

Candidate 2 evidence

The High-Speed Rail Project – Should HS2 go ahead?

Chapter One – HS2: Arguments for and against

1.1 Agglomeration Economies

One of the main benefits of increasing connectivity in general terms is what are called agglomeration economies¹. This is done by connecting suppliers to retailers more efficiently. Bringing businesses closer together causes benefits through the dissemination of information, which leads to a more competitive market, as well as gains in the efficiency and productivity for individual firms. All of this translates into benefits for consumers in the form of lower prices and higher-quality products.

However, diseconomies of agglomeration may also occur. As a result of increased competition, it becomes harder for some firms to compete on prices, as their pricing power has been reduced. In addition, it can create cause a brain drain from less well-connected urban areas as a result of the increased centralisation of economic productivity in the major hubs. In the context of HS2, this would have the effect on dragging workers away from cities not served by HS2, towards the large conurbations of London, Birmingham and Manchester. In mitigation of these potential effects, it is important that HS2 takes place within the context of generally improving rail infrastructure and services across the whole of the Northern Powerhouse.

As the Manchester review outlines², for large cities such as Manchester, their advantage in economic productivity over cities such as Newcastle comes from simply being larger, and therefore being able to take advantage of agglomeration economies. These accrue for a variety of reasons, such as a build-up of skilled labour.

Jonathan Dupont argues the importance of connectivity in his report on the Midlands Engine, the equivalent to the Northern Powerhouse for the Midlands³. Specifically on

¹ Essex University Research paper HS2, agglomeration economies:
<https://www1.essex.ac.uk/economics/documents/eesj/myles.pdf>

² <http://manchester-review.co.uk/wp-content/uploads/2015/02/Agglomeration.pdf>

⁶ <https://policyexchange.org.uk/wp-content/uploads/2018/12/Powering-the-Midlands-Engine-Jonathan-Dupont-Policy-Exchange-December-2018.pdf>

HS2, he argues that the main benefits accrue from the fixing of the bottlenecks of traffic in many major Midlands cities, such as Birmingham. He even thinks that the current constraints on the growth of these major cities will be alleviated by the project, allowing their productive potential to be better taken advantage of.

1.2 Impact on Inequality

A primary objective of HS2 is to adjust the regional inequality that currently exists in Britain. For example, Greater London is one of the richest regions in the UK, with a GDP per capita of over £62,000. However, areas such as Merseyside and West Yorkshire have far lower figures, at around £27,600 and £30,000 respectively.⁴ These are areas where HS2 would be projected to have the greatest impact. Although current spending in the North generally is higher in comparison to tax revenue than it is in the South, infrastructure spending has been historically lower. A 2018 government report found “Public spending on transport, both in absolute terms and on a per capita basis is considerably higher in London and the South than other regions of England”⁵. HS2 is part of the government’s plan to address this. Infrastructure is vital for ensuring the prosperity of a region, as it brings businesses and consumers closer together, enabling agglomeration economies to be taken advantage of.

As pointed out by Jonathan Dupont⁶, the Midlands is 15% less productive than the rest of the UK. This is backed up by the Manchester paper on agglomeration economies, which affirms that below-average productivity extends to the North, particularly cities such as Sheffield, one of the proposed cities on the HS2 route⁷. Connecting these cities to London will have the effect of causing the agglomeration economies to increase.

Spanish economist Gines De Rus argues that the spatial location of economic activity can be greatly affected by reductions in transport costs brought about by the proliferation of high-speed rail. The economic benefit derived from high-speed rail is dependent on the level of demand and the benefit that the new services provide over

⁴ European Union regional statistics: <https://ec.europa.eu/eurostat/documents/2995521/8700651/1-28022018-BP-EN/15f5fd90-ce8b-4927-9a3b-07dc255dc42a> page 7

⁵ <https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-8130#fullreport>

⁶ <https://policyexchange.org.uk/wp-content/uploads/2018/12/Powering-the-Midlands-Engine-Jonathan-Dupont-Policy-Exchange-December-2018.pdf>

⁷ <http://manchester-review.co.uk/wp-content/uploads/2015/02/Agglomeration.pdf>

those already in operation⁸. It is clear that the existing capacity on UK railways is not enough to cope with the current level of demand so therefore it will be wholly inadequate to address the ongoing problem of regional inequality.

