Economic Contribution of Udice Universities

A final report to Udice
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1. Executive Summary

The ten Udice Universities create a sizeable economic footprint, supporting €41 billion GVA and 364,000 jobs across France. They represent a new generation of universities that are transforming French higher education, drawing together collective research strengths, gaining international recognition and supporting the pillars which are fundamental for economic and social well-being.

Udice is an association of 10 major research universities in France which was formed in October 2020. It aims to draw attention to the role played by research universities in French economic life and society, giving them a collective voice for communicating with the public and private sectors. Its members represent a new model for higher education in France, pulling together the roots of the nation’s prestigious academic heritage and working collaboratively with their partners to form globally competitive institutions of scale and depth. Along with their partner National Research Organisations (NROs), they have 487,000 students, 116,000 staff members and a combined annual income of €10.4 billion.

There are three aspects to the case for investing in universities:

- **the strategic case** which highlights the ingredients that economies need to thrive and grow and the role which universities play in allowing this to happen;
- **the economic case** about the economic rate of return which universities generate relative to the income they receive; and
- **the fiscal case** which reflects the important fiscal contribution they make to local and national finances relative to their income.

The Udice Universities make a clear and strong contribution to each of these cases.
1.1 Strategic Case

Universities drive economic growth and boost competitiveness by creating and diffusing knowledge which raises productivity. They support ecosystems built on world-class research, attracting companies and investment which helps to catalyse innovation in business and create the knowledge sectors of the future. The link between higher education and positive economic performance is supported by empirical evidence: countries which spend more on education are associated with higher rates of economic growth and more positive labour market outcomes. Their impact is transformational, particularly at a regional level, and they leave a legacy for future generations.

In addition to their very sizeable economic footprint, the Udice Universities represent a new generation of universities in France that are deeply connected at a regional, national, European and international level. They bring together key education and research actors in their regions, creating stronger institutions through combining resources. They represent institutions of scale which compete at the top level on a world stage, gaining recognition for French research strengths, particularly in the field of science.

At a regional level, their influence is strengthened through having gained the prestigious IdEx award which is held by nine of the ten Udice Universities, making them part of a new generation of French universities that compete on a world stage. At a European level, the Udice members are part of the European Universities Alliance which aims to create a more integrated European higher education system for students and for staff.

1.2 Economic Case

The Udice Universities create an annual economic contribution of:

- €41.1 billion GVA and support 363,600 jobs in France; and
- €45.8 billion GVA and support 403,600 jobs globally (including France).

Therefore, 90% of the impact generated by the Universities is retained in France. In addition, they support:

- €4 in total GVA impact for every €1 income received; and
- 3 jobs throughout the country for each person they employ directly.

The impacts created can be classified as those that are purposeful and those that are operational. Purposeful impacts reflect the nature and value of an organisation’s work and, in the case of universities, are designed with the intention of driving innovation and productivity growth within the economy. Operational benefits occur regardless of the nature of the business or organisation and mainly reflect their physical scale.
The ten Udice Universities create a **purposeful impact** that is worth €17.9 billion GVA and supports 75,000 jobs in the French economy, representing 44% of the total GVA contribution. This mainly comes from:

- **learning impacts** – the lifetime earnings premium earned by graduates, the internships arranged by the Universities and the education they provide to support professional development; and
- **valorisation impacts** – from the research work of the Universities including licensing agreements, public sector commissioned research, commercial services for businesses, the spin-out and start-up companies created by staff and students, and the Universities’ contribution to the development of science parks and incubators.

The **operational impact** is worth €24.1 billion GVA and supports 298,700 jobs throughout the French economy, representing 59% of the total GVA contribution. This mainly comes from:

- **central impacts** – its core income and employment, spending on supplies of goods and services and the impact created by staff spending; and
- **student community impacts** – created by students spending and working part-time during their studies.

The operational impact accounts for a larger share of the total employment impact that of the GVA contribution. This is because the purposeful impacts include several important sources of impact, including learning impacts, that are measured in terms of GVA contributions but not in employment terms.

A small proportion of impact worth around €887 million, or 2% of the total, crosses the two categories and could be regarded as either purposeful or operational in nature. This includes capital spending, tourism and student volunteering and it is included in both totals.

### 1.3 Fiscal Case

Finance Ministries are aware of the contribution of public funding to the income of universities. However, they tend to be less aware of the tax revenues they generate as a result of their operations and their wider economic contribution.

The economic activity generated by Udice stimulates an estimated €20.8 billion in **taxation revenue in France**. This is approximately double the income of the Udice Universities and their partner NROs. Therefore, the Udice Universities and their partner NROs generate €2 in tax revenues for every €1 they receive in income.
1.4 Conclusion

The Udice Universities fundamentally support the social, natural, economic and human capitals which are essential for building economic resilience and creating sustainable economic well-being.

There is a very persuasive case for investing in the Udice Universities. Significantly, they offer an essential element of infrastructure to help the French economy recover from the COVID-19 pandemic. For economic recovery and transformation to be sustainable and resilient, it needs to be based on knowledge and innovation. The universities sector, and particularly the research-intensive organisations represented by Udice, will be the primary source of the human and intellectual capital required to make this a reality over the next few years. At a regional level, the Udice Universities give their regions an important degree of control over their own economic destinies.
2. Introduction

This section introduces Udice, explains the purpose of the study and outlines how it has been carried out.

2.1 Background

Udice is an association of 10 major research universities in France which was formed in October 2020. The members are:

- Aix-Marseille Université (AMU);
- Sorbonne Université;
- Université de Bordeaux;
- Université Claude Bernard Lyon 1;
- Université Côte d’Azur;
- Université Grenoble Alpes (UGA);
- Université de Paris;
- Université Paris-Saclay;
- Université Paris Sciences et Lettres (PSL); and
- Université de Strasbourg.

It aims to draw attention to the role played by research universities in French economic life and society, giving them a collective voice for communicating with the public and private sector.

Collectively they have 487,000 students, 74,000 staff members and, along with their partner National Research Organisations (NROs), a combined income of €10.4 billion. They account for two-thirds of the most cited French academic publications in the world and five members appear in the World’s Top 100 Universities in the ARWU (Shanghai) Ranking for 2020.

A brief description of each Udice University is given in Appendix A.

2.2 Study Purpose

Udice commissioned BiGGAR Economics to assess the economic contribution made by its 10 members and their university communities. This includes the universities themselves and their close partners that are National Research Organisations (NRO) including Centre National de la Recherche Scientifique (CNRS) and Institut national de la santé et de la recherche médicale (INSERM).

The aim of the study is to provide robust evidence about the important role the Udice university community plays in supporting the regional, French and global economies.
2.3 Method and Measurement

2.3.1 Method

The study estimates the total contribution made by Udice Universities and their NRO partners. The approach taken is to record all impacts which are generated by the Universities and, in this sense, it represents the impact they create on the economy which is *additional* and only arises because they exist.

The methodology has been tried and tested, having been used in over 100 university economic impact studies in recent years. This includes studies for CURIF, the League of European Research Universities (LERU), VLIR (Flemish Universities), the Russell Group in the UK, Universities Finland, Universities Estonia and ETH Domain in Switzerland. The overall approach taken is illustrated in Figure 2-1.

**Figure 2-1: Study Approach**

![Study Approach Diagram](image)

Source: BiGGAR Economics

The starting point for analysis was to consider the various activities undertaken by the Universities and their partner NROs and identify those that were likely to generate an economic contribution.

Logic chains were then developed to describe how each type of activity generates economic value and these were used to build an economic model to estimate the economic contribution of the Universities.
The next step was to consider how the value generated by each type of activity might be measured and what data would be required to do this. For most activity, two types of information are required: source information about the scale of the activity and data that could be used as the basis for assumptions to measure the economic value it generates. Where possible, source data was obtained directly from the Udice Universities and their partner NROs. Where this was not possible, an appropriate assumption was made based on BiGGAR Economics’ previous experience of comparable institutions.

The data required for the assumptions used in the model was obtained either from published reports, official statistical sources or based on BiGGAR Economics’ previous experience within the higher education sector. The key statistical source used was the Domestic and Import Input-Output Tables for France, 2018 edition published by the OECD. The sources used are referenced throughout the report and described in more detail in the methodology section in Appendix D at the end.

The data were used to populate an economic model that estimates the value of each source of contribution from the Universities. This has been aggregated in order to produce an overall estimate of the total contribution from all Udice Universities.

2.3.2 Measurement

The economic impacts are reported in two commonly used measures:

- **Gross Value Added (GVA)**, which is a measure of economic output and is expressed in Euros (€); and
- **Jobs** (employment) which are expressed as headcount jobs.

GVA impacts are reported to nearest whole € million, or € billion to 1 decimal point, depending on scale. Jobs and student numbers are rounded to the nearest 100.

The abbreviations and terms used in the report are described in Appendix C.

2.4 Reference Year and Geography

2.4.1 Reference Year

The analysis measures the impact created by the Udice Universities over a single year and is based on data provided by them and their partner NROs. In some cases the data supplied is for the academic year 2018/19 and in others it is for the calendar year 2019. Each impact presented in the report should be read as an annual impact, the only exception is the graduate premium which reflects the lifetime earnings premium for an annual cohort of graduates (who graduated in 2019).

2.4.2 Geography

This study considers the contribution of the Udice Universities at two geographic levels: France and globally (including France). A series of separate reports has been prepared to describe the impact of each individual Udice University in their respective regions, across France and at a global level.
3. Impact Framework

This section describes the context for the analysis, highlighting the role played by universities in creating economic growth and reflecting on the nature of the benefits they create.

Universities are fundamentally important to advanced economies, they provide new knowledge and facilitate its diffusion, fuelling productivity growth, which is the basis for driving economic growth. As a result, they play a critical role in driving economic growth and development through their role as providers of knowledge and innovation.

This chapter begins by considering the role played by academic activity in stimulating productivity and, by extension, economic growth. It presents a framework to describe the various ways in which universities generate economic benefits and how these are classified into those that are purposeful, driven by the nature and value of university activity and those that are operational, resulting from having large centres of employment and large numbers of students.

3.1 Productivity and Innovation

As producers of highly skilled graduates and postgraduates, generators of world-class research and development and located at the centre of industry clusters, universities contribute to economic growth. The connection has been long-acknowledged with many influential economists publishing work setting out a theoretical and empirical case for the role high level skills and innovation play in boosting economic competitiveness and addressing inequality in society.

Universities drive economic growth and boost competitiveness by diffusing knowledge which raises productivity.

In the late 1950s Robert Solow published papers that showed that it was not the savings rate or increases in the factors of production (labour and capital) that determined the long-run growth rate but increases in productivity. In the early 1960s Kenneth Arrow published papers on research and development and on learning by doing, which showed that almost all economic growth could be accounted for by innovation, both new ideas emerging from research and improving productivity through learning by doing during the process of production itself.
Building on this, the Nobel prize winning economist Joseph Stiglitz\(^1\) has argued that productivity is the result of learning and consequently, a focal point of policy should be to increase learning within the economy. The observation is made that, even within countries and within industries, there can be large gaps between the most productive and the others.

More recently in 2020\(^2\), he and other influential policy makers have identified investment in education, research and development as a central priority for economic recovery and transformation following the global COVID-19 pandemic.

Therefore, the diffusion of knowledge is as important as pushing the boundaries of knowledge. Since productivity growth drives growth throughout the economy, it suggests there is considerable scope for higher rates of economic growth. The scale of knowledge and innovation taking place is also important because there are dynamic effects that come into play. New knowledge and innovation (the diffusion of knowledge) are both based on the foundations of prior knowledge and high levels of investment in knowledge and innovation give rise to an accelerating pace of innovation. In contrast, cutting levels of investment in knowledge and innovation, will mean the pace of innovation slows because underinvestment compounds over time.

In summary, knowledge and innovation are fundamental to economic growth, since it is productivity growth that drives economic growth and productivity growth is in turn driven by knowledge and its diffusion (innovation).

### 3.2 Universities and Economic Development

Figure 3-1 illustrates how universities have a wide range of inter-related impacts on the economy.


The inputs of staff time (labour), supplies, equipment, research services and students create a set of outputs that range from the creation of knowledge and infrastructure to the transfer of existing know-how, technological innovation and capital investment.

Through these outputs, a set of impacts arise which result in economic growth and development. This includes productivity gains, business innovation, new business start-up activity and an increased capacity for development. All of this activity produces further direct and indirect impacts on the economy through expenditure and multiplier effects. Some of these outputs and impacts are discussed in more detail below.

### 3.2.1 Intellectual and Human Capital Creation

The two fundamental activities of universities are the creation of intellectual capital and human capital. They contribute to knowledge creation through undertaking basic and applied research which has given rise to the most influential technologies of today and will continue to shape the technologies of the future. Universities also provide high quality graduates for the labour market which in turn increases the innovation potential of the economy, as well as leading to productivity gains.
3.2.2 Knowledge Infrastructure

Universities play a role in producing knowledge infrastructures, which largely arise due to positive agglomeration effects. As an example, many research institutes and companies choose to locate in close proximity to research-intensive universities to benefit from informal knowledge sharing as well as frequent face-to-face contact with academics involved in research. This is why areas with universities often have associated knowledge infrastructure such as science parks and incubators, which can ultimately develop into knowledge clusters.

3.2.3 Exchange of Existing Knowledge and Technological Innovation

Over and above these fundamental activities, universities also work to exchange existing knowledge throughout the economy through their interactions with businesses such as commissioned research and professional education, which increases productivity and business innovation. Universities are vital sources of technological innovation through the commercialisation activities they undertake, the spin-out companies they help to create and the intellectual property licensing they allow.

3.2.4 Social Environment – The Ecosystem

Staff and students at universities create an impact on their local environment and bring a vibrancy of the cities and towns they are located in. In addition, they contribute to the attractiveness of a location as a knowledge centre and this wider role in underpinning the economy is something which should not be overlooked. Universities provide a space for discussion and create connections between academia, students and companies that would not otherwise exist, fostering an environment for innovation. This creates clusters of people and can lead to the creation of entire research ecosystems which, in turn, attract more people.

In the case of the Udice Universities, the members have a clear role in helping to attract investment into several science parks throughout France and, as a result, they are vital in helping to draw and retain inward investment into the country. In a marketplace for inward investment that is increasingly competitive on a global scale, this is a particular strength for the country as a whole.

The international dimension of the research undertaken at the Udice Universities and the international character of the institutions themselves contributes to improving the country’s brand as a whole, making France more connected and providing opportunities for partnerships with the wider global economy by attracting inward investment. The ecosystems are entirely built on the world-class research undertaken by the Universities and it is this which attracts companies and investment into France, helping to catalyse innovation in businesses. The fundamental research they undertaken is helping to create the knowledge sectors of the future.
3.3 Evidence of Higher Education’s Role in Economic Performance

BiGGAR Economics conducted an analysis of international statistics published by the World Bank (2020)\(^3\) and the OECD (2019)\(^4\) to test the extent to which empirical evidence supports the theory that investment in education results in better rates of economic growth\(^5\). Data were reviewed for a sample of economies in Europe, North America and Oceania. Not all datasets were available for all countries. The analysis found that across 19 countries\(^6\), investment in higher education is correlated with:

- higher levels of Gross Domestic Product (GDP) per capita;
- higher growth in GDP per capita over time;
- higher rates of labour force participation; and
- lower rates of youth unemployment.

The analysis also found a positive correlation between these same variables and the education level of the workforce: countries with a working age population educated to a higher level are also associated with positive economic outcomes.

While these results are correlations rather than evidence of causation, they support the theory that investing in education and in research and development at a national level is associated with economic growth, increasing the supply and quality of human capital available in the economy. This is gained through the transfer of knowledge and innovation opportunities HE provides, resulting in productivity increases, technological advancements, spin-out companies from graduates and staff, and patents and licences being developed. Together these advances, enabled by the transfer of skills and knowledge, can increase GDP growth.

