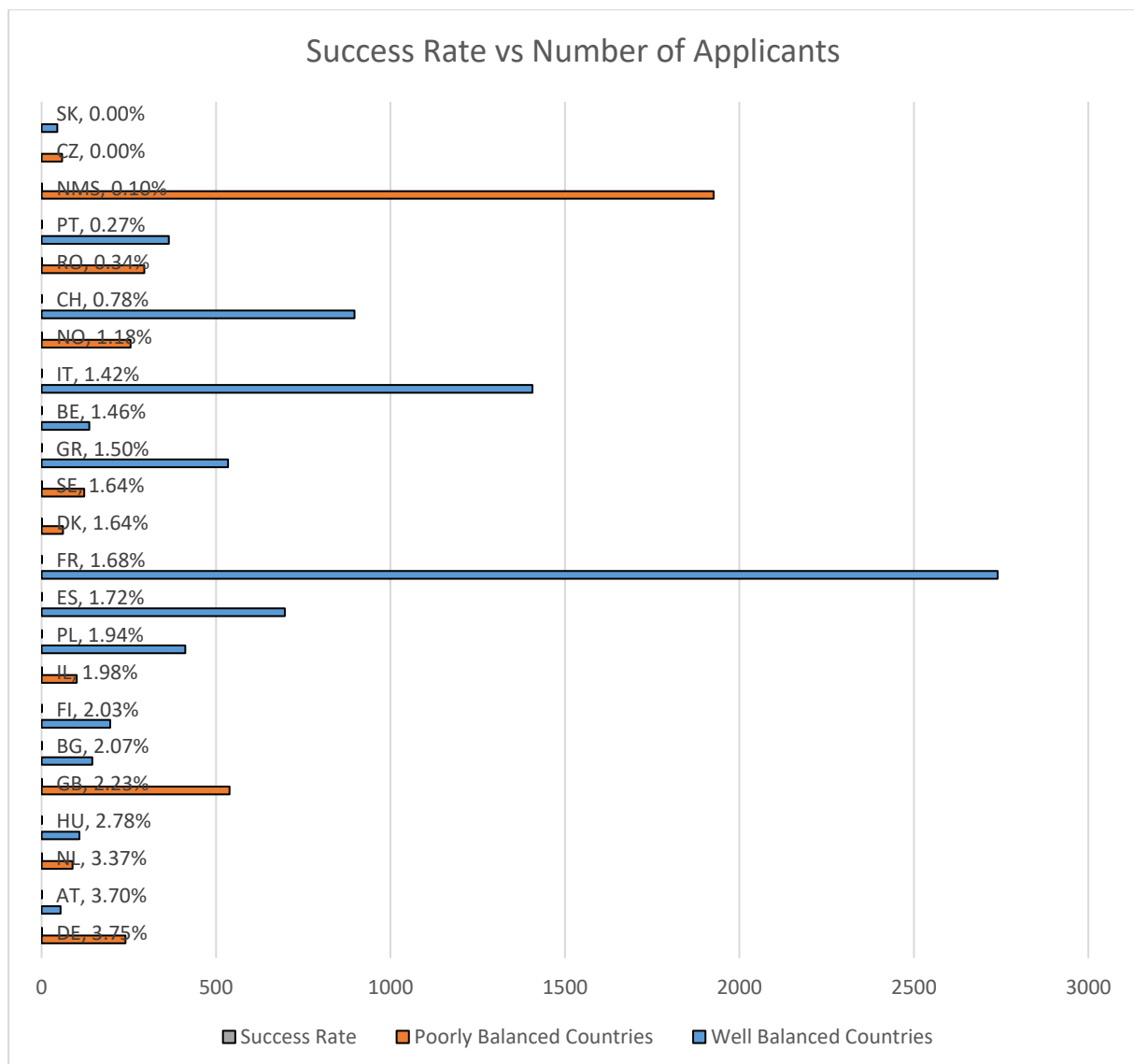


Figure 8: Comparison of success rate and number of applicants in 2016

By comparing Figure 7 and 8, it can be observed that a correlation exists between number of applications and staff members numbers (except for Non-Member States), but that it does not

translate into a higher success rate. Furthermore, there does not seem to be a correlation between success rate and the status of poorly balanced country (which is consistent with the concept that excellence goes above diversity).

As seen earlier, diversity has a powerful economic drive, and it translates into recruitment practices. The evaluation of whether a country is well represented or not at CERN is indexed to its contribution, to see if the population corresponds to the amount of money invested by the countries into the Organization's budget. To evaluate this, the ratio of staff over contribution was considered, and used the estimation that anything above 0.8 is considered as well balanced (this is the threshold used by Talent Acquisition when presenting evaluations to the Council). The numbers are from 2009, and the reason for that is the fact that those results are going to fuel the rest of the analysis and be cross-analysed with the current numbers (therefore, Israel and Romania are at zero as they were not Member States at the time). The outcome is depicted in Figure 9:

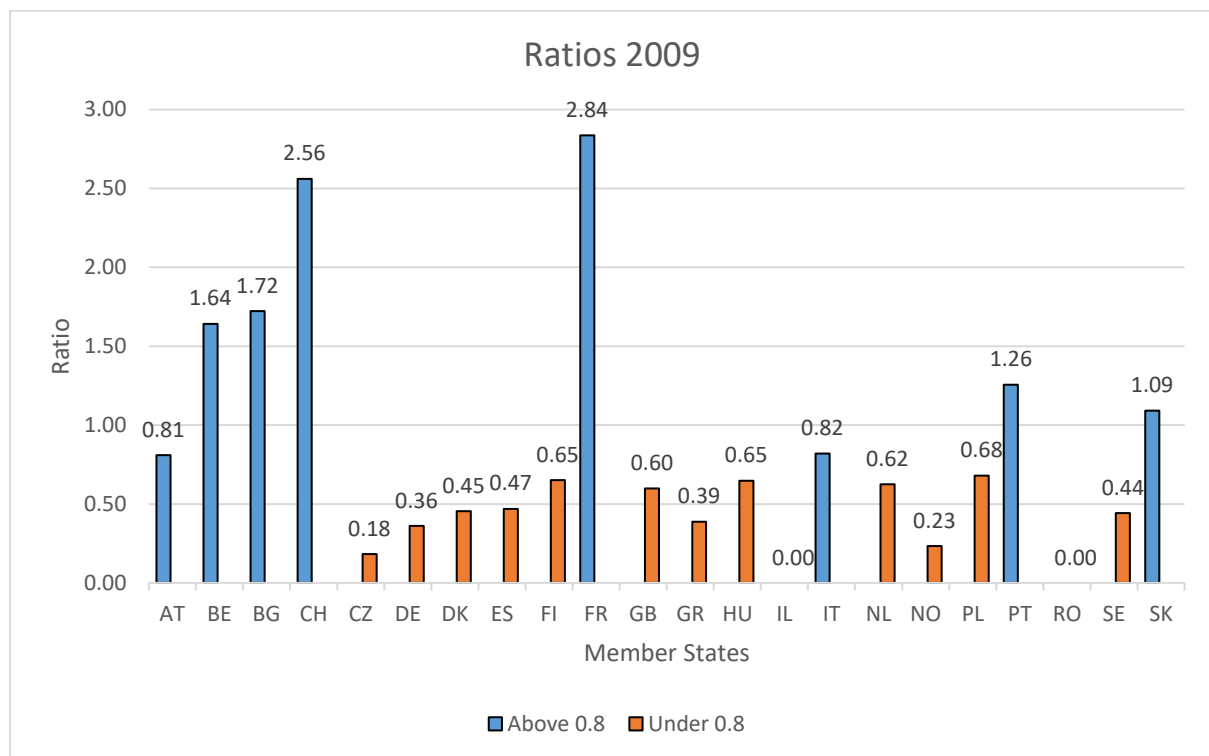


Figure 9: Ratio of population over contribution in 2009

On the 20 Member States at the time, only eight had a ratio superior to 0.8.