However, some have argued that the region that will benefit most from the project is London, a region which is already amongst the richest in Europe. A report by the New Economic Foundation⁹ estimated that 40% of the potential benefits from the project would go to London, with the North West, North East and East Midlands each receiving only a small fraction of the benefits London is projected to accrue. This would occur even with the building of Phase Two, the planned extensions taking the project into Yorkshire and to Wigan. The report also noted that London presently makes up 23% of total UK GVA, giving London an outsized share of benefits, even when economic clout is accounted for.

Report author Andrew Pendleton claimed the line will mainly be used by the wealthiest travellers, such as professionals and executives¹², as opposed to the majority of the working population. HS2 is primarily designed to improve connections for such professionals and will enhance executive face-to-face meetings. It will not see high levels of usage among, for instance, factory workers as factory premises tend to be located away from city centres and major train stations serviced by HS2.

As De Rus outlines, the positive effects of high-speed rail will be felt in the services sector¹⁰ more so than in the manufacturing sector. This is because high-speed rail is primarily aimed at improving domestic connectivity. Services make up around 80% of the economy and stand to gain the most from HS2. The manufacturing sector makes up 44% of UK exports¹¹, but manufacturing as a whole only represents 17.93% of the UK economy¹². This suggests that the effect of HS2 on manufacturing would not be as

⁸ https://read.oecd-ilibrary.org/transport/competitive-interaction-between-airports-airlines-and-high-speed-rail_9789282102466-en#page167

⁹ <https://neweconomics.org/2019/03/hs2-will-serve-wealthier-passengers-and-deliver-more-benefits-to-london-than-the-north>

¹⁰ https://read.oecd-ilibrary.org/transport/competitive-interaction-between-airports-airlines-and-high-speed-rail_9789282102466-en

¹¹ <https://www.themanufacturer.com/uk-manufacturing-statistics/>

¹² <https://www.statista.com/statistics/270372/distribution-of-gdp-across-economic-sectors-in-the-united-kingdom/>

great as in the services sector, as manufacturing leans more heavily on exports for business.