Universities are a major source of research and development and they transfer knowledge to both the public and private sector. Their research is often in areas where it will have a long-term impact and returns for the economy. Businesses which engage with universities on research and development activities can expect to see an increase in their productivity and a net gain on their business performance.

\(^3\) World Bank (2020), World Development Indicators
\(^4\) OECD (2019) Education at a Glance
\(^5\) BiGGAR Economics (2020), Universities in Advanced Economies: Recovery and Transformation, Productivity Growth and Fiscal Returns, for Universities Scotland
\(^6\) USA, Canada, South Korea, Australia, United Kingdom, Finland, New Zealand, Austria, Netherlands, Norway, Sweden, France, Belgium, Japan, Portugal, Iceland, Spain, Germany and Italy.
World Bank and OECD data show that spending on higher education across advanced economies is positively associated with a country’s economic performance.

Countries which spend more on education are associated with higher rates of economic growth and better labour market outcomes. This empirical evidence is in line with what is suggested by economic theory.

3.4 Purposeful and Operational Impacts

The contributions associated with the Udice Universities can be grouped into two main categories: purposeful and operational impacts.

3.4.1 Purposeful Impacts

Purposeful impacts are associated with the nature of the activity undertaken by the Universities and reflect outcomes designed specifically to drive innovation and productivity growth within the economy. In a sense they measure the wider value the Universities bring rather than record their impact as large employers with a significant supply chain. In this way, the following impacts can be thought of as purposeful:

- **the learning impacts** delivered by the Universities through their graduates who contribute to the productivity of the economy as a result of the skills and experience they gain during their time at university, from the internships they arrange and from the professional education and training they deliver; and
- **the valorisation activities** undertaken by the Udice Universities through licensing their intellectual property, by conducting industrial research and development, by supporting innovation and businesses creation and by influencing the growth of science parks.

3.4.2 Operational Impacts

Operational impacts result from the existence of any large organisation with a significant staff complement, an extensive supply chain and a large consumer base. These types of impacts occur regardless of the nature of the business or organisation and for this reason are thought of as operational impacts. In the case of the Udice Universities these include:

- the core operational effects of the Udice Universities, including the people they employ, their expenditure and that of their employees on goods and services and their expenditure on physical capital and research infrastructure;
- the effects generated by students at the member organisations including the impact of student expenditure on the economy and the contribution that
students make to the local economies in which they live by working or undertaking voluntary activity during the course of their studies; and

- the contribution to the tourism sector made by visitors to staff and students at the Udice Universities.

The division between purposeful and operational impacts is illustrated in Figure 3-2 which shows the split is not always clear-cut. For example, some tourism impacts are associated with conferences and events which are directly related to core areas of research or knowledge exchange activity. Similarly, students who decide to volunteer often do so independently of the universities, but their ability to do so may rest on skills or knowledge gained during their work or studies. The impact of capital spending also creates a purposeful impact in creating new facilities, however it only happens to support the core activity.

In reality these crossover areas are relatively small impacts, representing only around 2% of the total impact generated by the Universities. They have been included in the totals for both purposeful and operation benefits throughout our report, therefore the two groups sum to more than 100%.

**Figure 3-2: Purposeful and Operational Impacts**

![Purposeful and Operational Impacts Diagram]

Source: BiGGAR Economics

The distinction between purposeful and operational impact is a useful framework for analysing the impacts to reflect more insightfully the Universities true contribution to economic development. It has been used throughout this and the individual members reports to summarise and describe the impacts they create.
3.5 Universities and the Economy

The Udice Universities drive research and knowledge in their respective fields, finding and disseminating solutions to identified national and global issues.

As major drivers of knowledge exchange and innovation, the members of Udice are fundamental to regional and national economic growth and beyond since it is productivity growth that drives economic growth and productivity growth is, in turn, driven by knowledge and innovation. This puts the role of universities at the centre of French economic development policy and practice.

The growth of advanced economies is associated with a role for universities as providers of the intellectual and human capital required for a successful modern economy.
Learning Impact

This section explains the impact created from learning facilitated by the Udice Universities. It comes from the earnings premium realised by their graduates, the student internships they provide and the professional development education they deliver.

The learning impact is a key purposeful benefit created by the Udice Universities. It has three elements, each of which are explained and measured in this section:

- graduate premium;
- student internships; and
- continuing education.

4.1 Graduate Premium

By completing studies at university, graduates acquire skills which make them more productive than they would otherwise have been. There are two elements to the premium this creates: one that accrues to each graduate personally and one that accrues to the companies they work for whose profitability is improved by using the graduate’s skills.

Over their lifetimes, graduates are also more likely to be employed than those without a university education. Therefore, the decision to go to university not only means that graduates are more productive when they are employed, but they are also more likely to be in employment than individuals who chose not to go to university. Although not quantified in this section, the increase in labour market participation by graduates is also an economic benefit to the economy.

It is not possible to accurately calculate the benefits to individual company profitability and national productivity from employing graduates, therefore the method used here reflects only the personal benefit to graduates from studying at university. As a result, it is an under-estimate of the total economic impact associated with increased graduate productivity.

The graduate premium is a well-researched subject. Information on graduate earnings is available from the OECD’s Education at a Glance data for 2019 and this can be used as a measure of the additional contribution graduates make to the French economy each year, taking account of their degree subject.
4.1.1 Estimating the Graduate Premium

Around 119,000 students graduate from the Udice Universities each year. Approximately 42% of graduates receive a Licence Classique degree (equivalent to an academic Bachelor’s degree), 44% receive a Master’s degree and 6% receive a Doctorate. The remaining 8% graduate with a Licence Professionelle (vocational Bachelor) qualification which provides professional integration in a specific field.

Figure 4-1: Graduates from Udice Universities by Type of Degree, 2019

Data provided by the Udice Universities indicate that, of their French students, around 99% of Licence graduates, 94% of Master’s graduates and 78% of Doctorates remain in France after graduation. For non-French students the equivalent rates are slightly lower with 95% of Licence graduates, 82% of Master’s graduates and 51% of Doctorates remaining in the country after completing their studies.

As well as the level of qualification attained, the subject a student graduates in can determine the earnings premium they can expect to generate over the course of their working lives. Typically, graduates in STEM subjects earn the largest premium. Data on this topic is available from the OECD’s Education at a Glance study, published in 2019. This shows the average premium for a graduate whose highest qualification is a Licence Classique is € 124,000 and for a Master’s it is € 165,000.

The premium associated with different degree subjects and the number of graduates in each group from the Udice Universities in 2019 are shown in Table 4-1.
### Table 4-1: Udice Universities - Earnings Premium and Number of Graduates

<table>
<thead>
<tr>
<th>Degree Subject</th>
<th>Earnings Premium at Licence Classique Level (€)</th>
<th>Earnings Premium at Master’s Level (€)</th>
<th>No. Graduates (all levels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher training &amp; education science</td>
<td>112,000</td>
<td>149,000</td>
<td>3,500</td>
</tr>
<tr>
<td>Humanities, languages and arts</td>
<td>100,000</td>
<td>134,000</td>
<td>15,500</td>
</tr>
<tr>
<td>Social sciences, business and law</td>
<td>127,000</td>
<td>170,000</td>
<td>40,600</td>
</tr>
<tr>
<td>Science, maths and computing</td>
<td>135,000</td>
<td>180,000</td>
<td>36,400</td>
</tr>
<tr>
<td>Engineering, manufacturing, construction</td>
<td>147,000</td>
<td>196,000</td>
<td>7,000</td>
</tr>
<tr>
<td>Health and welfare</td>
<td>124,000</td>
<td>165,000</td>
<td>15,700</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>124,000</strong></td>
<td><strong>165,000</strong></td>
<td><strong>118,700</strong></td>
</tr>
</tbody>
</table>

Source: OECD Education at a Glance 2019 and Udice Universities

To estimate the graduate premium, the number of students achieving each degree (by level) was multiplied by that subject’s graduate premium (by level). The proportions of graduates who leave France on completion of their studies were then removed from the total. The impact of this additional premium on the economy was calculated using appropriate multipliers.

In this way, it was estimated that the impact of the lifetime earnings premium associated with an annual cohort of graduates from the Udice Universities is € 9.3 billion GVA in France and € 9.7 billion GVA globally. This impact is a productivity gain measured in terms of GVA, consequently it does not have an associated employment impact.

### Table 4-2: Udice Universities - Graduate Premium Impact

<table>
<thead>
<tr>
<th>GVA (€ billion)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Premium</td>
<td>9.3</td>
<td>9.7</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis

### 4.2 Student Internships

Over the course of a year, 72,200 internships take place for students at the Udice Universities and their partner NGOs that relate to their field of study. These create an impact on the wider economy through the contribution they make to the host organisations they are placed with. As well as providing students with opportunities to learn and apply their knowledge, it also helps them to gain valuable work experience, improving their employability after they graduate.
Businesses also benefit from student internships through:

- the work they undertake which helps businesses to implement new procedures or carry out specific projects by freeing up staff time and providing additional capacity;
- the fresh perspective students bring which can stimulate organisations to work in a different way, creating changes which may be difficult to achieve otherwise;
- the new experiences and skills the interns introduce to existing staff; and
- the deeper relationships they facilitate between the host organisations and the academic sector.

The value of an internship depends on several factors including its duration, the skills of the intern and the nature of the work. In this case, the value has been estimated based on the amount of time the students spend with the business or host organisation. Although the duration varies by University and by course, for this analysis, only internships of 12 weeks or longer were considered. Shorter placements were assumed to be observational and would not lead to a change in the hosts’ capacity to deliver its goods or services.

Finally, it was assumed that internship students are less productive than full-time employees because they have less experience and require more supervision. Therefore, they are assumed to contribute one-half of the GVA achieved by an average worker in the same industry. Using these core assumptions and applying appropriate multipliers to capture the indirect effect, the student internships organised by the Udice Universities contribute an estimated €1.6 billion GVA to the national economy and support 19,700 jobs.

### Table 4-3: Udice Universities - Student Internships Impact

<table>
<thead>
<tr>
<th>GVA (€ billion)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA (€ billion)</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobs</td>
<td>19,700</td>
<td>24,300</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis

### 4.3 Continuing Education

Continuing education is professional training designed to help working people develop new skills or update the existing skills they use. The Udice Universities and their partner NROs receive an income of €105 million from this source each year.
Businesses and organisations invest in continuing education because they expect it to generate positive returns. In the UK, a study for the government’s Department of Business, Enterprise and Regulatory Reform (DBERR)\(^7\) considered the impact of Regional Development Agency spending on businesses. One aspect considered was the GVA returns to business development and competitiveness interventions between 2002 and 2007. It found that interventions in science, research and development and innovation infrastructure had achieved a cumulative GVA impact equivalent to 340% of the cost of the projects. This increased to 870% when long-term benefits were considered.

This means that every € 1 spent on continuing education would generate € 3.40 GVA in direct economic benefit to businesses. Although the source relates to a UK study, the nature of this type of support is considered to be equally relevant to France, therefore, it is appropriate to use the same multiplier in this situation.

**Table 4-4: Udice Universities - Continuing Education Assumptions**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total income in 2019 from continuing education courses</td>
<td>€ 105 million</td>
</tr>
<tr>
<td>Return to GVA from investment in continuing education</td>
<td>340%</td>
</tr>
<tr>
<td>% of attendees from France</td>
<td>58%</td>
</tr>
</tbody>
</table>

Source: Udice Universities and PriceWaterhouseCoopers

Applying this rate of return to the total income received by the Udice Universities and their partner NROs and taking account of appropriate multipliers to capture the effect of subsequent spending rounds, it is estimated that the continuing education delivered by the Udice Universities contributes € 0.8 billion GVA to the national economy and supports 900 jobs each year.

**Table 4-5: Udice Universities - Continuing Education Impact**

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA (€ billion)</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobs</td>
<td>900</td>
<td>1,300</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis

---

\(^7\) PriceWaterhouseCoopers, Impact of RDA spending – National report – Volume 1 – Main Report, March 2009, DBERR
4.4 Summary Learning Impact

The learning impact created by the Udice Universities supports €11.7 billion GVA and 20,600 jobs across France each year. This includes the lifetime earnings premium received by the annual cohort of graduates, the internships that take place and the continuing education the Udice Universities deliver.

Table 4-6 Udice Universities – Summary Learning Impact

<table>
<thead>
<tr>
<th>GVA (£ billion)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Premium</td>
<td>9.3</td>
<td>9.7</td>
</tr>
<tr>
<td>Student Internships</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Continuing Education</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11.7</strong></td>
<td><strong>12.8</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Premium</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Student Internships</td>
<td>19,800</td>
<td>24,300</td>
</tr>
<tr>
<td>Continuing Education</td>
<td>900</td>
<td>1,300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20,600</strong></td>
<td><strong>25,600</strong></td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis (Note: Figures may not sum due to rounding)
5. 

Valorisation Impact

This section summarises the combined impact of valorisation activity associated with the Udice Universities and their partner NROs.

Impacts from valorisation activity can be considered as purposeful benefits from universities as they are created specifically to drive innovation and productivity growth within the economy. These include:

- licensing and technology;
- Industrial research and development;
- spin outs and start-ups; and
- science parks and incubators.

Each of these impacts are described and measured in this section.

5.1 Licensing and Technology

One of the ways in which academic research is translated into economic activity is through licensing agreements with industry. These give companies the legal right to use technology or intellectual property developed at the Universities or their partner NROs, to generate additional sales, reduce costs or otherwise improve productivity. In return, companies pay royalties to the Universities or their partner NROs. Around €10.9 million is received by the Udice Universities and their partner NROs in royalties over the course of a year and 72% of the licence holders are based in France.

Table 5-1: Licensing Income, Udice Universities

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total licensing income in 2019, € million</td>
<td>10.9</td>
</tr>
<tr>
<td>% of income from clients based in France</td>
<td>72%</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis

The relationship between the royalty paid for a technology and the turnover it generates for licensees depends on the details of individual licensing agreements, which can vary considerably. To agree on a licensing deal, negotiators form a view of how much the intellectual property is worth to the prospective licensee. This is often guided by the ‘25% rule’ which is based on an empirical study by the late Robert Goldscheider, first undertaken in the 1950s and updated in 2002⁸. The study found that royalty rates were typically around 25% of the licensee’s profits which represent around 5% of total turnover generated by licensed technology.

---

By applying the 5% rate based on the Goldscheider analysis, it is possible to estimate the increased turnover the licensed technologies generate. This figure has been converted into GVA and employment impacts by applying appropriate ratios and calculating multiplier effects.

In this way, it is estimated that the Udice Universities and their partner NROs generate €147 million GVA and support 1,600 jobs in France through their licensing activities.

Table 5-2: Udice Universities - Licensing Impact

<table>
<thead>
<tr>
<th>GVA (€ million)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>(€ million)</td>
<td>147</td>
<td>232</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jobs</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis

5.2 Industrial Research and Development

The Universities and their partner NROs facilitate knowledge transfer through their research activity and their interactions with businesses. This includes:

- consultancy work for businesses or public organisations to address identified issues;
- commissioned research;
- public sector supported industrial research; and
- access to facilities and equipment at the University or NRO.

During the course of a year, these services generate an income of €347 million for the Udice Universities and their partner NROs. A breakdown of income by source is given in Figure 5-1.
Businesses and public organisations expect this type of investment to generate positive returns, either by increasing staff productivity, by developing new products, services and processes or by improving existing products, services and processes.

Often, it can take several years to produce tangible results from academic engagement. For example, in 2012, Danish consultancy DAMVAD⁹ conducted a study on the economic impact realised by companies collaborating with the University of Copenhagen and the results showed that impacts are realised gradually. Six years after the collaboration, companies that had engaged with the university on research and development projects were 15.8% more productive than those that had not.

