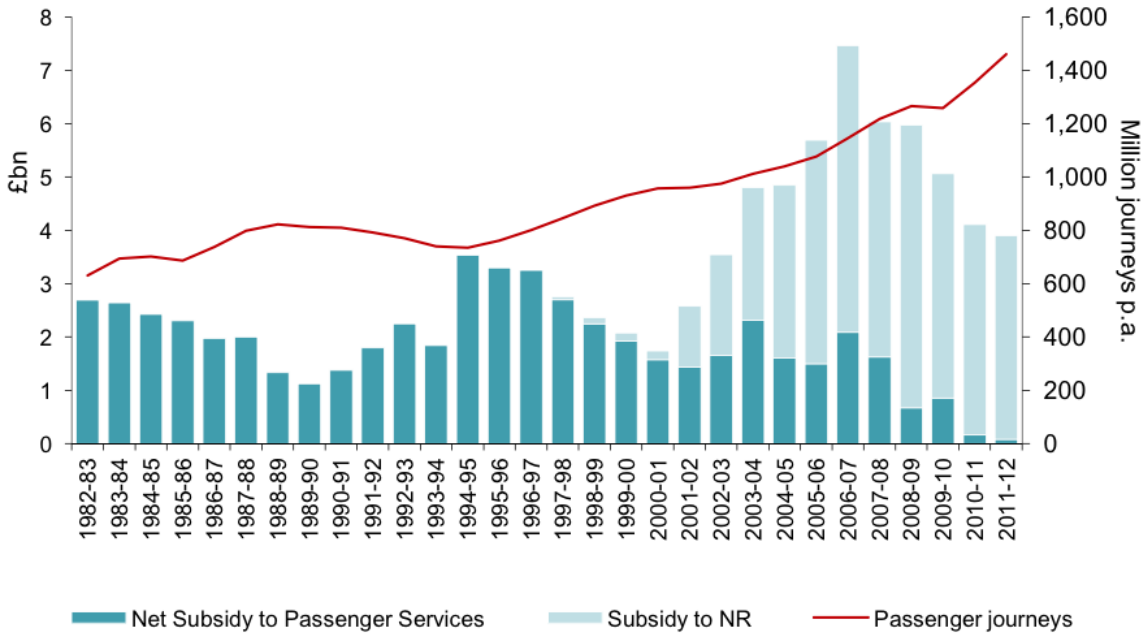
TEG TRANSPORT ECONOMISTS' GROUP

The Transport Economist

The Journal of the Transport Economists' Group



Editor Peter Gordon

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TEG TRANSPORT ECONOMISTS' GROUP

Railway finance and governance

Richard Davies

Arup

22 October 2014

Introduction

Richard Davies began by emphasising that he was speaking in a purely personal capacity and his opinions did not necessarily reflect those of his past or present employers or affiliations.

His presentation covered what he saw as five key features of railway finances over the last 25 years. These were:

- The 1994 reforms
- Railtrack, Network Rail and the Regulatory Determination for Control Period 4 (CP4)
- The "McNulty" Rail Value for Money study and report
- The Regulatory Determination for CP5
- Future rail finance, including funding the Regulated Asset Base (RAB)

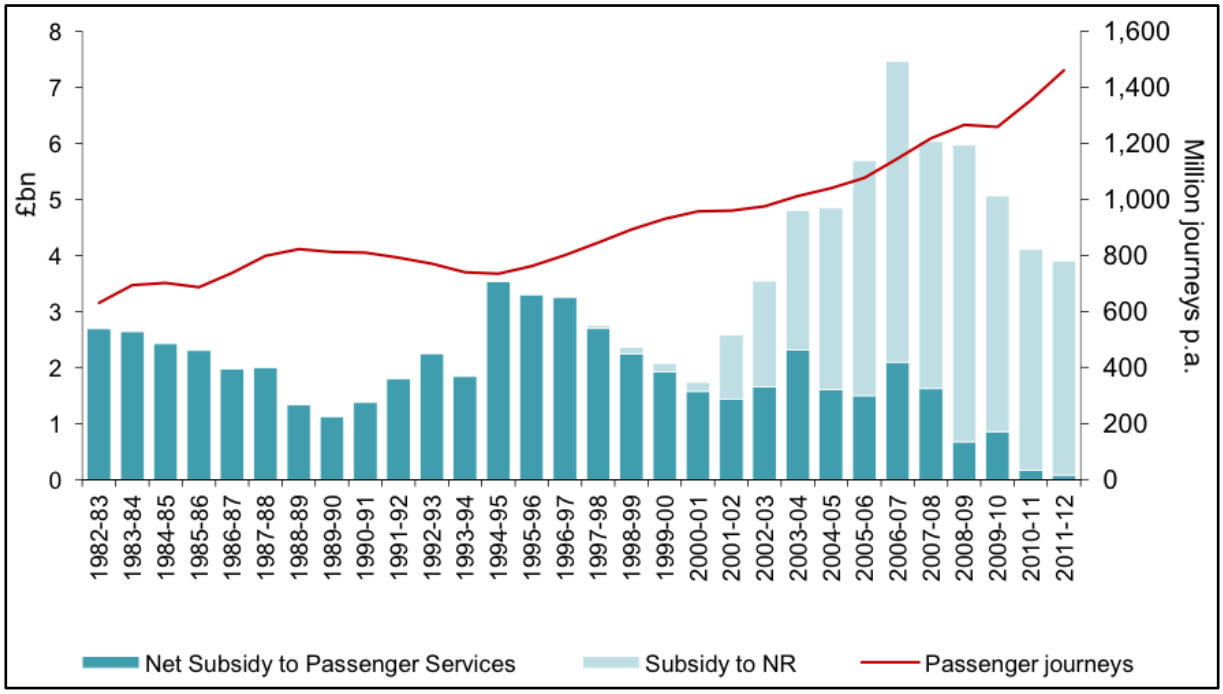
Background

Richard began with three charts illustrating contrasting views of how rail finances had evolved since the 1980s and where they might be heading, beginning with the level of subsidy since 1982. Each of the graphs is at constant prices, although for technical reasons not necessarily the same price levels.

In the first graph (Figure 1), two periods were worthy of interest. First, the 10 years between 1990 and 2000, when subsidy rose notably once the rail reforms began on 1 April 1994, and then declined significantly. Secondly, the similar rise and fall in subsidy to Network Rail after 2000.

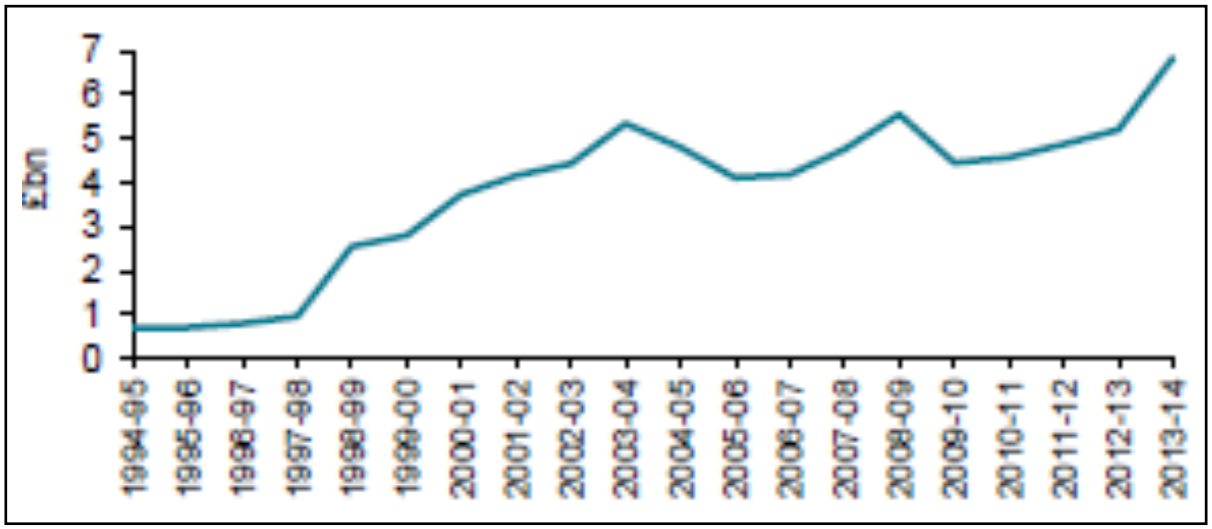
The second graph (Figure 2) showed annual capital expenditure by Railtrack and then Network Rail since privatisation in 1994.

Figure 1: Annual rail subsidy and journey growth (2012 prices)



Source: ATOC/RDG Growth and Prosperity, 2013

Figure 2: Network Rail capital expenditure (2013-14 prices)



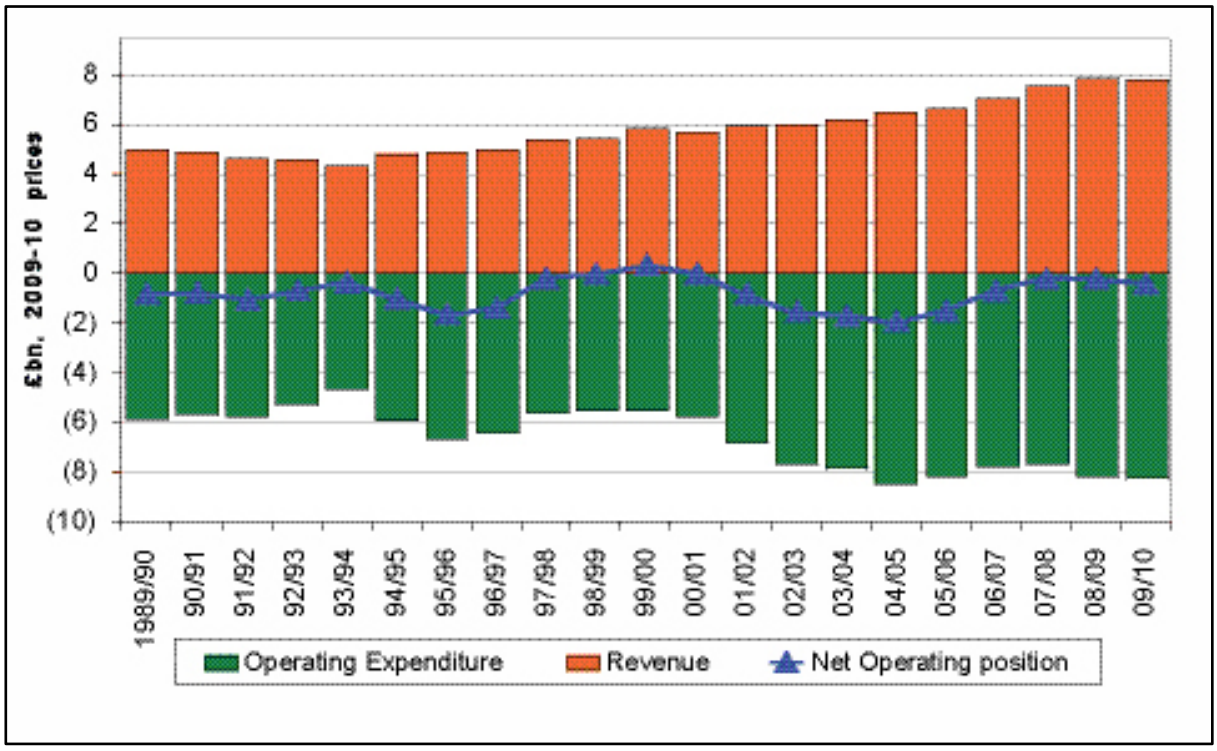
Railtrack continued capital spending in its first few years broadly in line with the historic levels of investment by British Rail. Only later did infrastructure spending rise, and this was the main reason for the noted increase in subsidy since 2000 seen in Figure 1.