1.3 Connectivity and Productivity

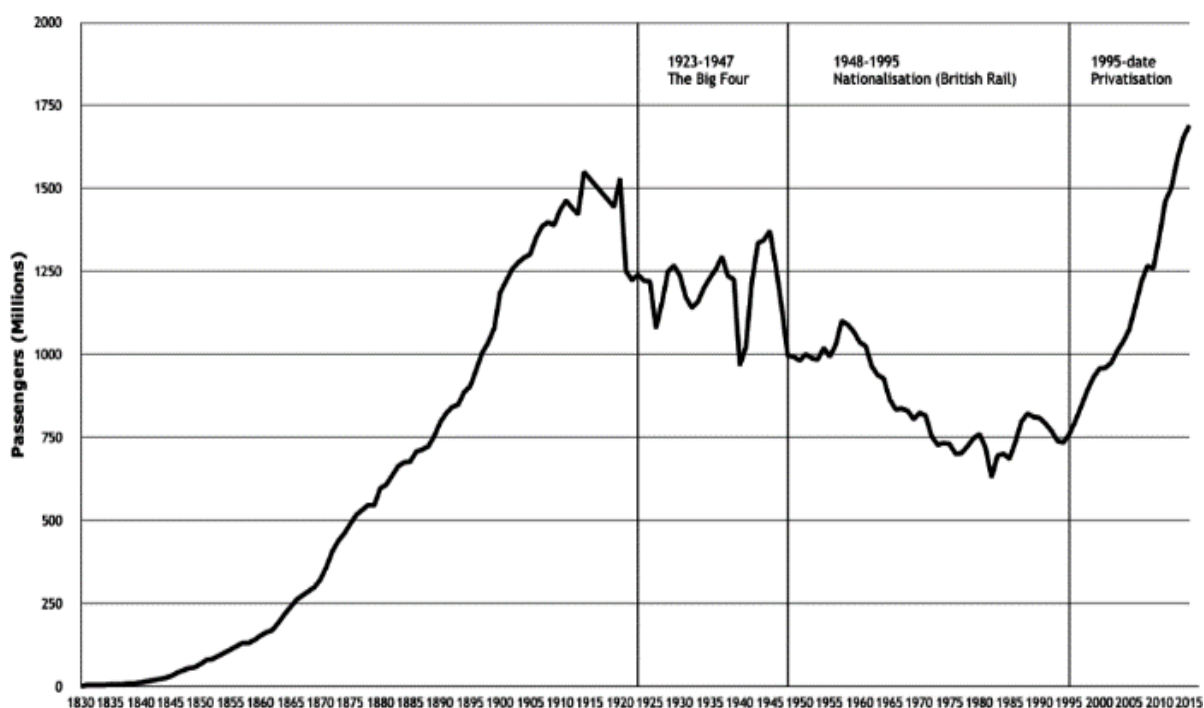


Figure 1, illustrating the growth in UK passenger numbers since Privatisation in 1995

One of the reasons that has been raised in explanation for the UK's lagging productivity rates¹³ is the lack of connectivity between major cities, particularly in the North. HS2 is one method of addressing this, by increasing the speed at which existing connections can be made, easing congestion and creating more miles of track, supporting existing lines and helping to improve connection. The project is estimated to be capable of reducing journey times from London to Birmingham by 30 minutes, to 52 minutes¹⁴. As can be seen from the graph, passenger numbers have risen consistently for a long period

¹³ <https://data.oecd.org/lprdty/gdp-per-hour-worked.htm>

¹⁴ <https://www.bbc.co.uk/news/uk-16473296>

of time on Britain's railways¹⁵ (see figure 1), meaning many major UK railway lines are currently operating far beyond their specified capacity¹⁶. HS2 is proposed as part of the solution, improving both capacity and travel times. According to an analysis by Midlands Connect, HS2, which is projected to carry 26,000 passengers an hour,¹⁷ will create space on the existing lines, allowing faster and more frequent services to be introduced¹⁸. Therefore, the effect of HS2 will not just be direct increased capacity, but, in the context of an integrated plan to further improve northern rail services, it will also take the strain off the main line railways.

Britain's rail infrastructure is outdated for a variety of reasons. For example, the ability to develop double decker trains has been largely precluded due to the low tunnels in existence on many of Britain's lines¹⁹. Making significant upgrades has not been considered worthwhile in terms of cost and benefits, and there is also the further problem of the fact that double decker trains take longer to load safely, which isn't a problem on railways in France and Belgium, for example, as sufficient time is allowed between trains (around five to six minutes), whereas the UK's main lines are far busier, not allowing enough time for long stops. Understanding these kinds of problems is important because there are certainly limitations placed on what can be achieved in the short and medium-timescale on Britain's railways. This is one of the reasons a "fresh start" with HS2 was proposed, in order to bypass such issues, by laying new track, and introducing faster trains than seen before in the UK.

The dual system of private and public enterprise collaboration has led to chronic underinvestment in the UK's rail infrastructure because of conflicting interests. Private companies have access to the lines only on the basis of short-term contracts, meaning little incentive to force through improvement to capacity or quality of service.

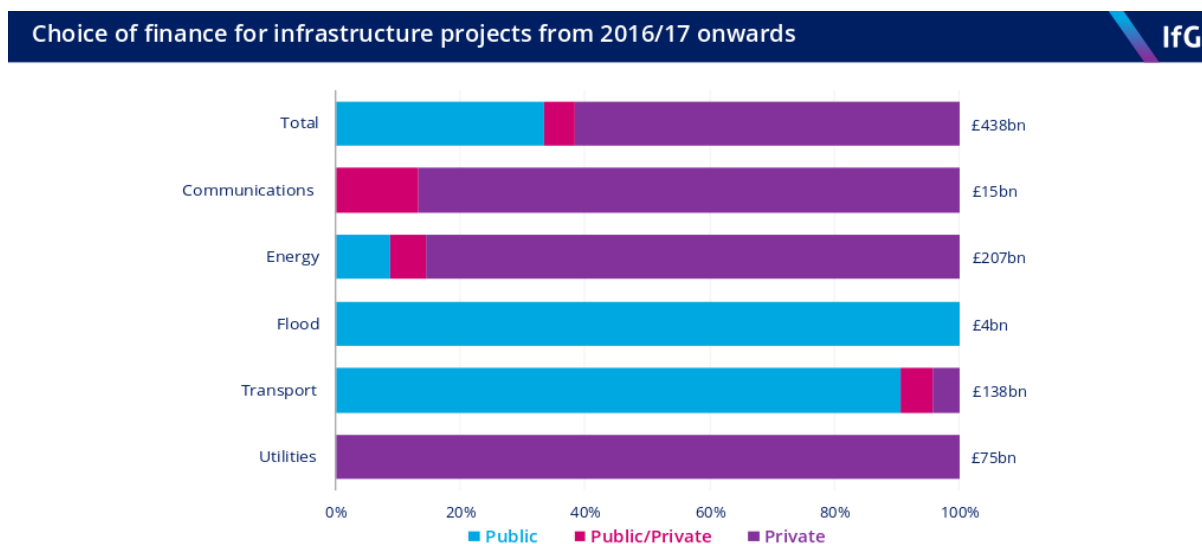
¹⁵ <https://dataportal.orr.gov.uk/statistics/usage/passenger-rail-usage/> Data tables 12.5 and 12.2