The value organisations gain from research collaborations will vary between projects, based on the type of work done, the stage in the development process the project relates to and the capacity of companies or organisations to absorb the results from the collaboration. Since detailed information on the returns achieved for individual projects is not available, it has been necessary to estimate what the value would be to a company or organisation based on typical returns from this type of academic interaction.

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⁹ DAMVAD (2012), Measuring the Economic Effects of Companies Collaborating with the University of Copenhagen.
The 340% assumption used in section 4.3 for calculating the impact on business turnover from investing in continuing education can equally be applied in this case\(^\text{10}\) since research and consultancy interactions with the Udice Universities and their partner NROs are similar in nature to those measured by the DBERR study. This is a cautious approach and may well underestimate the real impact of these interactions.

The sectoral and geographic split of the companies engaging with the Universities were estimated based on data provided. These have been converted into GVA and employment impacts by applying appropriate ratios and calculating multiplier effects. In this way, it is estimated that the Udice Universities and their partner NROs generate €2.3 billion GVA and support 3,800 jobs in France by providing research and consultancy services to businesses and public organisations.

Table 5-3: Udice Universities – Industrial Research and Development Impact

<table>
<thead>
<tr>
<th>GVA (€ billion)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA (€ billion)</td>
<td>2.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jobs</td>
<td>3,800</td>
<td>5,900</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis

5.3 Spin-Outs and Start-Ups

Spin-out companies are set up to commercialise a University’s intellectual property and typically they are established by staff or students from a university or partner NRO. The Udice Universities and their partner NROs have:

- 374 active spin-out companies in which they have a share; and
- 296 active start-up companies associated with staff and students.

All spin-out companies created prior to 2019 that continue to be active at the time of the analysis have been counted in this total. Based on data provided, they employed 13,400 staff and their combined annual turnover is estimated at €1.3 billion.

The total GVA and employment impact they create reflects their own employment and income, plus the impact of their staff spending and the impact they generate throughout their supply chains. This is calculated based on the appropriate ratios and multipliers for the sectors they each operate in. By applying these factors, it is estimated that the spin-out and start-up companies associated with the Udice Universities and their partner NROs generate €2.0 billion GVA and support 27,300 jobs in France.

\(^{10}\) PriceWaterhouseCoopers, Impact of RDA spending – National report – Volume 1 – Main Report, March 2009, DBERR
Table 5-4: Udice Universities – Spin-Outs and Start-Ups Impact

<table>
<thead>
<tr>
<th>GVA (€ billion)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA (€ billion)</td>
<td>2.0</td>
<td>3.3</td>
</tr>
</tbody>
</table>

| Employment | |
|------------|--------|--------|
| Jobs       | 27,300 | 44,900 |

Source: BiGGAR Economics Analysis

5.4 Science Parks and Incubators

Universities make important contributions to creating and developing Science Parks which draw companies in through their reputation and deliver benefits by supporting knowledge exchange, assisting with staff recruitment, and enabling face to face contact with academics involved in research. There are several science parks and incubator facilities associated with the 10 members of Udice.

In some cases, they have been privately financed and in others they have been established directly by one of the universities.

Having a physical environment in which academic researchers work with the private sector to exchange ideas can help to stimulate new developments and facilitate opportunities for collaborative research. The overall aim is to create optimum conditions for innovation between companies and academic researchers and to attract inward investment.

Ultimately, part of the success of science parks and incubators is due to the academic partners involved. Without them, they would simply be a collection of businesses with little incentive or stimulus to collaborate. Science parks generate economic benefits by increasing the level of economic activity as well as attracting more companies to the area. For these reasons, it is appropriate to include their value within an assessment of university economic impact.

Data provided by the Udice Universities suggests there are 14,360 employees at the science park and incubator facilities associated with their Universities that have not been considered elsewhere in this study. Based on this level of employment, it is estimated that companies on the science parks and in the incubators generate a turnover of €1.7 billion. Almost all of the Udice Universities is associated with science parks and incubators and this includes the very large science parks associated with Université Côte d’Azur.

Unlike spin-off companies, most of these businesses would exist even if the science parks did not, meaning that it would not be appropriate to attribute all of the economic impact of the businesses to the Universities.
If the science parks did not exist, it is likely that some of the businesses would have chosen to locate elsewhere in France, Europe or elsewhere in the world. It is also likely that colocation with a Udice University or partner NRO has enabled many of these businesses to achieve higher levels of growth than would otherwise have been possible.

In assessing the economic contribution of science parks and incubators, it was necessary to consider both of these factors and come to a view about the extent to which this impact is additional. These assumptions are discussed in further detail in the methodological appendix. Having accounted for the additionality of this impact, the economic contribution of the science parks and incubators was estimated using a similar approach to the spin-outs and start-ups contribution.

The total GVA and employment impact they create reflects their own employment and income, plus the impact of their staff spending and the impact they generate throughout their supply chains. This is calculated based on the appropriate ratios and multipliers for the sectors they operate in. By applying these factors, it is estimated that the involvement of the Udice Universities in science parks and incubators generates €831 million GVA and supports 11,500 jobs in France.

### 5.5 Summary Valorisation Impact

Taken together, the Udice Universities and their partner NROs create a valorisation impact of €5.3 billion GVA and support 44,200 jobs in France. At a global level this impact is €7.4 billion GVA and 60,000 jobs.

**Table 5-5 Udice Universities – Summary Valorisation Impact**

<table>
<thead>
<tr>
<th></th>
<th>GVA (€ billion)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing and Technology</td>
<td>0.1</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Industrial Research and Development</td>
<td>2.3</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Spin-Outs and Start-Ups</td>
<td>2.0</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Science Parks and Incubators</td>
<td>0.8</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5.3</strong></td>
<td><strong>7.4</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Employment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing and Technology</td>
<td>1,600</td>
<td>2,500</td>
<td></td>
</tr>
<tr>
<td>Industrial Research and Development</td>
<td>3,800</td>
<td>5,900</td>
<td></td>
</tr>
<tr>
<td>Spin-Outs and Start-Ups</td>
<td>27,300</td>
<td>44,900</td>
<td></td>
</tr>
<tr>
<td>Science Parks and Incubators</td>
<td>11,500</td>
<td>6,700</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44,200</strong></td>
<td><strong>60,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis (Note: Figures may not sum due to rounding)
6. Transformation and Legacy Impact

This section reflects on the wider impacts the Udice Universities have created, reaching beyond their quantitative influence to drive the transformation of higher education across Europe, to build the fabric of individuals and communities and to protect the cornerstones that are essential for current and future economic and social well-being.

Universities in general are good for economic and social well-being and large research universities, such as those represented by Udice, that actively engage in research, knowledge exchange and outreach are major drivers of economic and social development. They help to shape and transform individuals and economies, leaving behind a lasting, positive impact for future generations. Several features of the Udice Universities highlight this important role:

- nine of the ten members are IdEx institutions, part of a new generation of French universities actively expanding their research capacity and promoting wider integration on education and research;
- their membership of the European Universities Initiative which will create opportunities for staff and students to benefit from closer integration in higher education across Europe;
- their impact goes beyond traditional measures of economic value by contributing to personal development, community cohesion, the environment and health improvements: the things that count towards well-being in the OECD’s Better Life Index; and
- they underpin the ability of the economy to recover from the global COVID-19 pandemic, building economic resilience and creating a sustainable and inclusive economic future.

Universities also create a legacy impact through their alumni networks which can help to shape their future direction and impact positively on students. Feedback from the Udice Universities suggests there are over 250,000 alumni associated with three members and that alumni networks are being developed further by the Universities.
6.1 Initiatives of Excellence (IdEx)

Nine of the ten Udice Universities are IdEx confirmed and actively engaged in programmes to expand research capacity and facilities, support knowledge transfer, promote international relationships, foster regional cohesion and develop the student experience. As such, they are at the centre of university transformation in France. Around €844 million has been received by the Udice Universities\(^\text{11}\) to date under the IdEx programme which has helped to lever in €1.2 billion in further funding commitments from external partners.

Historically, French universities have suffered in international university rankings due to the structure of the country’s higher education system and its division between public universities, grandes écoles and national research organisations (NROs). As a result, the rankings do not reflect the country’s strong academic reputation in the field of, for example, world-class engineering, economics and mathematics. Furthermore, companies in France (both national and foreign) largely fail to use the universities as strategic partners and are less likely to invest in research than companies in other countries. Added to this, French universities tend to have less autonomy than other countries due to their funding and governance arrangements which are thought to curtail innovation\(^\text{12}\).

Nine of the ten Udice Universities hold the prestigious IdEx award, making them part of a new generation of French universities that compete on a world stage.

Against this background, IdEx, an ambitious programme of reform, was introduced in 2010 with the aim of creating a step change in the performance of French higher education in the global knowledge and education marketplace. With applications judged by an international jury, receiving the IdEx label reinforces a university’s commitment to develop and promote innovation and excellence in key areas such as education, teaching methods, themed scientific research, support for research projects, synergies with other institutions, knowledge transfer with industry, international relationships and visibility, the student experience and cultural life.

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\(^{11}\) Eight of the ten Universities provided data, therefore this figure is an underestimate.


Economic Contribution of Udice Universities
The IdEx award is a prestigious achievement, so far received by only 12 of the 78 universities in France. It gives an incentive for universities to drive forward collaborative research strategies and has extended the role of the NROs, making them more active in supporting regional research strategies instigated by the IdEx universities.

The long-term goal of the IdEx programme is to create universities that are capable of competing with their foreign counterparts at an international level in terms of visibility, attractiveness, impact on globally scientific challenges, research, innovation and social direction. The ARWU (Shanghai) Rankings for 2020 suggest the policy is beginning to work with the recently established Université Paris-Saclay entering the rankings in 14th place globally and 3rd place in Europe after Cambridge and Oxford13.

6.2 EU European Universities Initiative

The European Universities Initiative was launched by the European Commission in 2019 and is a flagship project designed to build a European Education Area. France has the largest membership of all EU member states and all ten Udice Universities are also members of alliances formed through the Initiative.

European Universities are transnational alliances of higher education institutions from across the EU that are joining together to benefit students, teachers and society. They aim to become the universities of the future, promoting European values and identity, and revolutionising the quality, attractiveness and competitiveness of European higher education.

They were designed to bring together a new generation of creative Europeans, able to cooperate across languages, borders and disciplines to address societal challenges and skills shortages in Europe. By building alliances, the Initiative offers freedom for students to study across Europe, as well as creating benefits for teachers and researchers who can pool their knowledge and resources to best effect. The benefits of research findings can be shared with a wider audience through enhanced public engagement, supported through programmes such as such as Science with and for Society (Swafs), part of the EU’s Horizon 2020 Programme to produce world-class science and make it easier for the public and private sectors to work together in delivering innovation.

The 41 alliances that currently exist have been formed in two stages, one in 2019 and one in 2020. Each alliance receives up to €5 million from the Erasmus+ programme and up to €2 million from the Horizon 2020 programme for three years to start implementing their plans and pave the way for other higher education institutions across the EU to follow14. In total, a budget of up to €287 million is available for all alliances.

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13 The Economist, 29th August 2020, Saclay Sacré: How France Created a University to Rival MIT.
14 EU, 9 July 2020, 24 new European Universities reinforce the European Education Area, press release
The Udice Universities that are part of European Universities alliance are connected with 57 other universities from 25 countries across Europe and have the potential to benefit well in excess of 1 million students\(^\text{15}\).

Early feedback given to the European Commission from the alliances formed in 2019 shows that:

- 96% of the institutions that are part of an alliance think they would have been better prepared to face the coronavirus pandemic if their European University had been fully operational before March 2020 (most alliances were only 6-9 months old at this point); and
- more than 60% consider that being part of a European University has helped them to address the current difficulties linked to the crisis for example, by creating virtual inter-university campuses, offering joint blended courses and common teaching units integrated into the curricula of all the member universities.

### 6.3 Contribution to OECD Better Lives Outcomes

Countries around the world are recognising the need to measure economic performance in broader terms than GDP and employment. While these things matter, they also miss other valuable indicators which suggest real progress is being made both in the economy and in wider society to support current and future generations.

Measuring the well-being of people and the progress of societies is a key priority for the OECD, whose overarching mission is to promote "Better Policies for Better Lives"\(^\text{16}\). Following a decade of work, they created the Better Life Index in 2011 to address this issue\(^\text{17}\). It is a tool which allows comparison between countries on 11 dimensions of current well-being that make a better life in terms of:

- **Material living conditions** – housing, income and jobs; and
- **Quality of life** – community, education, environment, governance, health, life satisfaction, safety and work-life balance.

To provide resources for future well-being, the OECD’s Well-being Framework highlights the importance of **building and protecting the four capitals**: the natural, human, economic and social resources that are necessary to sustain and grow for future generations.

The Udice Universities and their partner NROs make significant contributions towards all of these aspects.

\(^{15}\) This is an underestimate as only 5 Udice Universities provided data on the number of students covered by their alliance.

\(^{16}\) OECD, 2020, *Better Life Initiative*

\(^{17}\) http://www.oecdbetterlifeindex.org/
6.3.1 Material Living Conditions

By providing, well-paid, high-quality, stable and fair employment, the Udice Universities have a significant impact on the material living conditions for staff and for those that depend on them for their main source of income.

They collectively support incomes for 74,000 people directly and many more indirectly throughout France. They are responsible employers with modern and progressive employment policies and, in many regions, they rank among the top employment options in the area.

6.3.2 Quality of Life

Beyond the impact they have on material living conditions, the experience of education they provide makes a highly significant contribution to the quality of life for a large number of people. Education is one of the clearest indicators of life outcomes such as employment, income and social status and is a strong predictor of attitudes and wellbeing.\(^{18}\)

A large body of literature exists which explores the wider benefits of learning and the complex relationship it has across all aspects of life and well-being. Within the framework of the European Lifelong Learning Indicators (ELLI) project, the Centre for the Wider Benefits of Learning at the University of London’s Institute of Education\(^ {19}\) reviewed more than 200 international studies and research projects on the effects of learning in all phases and areas of life. Their findings summarised the benefits of learning into five themes:

- **Learning and identity**: all forms of learning in various phases over the course of a lifetime impact on an individual’s self-confidence, self-esteem, resilience and the development of social skills;
- **Learning and health**: numerous studies have made clear the direct relationship between the duration and frequency of the learning processes in various phases of life and mental and physical well-being, health behaviour, life expectancy and other physical and mental health aspects;
- **Learning, life satisfaction and happiness**: there is a positive correlation between learning and happiness, well-being and personal optimism;
- **Learning and community vitality**: learning has a positive impact on social cohesiveness and community vitality through its influence on social mobility, active citizenship, social participation, tolerance and inter-cultural sensitivity. This theme also investigates the link between learning and lower levels of criminality; and
- **Learning spill-overs and interplays**: more complex reciprocal effects of learning and living processes. Positive learning experiences impact people’s future learning behaviour, followed by the complex relationships between learning and occupational prospects. In addition, there are multifaceted impacts of learning


on family situations. These include, for example, the influence of the educational and learning level of parents on the development of their children.

The message is that the benefits of undertaking a higher-level education extend well beyond the personal earnings premium. There is a much wider range of benefits to the individual, to the workplace and to society that are associated with higher education that cannot be measured in monetary terms but are, nonetheless, highly valuable. Education enhances the life satisfaction experienced by individuals and can underpin their wider impact on local communities.