The third graph (Figure 3), also drawn from the "McNulty" Rail Value for Money study, showing the combined revenue and cost balance of train operation and infrastructure, was more difficult to interpret. In essence, much of the revenue growth

experienced since 1994 has been absorbed by increases in operating expenditure, although there has been some small improvement since 2004/05.

Experience suggested that different analysts could draw widely different conclusions from these three figures.

Figure 3: Rail operations and infrastructure revenue and cost



Source: "McNulty" Rail Value for Money study (From National Rail Trends, DfT statutory accounts, TOC statutory accounts). Operating Expenditure includes both train operations and infrastructure expenses.

The steady increase in revenue, contrary to popular belief, has been largely driven by increases in volume rather than in fares. That said, the essentially flat trajectory on net operating position is remarkable, given the usual assumption that rail is an industry with high fixed costs.

Finally, as part of the background, Richard noted that British Rail's financial performance in the decade or so before privatisation had been a "game of two halves". Following Sectorisation into separate businesses in 1982, the net position had improved and had benefited from growth in passenger volumes in the late 1980s, with costs kept under control. The position had then worsened during the early 1990s recession.

Year zero: 1994

Privatisation set aside the benefits brought to the industry by Sectorisation and BR's Organising for Quality (OfQ) initiative. The three BR passenger sectors were transmuted into 25 Train Operating Companies (TOCs), and a large single national infrastructure company had been created alongside the numerous, smaller franchisees. These changes led to a dissipation of inherited knowledge within the industry and a strange "balance of power".

To the outside observer the level of subsidy suddenly appeared to jump from £650 million to £2.1 billion, although services, procedures and fares seemed to be broadly the same. In essence, the numbers were the product of the new industry charging regime involving track access charges based on replacement costs and a return on capital, vehicle leasing on a similar basis and payment for traditionally internal services. However, the challenge set by the Government at the time, while all elements stayed in the public sector, was that the net effect on the Public Sector Borrowing Requirement (PSBR) should be zero. Thus, the income from access and leasing charges was offset by large payments from Railtrack and the ROSCOs back to government to reduce the industry's External Finance Limit back to the number planned before privatisation. This opaque "money-go-round", coupled with the huge rise in headline subsidies for delivering essentially the same thing, immediately got privatisation off on the back foot, from which it is still trying to recover.

Railtrack and Network Rail

Railtrack plc was envisaged as a classic regulated utility on the model adopted for the National Grid and the Regional Electricity companies. However, one can question whether this was ever a practical reality, given the difficulty experienced by all parties in funding and delivering the West Coast Main Line Upgrade (PUG2). Conventional wisdom is that Railtrack's credibility and financial capability was brought down by the serious train derailment at Hatfield on 17 October 2000, but it was clear that the then Labour government was, for political reasons, not supportive of Railtrack. The company had also been damaged

by its handling of PUG2 and Hatfield and by its inability to raise capital from the markets as quickly as required.

Railtrack plc was subsequently put into railway administration on 7 October 2001 and its assets and activities were formally taken over on 3 October 2002 by the newly created Network Rail, a company limited by guarantee wholly responsible to government. Network Rail was initially classified as a trading company in the private sector to satisfy government borrowing aspirations, but it has in practice been viewed as a public sector entity for over a decade and, indeed, its results have been consolidated within DfT's from the start. Ever since Network Rail was created government has clearly been in the lead. Its commercial relationships are essentially with the Office of Rail Regulation (ORR), DfT and Transport Scotland rather more than with the franchisees.

Railtrack started borrowing to fund capital expenditure but this was significantly expanded, at Government request, under Network Rail. The 2003 Periodic Review made clear that the Government (which had severe limits to its spending) wanted to use the RAB as much as possible, including to fund renewals (which had been expensed - paid for directly through access charges - throughout Railtrack's existence). Once again, the links between Network Rail and Government had been shown to be very close.

The Rail Value for Money study

In early 2010, as a result of what were felt to be high costs within the industry, the then Labour government in conjunction with the ORR commissioned Sir Roy McNulty (who had a background in aviation) to conduct a study of Value for Money in the rail industry. The assumption was that rail in Great Britain was inefficient. The timing of the study was significant since it spanned a general election and ensured that its findings could not be ignored by whichever party ended up in power.

Sir Roy reported back in May 2011. The evidence for inefficiency was mixed and, in particular, the assumption that there was circa £1 billion of TOC cost savings begged the question as to why the franchise owners, who were all experienced transport operators in other fields, had not already

addressed any efficiency issues. Was rail in Great Britain really as inefficient as implied by the potential saving of £3.5 billion over a decade identified in the report? Some substantive issues surrounding construction costs and the heavily unionised workforce were identified, but the report had practically nothing to say about allocative efficiency.

The report provided the framework for the CP4 Periodic Review, as part of which Network Rail had already agreed to a saving of £3.5 billion as a long term efficiency improvement.

Control Period 5 and beyond

The settlement for CP5 (2014-19) includes around £10 billion for enhancements to the network. These are mainly for further electrification, increased capacity and freight facilities. However, such enhancements do not form part of a long term national plan for the railways aimed at achieving a clear set of transport, economic or financial objectives. Rather, rail strategy is being framed incrementally, by the processes of Government Spending Reviews, ORR Periodic Reviews and re-letting of franchises. Exceptions are in London and Scotland, where the devolved administrations have attempted to put together a clear vision for the industry and its role.

The vast majority of the enhancements included in CP5 will be paid for by borrowing, thus increasing Network Rail's Regulated Asset Base (RAB). Richard believed that financing the RAB, during what has become an extended period of low interest rates, is far less of a concern than most commentators seemed to fear. Ultimately, once politicians had decided what investment programme they wanted, it was entirely legitimate for them to decide whether to adopt a "Pay-As-You-Go" approach or defer the costs over time, and for them to determine to what extent rail volume increases, fares or future taxes should be used to fund the programme over time.

There can be no expectation that much of the programme will be commercial, in the sense of driving cost savings or revenue increases that will cover its cost. Table 1, from the Initial Industry Plan for CP5, shows that most enhancement schemes are not commercially viable and the improved services will require continued revenue support.

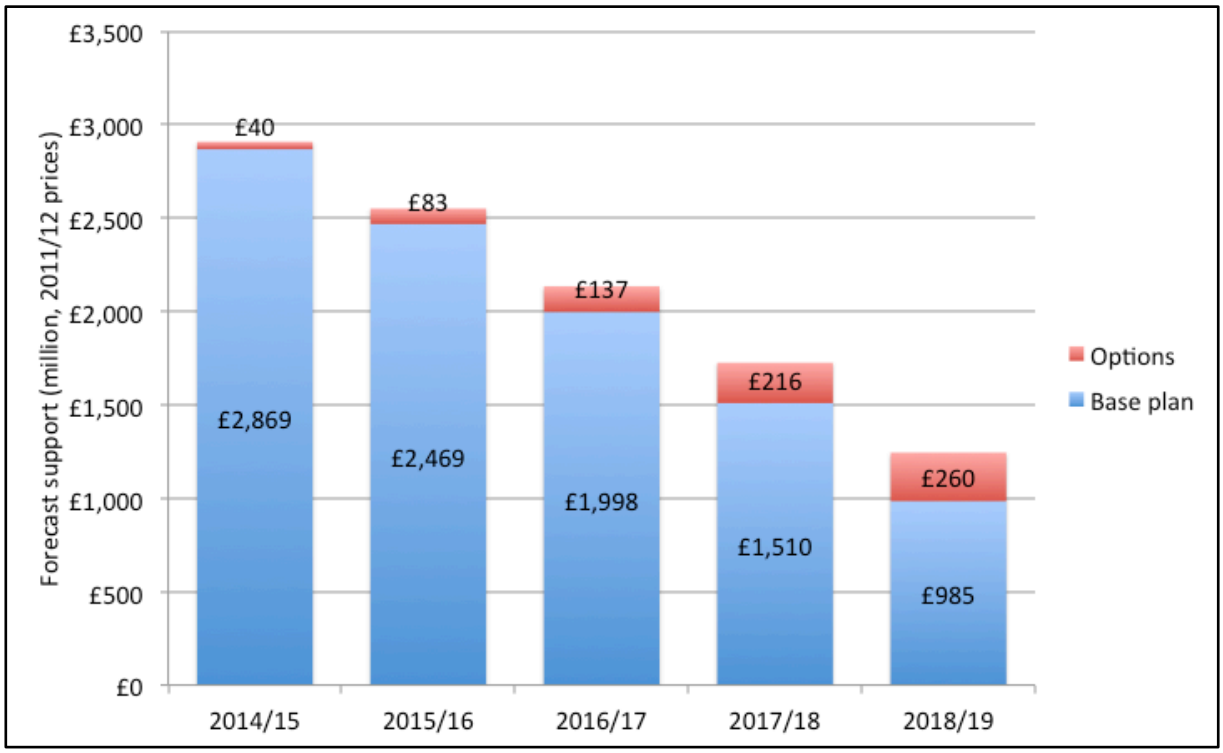
Table 1: examples of Benefit Cost Ratios (BCRs) for CP5

Scheme	**WebTAG BCR**
London Commuter Capacity	11.1
Northern Hub	4.1
Regional Commuter Capacity	2.5
Felixstowe-Nuneaton Freight Improvements Phase 2	2
Midland Main Line 11-car Trains	1.8 to 1.4

Source: Initial Industry Plan, England & Wales, September 2011 (IIP 2011). Estimates as at 2011. Figures not updated for changes in capital cost, project scope or WebTAG guidance.