¹⁶ <https://www.theguardian.com/uk-news/2019/jan/03/uk-train-overcrowding-highest-level-in-years-labour>

¹⁷ <https://www.gov.uk/government/news/britain-to-have-new-national-high-speed-rail-network>

¹⁸ <https://www.globalrailwayreview.com/news/89694/hs2-capacity-britains-existing-rail/>

¹⁹ <https://www.independent.co.uk/travel/news-and-advice/how-double-decker-trains-would-improve-britains-railways-10184527.html>



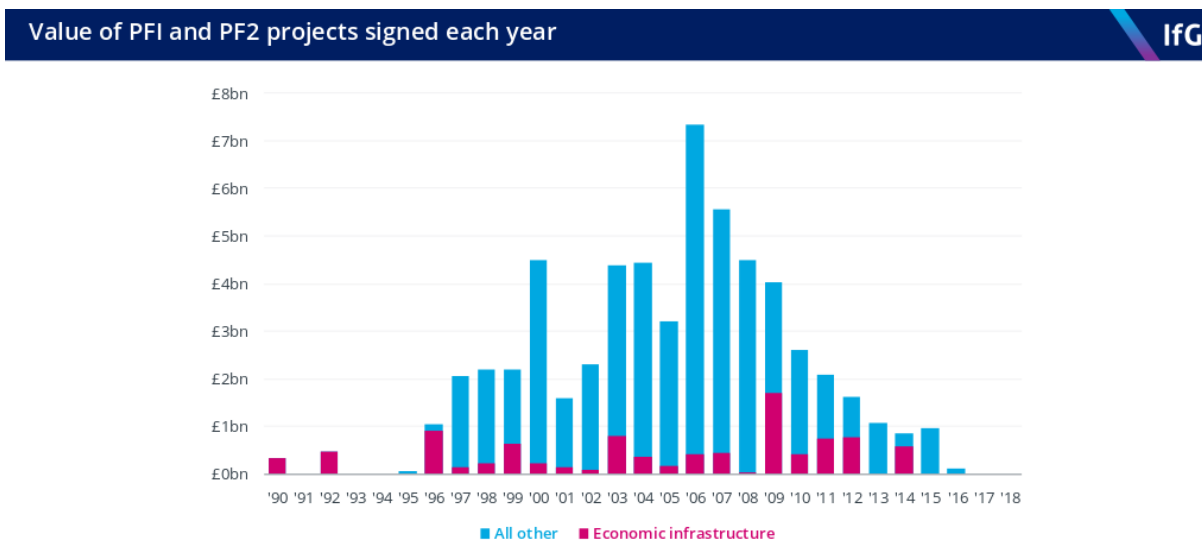
Source: Institute for Government analysis of IPA, National Infrastructure Delivery Plan, Funding and Finance Supplement, 2016



Figure 2, illustrating the financing of different infrastructure projects across the UK

Figure 2 (above) shows that private investment in transport is projected to account for an exceptionally low proportion of total expenditure, with public finance providing the overwhelming majority of funding. Office for Rail and Road statistics also back this up²⁰. This is against a backdrop overall of less private sector investment as is shown by Figure 3 (below) which highlights that the use of Private Finance for infrastructure projects is now almost non-existent. Therefore, it can be seen that investment in rail improvement has to be largely financed by the government. This is further evidence in support of HS2, as it is clear that there will be precious little improvement to the productivity and connectivity of UK railways without government involvement. HS2 is in effect a public good as private firms could never make a return out of it based on investment costs.