6.3.3 Sustainability of the Four Capitals

In their Compendium of Well-being Indicators, the OECD draws attention to the importance of sustaining the four capitals of the socio-economic and natural systems which are critical to create a lasting well-being\(^{20}\). By investing in and protecting the four capitals, countries will generate well-being for current and future generations. The four capitals are:

- **Economic Capital** – the financial, intellectual and physical assets from applying human productive activities to natural capital, which are used to provide a flow of goods and services;
- **Natural Capital** – the world’s stock of natural assets which includes geology, soil, air, water and living things. Some of these are fixed assets and some are renewable;
- **Social Capital** – the networks together with shared norms, values and understandings that facilitate co-operation within or among groups; and
- **Human Capital** – the knowledge, skills, health and well-being that people accumulate throughout their lives.

The research work of the Udice Universities and their partner NROs makes highly important national and global contributions in the fields of medical discovery and human health as well as protecting the natural environment. Ultimately, this work leads to improvements in the life expectancy of individuals and populations and helps to address the fundamental global issues of our time such as climate change, green energy, global health and digital technology.

6.4 Universities and Economic Resilience

Universities are fundamentally important to advanced economies, driving innovation and, by extension, economic growth. Section 3.1 contains a discussion on this theme, explaining the multi-layered links between education and wider economic wellbeing.

The COVID-19 pandemic has delivered the greatest shock to the global economy in modern times and, in parallel, it has brought a rare opportunity to build back a better economic future for ourselves and for future generations. At the initiation of France and Germany, a historic EU-wide recovery plan worth € 750 billion has been agreed to

\(^{20}\) OECD Better Life Initiative, Compendium of OECD well-being indicators.
speed up the transformation of European societies by investing in a green transition, young people, modernisation of the healthcare system and job protection. In France, a national recovery plan worth €100 billion was announced in September 2020 with the aim of recovering the 2019 level of GDP by 2022.

In this context it is worth acknowledging that universities have a powerful, long-term role in strengthening economic resilience in a way which is sustainable, equitable and transformative. This view is supported by influential global policy makers who have identified investment in education and R&D as priorities for long-term fiscal recovery, which will also support the desired focus on a green transition that is a shared goal in most advanced economies.

The wealth of countries is distinct from the economic success of companies or individuals. While companies and individuals can keep rewards from extracting wealth from the economy, at a national level, the wealth of the country can only be based on wealth creation. This has been the case at least since the industrial revolution and will continue to be the case as the global economy recovers from COVID-19. The Nobel Prize winning economist, Joseph Stiglitz, describes the source of wealth creation:

“The true source of a country’s wealth – and therefore increases in productivity and living standards – is knowledge, learning, and advances in science and technology. It is this, far more than anything else, that explains why living standards today are so much higher than they were two hundred years ago – not only the increase in our material goods, but also the longer lifespans and better health throughout our lives.”  

Joseph Stiglitz

The transformative role universities can play in this context include:

- securing and providing high quality employment;
- providing the human and intellectual capital necessary for both economic recovery and transformation;
- driving innovation for new and existing businesses and public sectors;

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21 Minister for the Economy, Finance and the Recovery, 3rd September 23020, France Relance, Press Release


23 Stiglitz (2019), People, Power and Profit
- reducing and avoiding youth unemployment, in particular avoiding life-long scarring effects for those unemployed as a result of the pandemic;
- building the resilience of public services, including the health and care sectors;
- supporting the net zero challenge and the green recovery, helping to provide the intellectual and human capital on which it will be based;
- providing leadership in national and regional economies as well as in wider civic society; and
- rebuilding the tax base to help ensure a net positive fiscal return which will help to pay for the cost of government assistance.

Universities have a crucial role to play in any advanced economy and they are particularly important in a time of uncertainty and change, which is the environment we are all living in now and will continue to be in for some years to come. In order to be sustainable and resilient, economic recovery and transformation needs to be based on knowledge and innovation. The universities sector will be the primary source of the human and intellectual capital required to make this a reality. At a regional level, the Udice Universities give their regions an important degree of control over their own economic destinies.
7. Operational Impact

This section summarises the economic impact created by the central activities of Udice Universities through employing staff, buying in goods and services, making capital investments, and also by attracting students and visitors to the region.

Each Udice University is an anchor institution with a long-established presence in its region. Over time they have become major employers, generating significant impacts through the people they employ, the supply chains they support, the capital investments they make and by attracting a student community. The significant contribution this makes to the economy is quantified and described in this section.

All of these impacts are operational benefits as illustrated in Figure 3-2, however three impacts – capital spending, tourism and student volunteering - could be described as crossover benefits as they also have purposeful intentions.

7.1 Central Impact

The central impact is the economic contribution an organisation makes through its main activities. For the Udice Universities and their partner NROs this includes the:

- direct impact;
- supply spending impact; and
- staff spending impact.

7.1.1 Direct Impact

The direct impact is the value an organisation adds to the economy through its own operations. In the context of the Udice Universities and their partner NROs, this can be estimated as the difference between total income and total supply spending.

The organisations generate an annual income of €10.5 billion. Over the same period, they collectively spend €2.3 billion on goods and services and directly employ around 116,000 members of staff.

7.1.2 Supply Chain Impact

As large and complex organisations, university supply chains have an impact on the wider economy by increasing turnover and supporting employment with their suppliers.
Over the course of a year, the Udice Universities and their partner NROs spend around € 2.2 billion on goods and services and an estimated 85% of this figure is spent with suppliers based in France. This has been converted into GVA and employment impacts by applying appropriate ratios and calculating multiplier effects.

### 7.1.3 Employee Expenditure Impact

Staff who work for the Udice Universities and their partner NROs have an impact on the wider economy by spending their wages and salaries in the areas where they live.

It is estimated that the 116,000 staff employed receive around € 6.6 billion in salaries, wages and other staff costs each year. Almost all, (99%) of those working for the Udice Universities and their partner NROs live in France. This has been converted into GVA and employment impacts by applying appropriate ratios and calculating multiplier effects.

### 7.1.4 Summary Central Impact

Summing up the economic impact generated by central activities, it is estimated that the Udice Universities and their partner NROs support € 17.2 billion GVA and 212,500 jobs in France each year. Globally, they create an economic impact of € 18.2 billion GVA and 226,200 jobs through these activities. A summary of annual impact by source is provided in Table 7-1.

#### Table 7-1 Udice Universities – Summary Central Impact

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GVA (£ million)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Impact</td>
<td>8.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Supply Spending Impact</td>
<td>2.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Staff Spending Impact</td>
<td>6.6</td>
<td>7.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17.2</td>
<td>18.2</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Impact</td>
<td>116,000</td>
<td>116,000</td>
</tr>
<tr>
<td>Supply Spending Impact</td>
<td>27,500</td>
<td>32,200</td>
</tr>
<tr>
<td>Staff Spending Impact</td>
<td>69,000</td>
<td>78,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>212,500</td>
<td>226,200</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis (Note: Figures may not sum due to rounding)
7.2 Student Impact

This section discusses the economic impact of the day-to-day spending and working habits of students attending courses at the Udice Universities. The focus is on full-time students, as the spending patterns and labour market contribution of part-time students is mostly driven by their work rather than their study.

7.2.1 Student Community

In 2018/19, there were 486,600 full-time students enrolled at the Udice Universities on all higher education courses. The breakdown of students between the level of courses they are enrolled on is shown in Table 7-2.

Table 7-2: Udice Universities - Student Numbers

<table>
<thead>
<tr>
<th>Full-time Students</th>
<th>Licence</th>
<th>Master’s</th>
<th>Doctorate</th>
<th>Ingenieur</th>
<th>Medical Interns (after graduation)</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licence</td>
<td>252,300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master’s</td>
<td>131,700</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctorate</td>
<td>30,800</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ingenieur</td>
<td>14,300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Interns (after graduation)</td>
<td>29,100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>28,400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>486,600</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis. NOTE: Figures may not sum due to rounding.

7.2.2 Student Spending

Student spending is estimated based on:

- where they live – data from Observatoire National de la vie eudiante suggests that around 68% of students live in rented accommodation either at the Universities or in the private sector. The remainder live with parents or guardians; and
- spending patterns – which are estimated by Eurostudent data.
Table 7-3 – Monthly Student Expenditure (€s)

<table>
<thead>
<tr>
<th></th>
<th>Living with Parents</th>
<th>Not Living with Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>-</td>
<td>403</td>
</tr>
<tr>
<td>Childcare</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Daily living (clothing, food, etc)</td>
<td>78</td>
<td>150</td>
</tr>
<tr>
<td>Other regular expenses</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>Social and leisure</td>
<td>82</td>
<td>77</td>
</tr>
<tr>
<td>Transport</td>
<td>64</td>
<td>50</td>
</tr>
<tr>
<td>Health and care</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>265</td>
<td>720</td>
</tr>
</tbody>
</table>

Source: Eurostudent. NOTE: Figures may not sum due to rounding.

Collectively, the annual expenditure on living costs and rent for all full-time students at the Udice Universities amounts to € 3.8 billion. This has been converted into GVA and employment impacts by applying appropriate ratios and calculating multiplier effects.

### 7.2.3 Student Working

Students have an impact on the economy by working part-time to support their studies. Often these jobs are in the hospitality and retail sectors, providing the additional labour some businesses require to support their economic activity. Several Udice Universities provided estimates of the proportion of their students who worked part-time. Where no estimate was provided, an assumption of 46% was used based on a national study of student working patterns in France\(^24\). Not all of these jobs will be additional as some may displace employment from non-students and the rate of additionality has been adjusted according to the prevailing rate of youth unemployment in each area.

Based on the Observatoire National de la vie erudiante data, it is further assumed that students in part-time jobs work for 13 hours per week on average. The impact of their collective working activity has been converted into GVA and employment impacts by applying appropriate ratios and calculating multiplier effects.

### 7.2.4 Summary Student Impact

The student communities at the Udice Universities, are estimated to contribute € 6.0 billion GVA and support 76,100 jobs in France each year.

\(^{24}\) Source: Observatoire National de la vie erudiante, Repres 2016 p25
Table 7-4 Udice Universities - Summary Student Community Impact

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>GVA (£ million)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Spending Impact</td>
<td>3.7</td>
<td>3.8</td>
</tr>
<tr>
<td>Student Part-Time Work Impact</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>6.0</td>
<td>6.4</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Spending Impact</td>
<td>39,300</td>
<td>42,000</td>
</tr>
<tr>
<td>Student Part-Time Work Impact</td>
<td>36,800</td>
<td>39,100</td>
</tr>
<tr>
<td>Total</td>
<td>76,100</td>
<td>81,100</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis (Note: Figures may not sum due to rounding)

7.3 Crossover Impacts

The following three impacts are considered to be crossover impacts as they create both operational and purposeful benefits: they depend on the core but they are purposeful in their intentions. For this reason, their impact has also been added to the purposeful benefits total, however they have been included only once in the overall grand total impact for the Universities and their partner NROs. Together they account for 2% of the total impact created in France.

7.3.1 Capital Spending Impact

Capital investments made by Udice Universities and their partner NROs have an impact on the construction sector and others that supply capital equipment. As capital spending fluctuates from year to year, an average value was derived based on actual capital spending for the past five years (2015 – 2019) and forecast capital spending over the coming five years (2020 – 2024).

By this method it is estimated that, in an average year, the Udice Universities and their partner NROs invest around € 434 million on capital projects, including buildings, machinery and IT infrastructure. Around 81% of capital spending benefits businesses in France. This has been converted into GVA and employment impacts by applying appropriate ratios and calculating multiplier effects.

By this method, capital expenditure by the Udice Universities is estimated to create an impact of € 568 million GVA and support 6,900 jobs in France each year.

7.3.2 Tourism Impact

The Udice Universities and their partner NROs draw people to their areas to visit their students and staff and to attend conferences and events.
Friends and relatives who visit staff and students at the Universities and their partner NROs make an economic contribution by going to areas they would not normally have visited. In this sense, their expenditure is additional to the area and would not have happened without the universities.

Conferences, events and graduations hosted by the Udice Universities also generate short-term economic impacts by drawing visitors to the area. It is estimated that more than 500,000 visitors attend conferences and events organised by the Udice Universities each year.

The economic impact associated with tourism-related activities stimulated by the Udice Universities and their partner NROs support €238 million GVA and 3,200 jobs across France each year.

7.3.3 Student Volunteering

Students contribute to the output of voluntary and educational organisations by providing their time and skills for free, enabling charities and other third sector organisations to undertake activities they might not otherwise be able to do. Based on the evidence from a study by GHK on Volunteering in the European Union25, estimated 24% of students take part in volunteering activities and each volunteer spends around 86 hours volunteering each year. As with part-time work, it was assumed that students volunteered in the areas where they lived. This has been converted into GVA and employment impacts by applying appropriate ratios and calculating multiplier effects. It is estimated that student volunteering supports €82 million GVA across France each year.

7.3.4 Summary Crossover Impacts

The crossover impacts that could be considered to generate both operational and purposeful impacts support €887 million GVA and 10,100 jobs across France.

---

### Table 7-5 Udice Universities - Summary Crossover Impacts

<table>
<thead>
<tr>
<th>GVA (€ million)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Impact</td>
<td>568</td>
<td>734</td>
</tr>
<tr>
<td>Tourism Impact</td>
<td>236</td>
<td>167</td>
</tr>
<tr>
<td>Student Volunteering</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>887</td>
<td>982</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Impact</td>
<td>6,900</td>
<td>8,500</td>
</tr>
<tr>
<td>Tourism Impact</td>
<td>3,200</td>
<td>2,200</td>
</tr>
<tr>
<td>Student Volunteering</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>10,100</td>
<td>10,700</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis (Note: Figures may not sum due to rounding)

### 7.4 Operational Impact Summary

The collective operational impact of the Udice Universities and their partner NROs is summarised in Table 7-6. It is estimated that they generate €24.1 billion GVA and support 298,700 jobs in France over the course of a year from operational activities.

### Table 7-6 Udice Universities – Summary Operational Impact

<table>
<thead>
<tr>
<th>GVA (€ billion)</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Impact</td>
<td>17.2</td>
<td>18.2</td>
</tr>
<tr>
<td>Student Impact</td>
<td>6.0</td>
<td>6.4</td>
</tr>
<tr>
<td>Crossover Impacts</td>
<td>0.9</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>24.1</td>
<td>25.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Impact</td>
<td>212,500</td>
<td>226,200</td>
</tr>
<tr>
<td>Student Impact</td>
<td>76,100</td>
<td>81,100</td>
</tr>
<tr>
<td>Crossover Impacts</td>
<td>10,100</td>
<td>10,700</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>298,700</td>
<td>318,000</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis (Note: Figures may not sum due to rounding.)

---

26 This figure includes crossover impacts from capital spending, tourism and student volunteering which amount to €821 million, or 2% of the total economic contribution created in France from all sources.
8. Fiscal Impact

The economic activity that is generated by Udice Universities and their NRO partners will generate tax revenue for the public sector in France, across local and national governments.

8.1 Approach

The economy of France has a high level of government income and expenditure. Taxes are collected from economic activities and in 2018 the tax to GDP ratio for France was 46.1%, the highest of all OECD countries\(^{27}\). The economic activity stimulated by each university will also generate tax revenues for the public sector in France, for example:

- the staff costs paid to employees of the Udice Universities and their partner NROs would also include social security payments and income taxes;
- the staff and student spending would also include VAT on products and services purchased;
- the companies in the supply chain and those that benefited from staff and student spending would also be liable to corporation tax, in addition to paying employment taxes including social security contributions;
- the companies that the Udice Universities support and establish will also be liable for corporation taxes, and payroll taxes associated with their staff; and
- the graduates of Udice Universities will pay a greater level of income taxes and generate higher social security contributions as their productivity and income increases.

The analysis of fiscal impacts focused on the types of economic activity generated by the Udice Universities and the relationship between the activity and different categories of taxation. The categories of taxation considered were:

- taxes on income, profits and capital gains;
- social security contributions;
- payroll taxes;
- taxes on property;
- taxes on goods and services; and
- other.

