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QUANTIFYING THE ECONOMIC AND SOCIAL IMPACTS OF HIGH-SPEED RAIL: SOME EVIDENCE FROM EUROPE AND THE PEOPLE'S REPUBLIC OF CHINA

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Abstract

In recent years there has been an increasing move towards allowing for impacts beyond the direct user benefits and costs in the appraisal of transport investments. Much of the interest to date has been in justifying the inclusion of such wider impacts as a genuine net addition to a cost-benefit analysis rather than just double counting of direct benefits or displacement effects. The focus has been mainly on the impacts on productivity and economic growth through the impact of increasing accessibility on agglomeration. The paper reviews the arguments in favor of measuring such impacts, the progress made in implementing such impacts in appraisal, and the limitations of such an approach. The paper then proceeds to discuss approaches that analyze the way in which new transport infrastructure may lead to the restructuring and rebalancing of local and regional economies through structural change and the relocation of activities. Evidence from high-speed rail networks in Europe and the People's Republic of China (PRC) is used to examine changes in specialization, the impacts on knowledge-intensive sectors, and new firm formation.

Keywords: transport appraisal, wider economic impacts, agglomeration, economic restructuring

JEL Classification: L92, R11, R42, R58

Contents

1. INTRODUCTION AND MOTIVATION

Transport as a determinant of land use and economic development has been the subject of much controversy. In the past it was thought that quantifying such effects would run the danger of double counting since direct user benefits through, for example, time savings would be reflected directly in changes in land values or employment. This assumes, however, that all of the markets using transport are in perfect competition such that any changes in the generalized cost of transport pass directly and completely into prices and costs in the transport-using sector. Once imperfect competition in these sectors is allowed for, this relationship breaks down such that rent seeking by firms can allow for impacts that are either larger or smaller than the direct user benefits. Such wider economic impacts (WEIs) may lead to significant additions (or reductions) in the total benefits associated with a project (SACTRA 1999).

But WEIs are only an extension of traditional cost-benefit analysis (CBA). Allowing for WEIs incorporates the likely impact of imperfect competition through measuring the impact of changing generalized cost on accessibility, and removing the assumption of self-balance in a perfectly competitive economy has an impact on agglomeration and productivity. However, this approach continues to assume that changes are marginal the resulting elasticities do not allow for fundamental changes in behavior changing (Vickerman 2017b). Recent work has improved our understanding of how changes in accessibility affect the performance of firms, productivity and labor markets, but this is still in the same marginal response framework and mainly about single cities in which agglomeration effects are more obvious. The question is whether this approach can be applied to "megaprojects" that cause step changes in supply, involve multiple metropolitan areas, and whose primary objective is to "rebalance the economy" (Vickerman 2017a; 2018).

2. DEFINING OBJECTIVES

The traditional objectives of new infrastructure projects have mainly been about user benefits. Thus, demand modeling has dominated the benefit side of CBA appraisal methods and the user benefits have been largely driven by the value of time savings. For the majority of projects, which are essentially those determining the capacity of a link needed to cater for peak-time travel, time savings are relatively small (marginal) but relate to large numbers of people traveling frequently.

Large-scale infrastructure projects, such as the construction of new high-speed rail (HSR) links, are now seen to be more about delivering wider economic benefits (Vickerman 2017a, b). The search for such WEIs is often seen as necessary for the viability of such projects as the direct user benefits may be insufficient to match the typically high construction costs. Time savings in such projects may be larger, but relate to smaller numbers of people traveling less frequently on fewer regular journeys. Demand modeling is less easy and less reliable in such cases. And it may be thought that traditional values of time savings are less appropriate for such projects.

This raises a number of fundamental questions. First, should we abandon a CBA-based approach for an alternative, and if so what? Is the emphasis on macroeconomic indicators such as GDP/GVA or productivity correct? If large-scale projects are seen to be about rebalancing the economy by promoting development in lagging regions, how do we measure regional rebalancing as an objective? Moreover, how do we ensure that such rebalancing is not just a redistribution in a zero-sum game, but does allow for positive benefits in all affected regions? It may be that instead of a focus on aggregate indicators, structural change may be more relevant and this could relate not just to differential growth and specialization of different sectors but also to specialization in terms of skills and occupations. Whilst the primary concern may be the appraisal of transport measures, these need to be seen alongside other policy interventions that help to validate these transport measures.

3. GETTING THE COMPONENTS RIGHT

In the light of these concerns, the question arises as to whether large-scale comprehensive modeling is the right approach to provide the basis for the appraisal of projects such as HSR. The danger of approaches such as spatial computable general equilibrium (SCGE) (Bröcker and Mercenier 2011) or land-use transport interaction (LUTI) (Wegener 2011) models is that they are all based on existing patterns of behavior and interaction and rely essentially on the response to marginal changes. What is needed is a framework more focused on adaptable models to ensure that the building blocks are right. System dynamics (SD) models that offer an opportunity to consider dynamic feedback through such models are numerical rather than analytical and depend, perhaps too much, on the "creativity of modelers" (Rothengatter 2014). The key elements clearly require more work.