²⁰ <https://dataportal.orr.gov.uk/media/1547/rail-finance-statistical-release-2018-19.pdf>



Source: Institute for Government analysis of IPA, National Infrastructure Delivery Plan, Funding and Finance Supplement, 2016



Figure 3, showing the fall in private finance initiatives funding

1.4 Other Productivity Gains

Many workers now spend their working week in a separate city to where they live. Analysis by the TUC reveals commuting times are on the rise, with everywhere but Northern Ireland seeing increases in commute times in the last decade²¹. Improving the speed of connections between these cities will not only enable more to choose this lifestyle, but will also mean that these commuters are able to spend more time at home, increasing their quality of life. The benefits from the improved connections do not just relate to the routes and stations directly affected by HS2. Businesses will consider relocating to Northern areas because of the better links. However, the full benefits will only be realised if Northern connections are improved in addition to the construction of HS2.

A further economic benefit is that workers have the ability to work compressed hours. This is a concept in which workers do the same hours a week as normally, but in fewer days, by compressing the number of days they work and doing longer hours on those days. A faster rail link would give workers more flexibility in the hours that they work, as they have more travel options, thus enabling them to choose the hours they work to suit them, improving productivity. For example, the faster link will enable workers who

²¹ <https://www.tuc.org.uk/news/annual-commuting-time-18-hours-compared-decade-ago-finds-tuc>

leave for work at the same time to work longer hours, giving them more options for when to work on other days of the week.

Investment in such infrastructure projects as HS2 comes at a cost, and the latest official estimates put this at over £100billion²². Much of the track being used by HS2 has to be constructed to be specifically compatible with high-speed rail travel, although the trains will utilise some existing lines, where the operating speed will be significantly reduced, to 125 mph, in comparison to 225 mph. This reduction in speed in some areas lessens the effective improvement in travel time, but also brings down costs. Productivity gains thus could have been much higher if costs had permitted more high-speed track to be laid.

1.5 Opportunity Costs

Many have said that, instead of spending upwards of £100billion on HS2, a better solution to the overcrowding problem on Britain's railways would be to upgrade existing rail networks. They argue that HS2 will not solve the fundamental problems that are already evident. Lord Berkeley, former co-chair of the Oakervee review, which looked into HS2, has made several suggestions, including electrification, extended platforms and longer trains, for improvement to the UK's railways in the here and now²³.

The main problem with such proposals is the disruption that this would cause to the network while the construction is taking place. A 2013 Network Rail study found that "Britain would be effectively left without a functioning intercity railway network on weekends for up to 15 years". The disruption caused by HS2 would be limited, because, broadly speaking, it will not affect existing railway lines. The Oakervee Review agreed with this, stating "if HS2 were to be cancelled, many years of planning work would be

²² <https://www.ft.com/content/27ab2f5c-a976-11e9-984c-fac8325aaa04>

²³ <https://www.expressandstar.com/news/uk-news/2020/01/28/lord-berkeley-identifies-alternative-rail-schemes-to-hs2/>

required to identify, design and develop new proposals. The upgrading of existing lines would also come at a high passenger cost with significant disruption”²⁴.

Other policies have been proposed to address regional inequality and lower productivity in the North. For example, regional corporation tax cuts could provide an even stronger incentive for businesses to relocate to the Northern regions than a high-speed rail link with London ever could²⁵.

The required capital investment represents a significant opportunity cost for the government and many think the funds could be used elsewhere. A poll for Channel 4’s Dispatches showed that just 12% of the public feel that HS2 represents good value for taxpayers’ money²⁶. Another poll in the Telegraph indicated that 86% per cent would rather funds were spent on the NHS²⁷. Indeed, the total cost of HS2 would be enough to finance the construction of 195 large hospitals²⁸. However, in the North West, (where the second phase of the line is intended to run), support of HS2 outweighed opposition - by 2%²⁹.

