

IMPROVING COMPETITIVENESS

A discussion paper on the
Commission's objectives

Contents

The Commission	3
Introduction	5
1. Improving access to markets	7
2. Access to mobile labour and capital	10
3. Creating and supporting globally significant clusters and assets	12
4. Productivity	15
5. Benchmarking	18
Conclusion	21
Endnotes	22

The Commission

The Commission's remit

The Commission provides the government with impartial, expert advice on major long term infrastructure challenges. Its remit covers all sectors of economic infrastructure: energy, transport, water and wastewater (drainage and sewerage), waste, flood risk management and digital communications. While the Commission considers the potential interactions between its infrastructure recommendations and housing supply, housing itself is not in its remit. Also out of the scope of the Commission are social infrastructure, such as schools, hospitals or prisons, agriculture, and land use

The Commission's objectives are to support sustainable economic growth across all regions of the UK, improve competitiveness, and improve quality of life.

The Commission delivers the following core pieces of work:

- a National Infrastructure Assessment once in every Parliament, setting out the Commission's assessment of long term infrastructure needs with recommendations to the government
- specific studies on pressing infrastructure challenges as set by the government, taking into account the views of the Commission and stakeholders, including recommendations to government
- an Annual Monitoring Report, taking stock of the government's progress in areas where it has committed to taking forward recommendations of the Commission.

The Commission's binding fiscal remit requires it to demonstrate that all its recommendations for economic infrastructure are consistent with, and set out how they can be accommodated within, gross public investment in economic infrastructure of between 1 per cent and 1.2 per cent of GDP each year between 2020 and 2050. The Commission's reports must also include a transparent assessment of the impact on costs to businesses, consumers, government, public bodies and other end users of infrastructure that would arise from implementing the recommendations.

When making its recommendations, the Commission is required to take into account both the role of the economic regulators in regulating infrastructure providers, and the government's legal obligations, such as carbon reduction targets or making assessments of environmental impacts. The Commission's remit letter also states that the Commission must ensure its recommendations do not reopen decision making processes where programmes and work have been decided by the government or will be decided in the immediate future.

The Commission's remit extends to economic infrastructure within the UK government's competence and will evolve in line with devolution settlements. This means the Commission has a role in relation to non-devolved UK government infrastructure responsibilities in Scotland, Wales and Northern Ireland (and all sectors in England).

The Infrastructure and Projects Authority (IPA), a separate body, is responsible for ensuring the long term planning carried out by the Commission is translated into successful project delivery, once the plans have been endorsed by government.

The Commission's members

- **Sir John Armitt CBE (Chair)** published an independent review on long term infrastructure planning in the UK in September 2013, which resulted in the National Infrastructure Commission. Sir John is the Chair of National Express Group and the City & Guilds Group. He also sits on the boards of the Berkeley Group and Expo 2020.
- **Professor Sir Tim Besley CBE** is School Professor of Economics and Political Science and W. Arthur Lewis Professor of Development Economics at the LSE. He served as an external member of the Bank of England Monetary Policy Committee from 2006 to 2009.
- **Professor David Fisk CB** is the Director of the Laing O'Rourke Centre for Systems Engineering and Innovation Research at Imperial College London. He has served as Chief Scientist across several government departments including those for environment and transport, and as a member of the Gas and Electricity Markets Authority.
- **Andy Green CBE** holds several Chair, Non-Executive Director and advisory roles, linked by his passion for how technology transforms business and our daily lives. He chairs Lowell, a major European credit management company and has served as Chair of the Digital Catapult, an initiative to help grow the UK's digital economy.
- **Bridget Rosewell CBE** is a director, policy maker and economist. She served as Chief Economic Adviser to the Greater London Authority from 2002 to 2012 and worked extensively on infrastructure business cases. She is a Non-executive Director at Network Rail, Chair of the Atom Bank and Non-executive Chair of the Driver and Vehicle Standards Agency.
- **Professor Sadie Morgan OBE** is a founding director of the Stirling Prize winning architectural practice dRMM. She is also Chair of the Independent Design Panel for High Speed Two and one of the Mayor of London's Design Advocates. She sits on the boards of the Major Projects Association and Homes England.
- **Julia Prescott** is a co-founder and Chief Strategy Officer of Meridiam and sits on the Executive Committee of Meridiam SAS. She has been involved in long term infrastructure development and investment in the UK, Europe, North America and Africa. Since 2019 she has sat on the board of the Port of Tyne.