\(^{27}\) OECD (2019) Revenue Statistics 2019: Tax revenue trends in the OECD. Note that the average across the OECD was 34.2%.
The OECD provides data on the equivalent value share of GDP for each type of taxation. This was adjusted to the equivalent value share of GVA by considering the difference between GVA and GDP, namely taxes and subsidies on production. The resulting values for each tax as a share of GVA are provided in Table 8-1.

Table 8-1: Taxes by Type, as share of GVA

<table>
<thead>
<tr>
<th>Taxes on income, profits and capital gains</th>
<th>12%</th>
</tr>
</thead>
<tbody>
<tr>
<td>...of which personal income, profits and gains</td>
<td>10%</td>
</tr>
<tr>
<td>...of which corporate income and gains</td>
<td>3%</td>
</tr>
<tr>
<td>Social security contributions</td>
<td>19%</td>
</tr>
<tr>
<td>Payroll taxes</td>
<td>2%</td>
</tr>
<tr>
<td>Taxes on property</td>
<td>5%</td>
</tr>
<tr>
<td>Taxes on goods and services</td>
<td>13%</td>
</tr>
<tr>
<td>...of which VAT</td>
<td>8%</td>
</tr>
<tr>
<td>...of which other taxes on goods and services</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51%</strong></td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis. NOTE: Figures may not sum due to rounding and the inclusion of subtotals.

Consideration was then given to how these categories of taxation related to the economic activities considered in the analysis. For example, the Udice Universities are non-profit making organisations and therefore would not have been liable for corporation taxes. Similarly, the earnings premium of graduates is a measure of income and therefore the taxes applied to these were those associated with an individual’s earnings, including income taxes and social security contributions.

### 8.2 Fiscal Contributions

The analysis found that, the economic activity generated by the Udice Universities stimulates an estimated € 20.8 billion in taxation revenue in France. This is equivalent to more than half of the GVA generated by the Udice Universities and greater than the equivalent average ratio in France. The economic activity stimulated by the Udice Universities results in a greater share of tax revenues because the income of graduates is typically taxed at a higher rate than the average across the labour market as graduates are more likely to be in the higher tax brackets.

**The Udice universities generate € 2 in tax revenues for every € 1 they receive in income**
In 2018/19, the total income of the Udice Universities and their partner NROs was €10.4 billion and so the fiscal impacts are estimated to be double this income.

**Figure 8-1: Fiscal Impact Compared to Income and Economic Impact**

The largest fiscal impact is from social security contributions paid, which are worth an estimated €7.9 billion. The second largest fiscal impact would be taxes on income, profits and capital gains, which would be worth €6.8 billion.

**Figure 8-2: Fiscal Impacts by Tax Type**

Source: BIGGAR Economics Analysis
9.

Total Economic Impact

The Udice Universities and their partner NROs contribute € 41.1 billion GVA and support 363,600 jobs in France each year.

9.1 Udice Universities

The total economic contribution created by the Udice Universities and their partner NROs is:

- € 41.1 billion GVA and 363,600 jobs throughout France; and
- € 45.8 billion GVA and 403,600 jobs at a global level (including France).

Therefore 90% of their total GVA impact is retained within the national economy.

On this scale, every € 1 received by the Udice Universities and their partner NROs creates a GVA impact of € 4 throughout France. Every job directly created by the Universities supports three jobs at a national level.

The purposeful impact of the Udice Universities is worth around € 17.9 billion GVA, or 44% of its total GVA impact at a national level. Its operational impact is € 24.1 billion GVA, or 59% of its GVA impact at a national level. This is illustrated in Figure 9-1.

The impact of the Udice Universities at a national and global level by source of impact is shown in Table 9-1.

28 The crossover impacts are included in both categories, therefore the totals sum to more than 100%.
Figure 9-1: Total Impact of the Udice Universities in France, 2019

Total Impact in France: €41 billion and 364,000 jobs

<table>
<thead>
<tr>
<th>Purposeful Impacts</th>
<th>Operational Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>€17.9 billion (44%)</td>
<td>€24.1 billion (59%)</td>
</tr>
<tr>
<td>75,000 jobs (20%)</td>
<td>298,700 jobs (82%)</td>
</tr>
<tr>
<td>Of which...</td>
<td>Of which...</td>
</tr>
<tr>
<td>Learning Impact</td>
<td>Central Impact</td>
</tr>
<tr>
<td>€11.7 billion</td>
<td>€17.2 billion</td>
</tr>
<tr>
<td>20,600 jobs</td>
<td>212,500 jobs</td>
</tr>
<tr>
<td>Valorisation Impact</td>
<td>Student Impact</td>
</tr>
<tr>
<td>€5.3 billion</td>
<td>€6.0 billion</td>
</tr>
<tr>
<td>44,200 jobs</td>
<td>76,100 jobs</td>
</tr>
<tr>
<td>Cross-over impact</td>
<td>€887 million</td>
</tr>
<tr>
<td>€887 million</td>
<td>10,100 jobs</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis (Totals may not sum due to rounding.)

Table 9-1: Total Economic Impact of Udice Universities

<table>
<thead>
<tr>
<th>GVA, € billion</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Impact</td>
<td>11.7</td>
<td>12.8</td>
</tr>
<tr>
<td>Valorisation Impact</td>
<td>5.3</td>
<td>7.4</td>
</tr>
<tr>
<td>Central Impact</td>
<td>17.2</td>
<td>18.2</td>
</tr>
<tr>
<td>Student Impact</td>
<td>6.0</td>
<td>6.4</td>
</tr>
<tr>
<td>Crossover impacts (capital, volunteering, tourism)</td>
<td>0.9</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41.1</strong></td>
<td><strong>45.8</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment</th>
<th>France</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Impact</td>
<td>20,600</td>
<td>25,600</td>
</tr>
<tr>
<td>Valorisation Impact</td>
<td>44,200</td>
<td>60,000</td>
</tr>
<tr>
<td>Central Impact</td>
<td>212,500</td>
<td>226,200</td>
</tr>
<tr>
<td>Student Impact</td>
<td>76,100</td>
<td>81,100</td>
</tr>
<tr>
<td>Crossover impacts (capital, volunteering, tourism)</td>
<td>10,100</td>
<td>10,700</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>363,600</strong></td>
<td><strong>403,600</strong></td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis (Note: Figures may not sum due to rounding.)
Appendix A: Overview of Udice Universities

This section gives a brief summary of the 10 Udice Universities.

- Aix-Marseille Université (AMU);
- Sorbonne Université;
- Université de Bordeaux;
- Université Claude Bernard Lyon 1;
- Université Côte d’Azur;
- Université Grenoble Alpes (UGA);
- Université de Paris;
- Université Paris-Saclay;
- Université Paris Sciences et Lettres (PSL); and
- Université de Strasbourg.

10.1 Aix-Marseille Université (AMU)

The Aix-Marseille Université is based in nine cities across southern France. It was formed in 2012 through the merger of three universities: the Université de Provence (Aix-Marseille I), the Université de la Méditerranée (Aix-Marseille II), and Université Paul Cézanne (Aix-Marseille III). Its origins in some cases date back to the 15th Century.

In 2019 Aix-Marseille Université had 62,600 full-time students, almost 8,100 academic and administrative staff and a total income of € 750 million. It also works with NROs which have a staff complement of 18,000 people and an income of € 940 million. It is structured around five disciplinary sectors in arts, letters, languages and human sciences; law and political science; economics and management; health and science and technology. In addition, three University Institutes of Technology and University Institutes for Teacher Training are part of the university.

In 2020, Aix-Marseille Université was among the top 100 Young Universities in the World in the Times Higher Education Rankings. The ARWU (Shanghai) Rankings for 2020 place the University in the top 150 universities worldwide for its overall performance.

It is a member of the European Universities CIVIS Alliance along with seven other universities across Europe. Its collective aim is to create a European civic university alliance.
10.2 Sorbonne Université

Sorbonne Université was created in 2018 by the merger of Université Paris-Sorbonne and Université Pierre-et-Marie-Curie (UPMC). Université Paris-Sorbonne was the largest institution in France dedicated to the study of literature, arts, humanities and social sciences. UPMC was a leading French university of science and medicine and both universities are direct descendants of the medieval Sorbonne University which was founded in the 13th Century. The Sorbonne Université is the European location for the INSEAD Business School, one of the world’s leading and largest graduate business schools.

The University’s primary campuses are in Paris, including the historic Sorbonne building, located in the heart of the City. It has three autonomous faculties: arts and humanities; science and engineering; and medicine. In 2019, the Sorbonne Université had 51,300 full-time students, 8,200 staff and an income of € 681 million. It also works with NROs which have a staff complement of 4,800 people and an income of € 587 million.

The University, has a long tradition of academic achievement and consistently ranks among the top universities both nationally and globally. It was ranked among the top 50 Universities in the World and within the top three in France by the ARWU (Shanghai) Rankings for 2020. It is also ranked among the top 10 Young Universities in the World in the Times Higher Education Rankings for 2020 and in the top 100 Innovative Universities in the World by Thompsons Reuters in 2019.

It is a member of the European Universities 4EU+ Alliance along with five other universities across Europe.

10.3 Université de Bordeaux

The Université de Bordeaux was formed in 2014 from the merger of three universities: Bordeaux 1, Victor Segalen University (Bordeaux 2) and Montesquieu University (Bordeaux 4). The original institutions were founded in the 18th Century.

The University consists of four colleges and three institutes. These are the Colleges of Law, Political Science, Economics and Management; Health Sciences; Human Sciences and Science and Technology. Its three Institutes are the Institutes of Technology, Education and Vine and Wine Science.

In 2019 the University had 6,000 staff members, 50,900 full-time students and an income of € 510 million. It also works with NROs which have a staff complement of 2,000 people and an income of € 210 million.

The Université de Bordeaux ranked among the Times Higher Education’s Top 100 Young Universities in 2020 and it features within the top 100 universities globally in the Thompsons Reuters ranking of Innovative Universities for 2019.
It is a member of the European Universities Enlight Alliance along with eight other universities across Europe. Their aim is to promote an equitable quality of life, sustainability and global engagement through higher education transformation.

### 10.4 Université Claude Bernard Lyon 1

Université Claude Bernard Lyon 1 was founded in 1970 and is named after the famous physiologist who is known chiefly for his discoveries concerning the role of the pancreas in digestion. Its origins go back to the “faculté des sciences de Lyon”, founded in 1833 and the “faculté de médecine”, founded in 1874. It is spread over three campuses and 11 sites in the Rhone-Alpes region.

It has a strong reputation in the fields of science and technology, medicine and sports science and is part of the Université de Lyon which is the second largest scientific research centre in France. Its scientific activity is divided between three main sectors: sciences and technology; life sciences and environment and human and social sciences.

In 2019, the University had 4,600 staff members, 47,600 full-time students and an income of €395 million. It also works with NROs which have a staff complement of 1,700 people and an income of €220 million. It ranked in Thompsons Reuters Top 100 Innovative Universities in the World for 2020 and also in the Times’ Top 150 Young Universities for 2020.

It is a member of the European Universities Arqus Alliance along with six other universities across Europe.

### 10.5 Université Côte d’Azur

The Université Côte d’Azur was founded in 2019 and has roots dating back to the 17th Century. It brings together 13 major players in higher education and research on the Côte d’Azur and aims to develop a new, 21st Century model for French universities. It includes a major research university, multiple top-level research agencies and laboratories, elite business schools, and a group of internationally renowned art and design schools.

In 2019, the University had 3,600 staff members, 31,500 students and an income of €250 million. It also works with NROs which have a staff complement of 750 people and an income of €90 million.

The Université Côte d’Azur was ranked among the top 100 Young Universities in the World by the Times Higher Education in 2020.

It is a member of the European Universities Ulysseus Alliance along with five other universities across Europe and aims to promote a university that is open to the world, person-centred and entrepreneurial for citizenship of the future.
10.6 Université Grenoble Alpes (UGA)

Université Grenoble Alpes was formed in 2016 following the merger of three long-established institutions: Université Joseph Fourier (Grenoble I), Université Pierre Mendès France (Grenoble II) and Université Stendhal (Grenoble III). Its original roots date back to the 14th Century.

Since 2020 it is a new university (EPE) that integrates six academic divisions: Grenoble INP, Graduate schools of Engineering and Management; Sciences Po Grenoble, School of Political Studies; ENSAG, School of Architecture; Faculty of Science; Faculty of Humanities, Health, Sports and Societies; and the University School of Technology. In 2019, the University had 8,600 staff members, 53,000 full-time students and an income of €589 million. It also works with NROs which have a staff complement of 2,200 people and an income of €241 million.

The University was ranked in the top 100 Young Universities in 2020 by the Times Higher Education and among the top 100 universities in the world in the ARWU (Shanghai) Rankings for 2020.

It is a member of the European Universities Unite! Alliance along with six other universities across Europe. Their collective aim is to create a university network for innovation, technology and engineering.

10.7 Université de Paris

The Université de Paris was formed in 2019 from the merger of three universities in the city: Paris Diderot (Paris VII), Paris Descartes (Paris V) and Institut de Physique du Globe de Paris. It is spread across 20 campuses in Paris and its inner suburbs.

It offers courses across four key fields: arts, humanities and languages; human, economic and social sciences; science and technology; and medicine, dentistry, pharmacy and nursing. The Université de Paris accounts for almost 10% of all scientific articles published in France and awards 8% of all doctorates in the country. It is notably visible in the fields of earth sciences, medicine and, more broadly, biology and health, and brings together one of the largest groups of laboratories associated with the CNRS and INSERM. In 2019, the Université de Paris had 53,200 students, 7,800 staff and an income of €620 million. It also works with NROs which have a staff complement of 4,200 people and an income of €216 million.

It ranked among the top 100 Universities in the World and within the top five in France by the ARWU (Shanghai) Rankings for 2020. It also ranked among the top 20 Young Universities in the World in the Times Higher Education Rankings for 2020.

It is a member of the European Universities Circle U Alliance along with six other universities across Europe.
10.8 Université Paris-Saclay

The Université Paris-Saclay was established in 2019 and is at the centre of the Paris-Saclay project, representing a step-change in French higher education to create a University which rivals the top institutions worldwide.

It is a large-scale, research-intensive academic campus and business cluster which has been developed near Paris, integrating the Université Paris-Sud and comprising 14 institutions in total (1 undergraduate school, 5 faculties/schools, 4 grandes écoles/graduate schools, 3 university institutes of technology, 7 research centres and 2 associate universities). The Université Paris-Sud has roots dating back to the 12th Century.

In 2019, the Université Paris-Saclay had 64,400 students, 16,400 staff and an income of €1.9 billion. It also works with NROs which have a staff complement of 4,000 people and an income of €450 million each year.

Université Paris-Saclay specialises in scientific research, and has many Nobel prize winning staff among its institutions. It ranked among the top 20 Universities in the World and in 1st place in France in the ARWU (Shanghai) Rankings for 2020. It also ranked in 1st place worldwide for mathematics and 9th worldwide for physics in the same source, making it the top ranked French university in these fields.

It is a member of the European Universities EUGLOH Alliance along with four other universities across Europe. Their collective aim is to promote global health.

10.9 Université Paris Sciences et Lettres (PSL)

Université Paris Sciences et Lettres (PSL) was established as a collegiate university in 2019.

It includes eleven schools: École nationale supérieure de Chimie; Conservatoire National Supérieur d’Art Dramatique; École normale supérieur; École Pratique des Hautes Études; ESPCI Paris; École nationale des chartes; École nationale supérieure des Mines; Observatoire de Paris; Dauphine; Collège de France and the Institut Curie. It also includes three research institutions: CNRS, Inria and INSERM. Many of the collegiate schools have roots dating back to the 18th and 19th Centuries and in the case of Dauphine, the 12th Century.