1.6 Direct Benefits

The construction of HS2 will lead to the creation of jobs in its planning, construction and maintenance. The Government’s paper “The Strategic Case for HS2”³⁰ laid out some of these, stating that its construction will create 24,600 construction jobs, and employing 50,000, directly and indirectly, at its peak, which was projected at the time to be in 2029. Construction jobs will be created in areas such as Birmingham, in particular, with the building of a new station at Curzon Street³¹. This station is part of wider urban regeneration effort that will create a total of 36,000 jobs. This represents

²⁴ Oakervee Review, page 115, Extract from conclusion 62:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/864842/oakervee-review.pdf

²⁵ <https://www.spectator.co.uk/article/three-better-ways-to-spend-200bn-than-hs2>

²⁶ <https://www.comresglobal.com/polls/quicksilver-media-hs2-poll-feb-2019/>

²⁷ <https://www.telegraph.co.uk/politics/2018/09/08/public-would-rather-spend-56-billion-hs2-fund-nhs-telegraph/>

²⁸ <https://www.independent.co.uk/news/uk/politics/hs2-cost-buy-billion-nhs-education-brexit-a9293021.html>

²⁹ <https://www.telegraph.co.uk/politics/2018/09/08/public-would-rather-spend-56-billion-hs2-fund-nhs-telegraph/>

³⁰

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/260525/strategic-case.pdf page 93

³¹ <https://www.hs2.org.uk/stations/birmingham-curzon-street/>

the kind of incorporated thinking that Britain's infrastructure needs. HS2 must not take place in a vacuum. Instead, its planners must consider what it is proposed to achieve, in order to ensure it provides the maximum possible benefit.

The central question is whether or not the same number of jobs could be created through other initiatives that would also improve the UK's railways. The creation of the Curzon Street station is unique to other proposals, most notably those of Lord Berkley, which have merely suggested upgrades to existing stations³². For this reason, the project will create more jobs than other proposals. The conclusion that HS2 will, in general, create more jobs than other initiatives, thus leading to greater direct benefits through the multiplier effect. These benefits can also be developed within the framework of addressing regional economic inequality, as long as workers from the towns affected are used in order to bring the maximum possible economic benefit to such towns.

1.7 Environmental Impacts

The effect on consumer behaviour as regards their environmental footprint was also found to be less than had been anticipated. The report from the New Economics Foundation found that a meagre 4% of people using HS2 would otherwise have driven. This undermines the argument put forward HS2 advocates about benefits from reduced traffic congestion. It also calls into question the idea that HS2 will have any positive environmental impacts, particularly when further considered with the fact that the energy costs for HS2 are, on a per mile basis, higher than when compared with those on standard trains on the current network³³, by a factor of almost two, according to the government's own estimates.

However, the estimated CO₂ equivalent emissions per passenger kilometre are far lower for high-speed rail than is the case with other major types of transport, such as aviation, private car transport and more conventional inter-city rail. From this perspective, HS2 can be considered as having, overall, a positive impact on the environment, through the prevention of such emissions.

³² <https://www.expressandstar.com/news/uk-news/2020/01/28/lord-berkeley-identifies-alternative-rail-schemes-to-hs2/>

³³

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69741/hs2-cost-and-risk-model-report.pdf

However, there are also direct implications for the environment resulting from the construction of HS2. Its line is projected to destroy 108 ancient woodlands, as well as risking the local extinction of rare species by disrupting their habitats. This goes against the government's plan for "environmental net gain" in infrastructure projects.

Chapter Two – HS2: Comparisons to similar projects

2.1 HS1

Specifically, for the UK, the benefits will be more significant than for other countries, as the UK has thus far allowed only one rail service to operate at speeds greater than 125mph, this being HS1 which carries the Eurostar. HS1 provides a good example of a high-speed rail network built with a clear purpose, to provide better connections between London and Europe. This has been so successful that the French city of Lille is considered by some as a commuter town for London³⁴, demonstrating the effect that high-speed rail can have in terms of cutting journey times and affecting behaviour patterns.