Dame Kate Barker DBE left the Commission at the end of March 2020 to become Chair of the Universities Superannuation Scheme.

Introduction

The National Infrastructure Commission has three objectives, which are specified in its charter:

- support sustainable economic growth across all regions of the UK
- improve competitiveness
- improve quality of life.¹

The Commission is publishing a series of discussion papers reviewing each of the objectives. These will clarify the Commission's interpretation of its aims, and explain how the Commission could measure how its recommendations contribute towards its objectives.

This paper is the first in the series, focussing on improving competitiveness. It sets out options for defining competitiveness, the evidence supporting each definition and how the definitions relate to infrastructure. The paper concludes with the Commission's current thinking on how to interpret competitiveness.

The Commission would prefer its objectives to be measurable, allowing the Commission to assess progress. The limitations of infrastructure evidence and data may restrict the degree to which this is possible at present. Nevertheless, the Commission's choice of definition will take potential measurability into account, in the expectation that evidence and data will continue to improve.

There will be overlapping areas and complementarities across the Commission's objectives. For example, productivity has a central role in economic growth, but could also be argued to be important for competitiveness and quality of life. These overlaps are not problematic, and the discussion papers will consider how the concepts might apply to each objective. However, for the purposes of monitoring, it will be useful for the Commission to maintain some distinction between its objectives. The discussion paper series will explain which objective such concepts are most relevant to and why.

The Commission welcomes comments on this discussion paper, including evidence on how infrastructure affects competitiveness and ways that the Commission could monitor and measure its impact. Please send any comments to NICdiscussionpapers@nic.gov.uk by 30 September 2020.

Background to the competitiveness objective

Improving competitiveness has featured as an objective for the National Infrastructure Commission since its establishment. Evidence to the LSE Growth Commission, which first proposed the creation of an independent infrastructure strategy body, emphasised that infrastructure is essential "for the success of a competitive modern economy".² The Armitt Review into long term infrastructure planning recommended that the National Infrastructure Commission identify infrastructure needs to "maintain the UK's international competitiveness amongst the G20 nations".³ Although competitiveness is often framed in terms of international competition, the Commission will interpret competitiveness in a way that is also relevant at a subnational level.

There is ambiguity surrounding the term competitiveness and it is not consistently used in the literature. Different definitions of competitiveness are not necessarily contradictory; they demonstrate the complexity of the idea and how competitiveness can interact with many different aspects of the economy such as trade, investment or productivity.

Conclusion

A definition of competitiveness will clarify the Commission's understanding of how infrastructure can contribute to the UK economy alongside supporting economic growth. The role of infrastructure in productivity is considered in this discussion paper, but productivity will be assessed as part of the Commission's objective to support sustainable economic growth across all regions of the UK.

Rather than aiming to summarise competitiveness in a single definition, the Commission will seek to measure competitiveness using a 'balanced scorecard' approach, which will include the following categories:

- **Improving access to markets:** how infrastructure makes it easier and cheaper to trade by improving connectivity within the UK and with other countries
- **Access to mobile labour and capital:** the role of infrastructure in accessing inward migration and investment, moving people and investment to where they are most productive, and the role of the Commission in providing a stable environment for investment in the UK's infrastructure
- **Supporting and being a source of globally significant clusters and assets:** infrastructure's role in supporting agglomeration and trade in the UK's clusters that have international significance in terms of their share of the sector's activity or innovations; growing clusters based around infrastructure industries; and infrastructure assets that are relied upon to provide infrastructure services outside the UK.

