

SPEECH FOR INET CONFERENCE
HONG KONG

A striking feature of the neoclassical economic theory which has been dominant in Western universities in recent years is that it has had so little to say about innovation and innovation policy which is useful for policy-makers. In contrast, policy-makers have seen it as a key issue on which they need to focus. They have recognised that innovation is a major factor driving economic growth and that losing the race for innovation advantage in the global economy can result in a relatively lower standard of living as nations lose higher-value-added sectors.

If we look around the world, we see that in recent years some three dozen countries have created formal national innovation strategies and at least two dozen have established national innovation agencies. Countries as diverse as Finland and China have made innovation a national priority.

Finland, for example, faced with a drop of 9 per cent in its GDP when the Soviet Union, the major market for its exports, broke-up in 1991, did not attempt to ride out the storm by simply cutting back all investment, but on the contrary, while slashing overall government spending significantly expanded its support for R&D. This it did in part through boosting funding for its national innovation agency, Tekes, and in part by putting in place innovation-based tax incentives for business.

Finland increased its R&D intensity from less than 3 per cent in the 1990s to nearly 4 per cent by 2008. As a result by 2001 Finland had become one of the fastest-growing and most competitive economies in the world, and in the competitiveness rankings of the Global Competitiveness Report, Finland took top spot from the United States in 2000. Today Finland is widely seen as one of the most innovative countries in the world and to have one of the best-designed national systems of innovation.

China also, not wanting to remain the low-cost manufacturer of the world for longer than it has to, has made clear its intention to be an innovation leader. In January 2006 it initiated a fifteen-year “medium-to long-term plan for the Development of Science and Technology”. The plan aims for China to become an “innovation-oriented society” by 2020, to develop indigenous innovation capabilities, to increase research and development expenditures to 2.5 per cent of GDP by 2020, to increase the contribution to economic growth from technological advances to 60 per cent, and to become one of the top five countries in the world in the number of patents granted. In 2011 it announced its updated “China Innovation 2020” goals which included investing \$1.5 trillion on seven “strategic emerging industries”.

As well as introducing new innovation policies and making major investment in innovation, recent years have seen many nations creating new national innovation agencies. Recognising that neither traditional science support agencies nor large, inflexible economic ministries can adequately support innovation, more than two dozen nations have created national innovation agencies. Some countries have had agencies for a number of years. Taiwan’s Industrial Research Technology Institute (ITRI) dates back to 1973 and Finland’s National Agency for Technology and Innovation, Tekes, to 1983, while recent years have seen Sweden create VINNOVA in 2001, Norway create Innovasjon Norge in 2004, Thailand create its National Innovation Agency in 2003 and the United Kingdom create its Technology Strategy Board in 2007.

I think it is fair to say that neoclassical economists have shown little interest in this new focus on innovation and innovation policy as a major factor driving economic growth. There are, I believe, two reasons for this neglect. Firstly, they have defined economics as being the study of how to allocate scarce resources among competing ends. They have not seen it as being about how firms create new forms of production, products and business models to expand wealth and people’s quality of life. They have, therefore, focused on how well a nation’s financial and labour markets allocate capital and labour, and not on how its firms accumulate the organisational and technological capabilities that enable them to gain an innovation advantage in world markets.

Secondly, neoclassical economists have shown little interest in the institutions, such as the governance of firms, a country's education and training system, and the institutions which underpin financial and labour markets, which empirical studies have shown have a major impact on a country's rate of economic growth. In particular, they have not given much thought to countries 'national systems of innovation' which have been defined by the economist, Christopher Freeman, as "the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies".

I think, however, that in the UK there is an increasing awareness of the importance of a country's national system of innovation, at least among politicians and policy-makers. When the Labour Government came to power in 1997, it found the UK's national system of innovation in a much neglected state, and it, therefore, launched a major programme of reform. This can best be described under three headings, the funding of research, knowledge transfer and the use of demand to stimulate innovation.

The most important area of research funding is that done by business enterprise (BERD) as this correlates most closely with a country's innovation performance. In the UK as a share of GDP it is below the EU fifteen average, and while its low level is at least in part the result of the country's specific industrial structure, it is nevertheless a cause of concern. The last Labour government, therefore, introduced R&D tax credits in 2000 for small and medium-sized enterprises, and extended the scheme to other companies in 2002.

A second key input to any national system of innovation is government-supported research, both basic research and collaborative applied or user-driven research. But while the research done in our universities is outstanding, when the Labour government came to power in 1997, it found that the funding of the science base had been allowed to decline in comparison with other countries, and that the UK's research facilities were increasingly out-of-date and in a poor state of repair.

It, therefore, doubled the science budget in real terms over a number of spending reviews by 2007/8. During the same period the government also set-up the Technology Strategy Board as an independent executive agency of government to administer a major programme of collaborative applied R&D. The projects, selected by regular competitions, are part-funded by government and bring together business and other research partners to carry out research with a future commercial goal.

The government also set-up a number of knowledge transfer schemes. The most important of these was the Higher Education Innovation Fund (HEIF) to incentivise universities to transfer knowledge into industry and society. This led in recent years to a dramatic increase in the amount of knowledge transfer from British universities, with the private sector putting a value of £3 billion on its collaborative and contract research with UK universities in 2009/10, and the number of spin-off companies trebling. Also a major report in 2007, using external investment attracted as a proxy for quality, stated that UK universities were now producing spin-out companies of equivalent number and quality to some of the USA's top institutions.

Finally, the Labour government sought to use demand to stimulate innovation. As well as attempting to use government procurement to increase innovation in the economy, it also launched the Small Business Research Initiative (SBRI) modelled on the highly successful Small Business Innovation Research programme in the USA. Under this programme, government departments issue R&D procurement contracts to develop new and innovative products and services in areas where government departments believe that innovation can help the public sector do its job better.

This programme of economic reform involved a substantial investment by the government, and the coalition government which came to power in 2010 could very easily have taken the view that the science budget had done very well during the previous thirteen years, and should, therefore, be cut back in line with other government spending in order to reduce the government deficit. But I think it is a measure of how

high innovation now is on the policy agenda that the government maintained the £4.6 billion ring-fenced science and research budget.

Also in 2011 the coalition government issued a policy document 'Innovation and Research Strategy for Growth', together with a background economic paper which argued that a large body of evidence shows that innovative economies are more productive and faster growing. It supported the concept of national innovation ecosystems, and announced a programme of targeted resourcing in three areas, a national network of technology and innovation centres, emerging technologies and open data and transparency.

While innovation is now high up on the policy agenda, it is surprising how little interest mainstream neoclassical economists still take in it. It is also, I believe, a missed opportunity because there are a number of areas which could benefit from some rigorous research and where they could make a major contribution. They are the measurement of the innovation performance of countries, the effectiveness of specific innovation policies, and the design of national systems of innovation, as there is not one best system which all countries should adopt.

But if mainstream neoclassical economists are going to contribute to the formulation of innovation policies they will have to re-define economics so that it involves more than simply the allocation of capital and labour, they will have to find a place for institutions in their thinking, and they will need to accept that mathematics is not the only language of economics. But if they make these changes I think that they will find that they can make a greater contribution to policy discussions about economic growth, which is now at the top of the agenda of almost all countries.

Words: 1,636