

Since the middle of the twentieth century, higher education has flourished around the world. Analysing data on 15,000 universities in 78 countries for the period since 1950, **Anna Valero** and **John Van Reenen** find that there is a strong positive impact of university expansion on regional economic growth.

How universities boost economic growth

In 1900, only 1% of young people in the world were enrolled at universities. Over the course of the next century, particularly after the Second World War, this proportion exploded to 20% as recognition of the value of human capital for both economic and social progress became widespread (Goldin and Katz, 2008; Schofer and Meyer, 2005).

Today, many governments – even in countries with advanced university sectors – see value in further expansion of higher education. In the UK, for example, the Higher Education and Research Bill is being pushed through parliament. This bill includes measures to encourage entry into the sector to foster growth and social mobility. It should be noted however, that at the same time, university maintenance grants have been converted to loans, which, evidence suggests, could harm applications from poorer students (Dearden et al, 2014; Dynarski, 2003).

The most obvious channel through which we may expect universities to have an impact on economic growth is via their role as producers of human capital. There is ample evidence that higher education pays off for the individual as wages of

graduates are much higher than those of non-graduates.

Macroeconomic research has generally found that at the country level, human capital (typically measured by years of schooling) is important for development and growth, but proving the link at the country level is difficult as there are many factors to control for. At the sub-national level – where you can hold unobserved country-specific factors constant, studies have shown that human capital is important for regional GDP per capita in the cross-section and confirmed that this relationship also holds for growth (Gennaioli et al, 2013; 2014).

Over and above producing graduates, universities may be expected to affect growth through stimulating innovation in their surrounding region (for example, Silicon Valley), and indeed there is a large body of evidence for this mechanism. In addition, universities may affect economic growth via their role in the development of institutions, and also as substantial purchasers of goods and services in a region.

Our research considers the effect of the growth of universities themselves on regional growth using a comprehensive

international dataset. We compiled new data based on UNESCO's World Higher Education Database detailing the location of 15,000 universities in 1,500 sub-national regions across 78 countries and examine the relationship between university entry and regional growth between 1950 and 2010.

It turns out that the expansion of higher education in this period was not just the product of riches: it has helped to fuel economic growth around the world. These findings are consistent with other, more contextual papers that have linked universities themselves or their spending to local economic outcomes for firms and regions (Cantoni and Yuchtman, 2014; Aghion et al, 2009; Kantor and Whalley, 2014).

The growth in universities over the last 1,000 years

The word 'university' was coined by the University of Bologna, founded in 1088. As the first modern university, it was distinct from the religion-based institutions that had come before. It was a community with administrative autonomy, courses of study, publicly recognised degrees and research objectives.

Since then, universities have spread worldwide (see Figure 1) in broadly the same form. Economic historians have argued that universities were an important force in the commercial revolution through the development of legal institutions (Cantoni and Yuchtman, 2014) and also the industrial revolution through their role in building and disseminating knowledge (Mokyr, 2002).

While growth has been experienced worldwide, today's distribution of universities across countries is skewed, with seven countries (the United States, Brazil, the Philippines, Mexico, Japan, Russia and India, in descending order) accounting for over half of the universities in the world (see Figure 2). The United States is the country with the largest share, accounting for 13% of the world's universities.

Universities and regional growth

Our analysis focuses on the period since 1950 when, as Figure 1 shows, university



The expansion of higher education has helped to fuel economic growth around the world

growth was particularly rapid. We look at sub-national data at the regional level (for example, US states) and find that increases in university numbers significantly raise future GDP per capita.

Our main result is that a 10% increase in the number of universities (which roughly means adding one more university in the average region in our data) increases that region's income by 0.4% as illustrated in Figure 3. This implies that the effect of adding a university to a region that has 10 universities is much larger (0.4%) than adding a university to a region that already has 100 universities (0.04%), reflecting diminishing returns. Our results are robust to controlling for population and geographical factors and even unobserved regional trends. Moreover, we show that it is not simply that faster growing regions open up more universities (reverse causality).

We find that universities also increase output in neighbouring areas within the same country, with stronger effects for geographically closer regions.