Benchmarking the performance and quality of the UK's infrastructure services compared to other countries will continue to be an important part of the Commission's ongoing work to develop infrastructure performance measures. However, benchmarking will not be used as part of the Commission's definition of competitiveness because weaknesses in the data currently make it difficult to draw reliable cross-country comparisons.

1. Improving access to markets

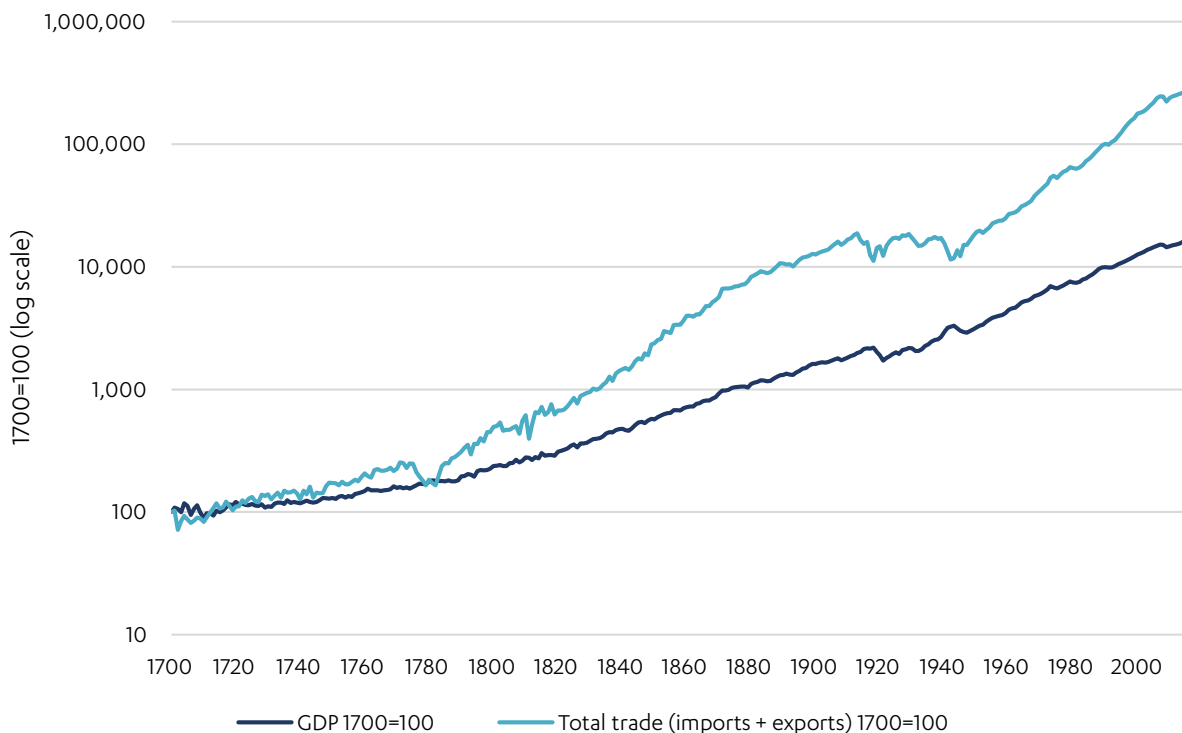
Trade is the activity of buying, selling or exchanging goods or services between people or businesses.⁴ Trade is often thought of as an international phenomenon, but because it refers to any exchange between two parties, trade takes place within countries too.