Essential to this is understanding the behavioral response to step changes in supply. HSR projects make nonmarginal changes to accessibility and time savings, essentially changing the time-space geography. This can lead to significant behavioral changes on the part of both individuals and businesses relating to the location of activities. In some cases, this may lead to the increasing centralization and concentration of activities; in other cases, it could lead to decentralization and greater convergence of regional economies as demonstrated theoretically by the "new economic geography" (Krugman 1991; Fujita, Krugman and Venables 1999).

Changes in speed that lead to changes in economic geography may also have implications for the valuation of time savings and especially of business time savings. (Hensher 2011; Mackie, Graham and Laird 2011). Step changes in accessibility may not be evaluated in the same way as a multiple of small time savings, although it is not clear a priori whether these would be larger or smaller. A small time saving on a regular commuting journey may have a higher value per minute than a potentially more usable larger saving on a less frequent longer journey. On the other hand, if the new link opens up opportunities for activities that did not exist previously, the value could be larger. This issue is compounded in the case of business time savings by the argument over whether, given the availability of comfortable conditions and the potential for communications such as Wi-Fi, the saving of time is not so important in terms of increased productivity. If passengers can keep in touch with their office and work effectively on the train, then is there an argument for reducing the perceived value of time savings? This is clearly an area where more research is needed to assess how effectively passengers can work. In addition, if the creation of a high-speed link leads to new business opportunities that generate new journeys, including the potential for more day return trips, then it is reasonable to include this value in the overall benefits. It may be prudent to test the sensitivity of these benefits to variations in the value of time savings, but not to discount them entirely.

This generation of new business will depend on the way firms respond to changing connectivity between cities. Much of the work on agglomeration has been carried out in the context of individual metropolitan areas and has focused mainly on labor market impacts rather than business relocation (Graham 2007; Combes and Gobillon 2015). This relocation could arise in two ways. The first and obvious response is that firms could relocate their entire business, the outcome envisaged by theoretical work on the new economic geography, which generates convergence or divergence. The alternative is that firms recognize that the productivity benefits of agglomeration typically occur at the level of skills and occupations and undertake internal reorganization to benefit from the greater ease of access between different locations (Venables 2013). There is some evidence that this has happened as a result of the introduction of the HSR in France, with firms relocating activities between Paris and provincial cities such as Lyon or Lille but without any tendency towards overall concentration or deconcentration of employment (Plassard and Cointet-Pinell 1986; Burmeister and Colletis-Wahl 1996).

As suggested above, agglomeration has been largely studied in the case of improvements of access across a single metropolitan area. This relates to the long-standing interest in the relationship between city size and productivity (Rosenthal and Strange 2004; Glaeser and Gottlieb 2009). This can be extended to consider the effects of the introduction of an HSR between two cities in which the impact may depend on the initial advantages or disadvantages of each city and the extent of the change in accessibility between them. Does the larger and initially more productive city have an advantage in exploiting any change in accessibility or will firms in the smaller city be able to exploit the reduction in transport costs to capture market share? However, in a multi-city context these considerations may become more complex. Will the improved accessibility between the second-order cities enable them collectively to gain a competitive advantage over the primary city? Some estimates of the impact of the rapidly developing Chinese network suggest this may be occurring (Chen et al. 2016; Chen 2019) and estimates of the impact of the full HS2 network in the UK suggest much larger relative gains than those arising just from the first stage link between London and Birmingham (HS2 2013a, b).

Large-scale projects carry significant risk and degrees of complexity that make it difficult to make forecasts with the degree of accuracy achievable in less complex projects. This raises problems in the decision process as decision-makers may feel nervous of committing to projects where there are significant confidence intervals around the central forecast. This is especially the case where public money is involved, which makes the importance of the narrative surrounding the project greater. A clear exposition of the objectives of a project is necessary to ensure that there can be an appropriate commentary from both its promoters and any objectors. This is particularly true with HSR projects as there is a tendency to focus on the speed and time-saving aspects at the expense of any wider economic or social impacts; making clear from the outset the importance of these objectives in helping transform or rebalance economies may help reduce later confusion. Understanding the process of change helps to increase the transparency and accessibility of the appraisal framework so that debates can be conducted against a common framework.

4. MEASURING WIDER ECONOMIC IMPACTS

At the heart of any discussion about wider economic impacts must lie some quantifiable elements (Laird and Venables 2017). It is important to recognize that these are not necessarily the sum total of all such impacts and especially in the case of large HSR networks these may seriously underestimate the total effect. Four main elements can be identified as the core economic impacts:

- agglomeration impacts
- output change in imperfectly competitive markets
- labor supply impacts
- move to more or less productive jobs

The easiest of these to measure are the agglomeration impacts, which depend on an estimate of each location's access to economic mass (ATEM). This is defined as *d* a measure of the way that for a given scenario S in location *i*, the generalized costs *g* for each sector *k* using mode *m* with a distance decay parameter of *α*, given total employment *E* in each location *j*. such that

$$d_i^{S,k,f} = \sum_{j,m} \frac{E_j^{S,f}}{\left(g_{i,j}^{S,m,f}\right)^{a^k}}$$