The financial position is that, in essence, the reductions in subsidy envisaged in the base for IIP 2011 (the Base plan in Figure 4) are assumed to provide funding headroom for the capital schemes which are not financially viable. This also assumes that the additional revenue growth during the period does not lead to additional operating expenses. IIP 2011 proposed £4.9 billion expenditure on new schemes with an amalgamated BCR of 4.5.

Figure 4: CP5 forecast support and options (from 2011 IIP)



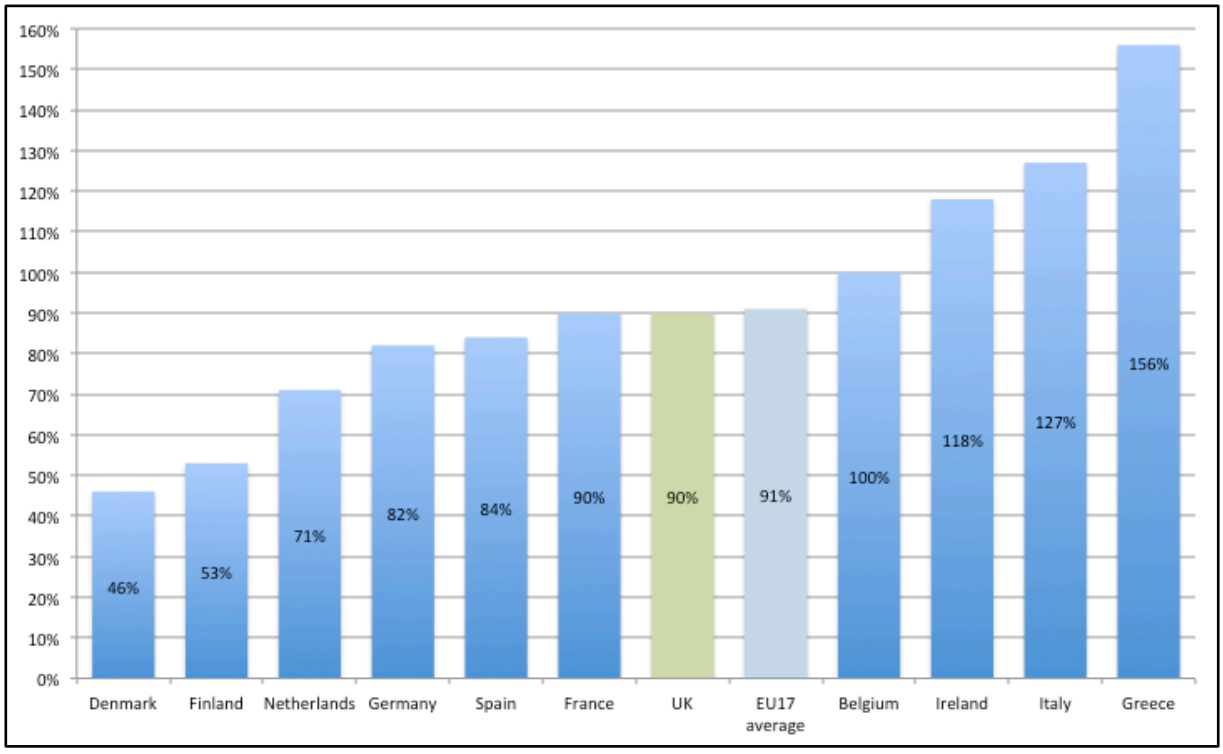
Funding the RAB

There is remarkable cross-party support for rail at present. Politicians are currently not just enthusiastic about railways and rail enhancements, but also seem to feel that they can afford the levels of investment indicated above. This is a quite different picture from rail in the 1980s and 1990s, but makes much more sense when the figures are put in the context of the overall government financial position.

Total UK-wide public sector investment, as set out in the 2014 Budget, is envisaged as slightly over £50 billion per annum gross, or a bit under £30 billion net. Rail represents only about 20% of these totals. Network Rail Gross Debt of around £32 billion in 2013-14 is only 2.1% of the total UK Gross Debt (on an EU Treaty basis, i.e. consistent with the "rules" behind the Maastricht criteria) of some £1,518 billion. The cost of financing NR's RAB of £50 billion in 2013/14 is around £1.4 billion per annum. (These figures all exclude the effects of government bailouts for UK banks.)

In addition, the overall stock of UK debt as a proportion of GDP is not exceptionally high in comparison to other EU countries.

Figure 5: Debt-to-GDP ratios



The main issue arguably remains persuading politicians to focus not on how projects are financed, but on how the operations that will benefit from these enhancements are to be subsidised, given that most are not commercially viable.

Conclusions

Experience has shown that the initial model adopted for financing the privatised railway did not work, or perhaps more accurately was not allowed to work.

Since 2002 the medium term strategy for the railways has largely been about investment, investment, investment, to address growth and improve quality and reliability. The scale of this investment is unprecedented within the last 50 or 60 years. This means that financial numbers relating to the rail industry are currently dominated by the levels of capital expenditure, which is approaching just under 50% of total industry-wide expenditure in cash terms.

Outside the devolved administrations in London and Scotland, however, there is little in the way of a longer term strategy guiding rail investment. The approach to investment is largely driven by Cost Benefit Analysis (CBA) of schemes on an incremental line-by-line or route-by-route basis.

Network Rail's RAB is a small element of the overall UK government debt and has proved straightforward to finance. However, there are questions over how the potential financial outcomes of the current investment are being balanced against the cost-benefit basis on which the decisions to go ahead are being taken. In other words, are future operating subsidy requirements properly being taken into account?

Discussion

Gregory Marchant (BR/SRA retired) asked if we are we seeing a repeat of the 1955 Railway Modernisation Plan, which all ended in tears when the ongoing costs of the railway continued to rise despite the investment? **Richard** replied that the comparison was not exact, since the 1955 Plan investment was (mistakenly) assumed to be financially viable, whilst current investment was being undertaken on a cost-benefit basis.

James Hodgson (Stagecoach Rail) said that Government policy of reducing dependence on subsidy is leading to increasing premium payments from TOCs. Passengers now feel they are paying more than they should. **Richard** said that cross-subsidisation has always existed in the railway industry, whether between standalone companies or divisions within British Rail. Given the scale of the direct payments to Network Rail, it is largely academic whether TOCs receive a subsidy or make premium payments.

Stephen Bennett (BR/SRA retired) felt that the almost total failure of the private sector to come forward with money for investments is surprising. Is it this failure which has meant that the public sector has had to step in to fund enhancements? **Richard** replied that rail privatisation has been notably different from other privatisations because its output is directly subsidised, and the amount of "purely commercial" investment that might be undertaken is restricted. It is also open to question whether governments have given the private sector sufficient opportunity to come forward with funding, given frequent changes of direction on franchising policy. Chiltern Railways is the only example of a TOC providing funds for upgrades to the network. Substantial private funding has been forthcoming for rolling stock, in some cases underwritten by Section 54 agreements.

John Dodgson (Independent Consultant) wondered what are the major components of rail subsidy and how have these changed since privatisation. **Richard** said that before 2000 infrastructure was funded through access charges paid by train operators. Since 2000 there have been increasing amounts of direct grant to the network provider, so subsidy to train operators has fallen and more TOCs are paying premiums. This arrangement appears to suit government.

Doug Roe (Arup) asked how rail fares might change in the future and what the speaker would like to see happen. **Richard** said that much CP5 spending is driven by the industry trying to catch up with the growth in passenger journeys. This phenomenon is not new and has been a feature of railways since Victorian times. The current framework means that there is pressure to meet rising demand, even though this can be

very expensive, since this is what voters appear to want. Rail is seen as supporting the growth of cities and providing economic benefits through supporting agglomeration. Someone, however, does need to take a view on how the longer term operating subsidies for these developments are to be financed.

Margot Finley (Arup) asked how far fare levels would have to rise to cover current and envisaged levels of investment. **Richard** replied that any required rise would undoubtedly hit the limits of price elasticity. Contrary to popular perception, even the London commuter market is not entirely captive, and is believed to have an elasticity of around -0.3: it may be that no level of fare increase would match the level of investment. There is a need to examine the framework within which fares are set, a difficult problem for politicians as there would inevitably be winners and losers.

Jeremy Drew (Independent consultant) asked if anyone looked at how higher fares might be used to alleviate the need for additional capacity. **Richard** said that at a general level, not since the Serpell Report, but the question has been looked at in the context of individual routes and projects.

Chris Stokes (First Class Partnerships) asked if, given the state of public finances and the need to find savings wherever possible, expenditure on Network Rail is as insignificant as has been suggested. Can we be certain that this level of expenditure will be allowed to continue? **Richard** replied that the government is not having any difficulty selling long-term gilts at present. The emphasis on deficit reduction appears to be something of a political construct of our times. The time when interest rates are likely to rise seems, thanks to Quantitative Easing, to be retreating ever further.

John Cartledge (formerly London TravelWatch) said that rail users seem to be their own worst enemies. Despite complaining about value for money, fares and overcrowding they continue to use the trains in ever greater numbers. **Richard** said that in London and the South East the growth in well-paying jobs and the need to find affordable housing is pushing up demand for rail travel. The difficulty for politicians is how they respond to the issues of fares and overcrowding. The railway industry appears to have reverted to a common carrier mentality.

Rail fares in Great Britain have always been high in comparison with many other European countries. Given the high degree of government control of fares, these are now often seen by the public as a form of taxation. Hence, it appears worthwhile for people to lobby against increases.

The growth in rail revenue since privatisation has largely been due to increases in journeys: little has come from fares increases *per se.* This is not surprising, given that for half the period increases were set at RPI-1, and for the remaining half have been at RPI+1.

Peter Gordon (Editor, The Transport Economist) asked about the effect of HS2 on Network Rail's finances. **Richard** replied that the government has not yet declared whether HS2 will be built and/or operated by Network Rail, but the capital cost of HS2 will be grant-aided, with no RAB or equivalent approach. The debate about the size of Network Rail's RAB may not be as important as some have suggested.