In 2019, the Université Paris Sciences et Lettres (PSL) had 16,200 students, 4,400 staff and an income of €750 million. It also works with NROs which have a staff complement of 2,500 people and an income of €273 million.

It includes many Nobel prize winners and Fields medallists among its alumni. It ranked in the top 50 Universities in the World in the ARWU (Shanghai) Rankings for 2020 and in 1st place in France in both the Times Higher Education Rankings and the QS Rankings for 2021.
It is a member of the European Universities ELLISA Alliance (European Engineering Learning Innovation and Science Alliance) along with eight other universities across Europe.

10.10 Université de Strasbourg

The Université de Strasbourg was created in 2009 by the merger of three long-established universities in the region. Its original roots date back to the 16th century.

It is organised into education and research departments, faculties, schools and institutes which cover five major academic fields: arts, literature and languages; law, economics, management and political science; humanities and social sciences; science and technologies; and health. It is a member of the Alsace Biovalley cluster, part of the broader Biovalley Life Sciences Network, one of the most important clusters in biotechnologies and health in Europe.

In 2019 it had 6,400 members of staff, a student population of over 56,100 students, from which there were 11,300 graduates, and an income of € 550 million. It also works with NROs which have a staff complement of 1,700 people and an income of € 220 million.

The Université de Strasbourg ranks within the top 150 Universities in the World in the ARWU (Shanghai) Rankings for 2020 and among the top 100 Innovative Universities in Europe by Thompsons Reuters for 2019.

It is a member of the European Universities EPICUR Alliance along with seven other universities across Europe. Their collective aim is to create a European partnership for an innovative campus unifying regions.
Appendix B: International Comparators

Over the last decade, BiGGAR Economics has carried out economic impact assessments for several university consortia across Europe. Those that might be considered to be the closest comparators to Udice are:

- LERU, the League of European Research Universities with 23 members in 12 countries; and
- ETH Domain in Switzerland with 6 members (including two universities and four national research institutes).

Any comparisons should be interpreted cautiously as these studies reflect organisations which operate within different public sector funding environments and a variety of national policy approaches to higher education over time. However, a consistent methodology was used to estimate the impact in each case. A comparison of the ratio between income and GVA impact for Udice and these comparator consortia is shown in Figure 11-1.

The income:GVA impact ratio for Udice is €4, meaning that every €1 income creates a total GVA impact across France of €4. This compares with €3.7 for ETH Domain and €4.3 for LERU, indicating that the Udice Universities and their partner NROs, are broadly in line with international comparators.

Figure 11-1: Income to GVA Impact Ratios for Comparative University Consortia

Source: BiGGAR Economics Analysis
Appendix C: Abbreviations and Terms

This section contains a list of common abbreviations and terms used in this report.

**Assumptions** - are the data upon which the economic contribution calculations are based.

**GDP** - Gross Domestic Product refers to the market value of all final goods and services produced within a country in a given period.

**Gross Value Added (GVA)** - is a measure of the value an organisation, company or industry adds to the economy through its operations. In the case of the Udice Universities it is estimated by subtracting the non-staff operational expenditure (mainly represented by expenditure on goods and services) from total income.

This report uses the production approach to measuring the GVA contribution, where GVA is equal to the value of the service produced less the value of the inputs used to create it. Typically this is estimated by subtracting the non-labour (goods and services) costs of the organisation from its total income.

**Multipliers** - expenditure and employment has a multiplier effect throughout the economy. Multipliers are a numeric way of describing the secondary impacts arising from a business, industry, service or organisation. For example, an employment multiplier of 1.8 suggests that for every 10 employees in Organisation A, 8 additional jobs are created in other supplier industries so that, in total, 18 jobs are supported by Organisation A through the multiplier effect.

Multipliers differ between sectors and countries. Each country calculates their individual multipliers in the form of Input-Output tables which form part of the national accounts. The Input-Output tables are quantitative techniques which represent the interdependencies between different branches of a national economy. The multipliers used in this report have been calculated from the OECD’s Domestic and Import Input-Output Tables for France, 2018 edition.

**Direct effect** - this relates to the income received and the employees directly engaged by the Udice Universities.

**Indirect effect** - this comes from the business-to-business transactions required to satisfy the direct effect. It is a second round impact that would not occur without the Udice Universities and it relates to the businesses engaged in their supply chains for goods and services.
**Induced effect** - as a result of the direct and indirect effects the level of household income throughout the economy will increase through increased employment. A proportion of the increased household income will be re-spent on final goods and services, which is known as the induced effect.

**Spin-outs** - are companies created to commercialise an organisation’s intellectual property, usually involving a licensing agreement and/or staff transfer.

**Start-ups** - are businesses that are set up by the staff of an organisation and/or former students. Although such businesses will draw on the experience acquired by the founders during their time at university, they have no formal intellectual property relationship with the Udice Universities.

**Turnover/employee** - is a ratio of the amount of turnover required to support one full-time equivalent job for one year. It varies by sector depending on the relative labour intensities of different industries e.g. agriculture is a relatively labour-intensive process compared to oil refining therefore the amount of turnover required to support an oil refining job is much higher than that required to support an agricultural job. The ratios used in this report are calculated from the OECD’s Domestic and Import Input-Output Tables for France, 2018 edition.

**Turnover/GVA** - is a ratio of the amount of turnover required to produce a certain amount of GVA in each sector. This relationship varies between sectors and countries. The ratios used in this report are calculated from the OECD’s Domestic and Import Input-Output Tables for France, 2018 edition.
13. Appendix D: Methodology

This section sets out the methodology followed in estimating the economic impacts of the Udice Universities and their NRO partners and provides the sources for the underlying economic assumptions.

13.1 Economic Ratios and Multipliers

13.1.1 Economic Ratios
The analysis considers the ratios between turnover, gross value added and employment for the different sections of the French economy. The ratios were derived from the Organisation for Economic Cooperation and Development’s (OECD) STAN Industrial Analysis\(^\text{29}\) for France in 2017.

13.1.2 Economic Multipliers
The economic contributions associated with the indirect and induced impacts are captured in the economic multipliers.

There are two types of multiplier. Type 1 \((M_1)\) multipliers only consider the economic impact in the supply chain, whereas Type 2 \((M_2)\) multipliers also include the spending of the staff involved in the process. The multipliers are expressed as the final figure for both GVA and Employment. For example, if there is a \(T_2\) GVA Multiplier of 1.75, then €1.00 of direct GVA \((D_{GVA})\) would result in €1.75 of total GVA \((T_{GVA})\) impact. Therefore, to extract the pure multiplier effect, it is necessary to subtract 1 from the initial figure given as the multiplier.

\[
T_{GVA} = D_{GVA} + (M_1 - 1) \times D_{GVA} + (M_2 - M_1) \times D_{GVA}
\]

The economic multipliers were calculated using the Input Output Tables for France\(^\text{30}\), which are provided by the OECD. The multipliers that were calculated using input output tables were Leontief Type 1 GVA and Employment Multipliers and Leontief Type 2 GVA and Employment Multipliers. Type 2 multipliers consider the impact of supply chain and staff expenditure and Type 1 multipliers just consider supply chain expenditure.

\(^{29}\) OECD (2020), STAN Industrial Analysis.

In the analysis indirect and induced impacts were considered separately. While, at the level of France, this is no different from applying Type 2 multipliers, this was necessary to provide accurate estimates of local impacts. This is because the extent of indirect and induced impacts may vary across different regions of France.

There is likely to be a high degree of variance between the size of multipliers considering how much leakage there is within any particular geography. In order to address this, our current method is to adjust each multiplier (for each industry and both Type 1 and Type 2) by the same proportion.

These proportions are different for both the indirect and induced multipliers. The relationship between the French and Global indirect multiplier is based on the proportion of supply chain of French companies which is secured in France. Analysis of the Input Output Tables suggests that the Global indirect multiplier would be 123% the level in France. Similarly, the induced multiplier is based on the location of household expenditure. Therefore, the OECD National Accounts for France would suggest that the Global induced multiplier would be 103% that of France. These proportions are given below.

Table 13-1: Geographic Multipliers as % of France

<table>
<thead>
<tr>
<th>Area</th>
<th>Indirect Multiplier</th>
<th>Induced Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Global</td>
<td>123%</td>
<td>103%</td>
</tr>
</tbody>
</table>

Source: BIGGAR Economics

13.2 The Economic Impact of NROs

Part of the economic impact linked to the Udice Universities is associated with the activities of National Research Organisations (NROs). This section sets out the assumptions used to allocate to each of the Udice Universities a share of the impacts generated by the two largest NROs: CNRS and INSERM.

13.2.1 Distributing NRO activities

Based on the CNRS annual accounts\(^\text{31}\), it was estimated that in 2019 the total CNRS income was € 3.5 billion.

The starting point in estimating the economic impact generated by CNRS at the Udice Universities was the data provided on state funding (subvention d'état) of CNRS research at the Udice Universities. This was the CNRS income that was considered as being linked to the activities taking place at each of the Udice Universities. The CNRS income associated with the Udice Universities was estimated to be €1.4 billion, equivalent to 39% of total CNRS income. A breakdown of income by institution is provided in Table 13-2 below.

Table 13-2: CNRS Income by University*

<table>
<thead>
<tr>
<th>University</th>
<th>CNRS Income (€ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CNRS income</td>
<td>3,500</td>
</tr>
<tr>
<td>...of which with Udice Universities</td>
<td>1,377</td>
</tr>
<tr>
<td>Aix-Marseille Université</td>
<td>160</td>
</tr>
<tr>
<td>Université Côte d'Azur</td>
<td>47</td>
</tr>
<tr>
<td>Université de Strasbourg</td>
<td>110</td>
</tr>
<tr>
<td>Université Grenoble Alpes</td>
<td>157</td>
</tr>
<tr>
<td>Paris Sciences et Lettres</td>
<td>165</td>
</tr>
<tr>
<td>Sorbonne Université</td>
<td>172</td>
</tr>
<tr>
<td>Université Claude Bernard Lyon 1</td>
<td>168</td>
</tr>
<tr>
<td>Université de Bordeaux</td>
<td>94</td>
</tr>
<tr>
<td>Université de Paris</td>
<td>127</td>
</tr>
<tr>
<td>Université Paris Saclay</td>
<td>178</td>
</tr>
</tbody>
</table>

Source: BiGGAR Economics Analysis of data from CNRS. *Totals may not add up due to rounding.

INSERM did not provide figures on the value of activity with each of the Udice Universities. To estimate the economic impact at the Udice Universities linked to INSERM’s activity, it was first necessary to establish the share of its income that is connected to the Udice universities. BiGGAR Economics’ study\textsuperscript{32} of the CURIF universities found that they accounted for around 85% of the activity carried out by INSERM. This share was weighted by the respective income of the CURIF and the Udice Universities. The combined income of the Udice Universities is slightly greater than that of CURIF and on this basis, it was estimated that the Udice Universities could account for around 86% of INSERM activity. Income was then allocated to each of the Udice Universities based on their relative size as proxied by their annual income.

The 2019 total income for INSERM was estimated based on 2018 income and adjusted by applying the rate of growth of staff costs over the period between 2018 and 2019. In this way, it was estimated that the total income of INSERM was around € 970 million. The table below provides a breakdown of income by university.

\textsuperscript{32}BiGGAR Economics (2018) The Economic Contribution of the CURIF Universities

Economic Contribution of Udice Universities
Table 13-3: INSEMR Income by University*

<table>
<thead>
<tr>
<th>University</th>
<th>INSEMR Income (€ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total INSEMR Income</td>
<td>970</td>
</tr>
<tr>
<td>...of which with Udice Universities</td>
<td>825</td>
</tr>
<tr>
<td>Aix-Marseille Université</td>
<td>89</td>
</tr>
<tr>
<td>Université Côte d’Azur</td>
<td>30</td>
</tr>
<tr>
<td>Université de Strasbourg</td>
<td>65</td>
</tr>
<tr>
<td>Université Grenoble Alpes</td>
<td>70</td>
</tr>
<tr>
<td>Paris Sciences et Lettres</td>
<td>89</td>
</tr>
<tr>
<td>Sorbonne Université</td>
<td>80</td>
</tr>
<tr>
<td>Université Claude Bernard Lyon 1</td>
<td>47</td>
</tr>
<tr>
<td>Université de Bordeaux</td>
<td>60</td>
</tr>
<tr>
<td>Université de Paris</td>
<td>73</td>
</tr>
<tr>
<td>Université Paris Saclay</td>
<td>223</td>
</tr>
</tbody>
</table>


13.2.2 Estimating Key Assumptions

For both CNRS and INSEMR it was necessary to estimate the levels of employment, staff costs and supply chain spending that was associated with their activities with each Udice university.

CNRS provided data on the level of supply chain expenditure, this estimated that the spending on supplies at Udice Universities associated with CNRS was € 254 million.

In 2019 CNRS employed around 32,000 people. To estimate CNRS employment supported by each of the Udice Universities, total CNRS employment was weighted by the share of CNRS income accounted for by the Udice Universities (39%). CNRS staff was then allocated according to the share of CNRS income generated by each university. For example, as Aix-Marseille Université was associated with around 12% of the CNRS income associated with the Udice Universities therefore it was allocated around 12% of the CNRS employees supported by the Udice Universities, equivalent to around 1,500 members of staff. Staff costs were estimated based on the average staff costs per employee across the Udice Universities.
The employment linked to INSERM supported by the Udice Universities was estimated by applying the same methodology as above to INSERM’s 7,900 employees in 2019. Staff costs were then estimated by multiplying the number of INSERM employees at each institution by € 57,900, the average staff costs per employee at INSERM in 2019.

Spending on non-staff operational costs was estimated by subtracting staff costs from the income of INSERM and by allocating spending on supplies across the Udice Universities. In this way, it was estimated that the total supply expenditure associated with INSERM at the Udice Universities was € 394 million.

In addition, CNRS provided data on its associated spin-outs and start-ups. To estimate the proportion of impact from these companies that would be linked to Udice Universities the approach used for distributing staff costs and supply spending was also applied to their activities. Around 39% of active start-ups were considered as being associated with the Udice Universities. The allocation was mindful of avoiding the double counting of those start-ups for which data had already been provided by the individual universities.

13.3 Learning Impact

13.3.1 Graduate Premium

One of the most important sources of the economic impact of universities relates to the benefits of education for the economy. The idea is that a university education will mean that a graduate would be more productive (that is, add more to the economy) than they might have been if they had not had a university education. Of course, this will not be true for every individual, there is evidence that this is the case for the population of graduates as a whole.

To capture this impact, the analysis, as standard practice, estimates the net lifetime financial returns that a graduate can expect to reap during her working life, the so-called “graduate premium”. In doing so, the analysis accounts for differences in the returns of different degrees (vocational, undergraduate, master’s and doctorate) and across subjects studied.

The starting point in estimating the graduate premium is to estimate the net financial returns at the individual level from attending tertiary education. These are estimated from:

- the costs of participation in tertiary education
  - direct costs of tertiary education (i.e. spending on tuition fees); and
  - foregone earnings while at university
- net benefits of participation in higher education, which are the difference between:

\[ \text{Graduate Premium} = \text{Net Benefits} - \text{Costs} \]

---

34 Ibid.
• a graduate’s gross lifetime earnings; and
• taxes and benefits (income tax, social insurance contributions and any other transfers).

The difference between costs of participation and net benefits of participation gives the total benefits from achieving a degree. The net financial returns are then estimated by applying a discount factor that considers individuals’ preference for present as opposed to future consumption (the OECD data on which this study relies adopt a 2% discount factor).

