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The Economic Impact of Infrastructure- a Comment

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I welcome and agree with much of Bridget Rosewell's paper on the economic impact of infrastructure. Many of the points made are interesting and I propose to comment on only a few of them.

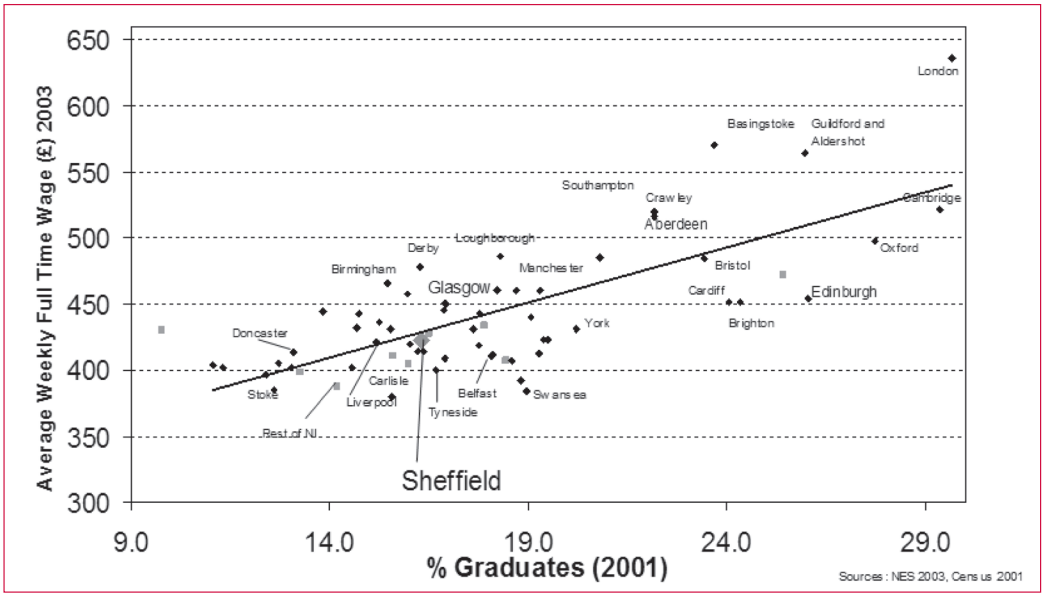
The paper deals with physical infrastructure including transport systems, power networks, water and sewerage systems as well as telecommunications. Much is made of the importance of cities in the need for infrastructure, although this reads oddly in the context of Wales, much of which is rural.

Of course cities cannot exist, at least not at their present sizes, without extensive modern infrastructure especially for transport. The second part of the argument, that cities underpin high productivity, is less obvious. The high productivity observed is viewed in the paper and by many others as depending on agglomeration economies, and associated innovation. This approach is, in my view, unconvincing. My preference is for the central place theory of the pre-war German geographer and planner Walter Christaller (1933), based on a study of the Bavarian plain. This theory says that simple services requiring only small markets will be widely dispersed (in villages and small towns and in districts within cities) close to the population. More specialised services needing larger markets will be located in larger and more central towns, right up to services like national administration, for which only one centre is needed. This gives rise to a hierarchy of settlements and it is in the largest settlements that the most specialised and hence highest paid services are located. This is an approach that has generally been overlooked by economists. It fits reasonably well with Bridget Rosewell's emphasis on the need for good infrastructure to sustain urban growth, so there is no great contradiction, but I believe this is a better account for why most cities exist, and importantly why they are observed to have higher productivity. It is the specialised services which generate the higher productivity (and many of the most successful innovative new firms). Well-located cities may be the least-cost locations for specialised services, but the productivity of many specialised services would be high where-ever located. An exception may occur when face-to-face information flows confer a competitive advantage but modern information technology undermines this advantage.

It is noticeable that the origins of ideas about urban agglomeration economies originated in studies of manufacturing, and most subsequent studies focus on manufacturing. While manufacturing located in cities in the 19th century when fuel and power needs were large and expensive, the arrival of electric power was followed by a general relocation of industry out of cities and into rural areas for much of the post-WW2 period (Fothergill and Gudgin, 1982). Subsequent globalisation and the movement of manufacturing to cities in emerging economies have more to do with low wage costs than agglomeration per se. However one looks at it, there is little current evidence of any agglomeration-type advantage for manufacturing in UK cities and hence no need for infrastructure to attract them. The revival of the main urban regional centres in Northern England over the last 15 years (currently being piggy-backed by George Osborne's 'Northern Powerhouse' policy) is based on the final disappearance of the drag-anchor of manufacturing from their economies at the end of the last century. Similar points could be made about Michael Porter's concept of clusters (1990). Long before the concept became hopelessly fashionable among UK local economic development officers it could be observed that all of the main urban industrial clusters had been in terminal decline for decades.

After an 'interlude' of nearly two centuries the future of UK cities now rests once more on the core function of acting as service centres. The importance of infrastructure needs to reflect this reality. The chief urban clusters in UK cities are now services, mainly in London but also including others such as the film and cartoon cluster in Cardiff. In London, clusters in banking, fund management, advertising and law depend on information flows and perhaps locational prestige. Whether the internet will diminish the importance of face to face proximity remains to be seen. Bridget Rosewell reminds us that the decision to go ahead with the £15 billion Crossrail scheme in London accepted the argument for the assessment of benefits

Figure 1: The relationship between the percentage of graduates and average weekly wages.



that agglomeration economies would accrue. These partly stemmed from a belief that easier access to Central London and Docklands would widen the pool of available labour leading to lower labour costs.