The expansion of trade throughout history has been closely related to economic growth and improvements in living standards. The benefits of trade were the focus of early economists. Adam Smith identified the benefits of specialisation, that trade allows producers to focus on a narrower range of tasks and be more efficient.⁵ David Ricardo's theory of comparative advantage explained how trade between countries specialising in their relative strengths could make both better off.⁶

More recently, Paul Krugman and Anthony Venables helped explain modern trade patterns with New Trade Theory. The theory states that when consumers like variety but economies of scale make it efficient for a place to specialise production, trade between places can make them better off even when their characteristics are identical. The theory helps explain the growth of trade between similar countries (for example, between high income economies) and within industries (for example, exporting one brand of car and importing a different brand of car).^{7,8}

Despite their close relationship, trade and economic growth are distinct aspects of economic performance. Figure 1 shows that Britain's international trade volumes have grown faster than economic output in the industrial era, and although the direction of trade and economic growth have often followed similar patterns, the two have not been perfectly related.

Figure 1: International trade and GDP in the UK (1700=100)⁹



At the level of individual businesses, trade involves selling goods or services domestically or internationally by outcompeting rival businesses on quality or price. Businesses can become more competitive by making their goods or services more attractive to consumers, for example by reducing costs or improving availability.

Extending this view of competitiveness to a whole economy incorrectly assumes that trade is a zero sum game, that one place can only be successful at the expense of another. In reality, as the trade economist Paul Krugman noted, “the major nations of the world are not to any significant degree in economic competition with each other”.¹⁰ Whereas there is usually limited scope for a business to shift its output to alternative products in the face of competition, at the level of the whole economy people and capital can reallocate in response to changing demands. Although this adjustment may take time, ultimately it allows economies to benefit from trade and specialisation.

How the gains from trade are distributed within and between countries will affect who benefits and by how much. Occupations and sectors are affected differently according to their comparative advantages and relative scarcity, and some groups can lose out. Most counterarguments to the view that trade is not zero sum actually identify examples where those benefits of trade have been distributed unevenly,¹¹ rather than arguing that whole countries have lost out at the expense of another nation's success.

The role of infrastructure in improving competitiveness is more helpfully defined as an enabler of trade. The clearest way that infrastructure can support this is by improving access to markets.

Infrastructure's role in improving access to markets

Access to markets improves when it becomes cheaper and easier to trade. High quality and reliable infrastructure can have a key role in improving access to both domestic and international markets. It can reduce the cost of distance, making it quicker, easier and potentially lower cost for people and businesses to access markets, lowering trade barriers and facilitating trade.¹² Market access refers not only to goods markets, but also to labour and capital markets.

Lower trade barriers can enable more entry and exit from markets; productive firms can enter and expand, challenging the market power of existing firms, pushing less productive firms out of the market and increasing the average productivity of the firms in the market.^{13, 14} Such competition can lead to other firms gaining from lower cost and higher quality inputs, leading to their outputs being more competitively priced. Up to a point, competition can also bring dynamic benefits through increased innovation.^{15, 16, 17}

Improved market access also enables specialisation, encouraging people, businesses and places to focus on their relative strengths and realise the benefits from trade. Firms are able to access and provide more specialist services, leading to greater variety in consumption.¹⁸ In addition, productive firms benefit from opportunities to expand to sell to larger markets.

These gains from improved market access may not be evenly distributed, and the Commission will be considering distributional impacts of infrastructure in more detail in its future work. Nevertheless, on the whole improved market access brings benefits through increased market efficiency.

Historically, the construction of canal and turnpike road networks in Britain in the 1700s supported growing demand for domestic trade as the country urbanised. In the 1800s, the emergence of railway and telegraph networks in Britain and other countries further supported trade and communication. These were particularly important in improving access to markets in places such as the United States and continental Europe that lacked Britain's density and natural waterways.¹⁹

Modern evidence indicates that improvements to transport, including global gateways such as ports and airports, have a particularly positive effect on international trade in lower income countries, while improvements to digital communications infrastructure play a bigger role in higher income countries.²⁰

²¹ This may be because higher income countries already have relatively mature transport networks whereas digital communications technology is improving rapidly, and is particularly important to service industries which account for a bigger share of high income economies.