Gregory Marchant noted that HM Treasury always believed that rail costs were more elastic than the industry tried to present, and that any increase in overall volume would lead to an increase in operating costs. **Richard** agreed that is one way of reading Figure 3. It may also be that customer pressure for improved quality of service, such as better performance and rolling stock, offsets efficiency effects of increasing volumes.

Derek Moore (Independent consultant) asked how any grand strategy for the rail industry would fit with increasing devolution. **Richard** said that devolution tends to lead to better rail strategic planning. Politicians in devolved administrations are more directly accountable for the formulation and delivery of their plans. Local politicians in the north of England are developing regional plans to compensate for the absence of a national strategy, which tends to be perceived as just too difficult. That said, the outcome of the Scottish referendum makes further devolution within England and Wales a significant challenge: it's possible that things cannot be taken further until the further reforms proposed for Scotland are implemented.

Report by Gregory Marchant

Transport and the limits to urban growth

Pedro Abrantes, PTEG

Arup

28 January 2015

Introduction

Pedro began by showing clips from the BBC's "Mind the gap" documentary.

http://youtube/DIpakXL6F6I?version=3&start=0&end=65&autoplay=1&hl=en_US&rel=0 (0-1'05'')

http://youtube/EpUNIKBWaU?version=3&start=42&end=94&autoplay=1&hl=en_US&rel=0 (0'42''-1'34'')

Some key themes raised at the beginning of the documentary were that "London is the capital of the world", "Everyone wants to live in it if they possibly can", "It can attract people from Tokyo, New York, Paris" and that it is a fifth of the UK economy. The counterview is that it is "crazy to centralise everything in one place, creating this huge suburb spreading North" and how to address a lop-sided economy. Evan Davies said that "Biggest cities are our best hope" and proposed a "Super-city of the North", an inverted city with greenbelt centre. However, what about smaller cities and towns?

In the real (policy) world, should we invest in London's growth or instead seek to create a Northern super-city? What would a market outcome be? Is there a case for government either to promote or to constrain urban growth, and what role should transport play in all this? What other tools such as taxation and fiscal devolution should we consider?

Going back a step, what are we trying to achieve? The speaker argued that it should be the "best" social return from available resources, or in other words the most productive outcome in a social sense. Chris Riley (a former Department for Transport Chief Economist), has said that failure to invest in worthwhile projects reduces future economic growth: it reduces debt, but also reduces GDP (TSC 2010).

Why cities?

The speaker took us through the available literature going back to the nineteenth century and the Industrial Revolution. There is a long history of descriptive models, such as von Thunen's bid rent curve. Alfred Marshall put forward the ideas of economies of scale and intra-industry externalities. Models focused on monocentric, industrial economies with an emphasis on freight transport to market costs.

What was the optimum urban size: in those days perhaps a mill town? It was difficult to make sense of very large cities. Discontinuities in transport accessibility (port cities, market towns) are a key part of the answer.

There were important theoretical advances in the 1960s and 1970s, with the development of monopolistic competition models (see Dixit, Stiglitz and Mirrlees for applications to city size). There was also a gradual shift from a manufacturing to a service economy, with an increasing importance of face to face communication. J. Jacobs developed the ideas of economies of diversification and density, building on the work of Marshall. There was also a growing concern over negative externalities (such as congestion) and an obsession with optimum city size. Transport technology was simple. Modelling applications emphasised commuting costs, congestion, land rent and taxation. At one point in the sixties, the Government decided that London was too large.

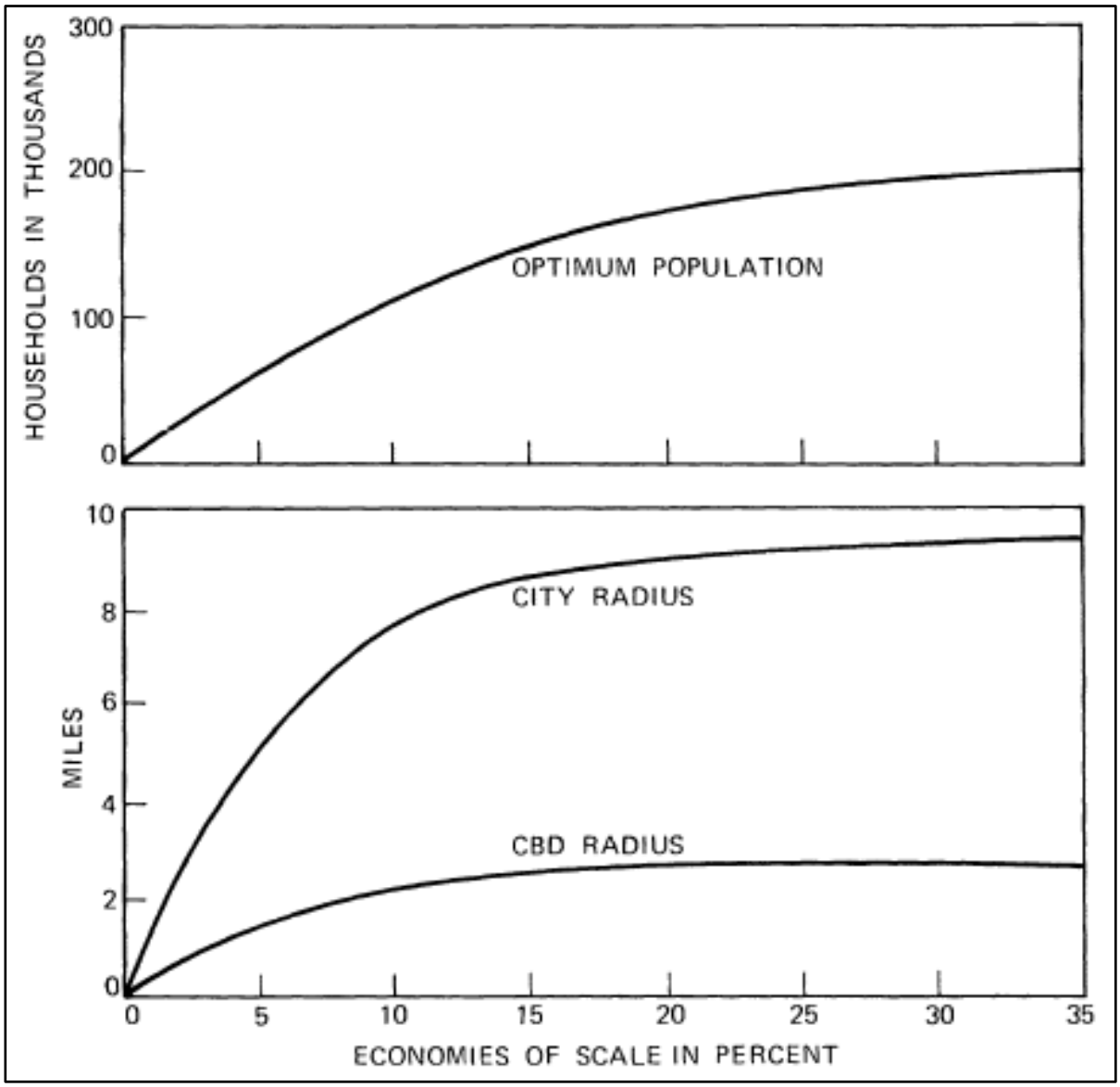
J. Mirrlees published *the Optimum Town* in 1972. This said that the equilibrium size is achieved when marginal productivity gain at the centre equals excess land rents plus externalities. It recognises that multiple commodities would give rise to very different and more complicated urban shapes.

A. Dixit in *the Optimum Factory Town* (1973) considered trade-offs between economies of scale at the Central Business District (CBD) and commuting congestion. Under prevailing assumptions, cities of over a million were difficult to justify.

M. Getz in *Optimum city size: fact or fancy* (1979) said that crime, environmental quality, commuting time and consumer choice vary with city size. He recognised that these are collectively important factors in regulating city size but difficult

to isolate. If productivity is higher in cities that consumers find unattractive, how can we determine optimum city size? Huang said that the highest net value of amenities was found in cities of between a quarter and half a million inhabitants, increasing again after 5 million: leading to the question why?

Figure 1: Overall welfare-maximising level of population



There were major theoretical advances in the post-industrial world, with the rise of the New Economic Geography literature and growing emphasis on inter- (not just intra-) industry agglomeration as a key driver of productivity, building on the work of Marshall and Jacobs. Glaeser, Florida noted the importance of face to face contact in driving innovation. But in contrast with the 1960s and 1970s, there was a move away from policy questions such as those around optimal city size.

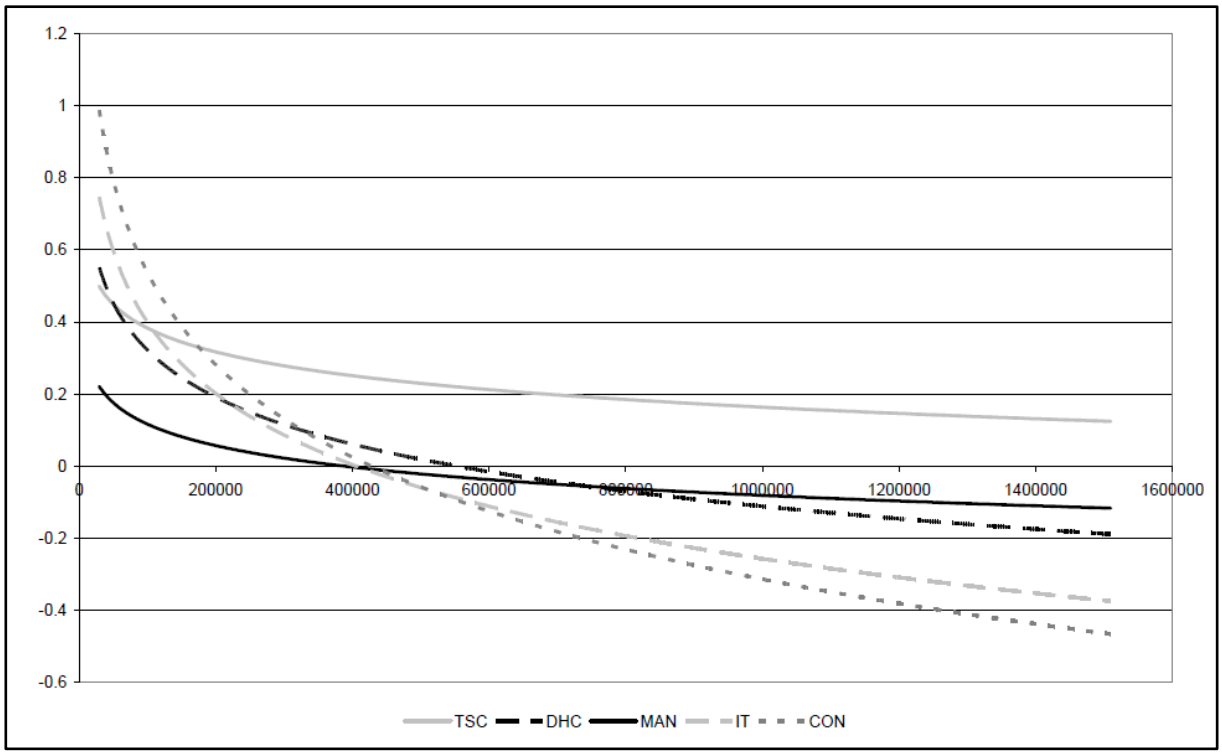
Dan Graham (2006) looked at UK empirical evidence on agglomeration economies, and this remains one of the best sources available. He found evidence of diminishing returns to agglomeration for five sectors: manufacturing, construction, distribution hotels & catering, transport storage & communications (TSC), and IT. The optimum effective job density was between 400,000 and 600,000 inhabitants except for TSC. For the remaining four industries, returns to agglomeration are assumed to be constant.