Looking at how that ratio evolved from 2009 to 2016 (ratio of 2016 – ratio of 2009) in Figure 10, it can be assessed whether the introduction of Talent Acquisition and the Diversity Programme was beneficial to the diversity equilibrium or not:

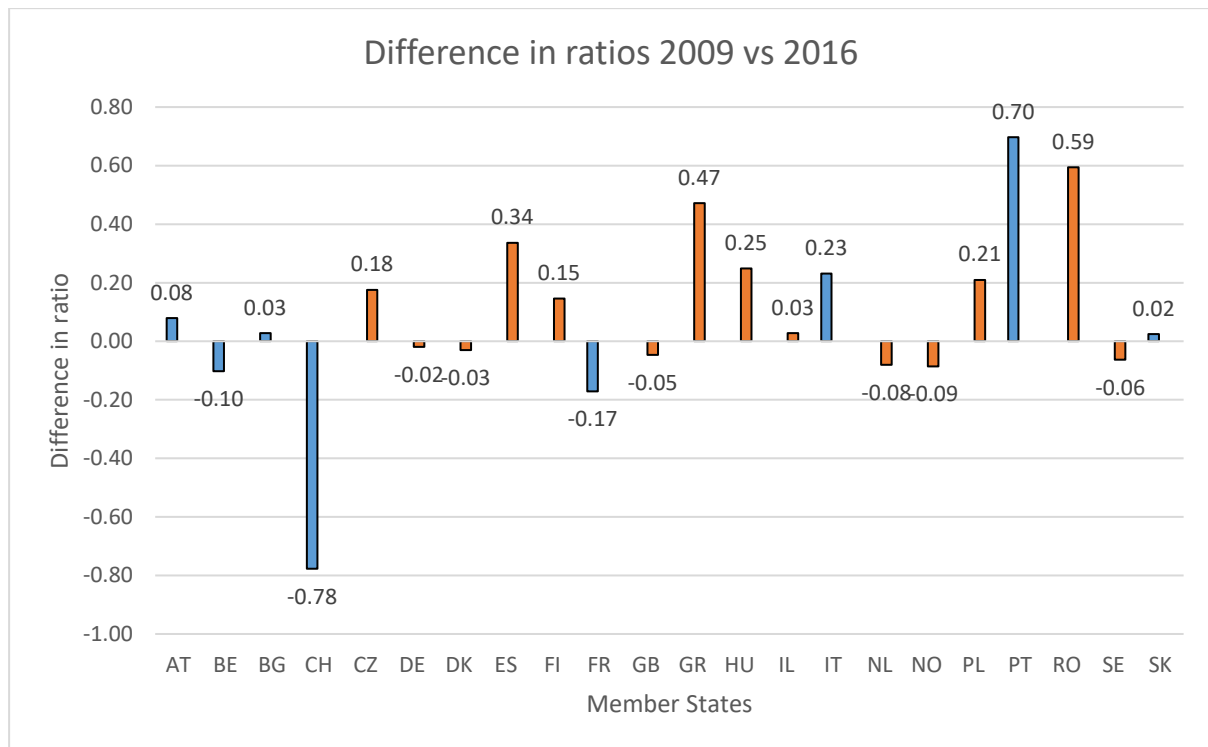


Figure 10: Evolution of the ratio population/contribution from 2009 to 2016

A general downward tendency for the countries which were above the threshold can be observed, and a real improvement for several of the Member States which were beneath this point can also be noted. Figure 12 confirms that 2016 is not a singular event (all ratios are compared to 2009).

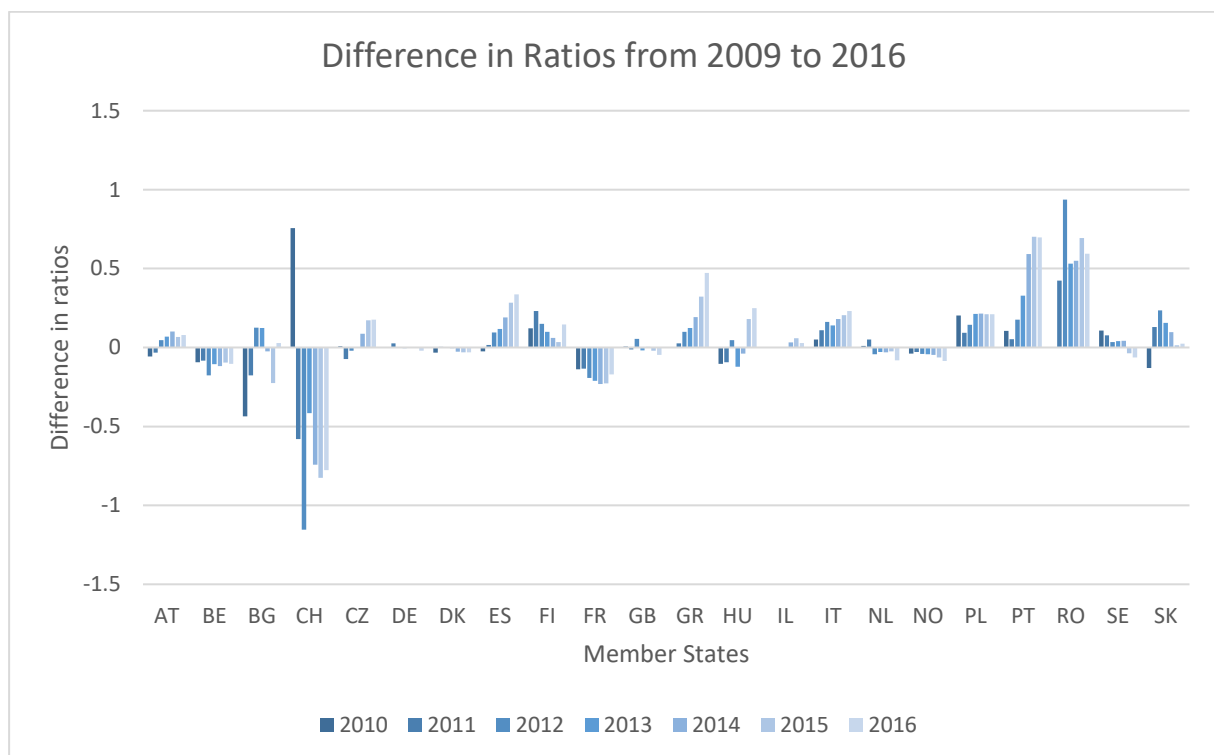


Figure 11: Evolution of the ratio population/contribution yearly from 2009 to 2016

This resulted in the following ratios for 2016:

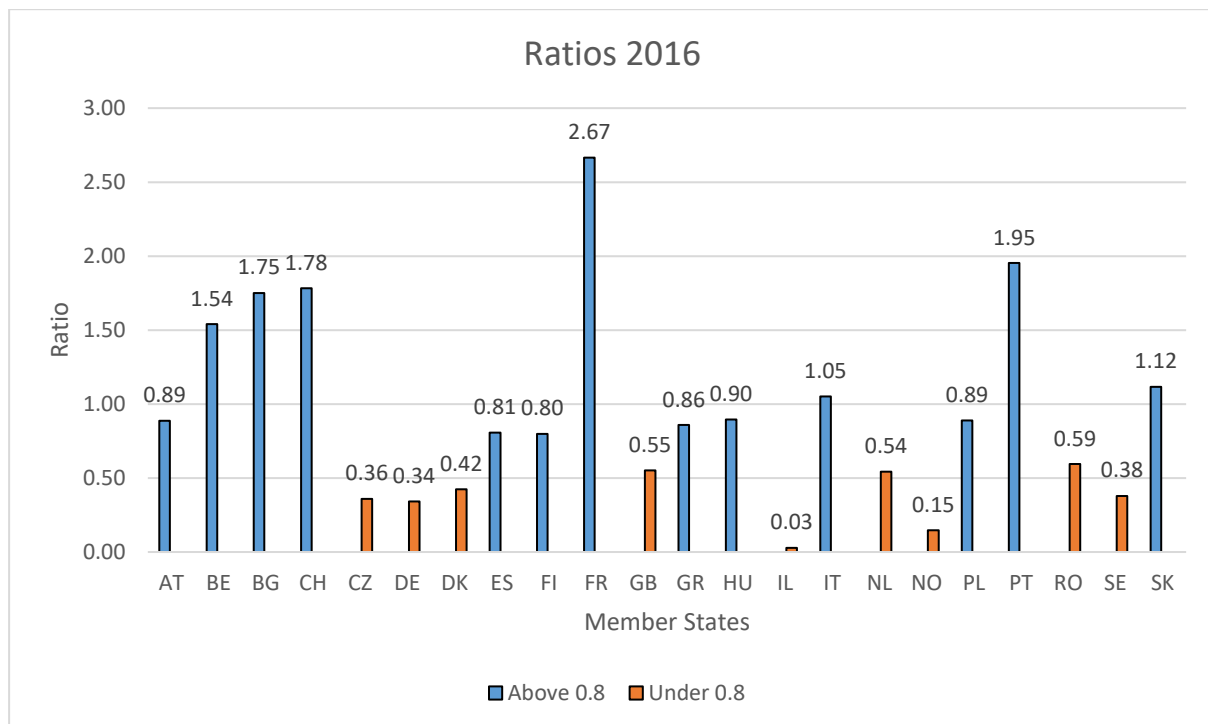


Figure 12: Ratio of population over contribution in 2016

The situation went from eight countries above the minimum desired balance to thirteen, newcomers included. This is overall good news. However, Figure 10 shows that six of the twelve countries which were poorly balanced in 2009 did worse in 2016. This could be explained by several hypotheses:

- Those nations have a harder time being recruited (because there is a lack of applicants, lack of skills related to CERN's, overall lower level of candidates than the one of other Member States, less awareness of CERN as an employer of choice, etc.)
- There has been an increase of contribution percentage, which negated potential improvements in recruiting.
- The attractiveness of CERN is significantly lower for those countries than for others.