Measuring access to markets

Although historic evidence suggests that infrastructure supports trade flows by improving access to markets, trade flows are difficult to measure. Measures of international trade exist, but tracing the movement of goods, services, capital and labour within a country is more difficult. Experimental estimates suggest that the value of trade between UK regions is higher than the value of those regions' trade with other countries in Europe, emphasising the importance of domestic trade.²² But the lack of robust regional trade data in the UK means that it will be difficult to estimate the impact of infrastructure on domestic trade.

Instead of measuring the impact on trade flows, the Commission could use its transport connectivity metric to measure changes to market access within Great Britain.²³ This measures the effectiveness of transport networks at moving people within an urban area or between different places. Extending this measure to include connectivity to international gateways would help to measure international market access.

2. Access to mobile labour and capital

In addition to extending the reach and depth of markets, infrastructure can play a role in reallocating labour and capital from one place to another. Competitiveness could be interpreted as whether places can successfully access the mobile labour and capital that they need.

This may involve attracting inward investment or workers with particular skills, depending on the comparative advantages and scarcities of the place in question. This brings benefits by moving people and investment to where they are most productive, which in turn increases the returns to education and the incentive to invest in human capital, further increasing productivity.²⁴ This mobility also enables sharing of new technological and managerial knowledge between places.²⁵

Infrastructure's role in accessing mobile labour and capital

Infrastructure may have a role in improving access to inward migration and investment, such as if the presence of high quality, low cost infrastructure services improves the liveability or profitability of a location.

For example, infrastructure can support new housing development which creates new capacity for workers to move to where they will be most productive.²⁶ For migrants, speed, quality and reliability of connections back to their home region may increase the attractiveness of a place of employment by allowing them to stay in contact with friends and family.

Communications infrastructure makes it easier for businesses to coordinate between a central headquarters and remote business units, which could facilitate inward investment.²⁷ Another channel could be infrastructure's role in supporting clusters, if productive clusters are particularly attractive locations for investment and skilled workers.²⁸

In addition to supporting investment in other projects, infrastructure itself benefits from attracting investment. The Commission's focus on providing a long term vision for infrastructure, with lasting plans and stable funding, could also encourage investment in UK infrastructure by improving certainty and stability.²⁹

Evidence linking infrastructure, migration and investment

The current literature on the link between infrastructure and inward migration or investment is weak. It is either based on survey data or focuses on how infrastructure affects investment to developing nations.

Surveys such as the *EY Attractiveness Survey* highlight that infrastructure is one of many factors that affect investment into the UK; the availability of skilled labour and political stability are found to be more important.³⁰ However, research into infrastructure and investment based on surveys is likely to be skewed by businesses' specific infrastructure needs that affect their opinion and investment decisions.

Transport infrastructure business cases sometimes propose that the project will attract new jobs and residents to an area. For example, the Crossrail Business Case writes that improved public transport is one of the major prerequisites for attracting more jobs and residents, but this is not quantified.³¹

It could be possible to apply existing research methodologies to this question to quantify the role of infrastructure in accessing inward migration and investment, which would make it possible for the Commission to measure the impact of its recommendations. The Commission would like to see further research on this topic.

For the time being, infrastructure's role in accessing mobile labour and capital will be a secondary consideration in the Commission's competitiveness objective until the quality of evidence improves.

3. Creating and supporting globally significant clusters and assets

Clusters are geographic concentrations of linked industries, with interconnected companies, suppliers, service providers and associated institutions. Clusters can be a source of jobs that pay above average wages and are often at the centre of innovation. High performing clusters can increase the economic performance of a place or country.³²

The best performing clusters have an international profile that makes them important assets for their host countries. This makes clusters particularly relevant to defining competitiveness.

The local network of interdependent productivity benefits that clusters generate means that they are often persistent and path dependent. Once cluster growth has begun, it can continue in a self-reinforcing cycle.³³

Unlike access to markets, where infrastructure directly supports trade flows, the role of infrastructure in clusters is more foundational. Infrastructure can support a cluster's establishment and its continued growth thereafter. It can also be the source of a cluster, or an important global asset in its own right.

