

## **Mr Gradgrind Meets Jude the Obscure: What Use is Higher Education to the Economy?**

This was the question addressed by me and by Professor Bernard King at the David Hume Institute Seminar in February 2007. In our different ways, for different reasons, we both concluded that while higher education did matter very much, the policy conclusions to be drawn from that were not the ones which dominate the policy agenda today. This note summarises my arguments, which move from some comments on the causes of growth in general to the specific causal role of higher education. I go on to argue that governments should not necessarily be picking research winners as the centres of growth clusters, as we know too little about why such clusters emerge and thrive; nor is higher education the most important recipient of government funding in education. I end with some further reflections.

### **Modern economic growth**

For much of the history of economics between its origins in the Scottish Enlightenment and about 1990, economists considered growth in output to be caused by growth in inputs, in the amount of labour and capital used. Long-run growth rates would depend on a mysterious force known as ‘technical progress’ which fell on the economy like manna from heaven, and should be broadly the same everywhere, at least once poor regions or countries had caught up to the economic leaders. Reality has now dawned on economists, however. Our models now recognise that innovation and human capital – how new technologies are invented and used by people and how and why people acquire the necessary skills – are fundamental in the process of growth.<sup>1</sup> These can and do differ widely from one place to the next. Why?

The question puts two areas of policy at the heart of the economic agenda: science and technology; and education. Universities are important both for creating highly skilled people and for generating ideas which can ultimately be turned into the production techniques of tomorrow’s economy. What’s more, as ideas and clever people feed off each other, growth forms either a virtuous circle or a vicious spiral. Many poor countries linger in a Catch 22: there is no point in investing in education if the economy offers no good jobs paying high returns to graduates; nor is there any point creating good jobs for graduates if nobody has bothered to get a good education. Conversely, growth hot spots feed on their own success: hi-tech companies locate in Silicon Valley because of all the brilliant people there; the most brilliant students and graduates will go there because of all the opportunities. Stanford University seeded that pearl.

---

<sup>1</sup> The evolution of models of growth is described in some detail in Chapter 3 of my book *The Soulful Science* (Princeton University Press 2007).

In short, growth is lumpy.<sup>2</sup> It was always so. Economic activity has always clustered in towns and cities. Urbanisation is one of the key markers of economic development, and Alfred Marshall explained this in a famous account at the turn of the 20<sup>th</sup> century, writing of the knowledge that seemed to be ‘in the air’ wherever there was a pool of skilled labour and a network of specialist firms to exchange know-how. The resulting clusters of activity are often very specialised indeed. Silicon Valley is one of the most famous but they are everywhere, from the one street in Rome where makers of religious vestments are clustered, to the three hotspots for the manufacture of isotope ratio mass spectrometry, Bremen in Germany, Santa Clara in California and Wythenshawe in the north west of England.

However, there are three new aspects to the clustering of economic growth today.

The first is that in what is often called the knowledge economy, that is a services-based economy with an important high technology sector, proximity has become even more important than ever. This seems paradoxical to some – after all, modern communications have made it possible to work at great distances too. However, advanced services and technology-based activities depend heavily on the transfer of ‘tacit knowledge’, ideas which are too difficult to pass on simply by writing down for others to read. Education involves a lot of tacit knowledge, which is why teaching is largely done face to face. But so do other complex services such as finance or programming. There is evidence that information and communications technologies are increasing urban density rather than decreasing it, because face-to-face and mediated forms of communication are complements and not substitutes. The cheaper and easier it is to communicate by email or phone, the more those people who so communicate will want to meet up as well.

The second reason is that in an economy consisting largely of service activities, the market will largely be where the people are. Although some services are becoming increasingly easy to trade down a phone line or on the internet, the great majority depend on proximity to customers. This, too, is a self-reinforcing phenomenon, as the presence of a large market will cause more service firms to locate there, which will increase the size of the market, and so on.

Thirdly, very few activities now depend on specific geographical features such as the presence of a port or the intersection of transport routes or the availability of minerals. Other factors will determine the location decisions of firms, and it is clear that one of the most important of these along with access to market is the availability of a skilled workforce.

---

<sup>2</sup> For a picture of how lumpy, see <http://gecon.yale.edu/data.php>

## **The evidence on education and growth**

The empirical evidence also points firmly to the importance of education for growth, and the higher the level the better. There are regression results for many countries demonstrating this, and it has become one of the least contentious findings in economics. The result holds true at the sub-national level as well. This includes Scotland, and the towns and cities within Scotland. The Harvard economist Edward Glaeser shows a correlation between growth rates and proportion of the population with higher education in his chapter in a recent book on the Scottish economy.<sup>3</sup> The same holds for regions and cities in other countries too: there is a strong correlation between a more educated workforce and a faster growth rate. Some governments were quick to identify education as a lever which could affect growth. Ireland stands out as a familiar example, with the strategy of creating a skilled workforce an important strategic element of the government's planning in the 1980s and 1990s.<sup>4</sup> The Irish government devoted a quarter to a third of the EU structural funds it received between 1989 and 2006 to education.