The first hypothesis finds mitigated support in the evidence found; observing Figure 8, one can see that those countries have substantial differences between their success rates, some being among the best others among the worst. No pattern can be extracted from this. The contribution level partially explains some of the changes. Norway is contributing more in term of percentage today than it used to in the past. So are Germany and Switzerland. Hungary, Greece and Spain achieved well-balanced status to a certain degree due to their lower contribution compared to the previous years. Those variations can be partially explained by economic variations (NNI, exchange rates, etc.).

The success rate of the Member States is the number of selected candidates divided by the amount of applicants, both for a given country. I developed an equation which “normalizes” their success as they are divided by the overall success of the specific year to make the different periods more comparable. The result is then minored by 1, setting zero on the horizontal axis as the expected result with no exogenous variable (that would mean that the success rate is only defined by the number of applicants, as all candidates would be equal in characteristics, therefore having the same chances of being selected).

$$\frac{\frac{\text{Selected Applicants}}{\text{Total Selected}}}{\text{Total Applicants}} - 1$$

To give an example, in 2016, 539 people from Great Britain applied for staff positions. From those, 12 were selected for the position they applied for. This gives a 2.22% success rate for nationals from Great Britain. The rate of success for all applicants at CERN was 1.25% this year, as 12'193 people applied and 152 were selected. Thus, if we compound this into the equation $(2.22/1.25 - 1)$, yields 0.776. It means that the percentage of success for Great Britain nationals is 1.776 times greater than the average success rate for the given year.

An average has then been taken for the period before the introduction of the Talent Acquisition Unit and the Diversity Office, from 2007 to 2009, and then two periods posterior to these two events, from 2011 to 2013 and from 2014 to 2016. Countries situated on the left of Austria in Figure 13 are the ones which were well balanced in 2009. The others were poorly balanced.

It shows that since the introduction of Talent Acquisition and the Diversity Office, there seems to be a trend downward for the well-balanced countries and a trend upward for most of the others, except for Non-Member States. It can be concluded that the success rate for underrepresented countries is increasing.

Attributing those results to one particular factor would be difficult, but from a recruitment perspective, this can definitely be considered as a success, as there is a significant improvement of the situation, and one could forecast that the objectives of diversity in comparison to contribution could be achieved in the coming years.

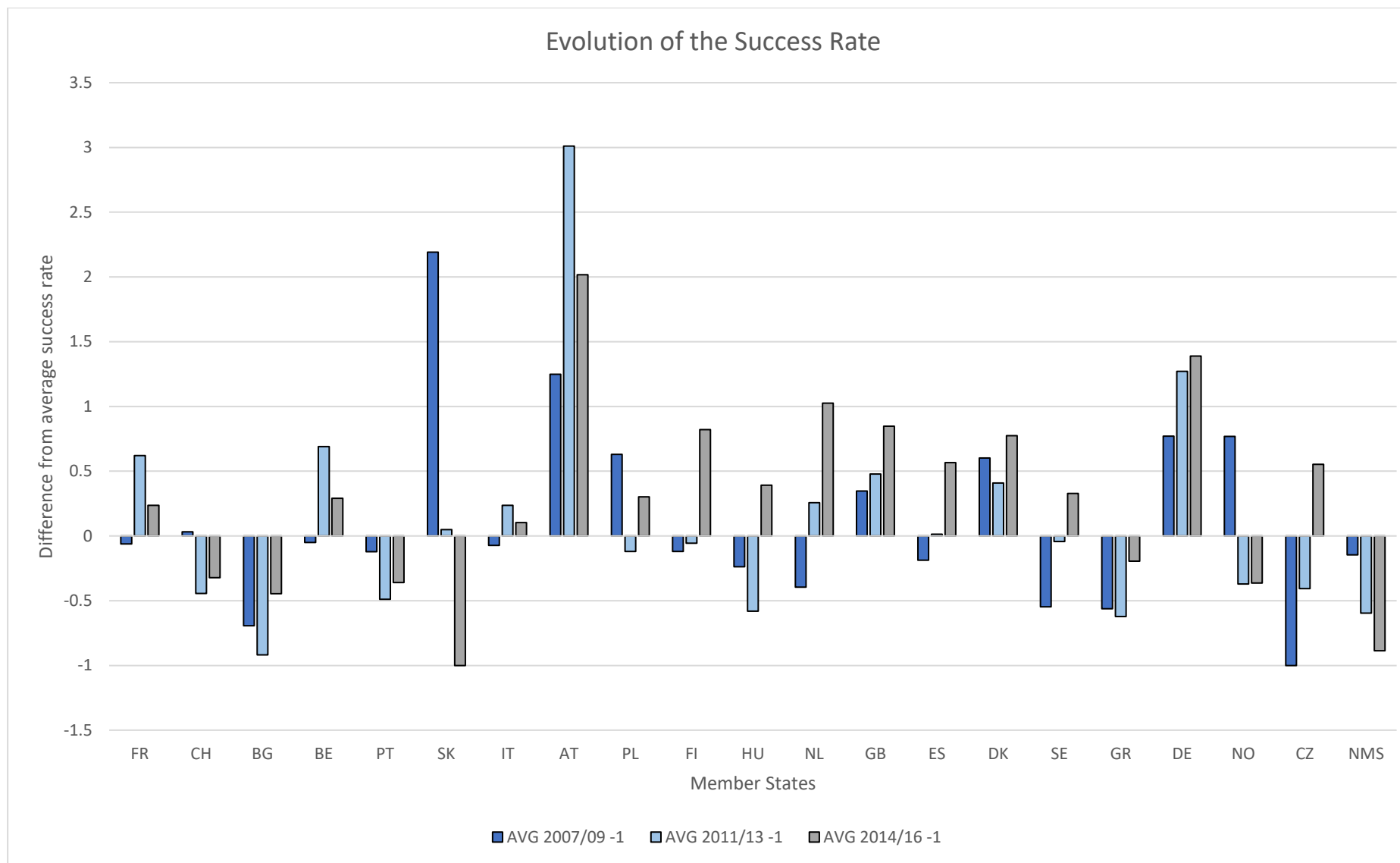


Figure 13: success rate per country normalized, from biggest population/contribution ratio to lowest (in 2009)

7.2 Diversity and Departments

Diversity is a well-integrated concept at CERN. Some countries are more represented than others, but most can be satisfied by the results. Diversity CERN-wide is monitored, and analysed to evaluate whether countries achieve return on their national personnel. Nevertheless, when talking about diversity as a value, can this representation of nations be observed within the departments as well?

To evaluate this, data from 2011 to 2015 was analysed, to see whether there had been a big change since the introduction of our two bodies of interest (a restructuring happened in 2016, making last year difficult to compare with the previous period). The access to this information is restricted, the amount that can be disclosed is therefore limited.

The first observation is that departments can have very different sizes at CERN, from the Pension Fund, which counted 14 people in 2011, to the Physics Department (it was split between EP and TH last year, see CERN structure for more details) which totalled roughly 500 people. As expected, the population diversity within the departments varies greatly, and doing the analysis of their evolution is complex. Most departments have a population that is not big enough to enable to extrapolate much (if one person of a certain nationality is being added, it can create a big change, whether there is a correlation between this person's presence and its nationality or not).