Then comparing the ATEM in scenarios *A* and *B*, the impact on productivity from this change in accessibility in year *f* with an elasticity of productivity with respect to *d* in sector *k*, of ρ^k gives a wider economic impact of

$$WI1_i^{k,f} = \left[\left(\frac{d_i^{A,k,f}}{d_i^{B,k,f}}\right)^{\rho^k} - 1\right] GDPW_i^{B,k,f} E_i^{B,k,f}$$

These estimates depend critically on being able to estimate the key elasticities, both of productivity with respect to agglomeration and the distance decay implicit in changes in generalized costs. Historically these estimates have been derived from changes in city size in an aggregate way. Research based on disaggregate data at firm or sector level suggests considerable variation in such elasticities with service sectors typically having rather larger elasticities than manufacturing industry, and it is service sectors that are more likely to be impacted by HSR (Graham 2007; Melo, Graham and Noland 2009).

For urban applications, the other elements identified in defining wider economic impacts are normally considered to be less important. The labor market impacts are largely captured in the productivity effects as they involve bringing into the labor market marginal workers for whom the net real wage has increased with lower transport costs and also enabling workers to move to jobs where they are more productive. These labor market participation and labor sorting effects have usually been estimated at the sectoral level, but may be more important at the level of skills or occupations.

Allowing for imperfect competition is the driving force of theoretical models of new economic geography as it is the price-cost margin that is changed by lower transport costs and how the imperfectly competitive firm reacts to this is not clear a priori. Furthermore, the aggregate impact on a city or region will depend on the collective reaction of firms in different industries and their competitors in the other cities or regions. This uncertainty has made it difficult to use empirical estimates leading to a tendency to use averaged add-ons based on the extent of typical price-cost margins in imperfectly competitive industries.