Clearly, extra commuter capacity should allow the financial sector to expand further in Central London than might otherwise be the case. Removal of labour supply constraints would remove the market pressures for firms to move out of Central London. Arguably that would hinder the rebalancing the UK regional economy. London's over-weening size reflects its past as an imperial capital, and it is three times larger than expected under Zipf's rank-size rule[1]. London's global status has permitted the development of a huge globally-focused finance sector but other successful western European economies show that an outsized capital and outsized financial sector are not necessary for economic success[2]. They may be detrimental since the huge amount of infrastructure involved in maintaining London's economy may draw investment away from other regions as the controversies over Crossrail and a third Heathrow runway have indicated.

Bridget Rosewell argues that increasing city size is associated with higher productivity. Chart 1 in her paper appears to have a take-off point for urban productivity and she indicates that Cardiff may have a scale close to the take-off point. My view is that the chart is contrived by including individual London boroughs alongside whole cities and hence exaggerating the effect of London. Figure 1 below from my own previous unpublished work does not indicate any take-off point but suggests that urban wages reflect the proportion of private sector graduates in the labour force, but also has an additional north-south component. An equivalent chart for graduates in the public sector shows no association at all with average wages. In the chart below Cardiff has lower than average wages given its high proportion of graduates in the private sector, but is in line with other peripheral cities. There is little indication of a take-off threshold.

One key issue not raised by Bridget Rosewell is whether rural dwellers should pay the full cost of infrastructure provision, which is usually higher than in cities due to the sparser population, hence requiring larger lengths of road, rail, wires or pipes per head of population. The averaging of prices, especially in public sector provision, traditionally provided a hidden subsidy to rural dwellers. Such subsidies have had to be phased out under private provision of infrastructure or at least made explicit through government subsidies to private operators. In the case of roads, it is notable that tolling has only been applied to major motorways and large bridges, on the basis that only on such high density parts of the network can the costs be widely borne. Even then much depends on the availability of alternative routes, allowing freight carriers and poorer car owners to avoid payment in return for a slightly longer journey especially at off-peak times, as in the case of the M6 toll motorway. Payments technology is also playing a role. The tolls on the Dartford crossing on the M25, London's ring road until recently caused long traffic jams with huge costs to hauliers and others. New number-plate recognition technology has removed these jams allowing tolls to be collected with lower real costs.

Bridget Rosewell's article brings out the traditional focus of time saved as a prime means of estimating the benefits of transport infrastructure, whether road, rail or air. Technocratic exercises based on apparently measurable benefits such as time saving have always been problematic and remain so. The siting of additional airport capacity for London has been bedevilled by this issue.

The justification for the proposed new high speed rail route from London to Birmingham and beyond has also prominently featured time savings. However this has been complicated by the argument that many business travellers work on train journeys meaning that little work time is lost in train travel. An alternative justification is that rising rail use means that capacity on these key routes will soon be exhausted. It is not clear however whether technological advances could result in better use of existing capacity.

Difficulties in evaluating infrastructural investment are also well illustrated from the history of electricity provision in the UK. Under public ownership, with the industry run by the almost Soviet-named central electricity generation board (CEGB), a large excess capacity over winter peak demand of around 28% was maintained by an organisation run largely by engineers. As in Soviet economies over-capacity guaranteed never being embarrassed by electricity shortages. Over-manning also made life easy for managers with no private share-holders insisting on sweating of capital. Estimating the need for new capacity depended on such things as population projections and electricity usage per head. Choice of generation technology then as now needed assumptions about imponderables. For instance the CEGB's case for the last new nuclear power station, built at Sizewell in Suffolk in the 1980s, presented five scenarios for the future price of coal, the competing fuel. In the event the world coal price fell well below the CEGB's extreme low coal-price scenario. Decisions also depended on an accepted government rule that North Sea gas was a 'premium' fuel not to be used in electricity generation. A change of policy following privatisation in 1990 allowed operators to build small gas-fired power stations with lower capital needs at a time of high interest rates. This was one of reasons that no further nuclear stations were built after Sizewell B.

The preferred investment strategy of the privatised electricity companies (perhaps excluding the nationalised French company EDF), is the opposite of the CEGB. It is to keep capacity low with little margin over projected demand, to the extent that the CBI and other business bodies continually now warn of a shortage of supply (which will hit industry first before domestic consumers). The fact that black-outs have not yet occurred was deemed irrelevant by Dieter Helm in evidence to the House of Commons Energy Select Committee. His view was that private companies aim to keep supply close to the black-out limit to increase their bargaining power in price reviews by regulators (Meek, 2014 p.153). The privatised operators certainly increased the efficiency of the industry, reducing excess capacity, unnecessary labour and other feather-bedding practices, but with the main initial gains going to profits rather than prices. Only with the change of policy on gas-fired capacity did prices fall significantly (Meek, 2014, Chapter 4).

Bridget Rosewell's conclusion that 'it is also possible to decide which benefits cannot be captured and need to be provided to us all and therefore paid for by us all' can be extended to cover the uncertainties involved in many infrastructure developments, especially the largest. The huge uncertainties involved in the proposed new nuclear power stations at Hinckley Point in Somerset have led operators to demand, and the Government to concede, guaranteed electricity prices at double current levels for the entire projected life of the station. In this case the uncertainties are being borne by future consumers. Since the consumers bear the cost much like a tax, it needs to be asked why the government does not run the scheme itself. Its preferred operators are after all a combination of a French nationalised company and a company from communist China.

Notes

1. Zipf G. K. (1949) The rank size rule for cities says that the 2nd city will be half the size of the first and the 3rd will be a third of the size etc. The rule is generated by a log-normal distribution.

2. Germany provides a much better fit to the rank-size rule than does the UK.

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