The data source underpinning this analysis was the OECD publication Education at a Glance 2020 and its tables on “private costs and benefits for a man attaining tertiary education” and “private costs and benefits for a woman attaining tertiary education”. To estimate the graduate premium regardless of sex, data for men and women were averaged. In this way, it was estimated that in 2016 the average financial return from achieving a degree in France was (PPP) $283,000. As the OECD estimates costs and benefits with respect to purchasing power parity (PPP) US $, figures were converted into euros, taking the ratio of GDP per capita in 2017 PPP euros and 2017 PPP Dollars. In this way, it was estimated that the average net financial returns from tertiary education in France in 2016 were €213,000, as shown in Table 13-4.

Table 13-4: NPV Lifetime Net Earnings Benefits from Tertiary Education

<table>
<thead>
<tr>
<th>France, 2016</th>
<th>US$ PPP</th>
<th>€ PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>283,450</td>
<td>212,792</td>
</tr>
</tbody>
</table>


The average net financial returns from tertiary education are then weighted to account for the differences in earnings across different degree levels, namely:

- bachelor;
- master’s;
- doctorate; and
- overall tertiary education.

36 World Bank (2020), GDP per Capita (Constant 2010 US$)
37 Eurostat (2020), Real GDP per Capita, Chained Link Volumes 2010, euro per capita.
Again, these were sourced from the OECD\textsuperscript{38} and refer to the average relative differences in earnings across these educational levels for full-time workers. To distinguish the premium linked to a doctoral degree from that to a master’s degree, the graduate premium for doctoral students was further based on a study on the economic contribution of PhD students\textsuperscript{39}. This found that the earnings premium associated with master’s students is 23% higher than someone who had not gone to university for men and 38% for women. For PhD graduates the earnings premium was 26% for men and 38% for women. On this basis, the doctoral premium has been estimated to be 5% in addition to the combined master’s and Licence premium. The average graduate premium associated with each qualification is set out in Table 13-5.

\textbf{Table 13-5: Returns from an Average Degree 2016}

<table>
<thead>
<tr>
<th>Qualification</th>
<th>Value (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational Bachelor (licence Pro)</td>
<td>123,557</td>
</tr>
<tr>
<td>Academic Bachelor (licence Classique)</td>
<td>123,557</td>
</tr>
<tr>
<td>Master’s</td>
<td>41,186</td>
</tr>
<tr>
<td>Doctorate</td>
<td>8,102</td>
</tr>
</tbody>
</table>


The returns from a master’s and a doctorate qualification are those attributable to that specific qualification. The returns from a master’s degree given in Table 13-5 compares that of a master’s graduate to a worker whose highest qualification is a bachelor’s degree. Therefore, a masters graduate could expect a total lifetime premium on earnings from their university education equivalent to the sum of the returns from an academic bachelor and a master’s degree.

\textsuperscript{38} Casey (2009), The Economic Contribution of PhDs.

Table 13-6: Mean monthly earnings of tertiary-educated adults, by field of education studied in France, 2011

<table>
<thead>
<tr>
<th>Field of education studied in France</th>
<th>Value (€)</th>
<th>Deviation from Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher training &amp; education science</td>
<td>2,900</td>
<td>-9%</td>
</tr>
<tr>
<td>Humanities, languages &amp; arts</td>
<td>2,600</td>
<td>-19%</td>
</tr>
<tr>
<td>Social sciences, business &amp; law</td>
<td>3,300</td>
<td>3%</td>
</tr>
<tr>
<td>Science, maths &amp; computing</td>
<td>3,500</td>
<td>9%</td>
</tr>
<tr>
<td>Engineering, manufacturing, construction</td>
<td>3,800</td>
<td>19%</td>
</tr>
<tr>
<td>Health &amp; welfare</td>
<td>3,200</td>
<td>0%</td>
</tr>
<tr>
<td>All fields (Average)</td>
<td>3,200</td>
<td>-</td>
</tr>
</tbody>
</table>


It was then possible to estimate the graduate premium across different degree types and subjects, where the difference across subjects was captured by considering the difference in median earnings across professions, as listed in Table 13-6.

To estimate the total graduate premium, the total number of graduates in each subject was multiplied by the premium associated to that subject and that educational attainment, as shown in Figure 13-1.

**Figure 13-1: Calculation and Inputs for the Graduate Premium Contribution**

**Formulas**

\[
GVA = \sum_d (G_d \times P_d)
\]

**Inputs**

\[
G_d = \text{Number of graduates with degree (d)}
\]

\[
P_d = \text{Graduate premium for graduate with degree (d)}
\]

13.3.2 Continuing Education

The Udice Universities also educate professionals through their engagement in continuing education. This is done by offering a range of short courses, which benefit participants by furthering their knowledge and skills and, in that way, improve their productivity.
The starting point in estimating the impact associated with continuing education courses was to consider the income that they generated. It was estimated that through these courses, the Udice Universities generated around € 105 million. This income was then allocated to the economic sectors to which the courses taught related. To estimate the direct GVA generated by this income, this was multiplied by 340%. This is based on a study for the Department of Business, Enterprise and Regulatory Reform\textsuperscript{40}, which considered the impact of Regional Development Agency spending. One aspect considered in this report was the GVA returns to business development and competitiveness interventions between 2002 and 2007. This found that interventions in Science, R&D and innovation infrastructure had achieved cumulative GVA equivalent to 340% of the cost of the projects and that this could increase to 870% if the long-term benefits were considered.

GVA per job ratios were then applied to estimate the direct employment supported by continuing education. In addition to the direct impact generated by the delivery of continuing education courses, it was necessary to consider indirect and induced impacts. Indirect impacts refer to the economic effects taking place within an organisation’s supply chain. Induced impacts consider the effect of the spending of salaries and wages of those workers employed within the supply chain. These were estimated by applying Type 1 and Type 2 GVA and employment multipliers to the estimates of direct GVA and employment. All the impacts were assumed to occur as a result of productivity improvements in the courses’ participants.

It was assumed that all of the growth from continuing education would be from increased worker productivity, rather than organisation expansion. As a result, the employment impacts are solely associated with the increased activity in the supply chains and from increased induced impacts from higher staff salaries.

**Figure 13-2: Calculations and Inputs for Continuing Education**

**Formulas**

\[
GVA(CE) = M(G)^2 \times \sum_i 340\% \times Income(SCE)
\]

\[
Employment(CE) = (M(E)^2 - G(p)) \times \sum_i \frac{GVA(SB)}{E_i + \delta}
\]

**Inputs**

\[
GVA(CE) = \text{Total GVA associated with Continuing Education}
\]

\[
GVA(CE_i) = \text{GVA associated with CE in industry (i)}
\]

\[
M(E)^2_i = \text{Type 2 Employment Multiplier in industry (i)}
\]

\textsuperscript{40} PriceWaterhouseCoopers, Impact of RDA spending – National report – Volume 1 – Main Report, March 2009, DBERR.
13.3.3 Student Internships

Students also contribute to economic activity when participating in internships within businesses. Their work supports the organisations where they intern as well as providing students with experience that will increase their future productivity and employability.

The analysis considered only those internships that lasted for longer than 12 weeks. This is because shorter internships were deemed as being mainly of an observational type and, as a result, interns were not assumed to make an economic contribution to the businesses where they did their placement.

It was estimated that across the Udice Universities around 72,190 students were involved in internships that lasted longer than 12 weeks. These students spent on average around 17 weeks as part of their placements. To estimate the economic impact associated with these internships, it was first necessary to establish in which economic sector they took place. Most interns were classified as undertaking internships in R&D and other business activities, medicine and education.

To estimate the number of full-time equivalent jobs (FTEs) supported, the number of weeks spent by students in internships was then divided by the average number of weeks that an employee in that sector would spend in the workplace over a year. This was further discounted by 50%, to account for the fact that interns have a lower productivity than the average worker in each of the sectors considered. It was also assumed that 50% of placements took place in the region where each Udice University is located and the remainder was allocated depending on the share of placements taking place outside France.

It was then possible to estimate the direct GVA supported through internships by applying the relevant GVA per job ratio for the sectors where students undertook internships. Indirect impacts were further estimated by applying Type 1 GVA and employment multipliers to the direct GVA and employment estimates. Induced impacts were not considered, as the impact of student spending had already been considered elsewhere in the analysis. Details of the calculations performed are provided in Figure 13-3.
Figure 13-3: Calculations of Student Internships Contribution

Formulas

\[
GVA = \sum \frac{G_i}{E_i} \times \frac{(Weeks)_i}{52}
\]

Inputs

\[
\frac{G_i}{E_i} = \frac{GVA}{Employment} \text{ ratio in industries of student placement}
\]

(\(Weeks)_i = \text{Number of weeks student spends on placement in industry (i)}\)

13.4 Valorisation Impact

13.4.1 Licencing Impact

The Udice Universities and their partner NROs also contribute to economic activity through their scientific discoveries and technology development, which are then commercialised through licences. It was estimated that through their licencing activities the Udice Universities and their partner NROs received €11 million.

Across the Udice Universities and their partner NROs, it was estimated that 72% of the turnover from licences came from businesses located in France. The economic impact from licences is dependent on the sector that the licence holder operates. Income from licencing activity was therefore allocated to an economic sector according to the academic field where the licence was developed.

To estimate the value generated by licencing agreements, it was necessary to form a view over the value of the licence. The amount of royalties paid depends on the details of the licensing agreement and this can vary considerably from company to company. In order to agree on a licensing deal, negotiators must first form a view of how much the IP is worth to the prospective licensee. The ‘25% rule’ is a general rule of thumb based on an empirical study first undertaken in the 1950s and updated in 2002. The study found that royalty rates were typically around 25% of the licensee’s profits. This implies that royalties paid for a technology typically represent around 5% of the total turnover generated by that technology. In 2002, Goldscheider\(^{41}\) analysed the returns by industry and found that the royalties rate varied around the ‘5% rule’ between 2.8% and 8.0%. Royalty rates by sector were applied to the income from licencing to estimate the total value generated by the licencing activity carried out by the Udice Universities.

Having estimated the value associated with each licensing agreement, this was then divided by the relevant sectoral turnover per GVA and turnover per job ratios to estimate the direct GVA and employment generated by licensing activity. The licensing payment covers 1 year and therefore the activity is assumed to occur within that time period. Type 1 and Type 2 GVA and employment multipliers were then applied to estimate indirect and induced impacts.

Figure 13-4: Calculations and inputs for direct licencing GVA

Formulas

\[ Rev(L_1) = \frac{Income (L_i)}{Rate_i} \]

\[ GVA(L) = \sum_{i} \frac{Rev (L_i)}{(T_i/G_i)} \]

Inputs

\[ GVA(L) = \text{Total GVA associated with licences} \]

\[ Rev(L_i) = \text{Revenue generated from licences in industry (i)} \]

\[ \left( \frac{T_i}{G_i} \right) = \text{The \Turnover}_GVA\text{ratio in industry (i)} \]

\[ Rate_i = \text{Royalty rate for industry(i)} \]

\[ Income(L_i) = \text{Income to the University from licences in industry (i)} \]

13.4.2 Industrial Research and Development

The Udice Universities and their partner NROs also make an economic contribution through the industrial research and development services they provide, including:

- consultancy;
- facilities hire;
- contract research; and
- public sector supported research.

To estimate the direct GVA that was generated through these activities, turnover was multiplied by 340%, in line with what was done when considering the economic impacts from continuing education.
The model recognised the fact that some sectors are more likely to engage with academia than others. Eurostat provides data regarding the level of engagement with academia by sector. This shows that half of the academic engagement with industry involves the Manufacturing sector. The model used the proportions given for France when the universities were not able to provide an industrial split of their collaborators.

Based on evidence from Danish consultancy DAMVAD, the impacts on employment were assumed to be realised over six years. In a 2012 study, they considered the economic impact of companies collaborating with the University of Copenhagen. Thanks to the availability of company level economic data for Danish companies DAMVAD was able to consider the productivity benefits associated with University collaboration and found these are realised gradually over six years.

Furthermore, it was assumed that around 25% of impacts from contract, collaborative and consulting activities were linked to increases in productivity, whereas the remainder was associated to increases in the level of employment of the businesses collaborating with the Udice Universities.

Figure 13-5: Calculations and Inputs Industrial Research and Development

\[
\text{GVA(SB)} = M(G)_{i}^{2} \sum_{i} 340\% \cdot Income(SB_{i})
\]

\[
\text{Employment (SB)} = (M(E)_{i}^{2} - G(p)) \sum_{i} \frac{GVA(SB_{i})}{E_{i}} \cdot 6
\]

**Inputs**

\[
GVA(IRD) = \text{Total GVA associated with Industrial Research and Development}
\]

\[
GVA(IRD_{i}) = \text{GVA associated with IRD in industry (i)}
\]

\[
M(E)_{i}^{2} = \text{Type 2 Employment Multiplier in industry (i)}
\]

\[
M(G)_{i}^{2} = \text{Type 2 GVA Multiplier in industry (i)}
\]

Employment (SB) = \( \text{Total Employment associated with SB} \)

\[
\left( \frac{G_{i}}{E_{i}} \right) = \text{The} \ \frac{GVA}{Employment} \text{ ratio in industry (i)}
\]

\[
Income(IRD_{i}) = \text{Income from IRD in industry (i)}
\]

\[
G(p) = \text{Share of growth from increased worker productivity}
\]

42 Source: Eurostat (2014) Enterprises co-operating with universities or other higher education institutions

43 DAMVAD (2012), Measuring the Economic Effects of Companies Collaborating with the University of Copenhagen.
13.4.3 Science Parks and Incubators

The Udice Universities contribute to economic activity also by hosting and supporting businesses in science parks and incubators. To estimate the impact that these facilities generate, it was first necessary to collect data on the employment, turnover and economic sector of the businesses operating within them.

The main assumption that was required to estimate their economic impact regarded the extent of economic activity that could be attributed to the universities that are part of Udice. In particular, it was assumed that domestic companies, if the universities did not provide science parks, would have found a place where to operate elsewhere in France. Equally, non-French businesses would have operated from somewhere else in the world.

Based on a 2013 assessment of the economic impact generated by the University of Surrey, it was estimated that around 33% of economic activity in the science park was attributable to the University. The additionality at the global level was estimated as lower, at around 15%, since businesses could find a location in a different country.

The level of support that is provided to companies within an incubator is greater than that at a science park and therefore the role of the Udice Universities is much greater. Also, as incubators house early-stage companies, this support can be vital to the survival and growth of these companies. Therefore, it was assumed that all activity within the incubators can be attributed to the University.

Table 13-7: Science Park and Incubator Additionality

<table>
<thead>
<tr>
<th>Area</th>
<th>Science Park Additionality</th>
<th>Incubator Additionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>33%</td>
<td>100%</td>
</tr>
<tr>
<td>Global</td>
<td>15%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: BIGGAR Economics

Impacts were estimated based on the companies’ direct employment. This was first divided by the number of partners that were operating the science park or incubator alongside the university. Employment was then multiplied by sectoral GVA per job to estimate the direct GVA generated. Indirect and induced impacts were estimated following the same approach as in previous sections.

Figure 13-6: Calculations and Inputs for Science Park Contributions

Formulas

\[ GVA\ (SP) = SPA_{(Study\ Area)} \times \frac{Turnover\ (SP)}{G_i} \times M(G_i)^2 \]

\[ Employment(SP) = SPA_{(Study\ Area)} \times Direct\ Employment\ (SP) \times M(E_i)^2 \]
Inputs

**Turnover (SP)** = Annual Turnover of Science Park / Incubator

**Direct Employment (SP)**

\[ E_{(i)} = Employment\ in\ SP\ excl\ Udice\ employees\ and\ spin\ off\ companies \]

\[ \left( \frac{T_{(i)}}{G_{(i)}} \right) = The\ \frac{Turnover}{GVA}\ ratio\ of\ the\ industry\ (i) \]

\[ M(E)_{(i)} = Type\ 2\ Employment\ Multiplier\ in\ industry\ (i) \]

\[ M(G)_{(i)} = Type\ 2\ GVA\ Multiplier\ in\ industry\ (i) \]

**SPA (Study Area)** = Science Park / Incubator additionality in the study area

**GVA (SP)** = Total GVA of Science Park / Incubator

**Employment (SP)** = Total Employment of Science Park / Incubator

---

13.5 Central Impact

13.5.1 Direct Impact

The direct impact of an organisation captures its own exclusive contribution to economic activity. This is expressed in terms of its direct Gross Value Added (GVA) and its headcount employment. The direct GVA of an organisation is estimated as the difference between its income and non-staff operational expenditure.