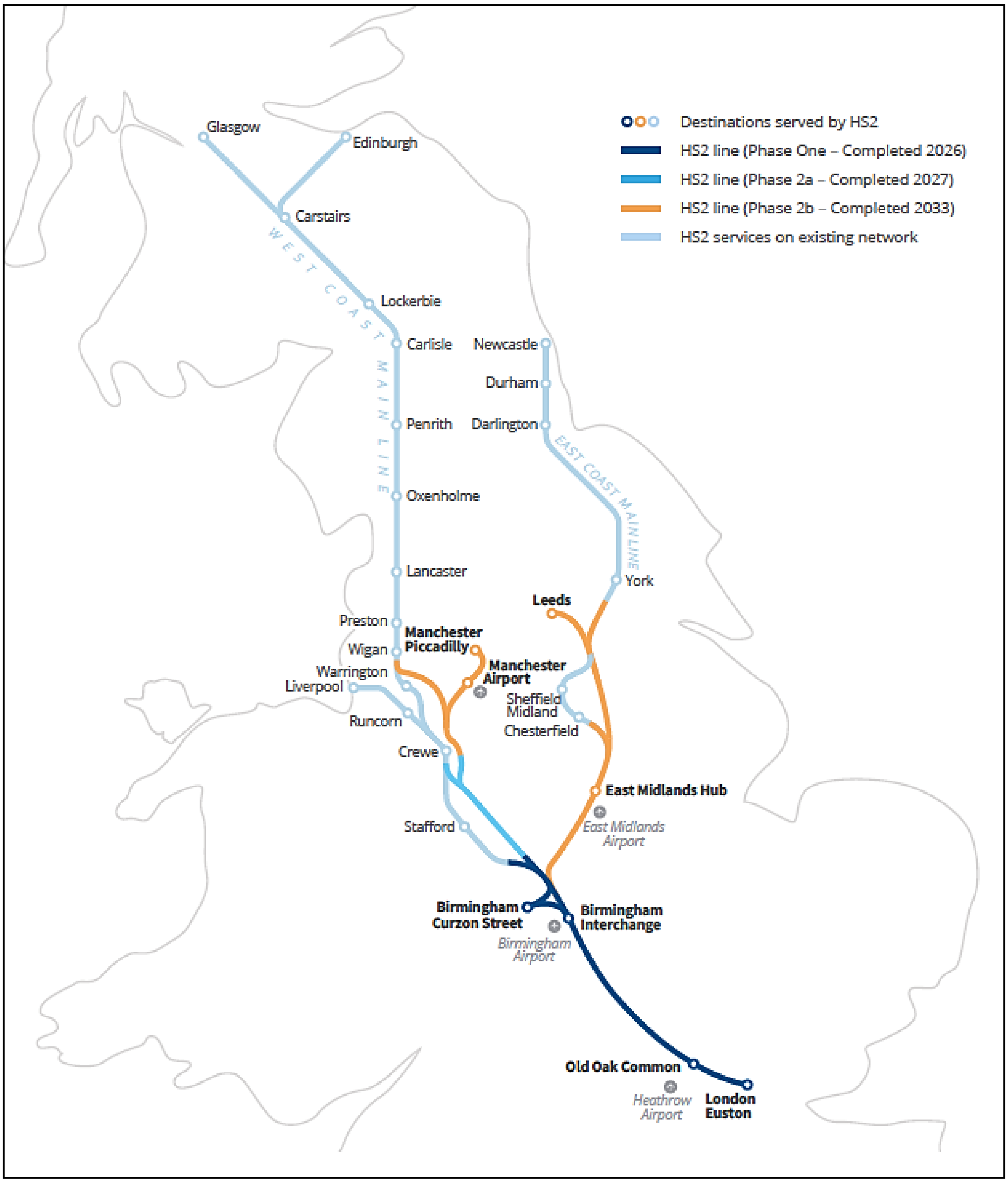
5. APPLICATION TO HSR

There are problems in trying to apply simple agglomeration-based estimates of wider economic impacts to HSR. The distance decay effects found in urban applications where the benefits decline steeply with distance from a station would suggest that there are very small benefits of this type from intercity applications (Graham and Melo 2011). Is it, however, logical to apply the same labor market approach as in the urban cases and is there an alternative? New HSR projects are more about the impact of adding labor markets together than extending single labor markets, so this is less about agglomeration effects than the potential for transformation and rebalancing of regional economies. There will be an agglomeration effect, but this may be less important than changing the competitive position of cities and regions. In such circumstances, the degree of imperfection in local markets and the resultant competitiveness of firms may be more important and needs further analysis. This reinforces the view that estimates of agglomeration elasticities are not easily transferable between applications.

The key question to address is therefore whether new transport investments can change a city's or a region's economic situation. This depends on whether such investments are centralizing or redistributive, raising the question of whether there is a net national economic benefit rather than the impacts being essentially a zero-sum game.

A standard wider economic benefits approach has been used in the UK to augment user benefits in a CBA framework. Here we look at some *ex post* estimates of the first HSR, HS1, and *ex ante* estimates of the impact of the more significant HS2 network. HS1 links London with the Channel Tunnel but also provides regional high-speed commuting services for towns in the county of Kent, saving 35 to 40 minutes on the commuting time to London. HS2 is initially providing a link between London and Birmingham, the two largest cities in England, but is ultimately planned to create a network linking to Manchester and Leeds and serving the majority of industrial cities in the Midlands and North (Figure 1).

Figure 1: Proposed HS2 Network



Source: HS2 Ltd.

Table 1 summarizes the impact of HS1. This shows that standard wider economic impacts were of the same order of magnitude as the direct user benefits and that including these was necessary to achieve a benefit-cost ratio (BCR) greater than 1. In addition, the evaluation by the National Audit Office (2012) identified the potential for a further set of regeneration benefits of the order of three times the level of standard wider economic impacts.

Table 1: *Ex Post* Evaluation of HS1

	Present Value (£mn, 2008 prices)
1. International transport benefits	2,500
2. Domestic transport benefits	1,200
3. Congestion relief	00
4. Total transport benefits (1+2+3)	3,800
5. Wider economic impacts	3,800
6. Total benefits (4+5)	7,600
7. Net costs	–3,900
8. Additional costs to achieve economic impacts	–400
9. Total costs (7+8)	–4,300
10. BCR (ratio 4/9)	**1.0**
11. BCR including WEIs (ratio 6/9)	**1.8**
12. Regeneration benefits	10,000

Source: National Audit Office (2012).

Table 2 summarizes the basic economic case for HS2 made in 2013. In this case the conventional estimate of wider economic impacts suggests a relatively small addition to all benefits that are dominated by benefits to business users dependent on high values of time savings. The contribution of WEIs, even on the standard basis of estimation of agglomeration benefits, can be noted to be relatively larger in the case of the full network, raising the BCR to more than 2.

Table 2: Standard Case CBA Analysis for HS2 (2011 Present Values)

Components		**Phase One** (£billion)	**Full nNetwork** (£billion)
1. Transport user benefits	Business	16.9	40.5
	Other	7.7	19.3
2. Other quantifiable benefits		0.4	0.8
3. Loss to government of indirect taxes		–1.2	–2.9
4. Net transport benefits (1+2+3)		23.8	57.7
5. Wider economic impacts		4.3	13.3
6. Net benefits including WEIs (4+5)		28.1	71.0
7. Capital costs		21.8	40.5
8. Operating costs		8.2	22.1
9. Total costs (7+8)		29.9	62.6
10. Revenues		13.2	31.1
11. Net costs to government (9-10)		16.7	31.5
12. BCR without WEIs (ratio 4/11))		**1.4**	**1.8**
13. BCR with WEIs (ratio 6/11)		**1.7**	**2.3**

Source: HS2: The Economic case for HS2 (2013a).

Part of the case for HS2 has been its potential to rebalance the regional structure of the UK economy by increasing connectivity to cities in the North and Midlands. Tables 3 and 4 summarize the estimates made of these effects. Table 3 summarizes the regional distribution of transport user benefits based on traffic forecasts. Table 3 confirms the relative benefit to the provincial regions from the full network. Although London is still the largest net beneficiary, the relative size of its benefit is lower in the case of the full network. Attempts have been made to refine the estimates of the total regional effect to allow for impacts beyond the standard case (KPMG 2013). One of these is shown in Table 4 (HS2 2013b). The detailed methodology of this has been questioned (Overman 2013) and it is thought that the absolute value of the estimated gains may be on the high side (see Vickerman (2018) for a fuller discussion), but the distribution of the gains does confirm the case for a transformational effect and also for a net national benefit, and although some individual regions will lose, there are net gains for the sum of all regions outside the direct influence of HS2.