Nevertheless, a set of observations can be made, about the evolution of diversity within CERN. Looking at the whole population, Figure 14 shows the difference between 2007 and 2010 in term of Staff Members per nationality, and Figure 15 highlights the same difference for the period going from 2010 to 2016.

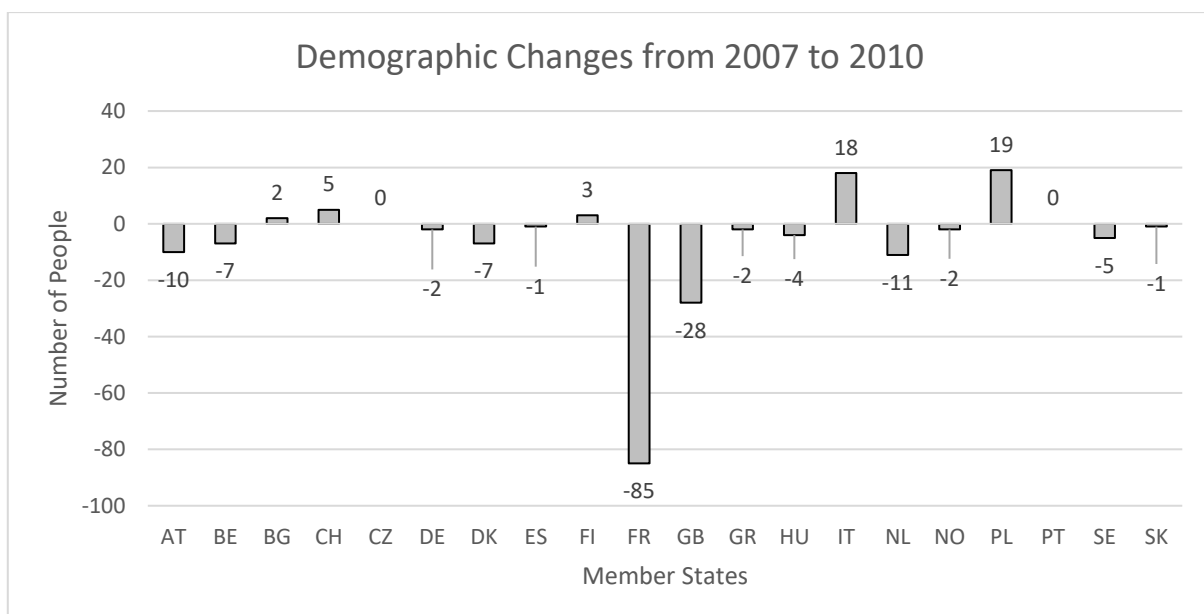


Figure 14: Difference in populations from 2007 to 2010, in number of people by Member State

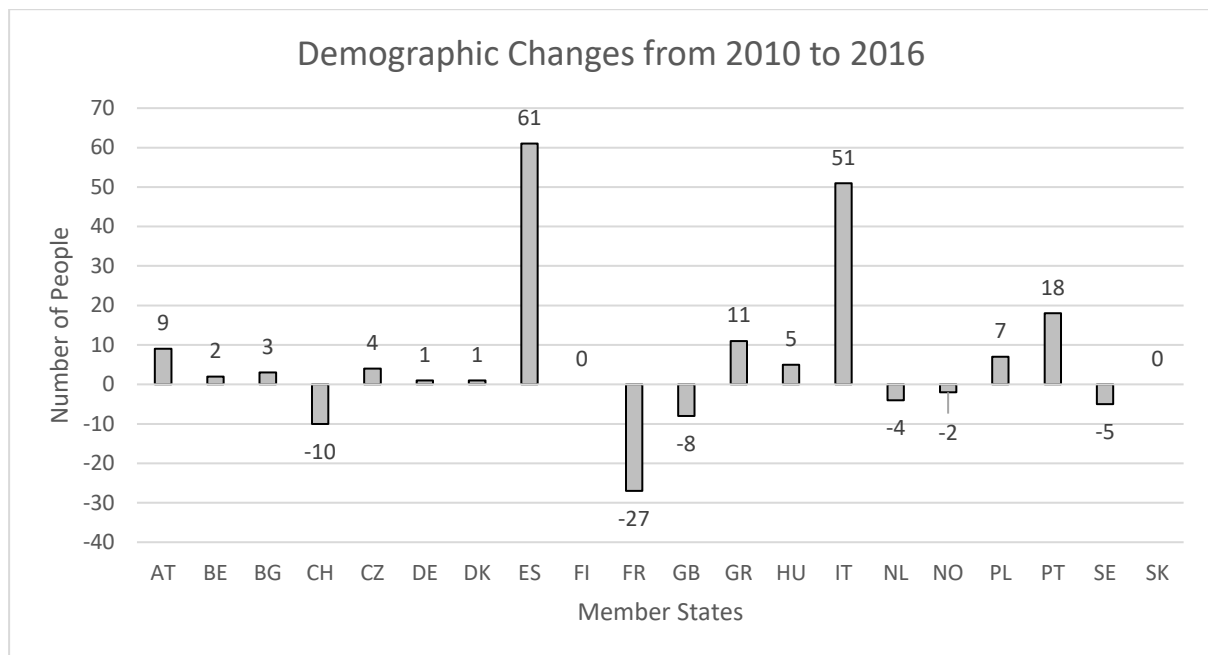


Figure 15: Difference in CERN staff populations from 2010 to 2016, in number of people by Member State

Can changes be witnessed in similar proportions in the departments? Interestingly, the decrease of French staff Members seems to be general, with a slightly bigger impact in the technical departments, which might be related to the end of the construction of the LHC between 2008 and 2010 (some people switched functions and those who were only involved in the construction project left once it was done). Southern Europe was hit very hard by the economic crisis of 2007, which might also explain the increased proportion of recruited personnel from those regions⁶⁰. Data is complex to interpret because of the uneven sizes of departments, but also due to the multiple changes which happened over the course of their history. Some entire services were shifted from one department to another creating migration of clusters of nationalities throughout the Organization. This fact however, gives a remarkable piece of information: a group was moved from a department to another, resulting in a significant nationality distribution rebalance. This is corroborated by the increase in Italian and Spanish populations, which happened in very specific departments, even more sometimes in specific groups (which can contain from a few people up to more than a hundred). Those groups can have two to three times the concentration of a certain nationality compared to the rest of CERN. Caution is advised, as this is not significant in small teams (50% of a nationality in a team of four could very well be a coincidence). Nevertheless, when observing teams of bigger magnitude having predominant nationalities not that common CERN-wide, it raises questions.

⁶⁰ Migration, Austerity, and Crisis at the Periphery of Europe - Othering and Belonging. 2017. *Othering and Belonging*. <http://www.otheringandbelonging.org/migration-austerity-and-crisis-at-the-periphery-of-europe/>, December, 2017.

The exact reason of those clusters cannot be evaluated because there could be several reasons apart from the obvious one (people recruit similar people). For example, some schools are recognized worldwide for their students in particular fields. This can create a secondary channel of recruitment as well, as people recruit from a specific university, which happens to be their own, which also happens to host mostly people from the same nationality. However, this mitigates the benefits from diversity: if the assumption is made that creativity and innovation can be fostered through diversity, it is negated by the fact of creating similar teams in a dissimilar Organization. Worse, you actually get the worst of both worlds: similar minds working together and then having to blend in and interact with dissimilar people. This creates management issues due to heterogeneity without harvesting its benefits.

At this stage, it is important to remember that the analysis is based on an external observation based on nationality head counts; diversity exists beyond nationality, and correlation does not mean causation. Furthermore, no team of 10 people or more sees one nationality representing more than half of the section (except for French, but that was to be expected as nearly 40% of CERN's staff population is from France). Another factor which is hard to evaluate is whether people might have changed nationality. It is not an issue for Limited Duration Contracts, but as Indefinite Contracts represent roughly 70% of CERN's staff members (and more than 20% have 20 or more years of service), the argument that it might impact the nationality distribution could be highlighted. People put forward their preferred nationality when they apply at CERN. However, in the databases, nationalities of Host States (France and Switzerland) take precedence over others if the staff member has two nationalities. This means that if someone enters CERN but then acquires French or Swiss nationality, he will be accounted for as such in the database, and not his original one. It can be assumed that several people each year change nationality for different reasons (living in Switzerland is easier with a Swiss passport, taking French nationality for people from Great Britain to have a European passport once the Brexit is over, etc.). Consequently, there is a significant probability that some staff members were recruited with a certain nationality, and then switched nationality in the database to French or Swiss after getting naturalized, therefore biasing the distribution analysis.