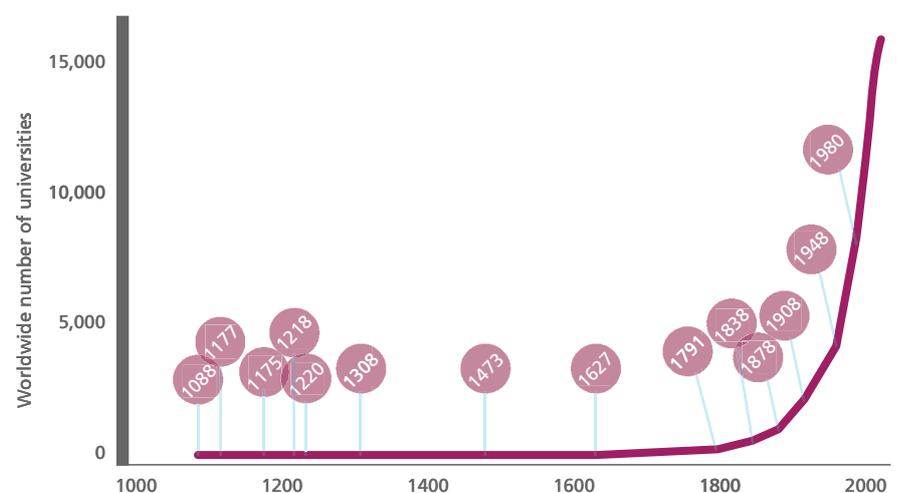
Policy-makers are not only interested in the potential benefits of universities, but also in the costs of building and maintaining them. In the UK, we estimate that if one university were added to each of its 10 regions, this would lead to about 0.7% higher national income (£11 billion based on 2010 figures). This is higher than the likely annual cost, which based on average university expenditure is more like £1.6 billion. The large margin between benefits and costs suggests that university expansion remains beneficial.

Mechanisms

A cynic might claim that universities affect growth in a mechanical way: more people move to the region and consume more 'essentials' there – housing, beer and night club services spring to mind. But our results remain even when we control for population growth. It could also be that when universities are financed by transfers into a region, say from the national government, there is a mechanical impact on GDP per capita. We show that even

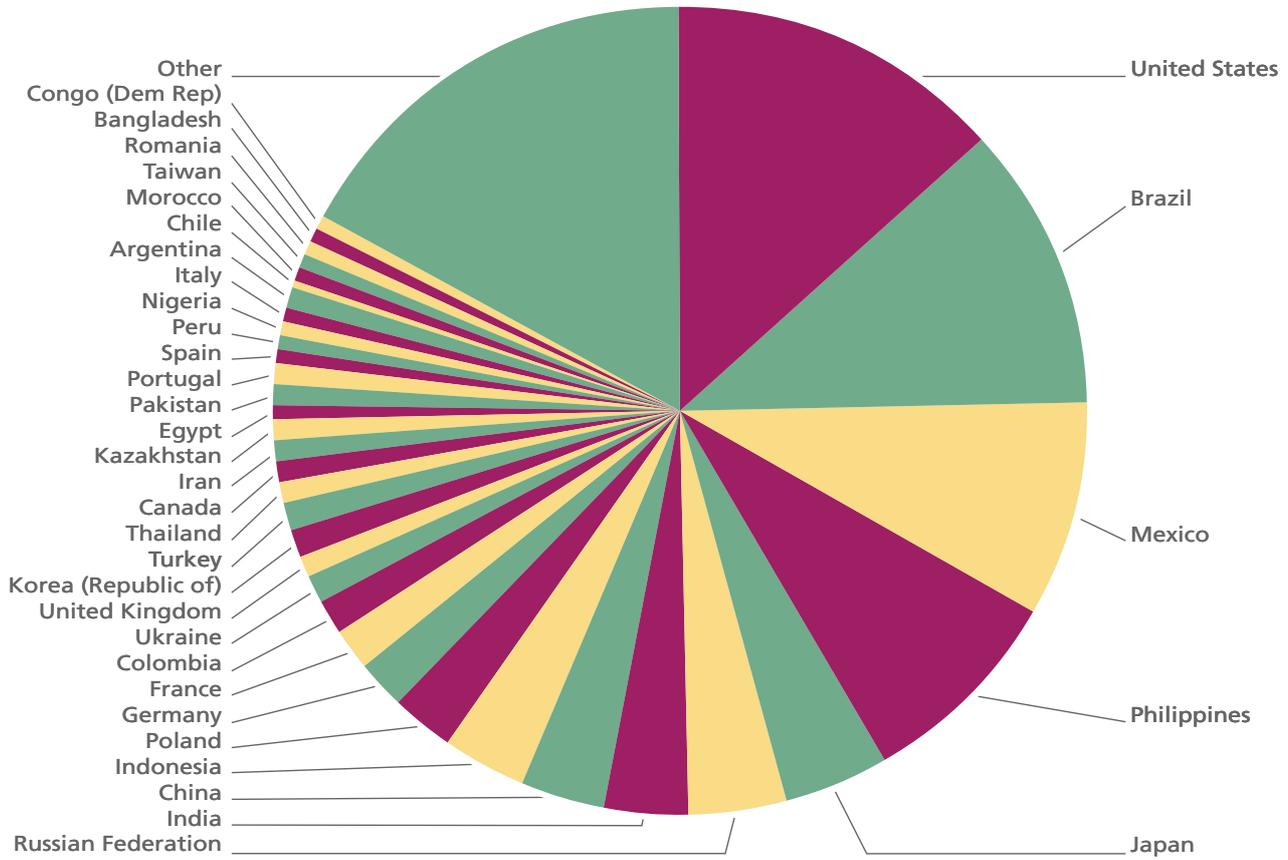
Doubling the number of universities in a region raises future GDP per capita by 4%