Figure 2: Productivity elasticities with respect to agglomeration

	β_{Ued}	β_{UUed}	elasticity
Manufacturing	1.105**	-0.086**	0.041
Construction	4.79**	-0.369**	0.214
Distrib, hotels & catering	2.488**	-0.188**	0.133
Trans, storage & comm	1.48*	-0.095	0.274
Real estate	0.084**	-	0.084
IT	3.68**	-0.285**	0.089
Banking, fin & insurance	0.251**	-	0.251
Business services	0.176**	-	0.176
Public services	0.292**	-	0.292

Note: ** - significant at 0.01, * - significant at 0.05

Figure 3: Spatial variance in returns to agglomeration



Starting with Aschauer, there was also a parallel empirical research strand trying to establish the relationship between productivity and infrastructure investment at a macroeconomic level. Gemmell, Kneller and Sanz (2009) examined the productivity of public investments from 1990-2004 in OECD countries, and found an elasticity of GDP to transport and communications spending of 0.15, that is to say that it is good to divert spending to these areas, compared to other forms of public spending. You can therefore summarise that:

- Transport = agglomeration
- Agglomeration = productivity
- Therefore Transport = productivity!

(Mega)Cities: why not?

In *Building Globally Competitive Cities* McKinsey (2011) said that congestion, housing shortages, pollution and a lack of urban planning mean that the biggest cities now risk dragging down their countries' economies. Instead, some second level cities are starting to show more dynamism than their larger siblings. The megacities may now see diseconomies of scale "because their institutional, social and environmental support structures have not kept up with their expanding populations."

http://blog.inpolis.com/2011/08/31/diseconomies-of-scale-in-urbanism/

There are various problems, including negative externalities such as pollution, congestion and crowding, rising commuting time (is there a threshold?), land scarcity and cost inflation (Malthus) and immobile inputs including raw materials and people/labour (there are limits to migration).

Land is in fixed supply, so the cost of housing can be an important driver of productivity. The ratio between median house prices and income in the area just outside greater London are greater than in New York, Singapore or Tokyo. But they are also higher in Merseyside than Singapore!

Access to environmental amenities valued highly: Gibbons *et al* (2014) found that access to green belt was worth an average £7,000 per dwelling.

Transport can deal with these constraints by making more land accessible and hence increasing its productivity. By enabling greater density within a given land area, it can also promote agglomeration, while addressing negative externalities and resource constraints.

Is there an optimum city size? Scale comes at a cost in infrastructure and public spending, a decline in economic welfare and negative externalities. The question becomes "At which point is marginal social return equals marginal social cost?"

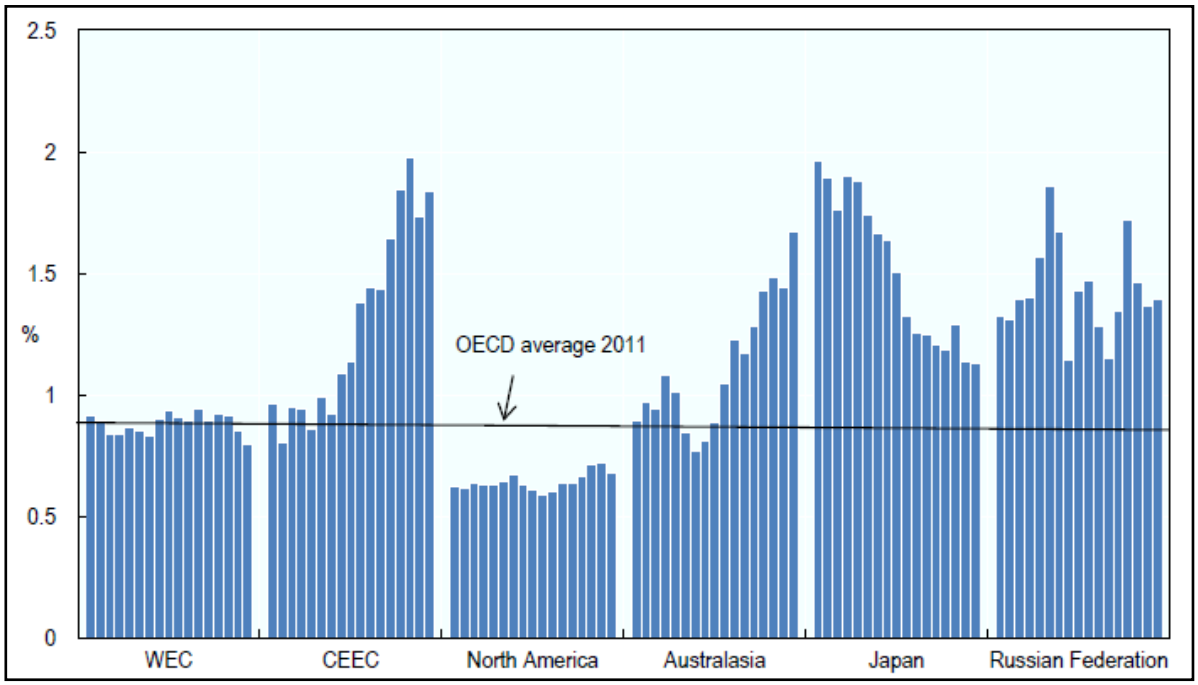
Is London too big?

Consider comparator cities

https://public.tableausoftware.com/shared/94WFFXT38?:display_count=no

The London urban area has a population of about 9.5 million with a density of around 6,000 inhabitants per km^2.

Figure 4: Inland transport infrastructure investment by region



Source: International Transport Forum at the OECD.
Note: as percentage of GDP, current prices and exchange rates.

Tokyo's core municipalities have a population of around 13.5 million and higher densities. Metropolitan Tokyo is much larger, but it really is several large cities next to each other. It is

heavily dependent on metro, suburban rail and interurban rail network and this comes at a cost. Cheaper bus plays a much bigger role in London than in comparable mega-cities. Poor cross-London rail connectivity constrains rail capacity (compared to Tokyo) and is costly to address.

Quality of life, tastes and preferences

The speaker briefly cited the titles of several recent newspaper and magazine articles to illustrate the point that there are real trade-offs between the economic benefits from ever greater urban scale and density and the resulting costs:

- Cities need talented workers, and the quality of life that the educated and ambitious have come to expect according to *Entrepreneurs*
- Londoners living near street trees are prescribed fewer antidepressants
- Inside Beijing's "airpocalypse", a city made "almost uninhabitable" by pollution
- If you think London traffic is bad, try Paris
- London population to reach record high
- World megacities: densities fall as they become larger
- Young Londoners flee the capital for the regions
- Central London tops world as most expensive city for construction
- Hong Kong's human battery hens
- Tesco to scrap dividend and close head office in Cheshunt (although it is only moving to Welwyn)

Higher cost of living is a symptom of resource constraints, but also a result of greater amenity value due to agglomeration.

Taking Tokyo as a comparator, London could probably get a lot bigger, but do we want it to? What would the free market outcome be? Tastes and preferences for environmental quality, open space, commuting time and house size can be expected to play an important role?

Is there a case for government to promote urban growth? Agglomeration leads to increased productivity and this in turn leads to greater tax take. But two important questions are whether the additional tax revenue more than covers the additional infrastructure cost, and whether the additional household income is enough to compensate for the potential reduction in quality of life.

Should policy be determined by equating the marginal net welfare, net public cost and net tax gains from urban growth? For example, what are the marginal tax take and infrastructure costs per additional urban worker/commuter? At what rate does London GDP need to increase for growth to continue to generate positive social/tax returns?

Other guiding questions could include: what is London's amenity value? how much would it cost to replicate this elsewhere?

Are other UK cities too small?

Consider global cities https://public.tableausoftware.com/shared/94WFFXT38?:display_count=no

The London urban area is 1,600 km^2, has a population of 9.5 million and a density of circa 6,000 per km^2.

Greater Manchester and Greater Birmingham are around 600 km^2, have populations of circa 2.3 million and densities of about 4,000 per km^2. Both metropolitan areas are larger in population than Frankfurt, Köln-Bonn, Berlin, Cape Town, Warsaw, Stuttgart, Copenhagen, Rotterdam-Hague, Brussels, Vienna, Hamburg, Kobe, Kyoto and Munich but less than Kiev, Milan, Cape Town, Rome, Naples, St Petersburg, Barcelona and Sapporo.

63% of all jobs in England are within 40 kilometres of London and the Core Cities. London has 4% of the country's land area but 24% of all jobs. City regions have 24% of land area and 39% of jobs.

In core cities 10% of jobs are within 1 kilometre of the centre and 20% within 5 kilometres of the centre. In London 29% of

jobs are within 5 kilometres of the centre (Job trends 1998-2008).

The UK economy has been changing for decades and the trend will continue: basic economics! Between 1998 and 2008 there were three 3 new finance and business services sector jobs in core cities (CCs) for every two in London, and 5 new finance jobs in CCs for every new finance job in London. CCs created 50% more FBS jobs in total than London. By 2008, CCs had surpassed London in total number of FBS jobs.