7.3 Diversity and Professions

7.3.1 Description

The last dimension is the professional one. At CERN, Staff Members are distributed among different professional categories, which represent the domain they work in. Then, job codes detail further the intricacies of the type of work they do.

The first category is the Research Physicists: those are the physicists purely oriented on research. There were 81 of them at the end of 2016, making them one of the smallest categories at CERN.

The second category is Scientific and Engineering work. As the name suggests, this category includes the physicists implicated in experiments at an operational level (called Applied Physicists at CERN) and all the engineers needed for the different tasks required at CERN, from Computing to Civil Engineers. This category is the biggest one at CERN, with 1090 people out of 2560 in 2016.

The Third category is Technical work, which includes Technical Engineers and Technicians. Those people are in charge of the field duties; they build and operate on the machines, supporting the engineers to ensure the well-being of the experiments. It is the second biggest category with 889 people, representing nearly 35 percent of the staff population.

The fourth category is Manual Work. It used to take a more significant part of CERN's staff population. However, this group shrunk once the LHC's construction was over (from 168 in 2009 to 61 in 2016). Some left, some became technicians, and the remaining are experts with specific roles for precise tasks, as for example the firefighters. Recruitment in this class are very rare nowadays.

The fifth category (called 5A) are the professional administrative workers. These people take care of key organisational jobs needed for the proper functioning of the Organization. Namely, they will be HR professionals, legal experts, translators, financial analysts, and many more. 161 people belonged in this category at the end of 2016.

The sixth category (called 5B) are the office and administrative workers. They support the professionals' category and the departments in the administrative processes needed in the Organization. There were 275 office workers in December 2016. Various jobs might be found here, from HR assistants to administrative support workers.

The last category is a remnant of an older system. It is the 5C category and represents the lowest level of office workers. There are only three people left in this group, the others left or evolved to a position with more responsibilities. CERN does not recruit people at that level anymore.

7.3.2 Analysis

The Graphs in this section represent the distribution of nationalities among professional categories at CERN for the last year of available data, 2016. I defined an equation based on the distribution of a given country observed in the given category divided by its distribution CERN-wide, minus 1. This means that the closer the distribution is to zero, the nearer it is to the expected value observed at the organisational level. A result of -100% means that the given Member State does not have any staff member in this category.

$$\frac{\frac{\text{National Population in the Category}}{\text{Total Population in the Category}}}{\frac{\text{Total National Population}}{\text{Total Population}}} - 1$$

To give a concrete example, there are 17 Germans from the 81 Research Physicists at CERN. Thus, they represent 20.99% of this category. In comparison, there are 179 Germans across all categories of personnel at CERN, compared to 2560 staff members, which yields 6.99%. Using the equation provided above, we can calculate that 20.99% divided by 6.99%, the result minored of 1, gives an outcome of 200.28% (discrepancies with graphic results are due to rounded effects). This means that the ratio of Germans within the Research Physicists is three times its representation CERN-wide (if we took 6.99% as the expected representation, there should be between five and six Germans in the highlighted category).

I chose not to represent categories 4 and 5C because of the size of the sample (less than 100 people). Indeed, a variation of one individual for most categories creates significant changes, making their interpretation unwise. I also showed the results for category 1 separately, because even if the sample is small, not representing the Research Physicists when introducing CERN seemed inappropriate. Figure 15 is there as an indication but will not fuel the following analysis.

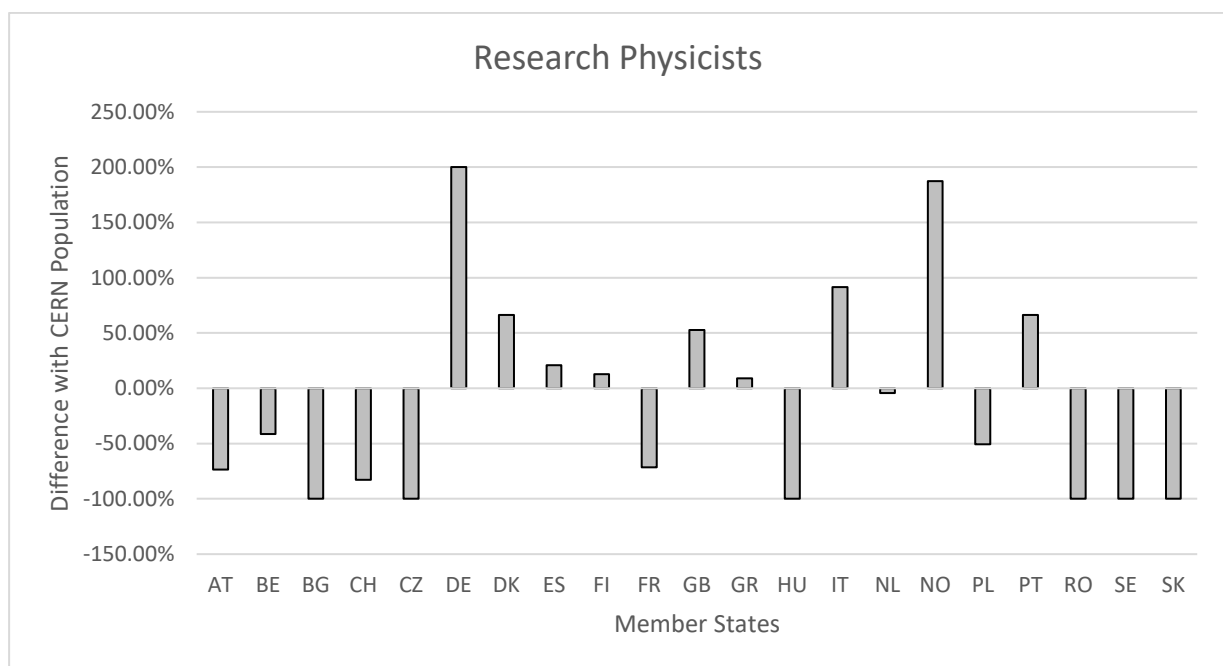


Figure 16: representation of category 1. Percentage of population in the category over percentage of population CERN-wide for each country in 2016.

Non-Member States were taken out of the preceding graph, as their representation is ten times higher than elsewhere at CERN, making the graph less readable. Nonetheless, it can be observed that France and Switzerland are significantly less represented than CERN-wide, and that six Member States do not

have any research physicists at CERN. To give a numeric example, France has result of -71.47% in category 1. This means that compared to France's representation CERN-wide of 38.95%, its distribution in the research physicists is only 38.95% multiplied by $(1-0.7147)$, yielding 11.11%, or 9 Research Physicists. One should be careful of the significance of results, as for example it can be observed that Norway is significantly overrepresented in the graph above, but it is due to the fact that their two representatives in the research physicists are proportionally a lot compared to their representation of 0.43% CERN-wide.