There is yet more supporting evidence for the importance of education for growth to be found from the returns to individuals from investment in education. As measured by the premium in their real wages, returns to graduates have always been high, but in England and especially Scotland the premium for a higher education had narrowed during the 1970s. During the past decade and a half it has widened substantially, however. This is a widespread phenomenon throughout the OECD in fact: in all the advanced economies wage dispersion has increased at some point during the past decade and a half. Economists believe the reason is largely the impact of new technologies, with a higher return to those who can use computers to work more productively.

If correct, this suggests a parallel with the late Victorian era, when earnings inequality increased substantially. The arrival of factory techniques raised the return to those who possessed new skills such as literacy, with an increase in inequality which was not reversed for some decades until primary schooling spread literacy and the political winds turned in favour of labour rather than capital.

As discussed above, universities also have potential importance for the economy because of the central role they play in innovation. Innovations take one of two forms: incremental improvements (usually developed by research and development functions in big companies) and radical breakthroughs (usually the province of entrepreneurs, and

---

<sup>3</sup> 'Four Challenges for Scotland's Cities' by Edward Glaeser, in *New Wealth for Old Nations*, ed. Coyle, Alexander and Aschcroft, Princeton University Press 2005.

<sup>4</sup> See John Bradley, 'Committing to Growth in A Small European Country', *ibid*.

scientific entrepreneurs in the case of high-tech breakthroughs).<sup>5</sup> So for example, patents issued to small firms are more likely than big firm patents to be amongst the most frequently cited, and high-tech innovations are more likely to be developed by small enterprises.

Hence the tremendous attention paid not to the commercialisation of university-based research. IT and biotech clusters for instance are almost all located close to and draw ideas and people from a major university research centre.

Both theory and evidence seem clear enough, leading policy makers the world over to ask how they can turn ‘their’ location into a successful economic cluster with a highly educated workforce and a lot of dynamic industries. In local and urban politics in particular, the idea of the ‘consumer city’ or ‘creative city’ has caused a huge buzz. Certain types of amenities are thought to make a place attractive to locate, the museums, parks, events, restaurants and shops – and also the universities – which can be guaranteed to attract a lot of other like-minded people.

What policy traction can be derived from this list of characteristics? Many cities already have them. Indeed, ‘top ten’ lists of dynamic cities have relatively little overlap because there are so many candidates with attractive amenities and so much vagueness about the criteria which determine their impact on economic dynamism. The table below shows the rankings from three recent lists of dynamic UK cities, all reported in the press, and with little overlap (although with less Scottish presence in any of the three than might have been hoped).

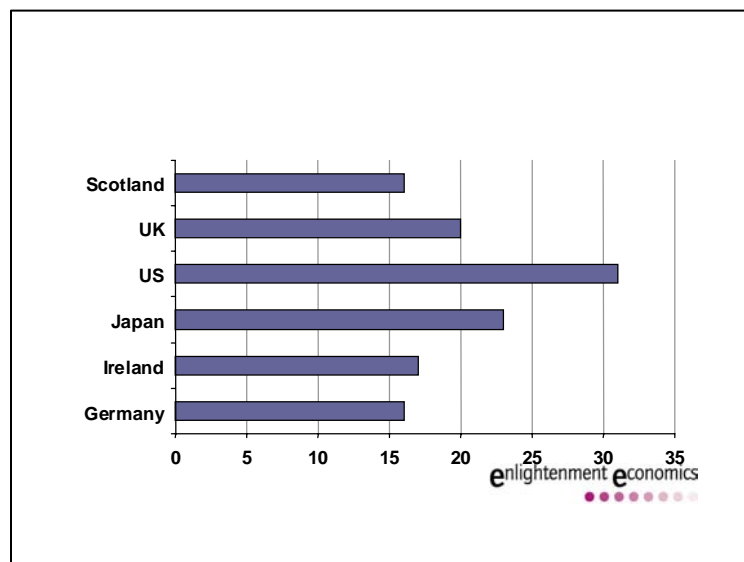
	<b>RRSII (2002)</b>	<b>Boho Britain (2003)</b>	<b>DKNY (2002)</b>
1	Bristol	Manchester	Cambridge
2	Birmingham	Leicester (2=)	Edinburgh
3	Manchester	London (2=)	Manchester
4	Nottingham	Nottingham	Bristol
5	Leeds	Bristol	Newcastle
6	Sheffield	Brighton & Hove	Sheffield
7		Birmingham	Glasgow
8		Coventry	Leeds
9		Cardiff	London
10		Edinburgh	Birmingham

However, despite the lack of clarity about what it takes to turn a city into a ‘creative city’ with economic buzz, it is clear that a highly educated population is a *sine qua non*. And in times gone by, the

---

<sup>5</sup> See *The Free Market Innovation Machine*, Will Baumol, Princeton University Press 2002.

Scots would always have been considered be on average better educated than the anti-intellectual English. However, Scotland does not fare well in the international rankings of higher educational attainment these days. The chart below gives a snapshot. Edinburgh is Scotland's best-educated city: 32% of its workforce are graduates. This is the same as the average for the whole of the US and far behind its leading cities.