Quality of life matters and regional cities offer a different trade-off in that respect compared to London. A hip 20-something overheard speaking on the phone at café in Leeds said "…It's a lot cooler than London, more like Bristol. There's loads of stuff to do and you actually do it because it is 5 minutes walk from your house."

Ultimately, we're interested in allocating resources in the most socially productive way. As Fujita, Krugman and Venables (2001, p349) put it, the spatial structure of an economy is … the result of a tug-of-war between external economies and diseconomies, between the linkages and information spillovers that foster concentration, and between congestion and other diseconomies that discourage it.

"Which externalities matter more? The truth is that nobody knows … pure theoretical speculation cannot answer this question."

"Before the theoretical revolution of the 1970s, [textbooks] contained many facts but little theory, and afterward they contained a lot of theory – period."

Pedro suggested the following research challenges:

- Imperfect competition and increasing returns = nonlinear models – a challenge for econometrics
- Theoretical model's simplifying assumptions ≠ real world
- Differences in technology / production frontier between cities are important unobserved factors https://public.tableausoftware.com/profile/pteg#!/vizhome/GlobalCities_0/Sheet2
- Path dependence

- Consumers' and firms' preferences are correlated with key dependent and independent variables (hence confounding effects)

Is it time for the following:

- A more policy-focused approach: back to the 1970s optimum city size?
- A more normative approach, looking at quality of life and PPP-adjusted GDP, not just GVA?
- A more multi-disciplinary approach? Mathematical models and econometrics have severe practical limitations in the realm of urban economics. Can we blend in evidence from sociology, business/management, psychology, engineering and other parts of economics to better understand the dynamics of urban economies and household/firms' preferences?
- A more pragmatic approach? "In certain fields of economics … quantified models play an important role as analytical tools. By a quantified model, we mean a theoretical consistent model whose parameters are based on some mix of data and assumptions, so that realistic simulation exercises can be carried out." Fujita, Krugman and Venables (2001, p347).

Discussion

Dick Dunmore (Steer Davies Gleave) asked how confident we are that cities are in equilibrium and of the levers that we can pull. **Pedro** replied that housing and planning policy are key policies but that there is also a strong built-in preference for a certain level of density and access to amenities.

Mark Sullivan wondered about the definition of a city: do you include the surrounding hinterland? He also noted that, in a smaller city, journeys could be completed by foot on having arrived at the main station, but that a further journey by public transport was usually required in London. **Pedro** replied that a higher proportion of public transport trips transferred in London: 30-35% compared to circa 15% in other large UK metropolitan areas. It would probably require more Crossrail-like links to make London function at Tokyo's scale as it would

increase capacity of the rail network. The net gain of Crossrail might also only be about 150,000 rather than 200,000 commuters per day as a result of passengers transferring.

Gerard Dugdill (Landor) wondered if men and women think differently. **Pedro** said that he had no idea, but probably yes. Family size and attitudes towards household formation more generally may well be an important factor in settling the trade-off between agglomeration and quality of life.

Peter Gordon (Editor, the Transport Economist) asked how important amenities such as cultural and sporting venues were and whether it would be easier to replicate them in smaller cities. **Pedro** replied that it is a really difficult issue to unpick although people have tried (see Huang). You could argue that there is no return to additional cultural amenities in London, as there are already too many things to do. A disproportionate share of the national cultural budget is spent in London, and one might therefore think that a more equitable distribution, or indeed, an increase in the budget available for other parts of the country (given that the cost is relatively small) would probably have a positive return if it were to promote greater agglomeration economies.

Rod Fletcher (Landor) wondered if jobs were the driving factor. Canberra won't grow if there are only Government jobs available. **Pedro** agreed that that individual choice plays a role in the growth of urban areas (see earlier points on tastes and preferences).

John Cartledge commented that the London plan was circular in that it assumed that people wanted to move there because it was growing. The important factors were quality of life and liveability: in surveys by *The Economist* the highest scores were achieved by cities of around 2 million inhabitants such as Vienna and Vancouver. **Pedro** agreed that quality of life plays an important role in location decisions by households and firms. However, defining the right measure of quality of life is complicated, and indices quoted in the media all have their own limitations.

David Spurling said that Gross Domestic Product (GDP) may not be a good measure of wealth. He would prefer a measure such as purchasing power parity (PPP), as suggested by the

OECD. It was also skewed by a small number of wealthy people, and he would prefer to use the median, or indeed data for lower strata, rather than the mean. **Pedro** agreed and showed an example of how GDP at PPP would change the relative position of countries. GDP is a good basis for measuring the tax take but should not be the only objective from a wider policy objective. Improved overall wellbeing (however defined and measured) is what we are ultimately trying to achieve.

Stephen Bennett said that he used to work in Cairo, which had a large population and abysmal public transport but keeps growing. **Pedro** said that developing world cities such as Dhaka often have a more decentralised economic structure than a city such as London, with employment in the service sector heavily concentrated in central areas. In the developing world, the average proportion of people who work in domestic occupations is also much higher, as might be labour force participation among women. It's also worth bearing in mind that average travel to work distance tends to be low (under 5 kilometres in Dhaka) and so a large proportion of people walk. **Scott Clyne** wondered if there was a parallel with large US cities, in the sense that decentralised employment enables these large urban areas to function without extensive public transport networks.

Tom Worsley (University of Leeds) noted that not much had been said about firms' rather than individuals' decisions: do other things affect them, and does it require a different agglomeration model? IT firms in the UK were mostly based on the fringe of cities, but in Silicon Valley have their own area. **Pedro** replied that much of the emphasis of academic work was on access to labour and markets, with a small number of notional economic sectors, but the economy is more complex in practice. The observed distribution of economic activity results from tensions between agglomeration and disagglomeration economies. Large car plants, such as the Nissan works in the North East, may benefit from agglomeration, but could not easily locate in central London because they require a large floor space per worker. Firms like Nissan also need a combination of cheap and qualified labour, ports and other amenities, and are likely to locate in fairly large metropolitan areas, though in places where they can find large sites at an affordable price.

Gregory Marchant noted that people prefer places with a benign climate: Brighton and Bournemouth were growing fast. Is this important? **Pedro** replied that he considered weather one of the variables making up amenity value. England's climate isn't that bad over the year. Ed Glaeser has on occasion highlighted that Detroit has an uphill struggle in this respect, as it benefits from few natural advantages. Once it began to lose population and competitive advantages in manufacturing, it found it difficult to retain and attract new population. Brighton and Bournemouth have a large retired population, which reveals different tastes and preferences as a function of age but could also be crowding out other parts of the population.

Ivan Viehoff (CEPA) wondered how conventional policy measures agglomeration benefits. It costs more to commute to London from Reading than Uxbridge, but it is quicker. **Pedro** replied that Graham's work partially captures this through the idea of effective density. Empirical work shows that agglomeration benefits to drop off quickly with distance from key employment centres.

Report by Peter Gordon

Bus deregulation: 30 years on

John Preston, University of Southampton

Arup

25 February 2015

Introduction

Deregulation day was Sunday 26th October, 1986. The speaker mused that the next day he went to get a bus into town and waited an hour and a half for a bus that was usually only a ten minute wait. Was this a sign of things to come?

The presentation began with a brief overview of the history of bus regulation. In the 1920s, the industry was concerned about driving standard and public safety, and so in the 1930s the industry was regulated. A period of some 55 years of bus regulation from 1930 was then followed by 30 years of deregulation. There are various forms of regulation which include:

- Fares Regulation
- Quantity Regulation (controlling the number of licenses)
- Safety Regulation
- Rate of Return Regulation (limits on profit)

The presentation focused mainly on Quantity Regulation, which is a system of controlling the number of service licenses available to operators and was in place from 1930 to 1985/6.

In 1980, the Transport Act led to fare deregulation, which was followed by the London Regional Transport Act in 1984 which introduced competitive tendering for bus services in London and was completed in 1994. It thus took ten years for competitive tendering to be fully implemented in London. Competitive tendering for services outside London happened as a result of the 1985 Transport Act. Publicly owned bus companies were commercialised and eventually privatised. For example, "Yorkshire Rider" was the successor to West Yorkshire PTE. There was also tightening of regulations concerning safety and competitive behaviour.

Why deregulation?

Market failures led to regulation and were encouraged by interest groups. Regulatory failure (high costs, low productivity, inappropriate mix of fares and services and lack of innovation) then led to deregulation. There had also been an issue of regulatory creep.

There was a deregulation debate around the time of deregulation, and the proponents of deregulation, including Beesley and Glaister, arguing that deregulation would reduce costs and improve resource allocation. Counterarguments were put forward by Gwilliam, Mackie and Nash, the main one being that bus competition should be off the road (for tendered services), but that competition on the road should not be allowed.

The speaker gave an overview of the regulatory cycle. It starts with competitive private supply and is followed by a private sector monopoly. This then becomes a regulated private local monopoly which then moves into a regulated public monopoly.

By 1985, under regulation, there was the National Bus Company (NBC), Scottish Bus Group (SBG), London Transport (LT), Metropolitan PTCs (7 companies) and Municipal PTCs (50 companies). By 1999, under deregulation, this had become the "big five" which controlled two-thirds of the market, along with some other private companies.

The speaker summarised the impacts of bus deregulation on passenger-kilometres, vehicle-kilometres, fares, operating costs and subsidy. Since deregulation there has been a decline in bus passenger journeys outside London, but an increase in bus passenger journeys in London. Bus vehicle-kilometres increased both in and outside London. After deregulation, there was a fall in operating costs, which has since slowly begun to increase. Trends in subsidy follow a similar pattern; subsidy falls after deregulation but then begins to climb from the 2000s.

A qualitative assessment of deregulation was as follows:

- Actual on-the-road competition has been limited and the threat of potential competition (contestability) does not seem to have been effective.

- Costs per vehicle-kilometre initially fell substantially but have since increased, and costs per passenger outside London have increased but in London have decreased.
- Resource allocation does not seem to have improved outside London, and there could be elements of oligopoly, while resource allocation does seem to have improved in London.
- "Curious old practices" of the bus industry seem not to be happening any more, and there have not been substantial undesirable spin-offs of deregulation.

John then asked what would have happened without bus deregulation. This question is essential to understand if we are to understand the impact of bus deregulation. The analysis was presented through (1) simple analysis and (2) more complex analysis.