Table 3: Estimated Regional Distribution of Transport User Benefits from HS2
(£mn)

Region	Phase One	Full Network
London	£339 (42%)	£726 (35%)
South-East	£22 (3%)	£58 (3%)
West Midlands	£211 (26%)	£303 (15%)
North-West	£164 (20%)	£342 (17%)
East Midlands	£15 (2%)	£157 (8%)
Yorkshire and Humber	£6 (1%)	£225 (11%)
North-East	£1 (0%)	£69 (3%)
Scotland	£19 (2%)	£91 (4%)
Other (East England, South-West, Wales)	£31 (4%)	£76 (4%)
Total	£809 (100%)	£2,047 (100%)

Source: HS2: The Economic case for HS2 (2013a).

Table 4: Regional Distribution of Estimated Gains

	GDP Impact per Year	
	"Low" Business Location Scenario	"High" Business Location Scenario
Greater Manchester	£1.3 billion	£0.6 billion
West Yorkshire (Leeds city region)	£1.0 billion	£1.0 billion
South Yorkshire (Sheffield city region)	£0.5 billion	£0.9 billion
East Midlands (Derby & Nottingham city regions)	£1.1 billion	£2.2 billion
West Midlands (Birmingham city region)	£1.5 billion	£3.1 billion
Greater London	£2.8 billion	£2.5 billion
Rest of Great Britain	£7.0 billion	£5.0 billion
Total impact on GB economy	£15 billion	£15 billion

Source: HS2: Regional Economic Impact (2013b).

6. GOING BEYOND STANDARD WIDER ECONOMIC IMPACTS

How to measure change has thus become a critical factor. The standard approach has always been essentially about the impact on productivity and growth as these can easily be incorporated into a standard CBA based on user benefits and costs. Justifying projects on the basis of impacts on economic aggregates allows them to be considered in terms of an economic rate of return. But this tends to ignore the mechanism by which this overall effect comes about. Understanding the mechanism may be as important as measuring the overall effect if it involves the redistribution of economic activity or structural changes within each urban or regional economy. Focusing on which sectors and which occupations are most affected gives us a greater understanding of the full economic impact of HSR. For example, agriculture or manufacturing industries may be less affected by HSR than by less major improvements to the classic rail or road networks where goods are more likely to be carried. For these sectors there may be a relatively minor impact on business travel or commuting. It is difficult to identify the extent of such travel in national accounts and estimate its significance to different sectors. In service sectors, however, and particularly those engaged in the knowledge economy, such travel is more likely to be a significant factor as proximity is a key factor in traditional Marshallian external economies of localization and in the sort of urbanization economies that depend on urban public goods such as those related to knowledge and culture.

Regeneration and transformation may be more important objectives, as we have already seen in the case of HS2. This involves a set of related indicators implying changes in specialization and structural change in terms of sectors or skills and occupations. Such changes are driven both by business and household relocation, by new firm formation, and by restructuring of the internal organization of businesses to incorporate the presence of HSR into a reappraisal of the optimum location of specific activities.

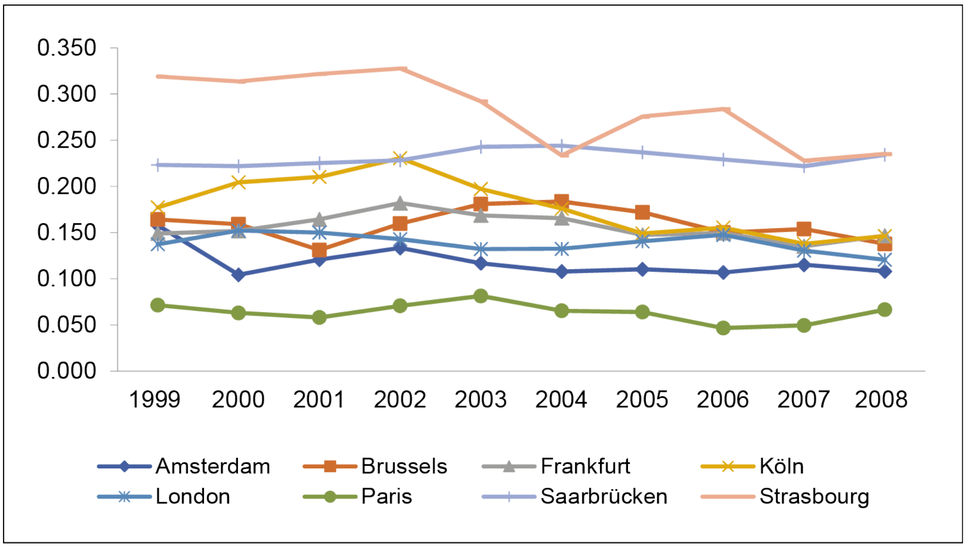
Cheng, Loo and Vickerman (2015) compared changes in specialization following the introduction of HSR services in North-West Europe (the region between Paris, Frankfurt, Amsterdam, and London) and in the Pearl River Delta region of the PRC (in the period after the speeding up of rail services but before the full introduction of new infrastructure).