Figure 1: The global growth of universities over the last 1,000 years



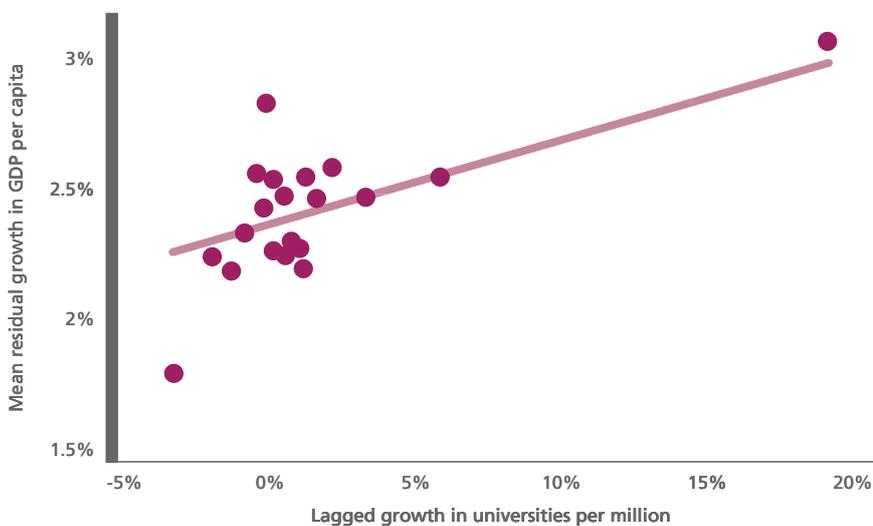
Source: World Higher Education Database; dates marked when the number of universities in the world doubled.

Figure 2:
Location of universities in 2010



Notes: Pie chart shows the share of worldwide universities in each country, as at 2010.
Source: World Higher Education Database.

Figure 3:
Average growth rates, region-year observations



Notes: 8,128 region-year observations are grouped equally into 20 bins, variation is within country.
Sources: World Higher Education Database; Gennaioli et al (2014) for regional GDP per capita and population.

The benefits of university expansion in the UK far outweigh the costs, but Brexit poses significant risks

under some very generous assumptions about the size and spending of a new university, this is unlikely to explain a large fraction of our result.

We find that the university effect seems to be related to increasing the supply of skilled graduates who raise productivity in the firms where they work. We also find that universities boost innovation (as measured by an increase in patenting).

Over a longer time frame, we find that higher university presence in a region is also associated with pro-democracy views among individuals. The striking thing about this result is that it persists even when we control for an individual's own education, suggesting that there could be some kind of externality associated with universities through the diffusion of ideas into their surrounding areas.

The strength of our research lies in the comprehensiveness of the dataset in terms of the coverage of sub-national regions and time periods. Due to our empirical design, we cannot rule out that the effects are at least in part driven by unobservable factors that vary over time, for example, strong regional governments that implement many growth-enhancing policies, including opening new universities.

Moreover, our measure of university presence – the number of universities – does not take account of differences in the size and quality of institutions. Future work, focused on the UK with more granular data, aims to address these issues and shed more light on the mechanisms at work.

Conclusions

International data since the 1950s shows that universities matter for growth, and using the UK as an example, we estimate that the benefits far outweigh the costs. Assuming that any new universities have the same qualities as those we already have, our analysis suggests that policies to encourage entry into the sector would be good for growth.

In the UK-specific context however, the Brexit vote poses significant risks. UK universities have thrived in recent decades in a climate of openness to international students, academics and collaboration, all of which will have contributed to the economy through skilled employees and innovations. It is important that whatever Brexit deal is finally agreed, these key strengths are preserved.



This article summarises 'The Economic Impact of Universities: Evidence from Across the Globe' by Anna Valero and John Van Reenen, CEP Discussion Paper No. 1444 (<http://cep.lse.ac.uk/pubs/download/dp1444.pdf>).

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UK universities have thrived in a climate of openness to international students, academics and collaboration

Further reading

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