Simple analysis

A demand model was used to estimate demand for bus travel with and without deregulation, and calculations on economic welfare were also made. Results from the modelling indicate that it took approximately 13 years for 90% of changes associated with deregulation to have taken place, and around 27 years for 99% of it to have taken place. The model indicated that if deregulation had not occurred, demand for bus travel in London would have grown by 64%, but with deregulation it grew by 89%. Outside London, the model suggested we would have expected growth of 9% if deregulation did not occur, but with deregulation there was a decline of 36%.

Table 1: Welfare impacts – simple analysis

	London	**Outside London**
Δ Consumer Surplus	+1,386	-6,740
Δ TR	+42	-3,718
Δ TC	-1,623	-14,504
Δ Welfare	+3,051	-4,046

£ million, 2008/9 prices, 1986/7 to 2009/10, includes impact of subsidy changes

Analysis of deregulation indicated that consumers were better off in London, and there was a bottom-line welfare increase, but outside London consumers were worse off. However, when considering other aspects of welfare such as total revenue and costs, then overall there was a positive impact on welfare for those in London and outside London, as shown in the table above.

More complex analysis

More complex analysis was undertaken which involved:

- Separate demand models for London and Great Britain outside London
- Development of cost models as per the above
- Development of fare models as per the above
- Revised treatment of counterfactual and subsidy
- Revised consumer surplus calculations in the face of shifting demand curves

The cost model included the cost-decreasing effect of privatisation and the increasing costs associated with service expansion. The fare model outside London examined how fares are related to average unit operating costs.

The outputs of this more complex modelling were then used to revisit the welfare analysis.

Table 2: Welfare impacts – more complex analysis

	London		**Outside London**	
	Constant	Trend	Constant	Trend
Δ Consumer Surplus	+399	+451	-24,044	-16,299
Δ Producer Surplus	+3,516	+2,676	+11,778	+12,630
Δ Welfare	+3,915	+3,127	-12,266	-3,669

£ million, 2008/9 prices, 1986/7 to 2009/10, includes impact of subsidy changes

Revised modelling showed that there was an increase in welfare in London; however the conclusions were different for outside of London, which now showed a decrease in welfare as shown in the table above.

This work assumed that subsidy changes were part of the deregulation package, but subsidy could be assumed to be a separate effect. A revised analysis which excluded the effect of subsidy changes made little difference for London, but the trend assumption became highly positive for deregulation outside London, as shown in the table below.

Table 3: Welfare impacts – revised analysis

	London		**Outside London**	
	Constant	**Trend**	**Constant**	**Trend**
Δ Consumer Surplus	+2,363	+4,348	-15,560	+7,538
Δ Producer Surplus	+3,416	+2,458	+8,536	+5,573
Δ Welfare	+5,779	+6,806	-7,024	+12,931

£ million, 2008/9 prices, 1986/7 to 2009/10, includes impact of subsidy changes

The conclusion of the analysis is that, broadly speaking, reforms in London were uniformly positive. Outside London, there has been a decrease in welfare. However, subsidy increases would have occurred if deregulation had not happened, and deregulation could be welfare positive, in that it would make better use of these increases in subsidy.

Case study – Wales

There was a short period of "bus wars" (intense competition) in Wales around the time of deregulation, but a number of bus companies then went bankrupt and bus trips per capita declined. After deregulation, bus supply in Wales decreased, operating costs decreased and then rose, but bus subsidy has increased sharply, mainly due to an attractive concessionary fares offer that was introduced around 2002.

Welfare analysis on Wales shows that there was competition after deregulation which increased welfare for a short period, then welfare declined sharply before stabilising around the year 2000. Overall, welfare in Wales was negative during the period 1985/6 to 2009/10, as shown in the table below.

Table 4: Welfare impacts – including Wales

	Pax	Bus-km	Fares	Op costs	Subsidy (2008/9)	Δ Welfare per head
London	+95%	+82%	+28%	-28% (2008/9)	+84%	+£514
Outside London	-35%	+18%	+47%	-16%	+5%	-£235
Wales	-29%	+32%	+35%	-22%	+123%	-£177

The key messages from the analysis in Wales are that:

- Deregulation has had a similar effect as in the rest of Great Britain
- The Welsh market exhibits some features of a local monopoly
- Wider application of Quality Partnerships/Contracts could increase service quality and demand for the same levels of subsidy
- Funding of Local Authorities would be the key enabler of Quality Partnerships.

The Welsh Government's National Transport Plan in 2015 promotes Network Partnerships.

Conclusions

The presentation concluded by noting some overseas examples of different types of contracts including:

- Comprehensive tendering at a route level (Copenhagen) or area level (Adelaide)
- Network management contracts (France)
- Performance based contracts (New Zealand)

as well as UK examples of Statutory Quality Partnerships, Qualifying Agreements, OFT Block Exemptions (Oxford); quality networks (St Albans); and community bus partnerships.

The concluding remarks also touched on bus quality. As quality has improved, welfare has also increased; improving quality has also improved profitability. Often quality does not improve,

as this can require capital work from the Local Authorities, or it may mean taking road space away from car users, which is politically unattractive.

There were a number of conclusions of the presentation including:

- Competition for the market is preferable to within the market
- Competition in the market may be better than no competition when subsidy is growing
- Analysis and conclusions don't support the view of Beesley and Glaister but support the viewpoint of Gwilliam et al
- Results are sensitive to the treatment of the counterfactual
- The impact of the regulatory reforms of the mid-1980s were largely complete by the late 1990s
- The "spiral of decline" does not seem to have been reversed by deregulation outside of London
- A further turn in the regulatory cycle may be required for services outside London
- The best system may be a 2-tier system with:
    - Quality contracts in London and other metropolitan areas
    - In the rest of the country, the industry might remain broadly deregulated, but with some promotion of quality partnerships

Discussion

David Metz (University College London) noted that the speaker didn't discuss network benefits. The more people on the system, the bigger the benefits. Has London been more successful because of the network? **John Preston** replied that bus network outside London doesn't work as a network as people don't perceive their journeys as being part of a wider bus network. There are some benefits of network effects, with the main benefits being getting the right mix of fares and services.

Peter White (University of Westminster) noted that earlier deregulation of coaches illustrated the network effect, and also commented on costs. The industry made enormous reductions in costs to 2000, but in many cases this was associated with poor wages and working conditions. There has been increased emphasis on service reliability where operators need to maintain reliable headways, and this has pushed up costs. There was an enormous increase in scale of operation in the early 2000s. The biggest growth was in evenings and weekends and not the peak. Fixed costs were being spread over a wider period. **John** noted that the coach market developed a concentration of core routes and that some of the more peripheral routes were withdrawn. The competition was on the price. In contrast, in the local bus market, it is in the service domain. So if you fill all gaps in the network and get too much service spread across too many routes, then you are not focusing on the core routes, and the networks then reconfigure differently. There was an increase in operating costs from 2000, with greater pressure on labour in costs, but the drive to reliability was not a big driver of costs outside of London. There are dangers in using London to make inferences for the rest of the country: in some places outside London there are hardly any bus services after 6pm and so comparisons are difficult. Subsidy per head is higher in London.

Andrew Evans (Imperial College) said that the speaker's analysis stopped around 6 years ago. Is that because that is when the research stopped or because of data availability? **John** said that there were some challenges relating to data collation, but the timeframes of the analysis also related to when the research work was undertaken.

Martin Higginson (Independent Consultant) said that many of the ills laid at the door of bus deregulation are about the way bus deregulation has been applied in this country. One is the restriction of the amount of money that Local Authorities can put into supporting bus services. Cross-subsidies have been outlawed and this has an impact on evening services. Local Authorities are therefore not able to procure services after certain times. Fares subsidies are no longer allowed: when fares have gone up, Local Authorities have been unable to subsidise the level of fares, so demand has gone down. Also,

there should have been something to encourage the incumbent operator to provide more services.

The other issue was the way the competition authorities have had a highly adverse effect. They see everything through the eyes of competition, and have prohibited things such as complementary offerings, such as two operators running alternately. **John** replied that the system is deregulation and competitive tendering. However, the socially attractive services have to be designed not to affect commercial services, so the fact that deregulation has occurred in parallel with competitive tendering may be a problem. Coordination has been permitted on a large scale within Oxford, which is now essentially a duopoly, with coordination of timetables and sharing of ticketing and an effective increase in capacity from the passenger perspective.

John Cartledge (formerly London TravelWatch) said that the speaker mentioned that there appeared to be a loss of integration outside London, or that the market hadn't generated the enhancement that integration can. Could he clarify? Secondly, what importance if any should be attached to stability in routings and timetables, as people make changes in modal choice at critical points in their lives, such as new jobs, and rail is attractive as it is seen as having continuity whereas bus does not. **John** replied that we shouldn't fool ourselves that there was brilliant integration 30 years ago. However with deregulation there has been a deterioration in travel cards, undercutting by operators, difficulties in coordinating information and bunching of services. A related issue is the instability of services, especially in the initial years. A discussion with a bus operator earlier that day revealed the adage: "change services, bleed passengers". Even a slight change in termini or route numbers sees changes in patronage.

John Cartledge replied by challenging the information that is now available. **John** replied that for core markets, survey work shows that increased information for passengers is not necessarily a draw, but there is better information through new technologies that has been beneficial for some markets, particularly London.

Robert Barrass had two questions. One is related to the obituary of John Hibbs, who was influential in deregulation. He envisaged a more atomised industry; a cottage industry with a single driver and a single bus. It turned out to be nothing like that. Was anything like that ever realistic? If not, was it due to economies of scale? Was there anti-competitive behaviour? Secondly, had the speaker distinguished rural and urban services, as they are different creatures? Bus priority is not an issue for rural areas. **John** said that John Hibbs envisaged a lot of things. This included more owner operators, as did Michael Beesley, who thought the reforms in safety and the tightening of some other regulations made it difficult for owner-operators. On the urban/rural point, demand responsive transport has been trialled in a number of rural areas, but such flexible transport is expensive. If you can develop rural services from an urban bus network, or serve rural areas as part of an interurban bus network, then the cost data suggest that these can outperform various demand responsive transport initiatives.