Using the Krugman Specialization Index, which measures the degree of variation in the industrial specialization of a city S_i relative to a benchmark S_i^*

$$I = \sum_i \left| S_i - S_i^* \right.$$

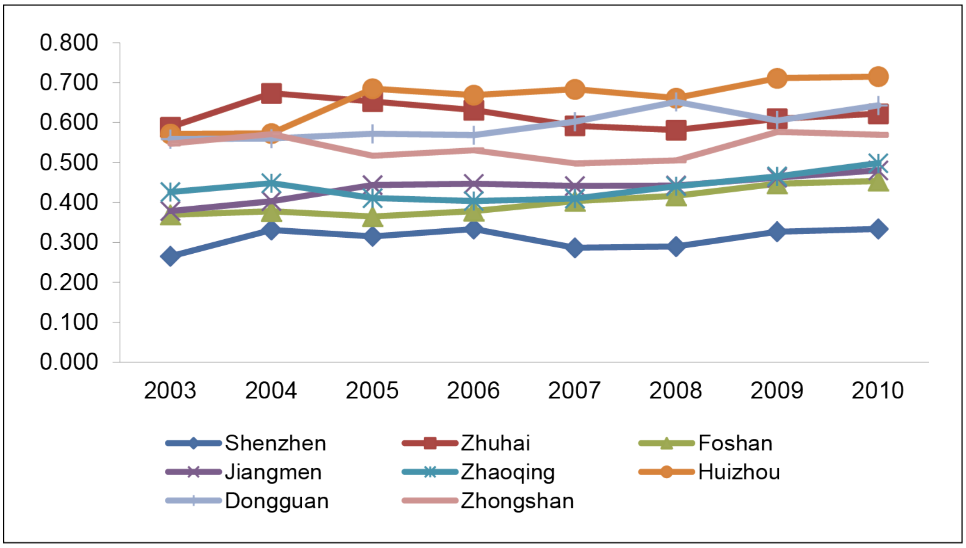
It was found that cities in Europe (Figure 2) were generally more similar (an index closer to 0) and tending towards convergence than in the Chinese case (Figure 3). This suggests that in the more mature European economy, improvements to transport had a general tendency towards regional convergence. In the case of the rapidly changing Chinese economy, transport improvements generally led to increasing specialization and divergence.

Figure 2: Specialization Index of Core European Cities



Source: Cheng, Loo and Vickerman (2015).

Figure 3. Specialization Index of Cities in the Pearl River Delta Region of the PRC

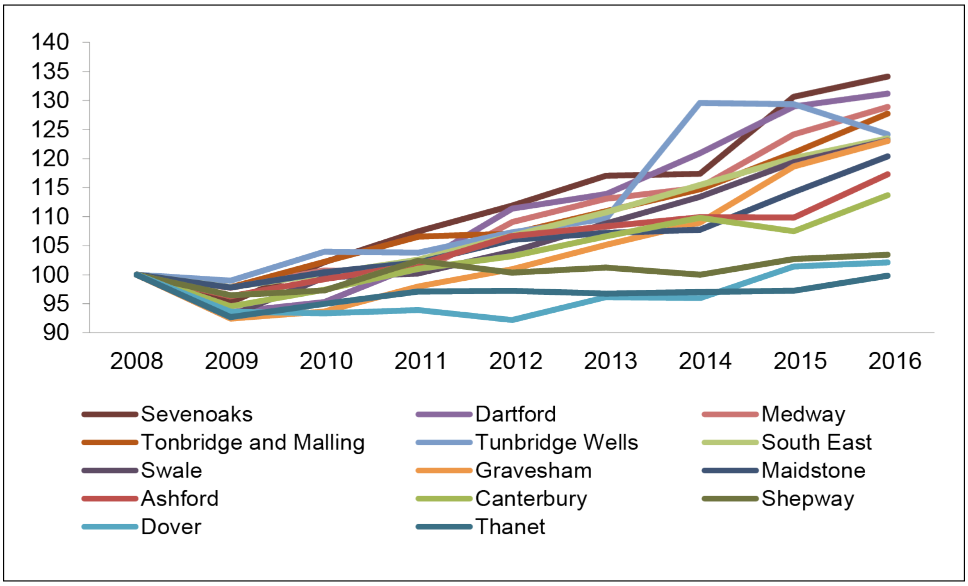


Source: Cheng, Loo and Vickerman (2015).

In a further study, Chen and Vickerman (2017) compared some more detail of the impacts on individual cities in Kent in the UK and the Yangtse River Delta in the PRC following the introduction of new HSR services. Two indicators were used: changes in GDP/GVA and changes in employment in the knowledge economy. The latter, it was hoped, would capture structural changes that would be less evident in the aggregate economic indicators.