The following graphs represent the four most populated staff categories of personnel at CERN:

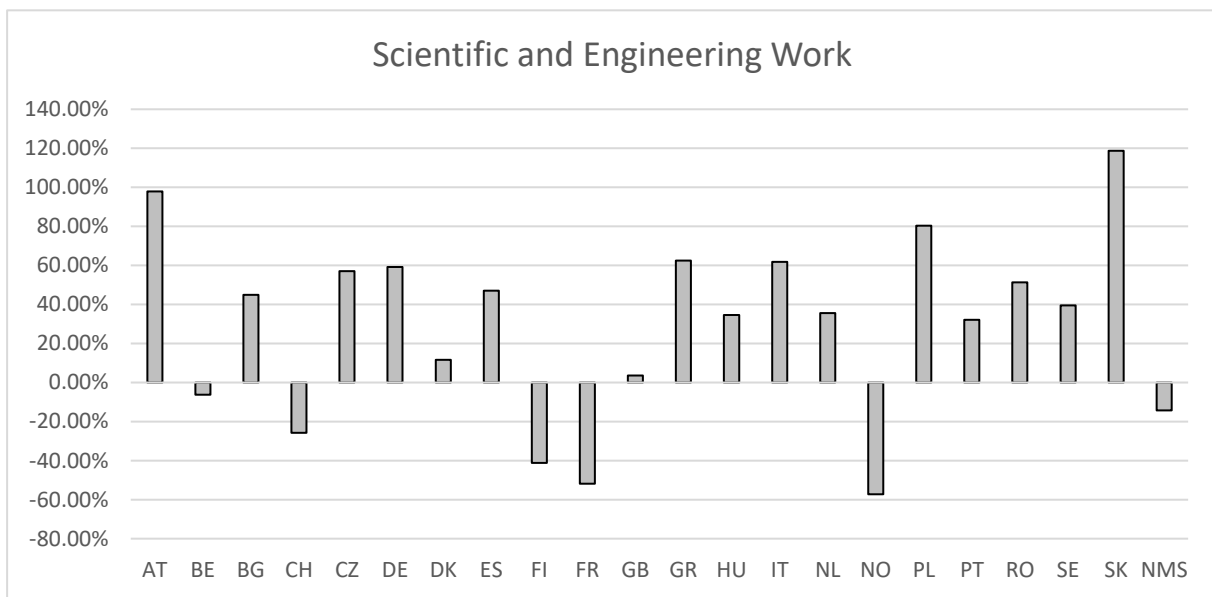


Figure 17: Percentage of population in category 2 over percentage of population CERN-wide for each country in 2016

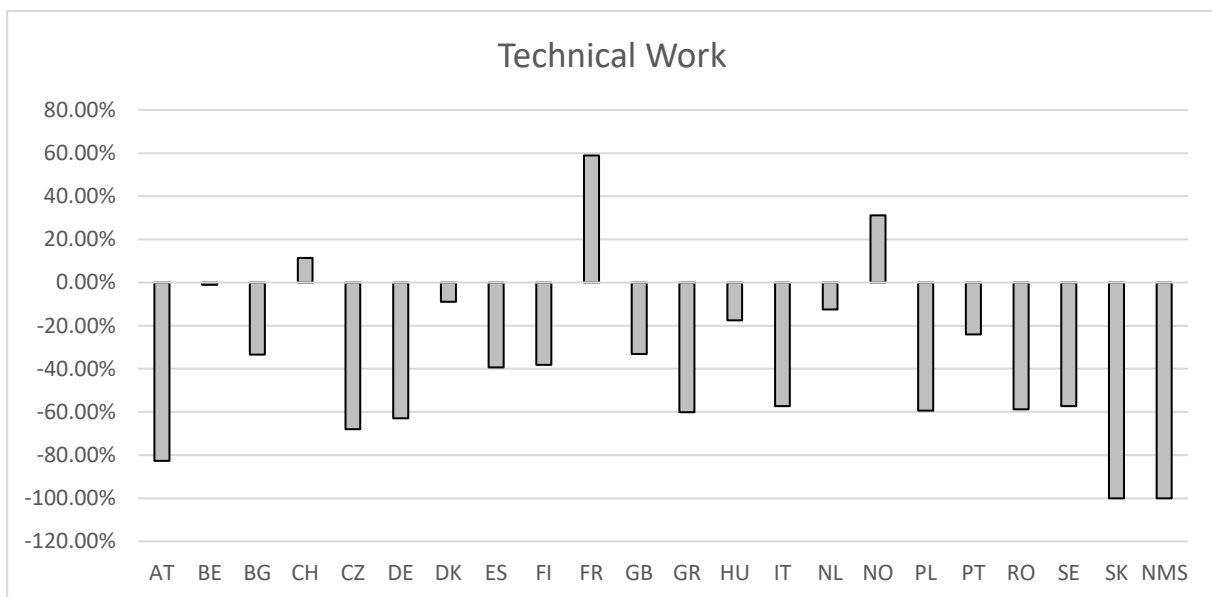


Figure 18: Percentage of population in category 3 over percentage of population CERN-wide for each country in 2016

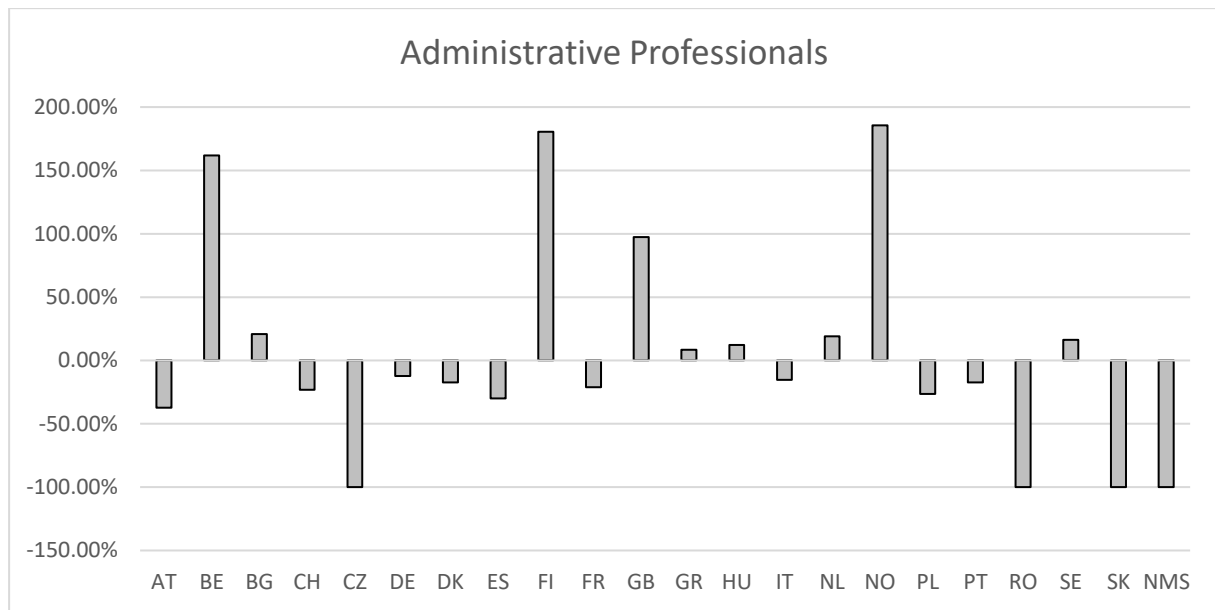


Figure 19: Percentage of population in category 5A over percentage of population CERN-wide for each country in 2016

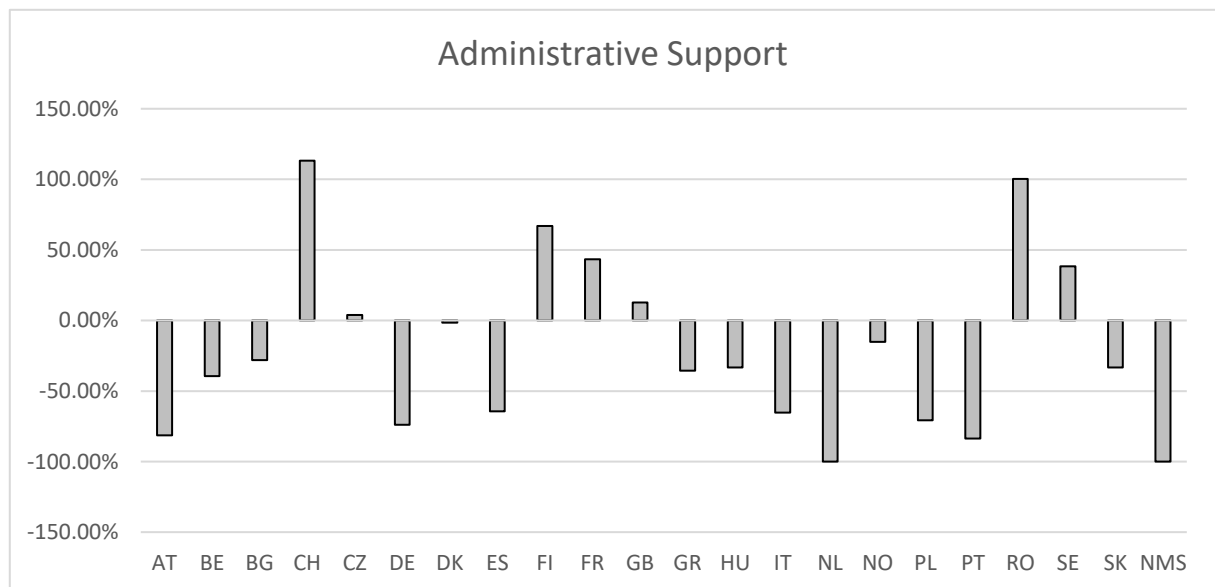


Figure 20: Percentage of population in category 5A over percentage of population CERN-wide for each country in 2016

Observing the different professional categories, a significant variance of population distribution among the different groups at CERN can be found.