### Policy lessons?

The story so far looks straightforward. Higher education and innovation both matter – a lot – for growth in theory and in practice. Growth in the advanced economies is increasingly concentrated in cities, where universities have a dual role as producers of highly educated people who have ideas which can be turned into the commercial technologies of tomorrow, and also as urban amenities which attract still more highly skilled people to the city. Scotland is relatively low in the OECD league table for higher educational attainment. Therefore investing more in higher education, and putting more effort into links between universities and business, are policy no-brainers.

Or are they? This is where Mr Gradgrind comes into the story. Here is how Dickens had Gradgrind describe himself:

“Thomas Gradgrind, sir. A man of realities. A man of fact and calculations. A man who proceeds on the principle that two and two are four and nothing over, and who is not to be talked into allowing for anything over. Thomas Gradgrind. With a rule and a pair of scales, and the multiplication table always in his pocket, sir, ready to weigh and measure any parcel of human

nature, and tell you what it comes to.”

Like Dickens, I want to warn readers to beware of simple, instrumental stories about the economic importance of higher education, at least when setting government policy. Many, perhaps most, successful research clusters from Silicon Valley down were not formed because of a specific government policy. The general environment for innovation certainly matters – is it straightforward to patent innovations? Easy to set up a business? Raise funds for new ideas? However, we are very far from understanding how policies can turn university research into new Hewlett Packards, which types of research to favour, which universities to select ahead of others in bids for this kind of instrumental funding. Until we can answer simple questions, such as whether a research team from Glasgow or Bristol is more likely to develop an innovation with commercial application and growth potential, the government should stick to what it does at the moment through the research councils, and fund good research. This can and should have a regional dimension to it. The academic world is almost entirely dependent on public money and I see no reason why the government should not allocate more of that to universities outside the ‘golden triangle’ than it does at present, as researchers will follow the funding. But this is a policy of regional distribution, not a growth policy.

There is a second reason for not seeing higher education as the solution to the challenge of increasing the economy’s potential growth. Beyond the usual warning about the incapacity of governments to pick winners (or anybody’s capacity – winners are created, not picked), we should remember that the private return to higher education is very high, and has increased in recent times. Governments do not need to set targets to get more young people into universities, although they might need to make it possible for some groups of them to do so. The incentive to study for a degree is already more than adequate.

When it comes to an assessment of where best to spend public money on education, the mismatch between social returns and private incentives is far greater at primary level. Adam Smith understood the vital importance of education in a child’s early years:

“The difference of natural talents in different men is, in reality, much less than we are aware of; and the very different genius which appears to distinguish men of different professions, when grown up to maturity, is not upon many occasions so much the cause as the effect of the division of labour. The difference between the most dissimilar characters., between a philosopher and a common street porter for example, seems to arise not so much from nature as from habit, custom and education. When they came into the world and for the first six or eight years of

the existence, they were perhaps, very much alike, and neither their parents nor playfellows could perceive any remarkable difference. About that age or soon after they come to be employed in very different occupations. The difference in talents then comes to be taken notice of and widens by degrees till at last the vanity of the philosopher is willing to acknowledge scarcely any resemblance. But without the disposition to truck, barter and exchange, every man must have procured to himself every necessary and conveniency of life which he wanted. All must have had the same duties to perform, and the same work to do, and there could have been no such difference of employment as could alone give occasion to any great difference of talents.”

The economic evidence on the social return to spending on pre-school and primary school is very clear, while the private economic returns are low relative to the returns to secondary and especially tertiary education.<sup>6</sup> Yet the scope to capture those gains depends on the skills acquired at the earliest stage. Governments can best equip people to enter university by educating them well in the earlier stages of their educational career. To conclude from the economic evidence of a link between higher education and growth that more higher education means more growth is Mr Gradgrind’s arithmetic. It overlooks the raw material which is the input into the higher education process. Thomas Hardy’s *Jude* holds a lesson for us here.

## **Conclusions**

My comments have been aimed at debunking a particular policy fashion, namely using public money to encourage universities to spin out scientific innovations for commercial application in order to create growth hotspots, and thereby boost the economy’s growth rate overall. There clearly has to be public funding of some types of scientific research, and it has to be concentrated in particular centres, as the costs are so high. Those centres will almost always choose themselves because the people leading the field will be there already, having congregated together. But I believe scientists who have a commercially viable idea will run with it themselves if the enabling environment is in place. When it comes to university-business relationships, the government is a wallflower. Moreover, universities receive too large a share of education spending compared to primary and secondary schools and other tertiary establishments, and the social and economic return would be higher if that spending were rebalanced. No doubt universities do need more money. They will have to raise it by charging students a small fraction of their enhanced lifetime earnings, a bullet we in England have already nibbled, if not yet bitten. The growing wage premium for graduates is evidence of the need for an

---

<sup>6</sup> For a perspective on this in the context of Scotland, see James Heckman, ‘Skill Policies for Scotland’, in *New Wealth for Old Nations*.

adjustment in the economy's labour supply mix. A knowledge economy requires all its people to be better educated; a brilliant scientific elite can't boost growth without a workforce able to apply and use its innovations.

**Diane Coyle**

**Enlightenment Economics and visiting professor, University of Manchester**