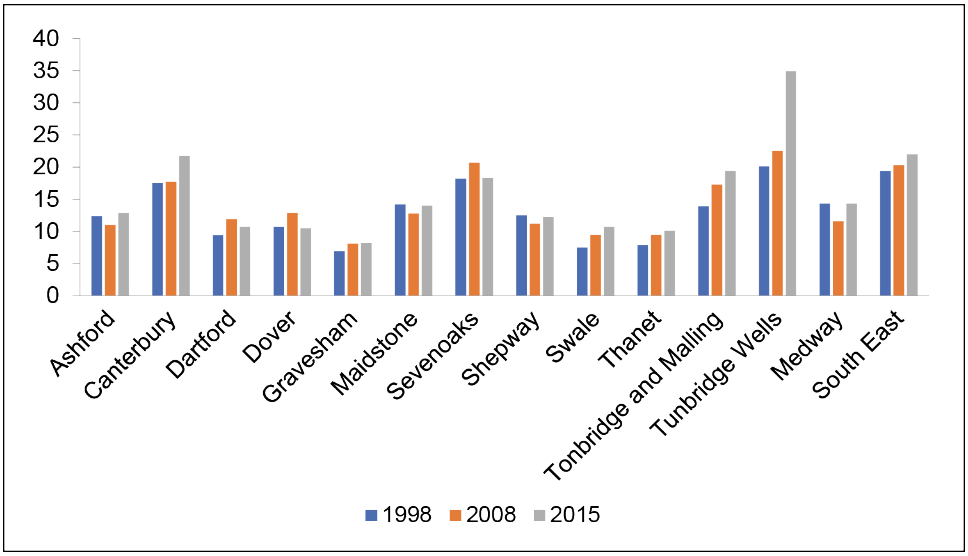
In the case of Kent (Figure 4), the areas most affected by the introduction of regional HSR services in 2009 did not show the greatest growth in GVA, with the exception of Dartford (the location of Ebbsfleet International Station on HS1). Ashford, which has the greatest proportional gain through time savings, was one of the poorer performers. Generally, the picture is one of better performance in those areas closer to London, with very little repositioning resulting from the introduction of HSR. Changes in the knowledge economy suggest a more varied picture (Figure 5), but again, the largest gain was in a town unaffected by HSR (Tunbridge Wells), although Canterbury, with a large university and research base and significant time reductions to London brought by HS1, also showed one of the larger positive responses, and growth since 2008 has been more marked than in the previous decade (Vickerman 2018).

Figure 4: Changes in GVA Kent Districts, 2008=100



Source: Kent County Council (based on ONS data) in Chen and Vickerman (2017).

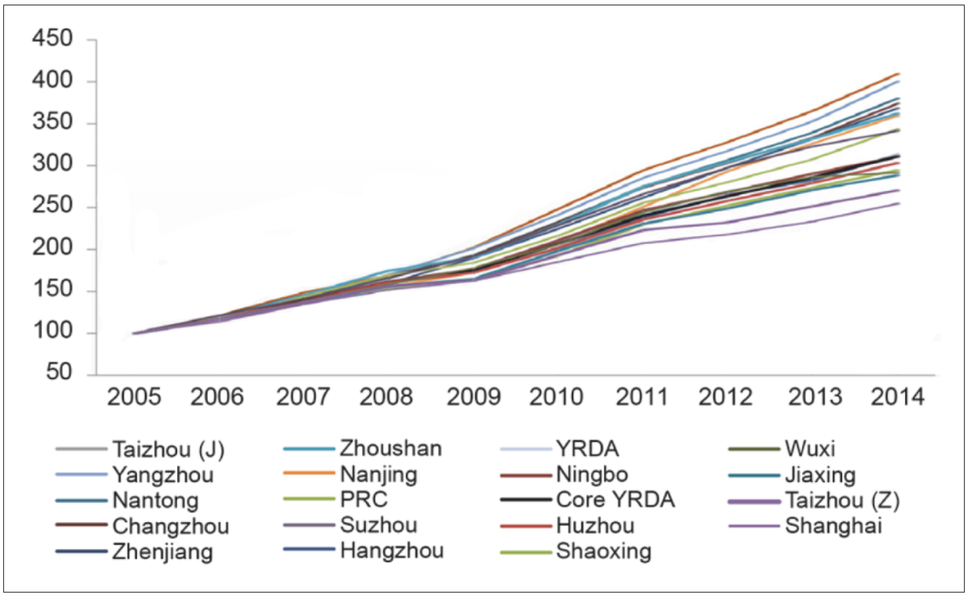
Figure 5: Employees in Knowledge Economy, Kent districts, 1998, 2008, 2015 (%)



Source: Kent County Council (based on ONS data) in Chen and Vickerman (2017).