Without drawing hasty or ill-informed conclusions, several observations concerning the population at CERN can be made:

- Scientific and Engineering Work (category 2) sees an overrepresentation of most countries except host states compared to their representation across CERN as a whole.

- Administrative Professionals (category 5A) is rather peculiar: two thirds of countries have representations comparable with the rest of the Organization, the remaining nations are at the extremes (significantly overrepresented or not represented at all).
- The categories that could be qualified as “operational” (Technical Work and Administrative Support, or categories 3 and 5B), see an overrepresentation of the Host Member States. The other countries above the zero level in those two categories have very few members of personnel overall, making their result somewhat hard to correlate with anything, as a difference of one staff creates a significant variation in the results.

There seems to be a correlation between the level of the job and the representation among Member States. The categories Research Physicists, Scientific and Engineering Work and Administrative Professionals recruit Masters and PhD holders or equivalent, while in the other categories, the targeted population typically has a lower level of education. Therefore, the lower the education level, the more locally people are recruited. This could be explained by multiple reasons:

- The communication channels used for sourcing purposes could be centred around the “high-level” workforce; universities, schools of technology, events attended by students, etc. The biggest category remains category 2, which are the engineers.
- It might be hard to source “lower-level” jobs outside of hosts states due to various explanations; economic (competitiveness), social (less international movement in these categories), geographical (distance), etc.
- The attractiveness of the Organization is built around factors, which might appeal more to certain professional categories (elite scientific perspective).

Talent Acquisition provided the map of the different Outreach events to which the unit participated in 2016. In total, they participated in more than 20 fairs and forums, in some of the hardest countries to source from for CERN, namely the United Kingdom, Germany, the Netherlands and the Scandinavian countries. They also participated in events in Switzerland, some for political reasons and also because Switzerland has a strong international workforce.

Talent Acquisition also communicated that CERN insourced 350 people during the construction of the LHC (around the year 2005). Those people were mainly of the operational categories 3 and 4, and therefore a significant part of this population was French, which helped setting up the situation as it currently is.

Another important element to understand the current conditions of national diversity is the fact that in 2016, to accompany the restructuring of the departments, CERN also changed its career structure

and introduced benchmark jobs⁶¹. Before that, the lowest jobs level, which are part of categories Technical Work, Administrative Support and Office Workers (3, 5B and 5C), did not receive an international indemnity (there were truly two distinct pools of recruitment; one international and one national). This financial benefit is delivered today to anyone living more than 150 kilometres from CERN, representing a significant amount of money paid twice each year. Following this, an increase in applications from further countries can be expected in those fields due to the higher level of financial attractiveness, giving another element to further rebalance the national distribution among those professions in the future.

Fully testing those three hypothesis would be a difficult task and would require a research paper exclusively on the topic of attractiveness factors of the Organization. An assumption would be that responsibility is shared between those three hypotheses, but inferring more than this without the required evidence would be imprudent.

7.4 Statistics Conclusions

To conclude, several conclusions were extrapolated from the statistics. The ideal distribution of nationalities is indexed to the contribution of the different Member States. In reality, some countries are overrepresented: France for example composes nearly 40% of the population at CERN. Others are virtually non-existent in comparison; Israel's participation is above 1% of the total budget, but has only one staff member. However, this distribution is uneven in the departments, creating groups of specific nationalities within departments and showing that diversity observed at the organisational level is not spread evenly throughout CERN. This creates questions about the benefits fostered by diversity for those teams, as there seems to be a quite high level of homogeneity at some levels. The distribution of professional categories was evaluated, and here as well, discrepancies in the distribution of nationalities among the different professional categories were observed, which suggests that exogenous variables other than policies and official recruitment practices influence the distribution.

⁶¹ Benchmark Jobs | HR Department. 2018. Hr-dep.web.cern.ch. <https://hr-dep.web.cern.ch/content/benchmark-jobs>, January 2018.

8. Recommendations

8.1 Diversity Value

As seen through the theoretical framework, diversity is a double-edged sword: it is a powerful creativity and problem-solving tool, but can have overall negative impacts on the organisation if poorly managed. At CERN, diversity is an influential concept as it is one of its core values and part of its business model. Indeed, without diversity, the Organization would not exist. However, suggesting that being diverse means that diversity management is unnecessary would be a mistake. Indeed, diversity takes many forms, and even if the global picture seems to indicate a brighter future, macro-diversity does not mean micro-diversity. Creating pockets of similar individuals in a dissimilar environment is not efficient. However, there is no significant evidence that it cannot work at CERN. As observed, the mission of science for the greater good is a powerful motivator, and CERN seems healthy as an Organization. Nevertheless, tackling the diversity issue at an organisational level and not break it down any further could lead to misleading conclusions about the diversity climate. Creating diversity all the way through the Organization is a key factor to fostering its benefits. This will however create a change, which will need to be managed to truly be able to reap the benefits of diversity. The study from a fellow at CERN in 2016 mentioned earlier shows that progress could be made on the axis of diversity climate; corroborated by the literature, inclusion climate fosters diversity benefits. This could be an improvement direction where CERN can enhance its current diversity management.

My suggestion would be to analyse diversity within departments and professions more in depth, and compare this to the perception of recruitment needs from the hiring managers: understanding the factors leading to the homogenisation of teams could give fundamental tools to potentially break the tendency and promote diversity transversally within the Organization.

Once this is done and the factors have been identified, tailoring the awareness training accordingly will be crucial. It is vital for people to see the potential benefits, and not feel that they have an obligation to conform or suffer the consequences as the only possible outcomes. Training can prove to be fruitless if the message is not transmitted properly. The syndrome of “Diversity Fatigue” can easily appear if the concept appears force fed to the workforce⁶². Indeed, the evolution of the mind-set can only happen if the values of the individuals can find echoes in the principles of the strategic agenda.

⁶² Ryder, B. 2016. Diversity fatigue. *Economist.com*. <https://www.economist.com/news/business/21692865-making-most-workplace-diversity-requires-hard-work-well-good-intentions-diversity>, December, 2017.

8.2 Management Involvement

It is necessary to also make sure that the change is supported by the management: as seen in the model developed by J. A. Gilbert et al., defining diversity strategically before pushing it down the hierarchy to increase the chances of integration and acceptance is critical to ensure the success of the procedure.

Even though the hiring managers will be making the decision in the end, underlining that diversity is supported by the management will help root the idea in their minds, and create ownership and subscription to the issue, thus increasing the chances of attaining the goals set up for diversity at CERN.

8.3 Extension of the Outreach to Blue Collar Professions

CERN relies on its engineers to bring science to life. However, the technical, support and administrative bodies are also necessary to ensure the well-being of the Organization. Outreach activities currently focus on the first group, when some things might be expanded to reach different populations. As mentioned by a Talent Acquisition representative, CERN tries to reach those functions. It seems that finding the right medium is more complicated than to reach engineers for example, as technical schools have different approaches to fairs and forums. The overrepresentation of French nationals in the population is greatly influenced by the technical and administrative staff. Language is an effective barrier that is difficult to overcome (contracting companies in the region have mainly French speaking staff). However, it is possible that if those professional categories were more attractive for other nationalities, the overall balance could be shifted and show some improvement.

The first step for this process to work would be to interact with members of personnel from non-host states to understand the process that made them leave their country to seize an opportunity at CERN. An in-depth understanding of the different factors of expatriation is of paramount importance if one wishes to repeat the process elsewhere. The key aspects to identify are first, the motivators, which made the different staff members decide to leave. Then, the communication channels that will enable to reach the people with similar profiles. The perfect channel of communication does not exist. However, understanding opens the path for reflexion on how to improve the current situation.

Understanding what makes the Organization attractive and being able to break down the information and identify correlations between the different staff members' preference and choices might provide leads on how to improve the outreach programme for non-university level jobs, as those are the categories the most in need of improvement.