2.2 France

High-speed rail has existed in France since the early 1980s, when a link between Paris and Lyon was constructed, and the network has been extended and speeds increased in a continuing process since then. This network, centring on the capital and largest city of Paris, is far more extensive than anything that has been proposed in the UK, and this has allowed for more effective communications between cities. There has been limited analysis of the economic effects of high-speed rail in France, although there is one PHD dissertation from the University of Pennsylvania, written in 2014³⁵. This found that high-speed rail had been particularly beneficial for knowledge-based employment. Knowledge-based jobs are defined as “people who have to think for a living, unlike manual labourers who are paid for performing physical tasks”. This links back to what was discussed above with regards to impact on the secondary sector in the UK. It is clear to see that knowledge-based employment within the tertiary sector will benefit the most from the scheme.

The New Economic Foundation report³⁶, referred to earlier, found that, in France, the richest 10% of earners made nine times as many trips on the high-speed rail network than the poorest 10%, reinforcing the argument that high-speed rail does very little to address inequality, with most of the direct benefits being enjoyed by the rich. One of

³⁴ <https://www.justlandlords.co.uk/news/lille-londons-next-commuter-hotspot/>

³⁵ <https://repository.upenn.edu/cgi/viewcontent.cgi?article=3046&context=edissertations>

³⁶ <https://neweconomics.org/2019/03/hs2-will-serve-wealthier-passengers-and-deliver-more-benefits-to-london-than-the-north>

the ways to try to encourage those on lower incomes to use such services is through the government subsidising of prices in order to reduce them for low income commuters. However, this has the disadvantage of increasing costs further, and distorting the market for train tickets.

Whilst a success with commuters, the TGV network has also been met with some criticism because of the debt accumulated in order to finance the operation of unprofitable and inefficient routes³⁷. Thus far it has racked up debts of €47 billion with the French government promising to pay €35 billion. This brings up the question of whether the UK government would have to face a similar bail-out once HS2 is complete if it didn't generate sufficient revenues.

2.3 China

China's current high-speed Rail begun construction in the 1990s and the government has extended the network, building a vast network of 64 lines linking many of China's major cities. China, in fact, has more miles of high-speed rail than the rest of the world put together³⁸. Much of this network is the result of recent extensions, so the full economic impact is presently unknown, but some analysis has still been possible. For example, Yang, Lin, Zhang and He³⁹ argue that there is a differentiation to be made between the impact of "core" and "peripheral" cities. HSR in China has positively impacted the productivity of core cities, but to the detriment of peripheral cities. This has significant implications for the considerations regarding HS2. The more peripheral cities in the North, those which it is supposed to benefit, may well see their productivity harmed by HS2. This links to Chapter 1.1 where it was found that agglomeration economies centred around the major hubs to the detriment of smaller urban areas.

There has been recent indications that The Chinese Railway Construction Company (which has built most of the network in China) would be prepared to undertake construction of HS2. Given their track record of speed of production, they say they would be able to deliver the project faster and cheaper than the figures and timescale already proposed. They also promised faster trains⁴⁰. This is part of an ongoing debate

³⁷ <https://www.businessstraveller.com/business-travel/2019/02/12/sncf-may-have-to-cut-less-profitable-tgv-services/>

³⁸ <https://link.springer.com/article/10.1007/s12544-017-0233-0>

³⁹ <https://www.hindawi.com/journals/jat/2019/1279489/>

⁴⁰ <https://www.building.co.uk/hs2-and-the-chinese-what-now/5104354.article>

in the UK over what the country's strategy should be with respect to China, with similar issues as have been discussed previously regarding phone manufacturer Huawei and the implementations of the UK'S 5G network.

2.4 Japan



Perhaps the most well-known of high-speed rail projects is the Shinkansen in Japan (Bullet Train). The project began as a response to the common problem of traffic congestion, particularly on the densely populated roads around Tokyo and Osaka. The project has been a success, with extensions since constructed across all four of Japan's major islands. It contributes an estimated ¥500billion a year to the Japanese economy. Investment has continued in attempts to upgrade and modernise, with the introduction and further research into new generation trains.

HS2 differs from other examples of the implementation of high-speed rail in other countries in a variety of ways. For example, in Japan and China, the projects replaced domestic air services as a primary method on transportation within a country. In Britain, the main objective will not be the replacement of domestic airlines, but instead to take the strain off other lines, address regional inequality and improve productivity. Because the project is designed with a different purpose in mind the considerations for evaluating whether or not it will be a success are somewhat dissimilar.