David Spurling (Learning Through Co-operation Limited) noted that he worked with John Hibbs for six years. If you haven't got a form of road pricing, then you'll always be sub-optimising. David disliked buses, as you never know when they will turn up. In other parts of the country, there is more bus priority. **John** replied that as far as road pricing was concerned when he first started studying transport economics, he thought that once they'd introduced road pricing, all they'd have to do is estimate the price, and then it'd all be sorted out. As he got older, he realised that was naïve. We don't expect bus transport to be free at the point of use. For car travel, we do expect it to be free at the point of use, which leads to problems. But introducing road pricing wouldn't mean that the organisational issues surrounding bus transport would disappear.

Gregory Marchant said that back in the day, there was a statutory obligation for the rail industry to consult the bus industry. These were "nice lunches" and didn't get very far. Has deregulation helped this? What about rail franchising?

John replied that deregulation got rid of “nice lunches” and marble halls for bus operators. In the past, bus operators meeting in pubs to conspire have been foolish enough to minute the meetings, which attracted the attention of the Competition Authority. Bus-rail integration has also stalled due to similar concerns.

Report by Margot Finlay

Reviews

The views expressed are those of the reviewers and should not be attributed to the Transport Economists' Group

Evolution of International Aviation: Phoenix Rising (Third Edition)

Dawna L. Rhoades

Published by Ashgate Publishing Limited, Farnham, Surrey & Burlington, Vermont

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Given that the author holds a senior academic position at Embry-Riddle Aeronautical University at their Daytona Beach campus in Florida, USA, a strong American perspective in this book is to be expected. Indeed, with a few exceptions, the story of successful commercial aviation has, until recently, been very much an American tale. However, inevitably, that does have its drawbacks, as noted later.

Overall, the book provides a useful primer covering the history and development of commercial aviation for both a general reader and a first year student. It does not cover airports, but concentrates on aircraft manufacture, airline services, air traffic control and governmental or inter-governmental regulation. At the outset the author poses the question of why the aviation industry has consistently failed to make money over the longer term. Unfortunately, there appears to be no clear answer. Compared to many other industries, she considers commercial aviation to be a "Special Case", being characterised by repeated disastrous cycles - a few years of modest profits offset by brief periods of large losses.

Part I of the book begins with Orville and Wilbur Wright achieving the first powered, controlled heavier-than-air flight on that famous beach at Kitty Hawk, North Carolina in December 1903. It then tells a broadly chronological story up to 1950 through the early days of the Douglas and Boeing corporations, the pioneering role played by the U.S. Post Office after World

War I in developing services by subsidising air mail, the history of government intervention and the boost to aviation given by developments during World War II. The contrasting approaches of U.S. and European governments with regard to "freedom of the skies" versus "sovereignty over airspace" as evidenced at the Paris Conference of 1910 and later Chicago Conference of 1944, thereby preventing regulation on a multinational basis, make for interesting reading.

Unfortunately, when the author strays into the history of European aviation there are some spectacular gaffs, which can lead the reader to question other assertions in the book. In 1911 aviation pioneer Henri Pequet is said to have transported thousands of letters "from Allahabad to Naimi Junction *in France*" (reviewer's italics). Similarly, the formation of a private carrier called British Airways Limited (BAL) in 1935 is confused with the creation of the state-owned BOAC out of Imperial Airways and BAL in 1940 and the later merger of BOAC with BEA in 1974 to form the now privatised British Airways of today, a wholly different entity from BAL, with a much more complex history.

Part II covers the period from 1950, when the industry showed the first signs of becoming a mass transportation mode, at least in the USA, to 2008, when the second edition of this book was published. This was a period of great expansion and development based on wartime innovations originally sponsored by governments. During the 1950s aircraft manufacturers such as Lockheed and Douglas, and airlines such as Pan Am, TWA, American Airlines and United Airlines were driven by the twin goals of providing non-stop flights coast-to-coast across the USA and across the North Atlantic. Discussion then switches to a more recent history of consolidation among aircraft manufacturers, and how the emergence of Airbus and niche builders of smaller aircraft has affected the industry. Similarly, the book concentrates during the second half of this period on analysing the effects of US and European deregulation, and "Open Skies" agreements between countries on airlines. Neither of these developments is seen as an undoubted "good thing" from a customer viewpoint, inevitably producing winners and losers among both users and providers.

In a departure from the previous chronological approach, Section II concludes with chapters covering airline alliances; the legal frameworks surrounding noise controls and affecting monopolies and mergers; and how "quality" might be defined and measured in the industry. Airfreight, overlooked in the book since the early days, then gets a brief chapter. Sadly, much of the discussion and comment in Section II now seems seriously dated; many of the tables end in the early 2000s, when the first edition was published.

Part III attempts to bring the story up-to-date and in doing so revisits some of the issues discussed in Section II, but from a different perspective and sometimes with differing conclusions. In the context of the "boom-and-bust" nature of the industry, chapters in this section examine the rise of low cost carriers and how the legacy carriers have responded to this challenge through cost-cutting, marketing, mergers and alliances (or merely bankruptcy). The efforts of governments to promote efficiency through more liberal market environments; and the impacts of larger (and smaller) aircraft on costs and capacity. There is an extensive and interesting discussion of aviation in emerging markets outside North America, Europe or the Far East, with some horrifying statistics about safety in Africa.

The book concludes with some thoughts on more wide-ranging issues such as the potential impacts of climate change; the utilisation of airspace and the funding of increasingly complex air traffic control systems; and the possibilities for commercial space travel. The last chapter strays into the acknowledged dangerous territory of "futurology". Contrary to expectations, this American author concludes that aviation can never be an industry with perfect competition and that some form of regulation will always be needed. The key questions are what form such regulation takes, who is the regulator, and to whom is it accountable. Compared with its experience in the last century, aviation is seen as a maturing industry in its traditional "Western" markets, with limited opportunities for the sorts of dramatic expansion previously seen in Europe and North America.

For an interested outsider such as this reviewer, the book as a whole provided a fascinating insight into the history and

workings of the aviation industry. Its author raised some significant issues which could apply equally to any mature form of public transport. Its major drawbacks are a lack of informed critical editing and the need for a more substantial rewrite of the middle chapters in the light of post-2008 events and developments.

Review by Gregory Marchant

International Maritime Costs: Market Structures & Network Configurations

Gordon Wilmsmeier

Ashgate, 2014 (ISBN: 978-1-4094-2724-17)

The author works for the United Nations Economic Commission for Latin America and the Caribbean and the University of Applied Sciences at Bremen. This book summarises the work that he has done looking at shipping cost for users.

The first two chapters provide an introduction to the area and include a literature search and theoretical evidence. There is relatively little on the cost structure of shipping lines: the author concentrates on the economics of the market and pricing power of the shipping lines, and the reader wanting a lot of detail needs to look elsewhere.

He does make the interesting point that port costs account for around 60% of shipping costs, with at-sea costs only being about 40%. An interesting graphic on page 47 shows that at-sea unit costs fall by around 40% as the capacity increases from 1,200 TEUs to 11,000 TEUs. While capital costs fall roughly in line with this, bunker (fuel) costs only fall by about a third, but operating costs by over 80%. Indeed, for an 11,000 TEU container ship, fuel accounts for 57% of at-sea costs, capital costs for 37%, and operating costs such as crew for only 6%.

Elsewhere he notes that costs are lower where a flag of convenience is used. Is this because operating costs are lower or because larger vessels use flags of convenience (which would appear to be one way of explaining the difference)? It is perhaps surprising that the author does not mention super-slow steaming anywhere, given that this has a significant effect on costs when fuel prices are high.

There is, by comparison, a wealth of detail on the costs charged to shippers which, as with air travel, may not appear to bear any relationship to cost but, as the author says, are more likely to be based on ability to pay. There is often evidence of oligopolistic behaviour among shippers.

Chapters four and five examine and discuss the empirical evidence, looking at how factors such as the number of operators serving a port affect cost. Much of the discussion is highly technical. The author concludes that there is no correlation between the distance that a container is shipped and the cost. He goes on to discuss networks. A typical route may well have a dozen port stops. The size of vessel will be determined by the facilities at the smallest or least well-equipped port, but the value of trade may well make such a call worthwhile. Your reviewer has often wondered if it would make sense for shippers to operate a hub-and-spoke rather than a linear network. The additional transhipment costs explain why shippers generally operate the latter, but it might have been interesting to have more discussion on this.

The author contents that, while the general view is that shipping costs are generally so low as to be irrelevant to the cost of sales for traded goods, they often account for more than 5% of costs, and can this can often be decisive in deciding where to manufacture.

Appendix one is a useful discussion of data collection and modelling. Transport economists will be aware that statistical data is not always consistent among all modes and there is often a lack of available data. This is certainly true for the costs paid by shippers. It would be interesting to know profitability by a shipping route, but this would certainly be commercially sensitive.

Appendix two gives the average freight and insurance costs per ton for freight (unfortunately without units) and freight and insurance margins. It would have been useful to provide a description for the novice of how these have been calculated.

There are a further ten appendices, but these are of a highly technical nature, often containing detailed regression analysis, and a good knowledge of statistics will be required to appreciate them.

The book is a thorough piece of work, with a lot of original research, and will be of great interest to the academic researcher and indeed the shipper of freight in South America. However the general reader should be aware that much of it is highly technical, and anyone wishing to gain a basic understanding of the shipping market, and to look for simple tables of costs, will probably want to look elsewhere.

Reviewed by Peter Gordon

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The Transport Economists' Group, formed in 1973, provides a forum for people involved in transport economics to meet regularly and discuss matters of mutual interest. Membership is open to economists working in transport and others whose work is connected with transport economics.

The aim of the Group is to improve the quality of transport management, planning and decision-making by promoting lectures, discussions and publications related to the economics of transport and of the environment within which the industry functions.

Meetings, held at Arup's Central London HQ at 13 Fitzroy Street from September to June (except December), consist of short papers presented by speakers, drawn from both within the Group's membership and elsewhere, followed by discussion.

The Group's Journal, "The Transport Economist", is published three times a year reporting on meetings and other activities of the Group. It reviews recent publications of interest and contains papers or short articles from members. The Editor welcomes contributions for inclusion in the journal, and can be contacted at **petersgordon@blueyonder.co.uk**.

The current membership of over 150 covers a wide range of transport modes and types of organisation. Members are drawn from transport operators, consultants, universities, local and central government and manufacturing industry. All members are provided with a full membership list, updated annually, which serves as a useful source of contacts within the profession. Applications from people in all sectors are welcome.

Applications for membership should be made on a form which can be downloaded from the Group's website at **www.transecongroup.org**.

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