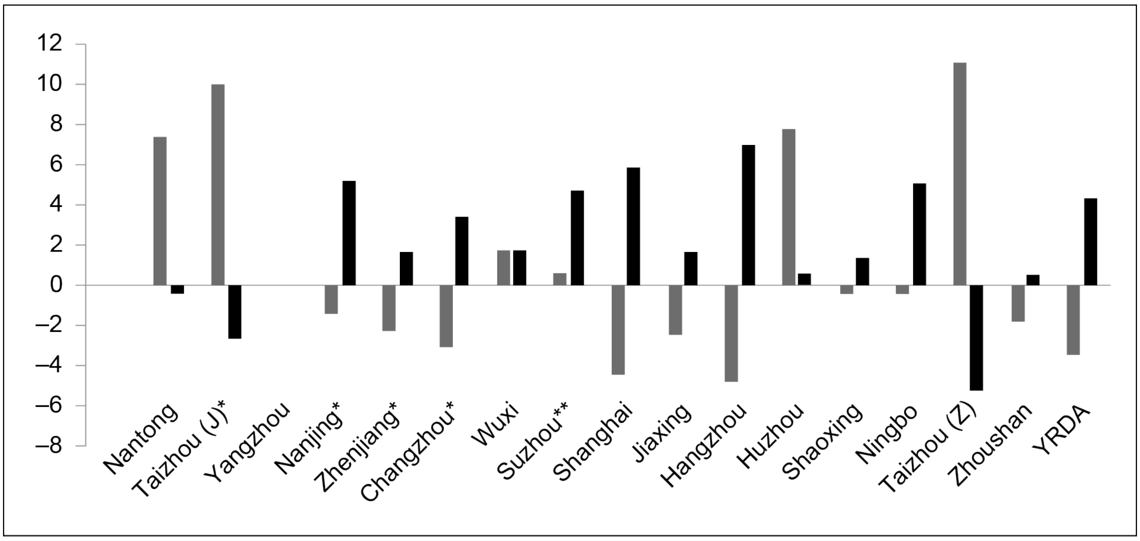
Economic impacts from HSR in the Yangtse River Delta region of the PRC show slightly less variation in terms of the aggregate GDP index (Figure 6). Although there was a general tendency of decline in employment in secondary industry and growth in the knowledge economy, some cities moved in the opposite direction to this trend, suggesting again that a process of greater specialization was in progress (Figure 7). Since much of the change affected the location of new and relocating firms, an analysis was carried out of new firm formation in one city of the Yangtse River Delta region, Suzhou (Chen, Chen and Vickerman 2018). In the five years before the introduction of HSR a total of just under 15,000 new firms were registered; in the five years after HSR the number increased to nearly 43,000. Table 5 compares the distribution of these between manufacturing and knowledge-based firms both overall and in the zones around stations and outside these buffer zones. This suggests that proximity to an HSR station was not an overwhelming priority, although knowledge economy firms were more likely to select a

Figure 6: Changes in GDP by Prefecture-level City 2005=100



Source: Statistical yearbooks of various YRDA prefecture-level core cities, 2006–15, in Chen and Vickerman (2017).

Figure 7: Employees in Secondary Industry and Knowledge Economy
(% Change 2009–2014)



Source: Statistical yearbooks of various YRDA prefecture-level core cities, 2006–15, in Chen and Vickerman (2017).

Table 5: New Firms by Sector and Location Before and After HSR, Suzhou

	In Whole Study Area		In Station Buffer Zone		Out of Station Buffer Zone	
Industry Percentage	Knowledge Economy	Manufacturing	Knowledge Economy	Manufacturing	Knowledge Economy	Manufacturing
2005–2010	30.1%	22.7%	12.7%	5.2%	28.6%	28.7%
2011–2015	36.9%	10.2%	13.0%	2.7%	37.6%	11.9%

Source: Chen, Chen and Vickerman (2018).

Closer location whilst overall manufacturing industry firms were a declining share of all firms. Looking more closely at the precise locations of new firms, what seems to have happened after the introduction of HSR is that previous clusters have tended to dissipate across the urban area. This may reflect the way that the multiple HSR stations in a city give firms access to a wider range of connections in a range of urban areas and reduce the need for local proximity to gain the benefits of agglomeration. Improved intra-urban transport links associated with the arrival of HSR may also play a part in this process. For large firms, the findings show an evident shift of concentration from one zone to another, reflecting the policy objective of creating large-scale clusters rather than being caused by HSR.

This research suggests that looking in more micro detail at the local contexts and the way firms react to the arrival of HSR is important. This is similar to the findings of French research that identifies internal restructuring as a response to the new opportunities offered by HSR links (Burmeister and Colletis-Wahl 1996).

We have gone beyond the simple application of estimates of wider economic impacts that remain within a CBA framework to look at the extent to which restructuring occurs in response to HSR and provides the basis for assessing whether HSR can be transformative. This does still focus on basic economic indicators and it may be necessary to look beyond the economic impacts as demographic change and changing lifestyle choices may be further factors. This implies a need for more behavioral analysis of individual and household responses to new transport opportunities to match the micro analysis of firm responses.

7. CONCLUDING REMARKS

The basic premise of this paper is that standard CBA is inadequate for megaprojects such as new HSR networks. Wider economic impacts, measured in a conventional way in terms of accessibility-related productivity changes, may show benefits (and costs) beyond the direct user impacts, largely related to changes in agglomeration, but do not capture the transformational impacts that megaprojects like HSR could create. In looking at evidence of the impacts of HSR on different cities, including impacts on the transformation, structural change, and location of new firms, clear differences emerge between Europe and the PRC. These suggest potentially important lessons for less developed or transitional economies. Above all, HSR investment needs to be seen as one element in a comprehensive policy of regeneration and transformation; HSR cannot create change on its own. There is a considerable research agenda suggested by the preliminary finding reported in this paper and it is argued that the research effort should focus on these structural changes before embarking on even less measurable impacts.

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