9. Conclusion

CERN has had diversity as a core value since its conception. The Organization was built around the timeless principles of collaboration and diversity. It is based on an ideal that science transcends boundaries and that differences can make it go further. What has been observed is that CERN has a long tradition of diversity in terms of population, but its diversity management strategy is in itself rather young, with the launch of its dedicated programme in 2011. This has led to the analysis developed in this paper, which had as objectives understanding how diversity is managed at CERN, how the Member States influence it and how this translates into recruitment practices; the reasoning being supported by a theoretical analysis and statistical observations of the situation.

After gathering a significant amount of information from the different websites of CERN and its departments, the Diversity Office, the Talent Acquisition Unit and the International Relations sector, I developed a better understanding of how the Organization works and how it has evolved over the years. It appeared that CERN's budget is entirely financed by public money, and that it was treated as a form of investment by its 22 Member States. Thus, on top of the public image provided by collaborating on such a vast international endeavour, the Member States collect the fruits of their investment through employment for their nationals, training for their students, supplies bought from their firms and contracts made with national companies. This creates a very interesting diversity case as its concept is not only one of principles and moral values; there is a strong economic factor involved, as Member States invest in CERN and naturally expect concomitant returns.

The theoretical framework presented tools to understand and describe diversity as it is defined in academic literature, its benefits and potential issues. Three articles discussing the subject more in-depth were analysed. This framework was then applied to CERN, which led to mixed results. Indeed, the fact that the Organization was born out of diversity values and has strong economic factors linked to it seemed to leave very little management to be done, at least from an internal point of view. This left one question: would a diversity office have been set up in the first place if other dimensions, such as gender, were not seen as an issue?

The statistical evidence provided a more interesting view of the Organization as it could be seen that organisational diversity did not translate in departmental nor professional variety of nationalities. Certain areas of CERN contain a strong concentration of specific nationalities, creating pockets of homogeneity within a rather heterogeneous organisation. This leaves open the question whether the Organization could profit more from its diversity by breaking down those small pouches of similarity.

It is important to remember that despite diversity management and the specialisation of the recruitment function being introduced at CERN only recently, the Organization was still performing. However, margins of improvement have been observed and further comprehensive research would be needed to fully comprehend the potential improvement possible in the diversity climate at the nationality level, and how recruitment may be an active partner in the process.

The suggestions for further investigation concern two different bodies of research: from the organisation point of view, CERN can improve certain aspects of its diversity through management and outreach, and this will require diving into the motivators of both hiring managers and expatriate candidates. Understanding what impacts the attractiveness of the Organization for the different targeted populations, both from a professional and geographical point of view, could greatly benefit CERN, its diversity, and the stakeholders, both actual and future ones.

From an academic standpoint, the case of CERN is extraordinary and worth a deeper investigation. It has created a very specific diversity ecosystem, based on values and economic factors. Comparing its situation with other organisations and firms, both from the public and private sector, might provide some interesting insights on how theoretical models can be transposed to different organisational entities, and to what extent diversity management can be trumped by objectives within an group.

Annexes

Annex 1: Country Abbreviations

ABBREVIATION	COUNTRY
AT	AUSTRIA
BE	BELGIUM
BG	BULGARIA
CH	SWITZERLAND
CY	CYPRUS
CZ	CZECH REPUBLIC
DE	GERMANY
DK	DENMARK
ES	SPAIN
FI	FINLAND
FR	FRANCE
GB	GREAT BRITAIN
GR	GREECE
HU	HUNGARY
IL	ISRAEL
IN	INDIA
IT	ITALY
NL	NETHERLANDS
NMS	NON-MEMBER STATES
NO	NORWAY
PK	PAKISTAN
PL	POLAND
PT	PORTUGAL
RO	ROMANIA
RS	SERBIA
SE	SWEDEN
SI	SLOVENIA
SK	SLOVAKIA
TR	TURKEY
UA	UKRAINE

Annex 2: Number of staff member per country (including Associate and Non-Member States)

Countries	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
AT	51	43	43	41	41	47	49	51	49	50
BE	113	109	108	106	105	105	107	107	108	108
BG	8	8	9	10	12	13	13	12	11	13
CH	189	180	183	194	182	182	172	167	170	184
CY	0	0	0	0	0	0	0	0	0	1
CZ	5	5	5	5	3	4	5	7	9	9
DE	180	175	170	178	182	184	182	183	185	179
DK	25	20	19	18	20	21	20	19	19	19
ES	97	95	95	96	104	115	126	138	149	157
FI	25	23	24	28	27	28	27	25	24	28
FR	1109	1047	1033	1024	1010	1031	1027	1012	999	997
GB	243	222	209	215	213	223	212	211	209	207
GR	20	16	18	18	19	20	23	24	26	29
HU	13	12	12	9	9	11	9	10	13	14
IL	0	0	0	0	1	1	1	1	2	1
IT	228	221	224	246	252	275	284	290	287	297
NL	81	77	71	70	70	67	69	69	69	66
NMS	13	15	14	14	11	10	9	11	12	11
NO	15	14	14	13	13	12	12	12	12	11
PL	38	37	46	57	59	60	61	60	62	64
PT	39	37	34	39	40	45	49	56	57	57
RO	0	0	0	0	4	8	8	10	13	14
RS	0	0	0	0	0	1	1	2	3	3
SE	37	30	29	32	31	33	31	32	29	27
SK	15	14	14	14	16	16	16	15	14	14
Total	2544	2400	2374	2427	2424	2512	2513	2524	2531	2560

Annex 3: Contribution per country, in percent of total budget

Countries	2009	2010	2011	2012	2013	2014	2015	2016	2017
Member States									
AT	2.24	2.25	2.18	2.19	2.22	2.22	2.21	2.2	2.1654
BE	2.77	2.82	2.78	2.85	2.77	2.78	2.76	2.74	2.7649
BG	0.22	0.32	0.32	0.28	0.28	0.28	0.29	0.29	0.293
CH	3.01	2.41	3.79	5.15	3.19	3.64	3.87	4.03	3.916
CZ	1.15	1.08	1.13	0.98	1.07	1.03	1	0.98	0.937
DE	19.88	20.3	19.44	20.25	20.29	20.27	20.47	20.52	20.439
DK	1.76	1.76	1.8	1.83	1.77	1.76	1.77	1.75	1.772
ES	8.52	8.89	8.82	8.11	8.53	8.28	7.82	7.61	7.216
FI	1.55	1.49	1.26	1.39	1.43	1.39	1.38	1.37	1.347
FR	15.34	15.63	15.42	15.52	15.57	15.39	15.13	14.61	14.32
GB	14.7	14.64	15	13.58	14.51	13.88	14.26	14.64	15.096
GR	1.96	1.93	1.9	1.64	1.79	1.64	1.45	1.32	1.201
HU	0.78	0.68	0.67	0.63	0.68	0.65	0.62	0.61	0.603
IL	0	0	0	0	0	1.19	1.34	1.42	1.491
IT	11.51	11.65	11.19	11.15	11.78	11.48	11.06	11.04	10.624
NL	4.79	4.55	4.28	4.59	4.61	4.6	4.55	4.74	4.772
NO	2.53	2.76	2.61	2.48	2.5	2.55	2.8	2.91	2.897
PL	2.85	2.66	3.15	2.9	2.72	2.66	2.75	2.81	2.821
PT	1.14	1.18	1.26	1.25	1.23	1.2	1.15	1.14	1.114
RO	0	0	0.39	0.34	0.6	0.72	0.74	0.92	0.993
SE	2.76	2.4	2.46	2.75	2.55	2.61	2.82	2.78	2.734
SK	0.54	0.6	0.54	0.48	0.51	0.5	0.5	0.49	0.484
TOTAL	100	100	100.39	100.34	100.6	100.72	100.74	100.92	100
Associate Member States									
CY	0	0	0	0	0	0	0	0.01	0.09
IN	0	0	0	0	0	0	0	0	1.035
PK	0	0	0	0	0	0	0	0.12	0.132
RS	0	0	0	0.09	0.09	0.09	0.09	0.12	0.173
SI	0	0	0	0	0	0	0	0	0.046
TR	0	0	0	0	0	0	0	0.43	0.4259
UA	0	0	0	0	0	0	0	0	0.0899

n.b: Member States are the current ones as of 2017. When the sum is superior to 100, it comes from a time when some countries were still Associate Member States.

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