The Udice Universities had a total income of around €6.9 billion and spent a total €696 million in non-staff operational expenditure. Similarly, the NROs affiliated with them generated an income of around €3.5 billion and spent a total €1.3 billion in non-staff operational expenditure. Over the same period, the Udice Universities supported around 74,000 jobs and 48,000 people where employed by NROs.

13.5.2 Expenditure on Supplies

The Udice Universities and their partner NROs also contribute to economic activity through their expenditure on goods and services. This benefits the businesses where money is spent and supports their activities and employment.

It was estimated that the combined spending on non-staff operational costs of the Udice Universities and their partner NROs was around €2.3 billion. Based on data received from the universities and their academic partners, it was estimated that around 90% of this expenditure benefitted businesses in France, with the remainder going to businesses located elsewhere in the world.
To assess the economic impact generated by this spending, it was first necessary to estimate in which sectors of the economy money were spent. Allocating spending by sector allowed for the use of sector-specific economic ratios and multipliers. In particular, the direct GVA and direct employment generated by supply spending were estimated by diving sectoral turnover in each study area by its respective turnover per GVA and turnover per job ratios. Indirect and induced effects were estimated by applying French Type 1 and Type 2 multipliers for the relevant sectors.

The economic contribution made by supply spending was estimated in line with the methodology set out in Figure 13-7.

**Figure 13-7: Economic Contribution of Expenditure on Supplies**

**Formulas**

\[
\text{GVA} = \sum_a (\text{Exp}(a) / \frac{\text{T(a)}}{\text{G(a)}}) \times M(G)^2
\]

\[
\text{Employment} = \sum_a (\text{Exp}(a) / \frac{\text{T(a)}}{\text{E(a)}}) \times M(E)^2
\]

**Inputs**

\[
\text{Exp}(a) = \text{Expenditure on commodity (a)}
\]

\[
\frac{T(a)}{G(a)} = \text{ratio in industry associated with commodity (a)}
\]

\[
\frac{T(a)}{E(a)} = \text{ratio in industry associated with commodity (a)}
\]

\[
M(E)^2 = \text{Type 2 Employment Multiplier in industry (i)}
\]

\[
M(G)^2 = \text{Type 2 Employment Multiplier in industry (i)}
\]

**13.5.3 Staff Spending**

The Udice Universities and their partner NROs also support economic activity through their employees spending their salaries and wages across the economy. It was estimated that the Udice Universities and their partner NROs spent around €6.5 billion in staff costs. These include spending on staff wages, social security contributions, pension contributions and other benefits.

To estimate the economic impact that is generated by this expenditure it was first necessary to make assumptions on where staff would spend their money. As some money would benefit businesses from outside France, there is no exact match between where staff is located and where spending takes place. In particular, it was assumed that staff living in France would spend around 97% of their incomes in France and 3% elsewhere in the world. Members of staff living outside of France were assumed to spend 10% of their salaries in France.
Having estimated the amount of spending taking place in each study area, it was then possible to allocate this to the sectors benefitting from it. This was based on an analysis of household expenditure in the French Input-Output Tables\(^{44}\). Households spend the most (25%) on real estate, with wholesale and retail (13%), food products, beverages and tobacco (8%) and hotels and restaurants (8%) accounting for a further 29% of household spending.

Prior to estimating the economic impact generated by this expenditure, it was necessary to discount it by 8.3%, the share of household expenditure devoted to Value Added Tax (VAT) in France, according to a 2013 study carried out by the European Commission\(^{45}\).

It was then possible to estimate the direct GVA and employment supported by this expenditure by applying the relevant turnover per GVA and turnover per job multipliers. Indirect and induced impacts were then estimated based on the relevant Type 1 and Type 2 GVA and employment multipliers. The calculations performed to estimate the economic impact from staff spending are displayed in Figure 13-8.

**Figure 13-8: Calculating Staff Spending Contribution**

**Formulas**

\[
\text{GVA} = SE_{\text{Study Area}} \frac{T_{z_s}}{G_z} \cdot M(G)_z^2 \\
\text{Employment} = SE_{\text{Study Area}} \frac{T_{z_s}}{E_z} \cdot M(E)_z^2
\]

**Inputs**

\[
\frac{T_{z_s}}{G_z} = \frac{\text{Turnover}}{\text{GVA}} \quad \text{ratio for staff spending}
\]

\[
\frac{T_{z_s}}{E_z} = \frac{\text{Turnover}}{\text{Employment}} \quad \text{ratio for staff spending}
\]

\[
M(E)_z^2 = \text{Type 2 Employment Multiplier for staff spending}
\]

\[
M(G)_z^2 = \text{Type 2 GVA Multiplier for staff spending}
\]

\[
SE_{\text{Study Area}} = \text{Value of staff expenditure (less VAT) spent in each study area}
\]

---

\(^{44}\) OECD (2020), Final consumption expenditure of households, France, 2019

\(^{45}\) European Commission (2013), A study on the economic effects of the current VAT rates structure.
13.6 Student Impacts

13.6.1 Student Spending
During their time at the Udice Universities, students spend money on a range of goods and services. This expenditure supports the businesses where money is spent, their turnover and employment. The analysis of student impacts considers only the impact that is generated by full-time students, as part-time students tend to have different spending patterns, due to their labour market participation.

The first step in estimating the economic impact from student spending was to establish how much students spend each month on a range of items, including housing costs, transport and other living expenses (e.g. food items). The analysis of student expenditure was based either on data from the Udice Universities or, where these were not available, from the 2016 “Enquête sur les conditions de vie des étudiant·e·s”46. It was estimated that on average students at the Udice Universities spend €7,734 per year. There are, however, differences in spending across cities, with students in Paris tending to spend more than their counterparts.

In addition, it was necessary to consider in which type of accommodation students lived, as students’ patterns of expenditure are expected to vary depending on their tenure. For instance, students living in parental accommodation would not incur any accommodation-related expenses.

Monthly spending by accommodation type was then multiplied by the number of months that students spend at university. In particular, it was assumed that students at the licence level spend nine months at university, whereas all other students spend the whole year at university. Spending was then discounted by the rate of VAT, depending on the different goods and services purchased by students.

Total student expenditure was then divided by the turnover per GVA and turnover per job of the relevant economic sectors to estimate the direct GVA and direct employment generated by student spending. The turnover generated by students’ spending on university-maintained accommodation was not considered, since this was already included as part of the universities’ income.

To estimate indirect and induced impacts, it was then necessary to apply to direct GVA and employment, the appropriate Type 1 and Type 2 GVA and employment multipliers, as done in previous sections. Details of the calculations performed are set out in Figure 13-9.

13.6.2 Student Part-Time Work

Students studying at the Udice Universities also contribute to economic activity through their part-time work. Doing so, they support the operations of those businesses where they work. It was estimated that around 190,000 students, equivalent to 39% of the total number of full-time students at the Udice Universities, work part-time. These students were assumed to work on average 13 hours per week.

However, not all the economic activity engaged into by students can be considered as additional, that is, some of it would have taken place even if students had not carried it out. To estimate the extent of student part-time work’s additionality, it was assumed that this would be negatively related to the unemployment rate of 16-24 years old in their region of France. This was calculated in line with the approach taken by BiGGAR Economics in the study of LERU members\(^{47}\). On average, the rate of youth unemployment was 17%\(^{48}\) and therefore the rate of labour additionality was 69%.

\(^{47}\)BiGGAR Economics (2017) Economic Contribution of the LERU Universities: Supplementary Methodological Appendix
To estimate the economic impact from part-time work, it was first necessary to estimate in which sectors students would work while studying. Based on evidence from the UK Department for Business Innovation and Skill (BIS)\(^49\), it was estimated that more than two thirds of students work in either retail (38%) or in food and beverages activities (33%). The other main industries of student employment were residential care activities, office administration and the leisure sector.

It was then necessary to estimate the number of weeks that students would spend in employment and divide this by the average number of weeks worked across those sectors. In this way, it was possible to estimate for each sector the number of jobs that students support. To estimate the direct GVA that is generated by students’ part-time employment, it was then necessary to multiply the number of jobs in each sector by their respective GVA per job.

Type 1 GVA and employment multipliers were then applied to estimate the indirect impacts generated by student part-time employment. Induced impacts were not considered because they were already considered as part of student spending and their inclusion would have led to double-counting. Details on the methodology followed in estimating the impact from student part-time work are provided in Figure 13-10.:  

Figure 13-10: Calculations of Student Part-Time Work Contribution

Formulas

\[ GVA = M(G)_1 \times (Employment \times \frac{GVA}{Employment}) \]

Employment = \( M(E)_1 \times \left( SW \times \frac{(H_{rsit})}{(H_{rsj})} \times LSA_{(Study\ Area)} \times \left( \frac{Months\ studying}{12} \right) \right) \)

Inputs

\( M(E)_1 \) = Type 1 Employment Multiplier in industry (i)

\( M(G)_1 \) = Type 1 GVA Multiplier in industry (i)

\( LSA_{(Study\ Area)} \) = Labour Supply Additionality in study area

Employment = Equivalent employment in industries of student work

\( SW \) = Number of students with part time job

\( (H_{rsit}) \) = Average weekly hours worked by students

\( (H_{rsjt}) \) = Average weekly hours of student employment in industries of student work

\( (Months\ studying) \) = Average months of the year spent at University

\( \frac{GVA}{Employment} \) = ratio in industries of student work

13.7 Cross-Over Impact

13.7.1 Capital Contribution

The Udice Universities and their partner NROs also contribute to economic activity through their spending on capital projects. This includes spending on buildings, equipment, including software and IT, and machinery.

Whereas operational spending tends to be a function of an organisation’s turnover, this type of expenditure tends to fluctuate over time. For this reason, data were collected for the period between 2015 and 2024. In this way, it was estimated that the Udice Universities and their partner NROs spend on average €434 million on capital projects each year. Most of this spending benefitted businesses located within France.

To estimate the economic impact that was generated by spending on capital projects, it was necessary to divide annual expenditure in buildings and equipment by the relevant turnover per GVA and turnover per job ratios. Type 1 and Type 2 GVA and employment multipliers were then applied to these estimates to account of indirect and induced impacts. The process followed is described in Figure 13-11.
Figure 13-11: Calculating Capital Spending Contribution

Formulas

\[ GVA = \sum_a ((Estates\ Expenditure) G_a) * M(G)_{c}^2 \]
\[ + ((Research\ Expenditure) G_m) * M(G)_{m}^2 \]
\[ Employment = \sum_a ((Estates\ Expenditure) E_a) * M(E)_{c}^2 \]
\[ + ((Research\ Expenditure) E_m) * M(E)_{m}^2 \]

Inputs

\[ Exp(a) = Expenditure\ on\ commodity\ (a) \]
\[ \frac{T_c}{G_c} = \frac{Turnover}{GVA}\ ratio\ in\ the\ construction\ industry \]
\[ \frac{T_c}{E_c} = \frac{Turnover}{Employment}\ ratio\ in\ the\ construction\ industry \]

\[ M(E)_{c}^2 = Type\ 2\ Employment\ Multiplier\ in\ construction\ industry \]
\[ M(G)_{c}^2 = Type\ 2\ GVA\ Multiplier\ in\ construction\ industry \]

\[ (Estates\ Expenditure) = Average\ estates\ expenditure\ over\ 10\ years \]
\[ (Research\ Expenditure) = Average\ research\ infrastructure\ spend\ over\ 10\ years \]

13.7.2 Student Volunteering

Students at the Udice Universities contribute to economic activity by volunteering during their studies. Their participation in these activities helps the organisations where they volunteer to expand their operations. In return, these experiences benefit students in several ways, including through the acquisition of skills that will be transferable once they will enter into the labour market.

It was estimated that on average around 114,000 students at the Udice Universities spent some time volunteering during their studies. These students spent around 86 hours\(^50\) per year helping as volunteers. To estimate the value of their contribution the number of hours spent volunteering was multiplied by the 2019 minimum wage rate of € 10.03\(^51\).

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13.7.3 Visits to Staff and Students

When studying or working at the Udice Universities, students and staff receive visits from relatives and friends (VFR visits). These visitors contribute to economic activity by spending money during their trips, supporting the turnover and employment of local businesses. Based on data from Eurostat\textsuperscript{52} on VFR tourism in France, it was estimated that in a single year in France there are around 0.95 domestic VFR trips and around 0.11 overseas VFR trips per capita.

These ratios were then multiplied by the total number of students and staff at each of the Udice Universities to estimate the total number of VFR visits taking place over a year. Based on data on expenditure by trip from Eurostat\textsuperscript{53}, it was estimated that on average each domestic visitor would spend €360 per visit, whereas each overseas visitor would spend around €550 per visit. Not all this spending could be considered as additional, since some of it would have taken place in any case. In particular, it was assumed that around 25\% of VFR tourism spending was to be considered as additional to French tourism.

**Figure 13-12: Calculations of Visits to Staff and Students Contribution**

**Formulas**

\[
\text{Visitor Spend} = (N_{\text{students}} + N_{\text{staff}}) \times T(f) \times S(f)
\]

\[
\text{GVA} = \frac{T_i}{G_i} \times \text{Visitor Spend}
\]

**Inputs**

- \(N_{\text{students}}\) = number of students
- \(N_{\text{staff}}\) = number of staff
- \(\frac{T_i}{G_i}\) = ratio in industries of tourism spend
- \(S(f)\) = VFR spend per trip in France
- \(\frac{T_i}{G_i}\) = ratio in industries of tourism spend

Visitors’ spend was then allocated to the economic sectors where it takes place (hospitality, transport and retail). Direct GVA and employment were then estimated by dividing turnover by the turnover per GVA and turnover per job ratios of those sectors where visitors tended to spend their money. Type 1 and Type 2 multipliers were then applied to estimate indirect and induced impacts, as done elsewhere in this study.

\textsuperscript{52} Eurostat (2020), Number of Trips by Purpose.
\textsuperscript{53} Eurostat (2020), Tourism Expenditure by Purpose.
### 13.7.4 Conferences and Events

Universities part of Udice have also an impact on tourism activity through the organisation of events and conferences, including open days for perspective students. To estimate the economic impact generated by these visitors, it was necessary to make a distinction based on where they came from and the length of their stay. This is because overnight domestic visitors, overnight overseas visitors and domestic visitors have all different spending patterns.

In addition, as done for visiting friends and relatives, it was necessary to take into account that not all the visits could be considered as additional.

In this way, it was possible to estimate the total expenditure generated by these visitors, which was then discounted by the prevailing VAT rate. Direct GVA and employment were estimated by dividing turnover by the turnover per GVA and turnover per job ratios of those sectors where visitors tended to spend their money. Type 1 and Type 2 multipliers were then applied to estimate indirect and induced impacts, as done elsewhere in this study. Details of the methodology followed are provided in Figure 13-3.

#### Figure 13-13: Calculation of Conference and Event Contribution

**Formulas**

\[
\text{Visitor Spend} = A_o \times S(E)
\]

\[
\text{GVA} = \text{Visitor Spend} \times \frac{T_i}{G_i}
\]

**Inputs**

\[ A_o = \text{Overseas Attendees} \]

\[ S(E) = \text{Average visitor spend in France} \]

\[ \frac{T_i}{G_i} = \frac{\text{Turnover}}{\text{GVA}} \text{ ratio in industries of tourism spend} \]