

### 3 UNIVERSITY DRIVEN GROWTH

Universities are recognised globally as one of the critical drivers of economic growth. The growth of advanced economies has been associated with a growing role for universities, providing the intellectual and human capital required for a successful modern economy. This section examines the role of universities in underpinning growth by discussing how knowledge and innovation contribute to productivity growth and therefore economic growth and the various ways that universities impact the economy.

#### 3.1 Theoretical Foundations

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. In recent years a number of influential economists have published works that set out a theoretical and empirical case for the role that high level skills and innovation play in both boosting economic competitiveness and addressing inequality in society.

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<sup>3</sup> 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 rest. This means that the diffusion of knowledge is as important as pushing the boundaries of knowledge. Moreover, since productivity growth is what drives growth in the economy, this indicates that there is considerable scope for higher rates of economic growth.

Analysis for the UK Government (2014) has noted the strong drivers for productivity growth flowing from universities and science and technology:

- one third (32%) of the productivity growth that took place in the UK between 2000 and 2008 was attributable to changes in technology resulting from science and innovation<sup>4</sup>;
- data from 15 advanced economies for the period 1982 to 2005 on graduates and human capital found that<sup>5</sup>:
  - GDP per employment hour and the share of employment with tertiary education both increased in all countries between 1982 and 2005;

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<sup>3</sup> Stiglitz and Greenwald (2014), *Creating a Learning Society: A New Approach to Growth, Development and Social Progress*

<sup>4</sup> HM Treasury and Department for Business Innovation and Skills, Dec '14, 'Our Plan for Growth: Science and Innovation'

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/387780/PU1719\\_HMT\\_Science.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/387780/PU1719_HMT_Science.pdf)

<sup>5</sup> Department for Business Innovation & Skills (August 2013), BIS Research Paper No 110: The relationship between graduates and economic growth across countries.

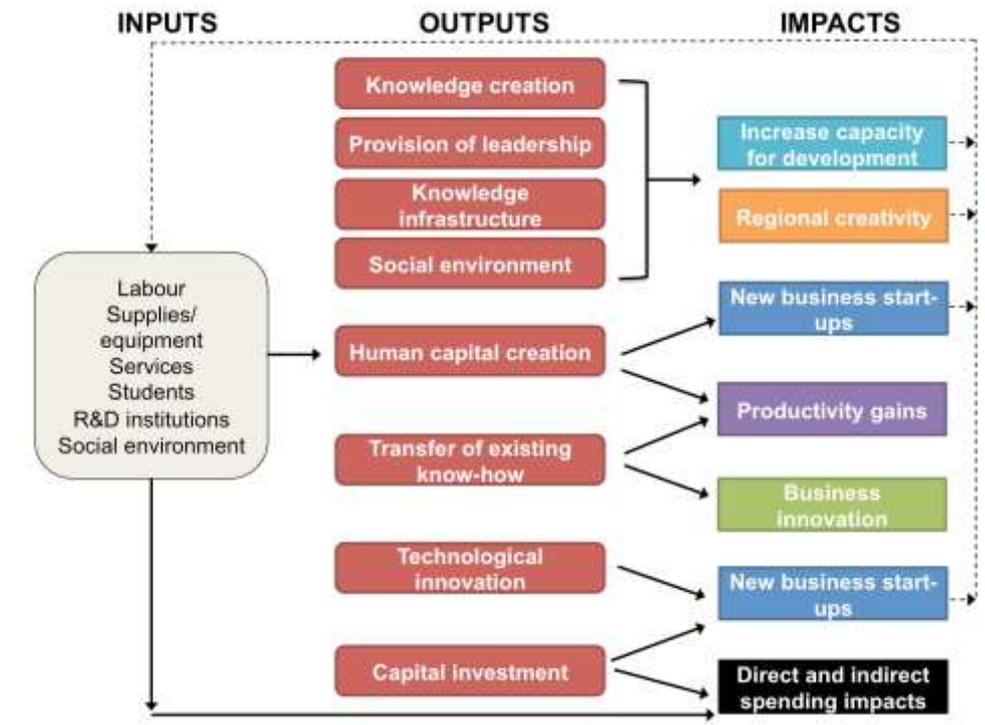
- graduate skills accumulation contributed to roughly 20% of GDP growth in the UK from 1982-2005;
- a 1% increase in the share of the workforce with a university degree raises the level of long run productivity by 0.2-0.5%; and so
- with the share of the UK workforce with university education having increased by 57% between 1994 and 2005, it is estimated that this will have raised UK long-run productivity by 11-28%. This means that at least one-third of the 34% increase in labour productivity between 1994 and 2005 can be attributed to the accumulation of graduate skills in the labour force.

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 The Role of Universities

Universities have wide and far-reaching impacts on the economy, which are often interrelated. The outputs and direct and indirect positive impacts associated with the main activities that universities undertake are illustrated in Figure 3.1 below. Figure 3.1 illustrates how universities deliver enhanced productivity in the economy through a number of mechanisms.

Figure 3.1 – University Outputs and Expected Economic Impacts



Source: Goldstein and Renault (2004), *Contributions of Universities to Regional Economic Development: A Quasi-Experimental Approach*

The two fundamental activities of universities are the creation of **intellectual and human capital**. Universities contribute to knowledge creation through the basic and applied research that is undertaken. The most influential technologies today and the technologies of the future arise out of this research. 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 for the economy.

Over and above these fundamental activities universities also work to **transfer existing knowledge throughout the economy** through their interactions with businesses such as through research collaboration, consultancy and workforce training, which increases productivity and business innovation. Universities are also a vital source of **technological innovation** through the commercialisation activities that they undertake such as the creation of spin-out companies and licensing of intellectual property.

**Knowledge infrastructures** largely arise due to positive agglomeration effects from universities. For example, many research institutes, and companies choose to locate in close proximity to research intensive universities in order to benefit from informal knowledge sharing as well as frequent face-to face contact with academics involved in research. It is for this reason that cities with universities also have large numbers of associated knowledge infrastructures such as research institutes and science parks, which can ultimately develop into knowledge clusters.

Many universities play an important civic **leadership** role regionally and nationally, contributing to the advisory boards of private, public and non-profit organisations. This ensures a coordinated economic development approach helping to match skills with regional needs and vice versa. Universities can also have a number of impacts on their **social environment**. The staff and student base provided by universities undoubtedly contributes to the overall vibrancy of the cities they are located in. In addition to adding to the quality of the local environment, universities contribute to the attractiveness of a region as a knowledge centre thereby attracting investment and attracting people to work, live and study in an area.