Infrastructure's role in supporting the creation and growth of clusters

Infrastructure can support the agglomeration benefits of sharing, matching and learning that cause firms to cluster together.³⁴

- **Sharing:** Businesses in a cluster share local infrastructure, spreading its fixed cost over a greater number of users.³⁵ This reduces average costs directly if the businesses fund the infrastructure, through lower fees per user if they are paying an operator for infrastructure services, or may be factored into the project appraisal for publicly funded infrastructure. This helps explain why clusters can form around significant infrastructure assets, such as airports and ports.
- **Matching:** Infrastructure reduces the cost of accessing larger markets quickly and reliably for businesses, customers, suppliers, employees and any other market participants. This results in businesses having access to a wider and more specialised range of suppliers and workers, which supports the formation of specialised clusters.

- **Learning:** Areas of high employment density, with many workers located in close proximity, encourages learning by enabling informal communication networks and information spillovers.³⁶ Firms can learn early about evolving technologies, the opportunities for innovation are more visible and there may be increased competitive pressure from rivals.³⁷ Urban transport has a key role in supporting this density by increasing the number of commuters who are able to travel into city centres. High quality digital infrastructure could also have a role: somewhat paradoxically, reductions in communication costs have in many cases been complements rather than substitutes for firms clustering closely together.³⁸

These agglomeration benefits make clusters persistent once they have been established. Firms benefit from the presence of other nearby firms, and the scale of these benefits increases with the size of the cluster. As well as providing a source for some of these benefits as described above, infrastructure can also provide additional capacity, reducing congestion and reinforcing the cluster by allowing businesses to form and expand.

The Commission's study of the Cambridge-Milton Keynes-Oxford (CaMKOx) corridor illustrates how infrastructure could support the growth of clusters with global influence.³⁹ The CaMKOx corridor is a concentration of world leading universities, research facilities and internationally significant businesses clusters, with a track record in innovation and entrepreneurship and a highly skilled workforce.

The future success of the CaMKOx corridor is reliant upon improved transport infrastructure and housing development, ensuring the clusters can benefit from access to a larger skilled workforce. The proposed Oxford-Cambridge expressway and the East-West rail line will link the cities and employment centres, expanding and diversifying labour markets as well as unlocking new locations for development. This will help ease congestion and increase the employment density in the highly productive centres, as well as improving connectivity to international gateways such as London Heathrow airport. These improvements will enable the clusters in this corridor to grow and expand. Quick and reliable digital communications are also important for knowledge-based clusters.

Different industry clusters are reliant on different types of infrastructure. For example, businesses in the metals manufacturing cluster in South Yorkshire are dependent on a reliable and affordable energy supply, and transport connections for supplies and finished products.⁴⁰

Infrastructure as the source of a cluster

As well as providing infrastructure services that support globally important clusters, infrastructure and its supply chains can themselves develop into industrial clusters. These can attract investment and talent, and lead to exportable innovations for the UK.

For example, the UK has previously developed a highly productive and globally significant hub of expertise around offshore oil and gas in Aberdeen.⁴¹ More recently, clusters are emerging close to offshore wind farms in places such as the Humber, the Solent, and North East England.⁴² Similar technology clusters could develop in future around expertise in low carbon technologies.

Infrastructure as a globally significant asset

Infrastructure can itself influence international economies beyond the borders of its host country to become a globally significant asset. Most commonly, infrastructure can be a key link in international trade and communications networks. It can also be a source of infrastructure services such as power generation or data storage which are consumed internationally. These global assets may provide additional economic benefits to the countries that host them.

For the UK, London Heathrow airport could be considered a globally significant infrastructure asset. It supports trade, inward investment and exports,⁴³ as well as the movement of workers and tourists.⁴⁴ Heathrow's role as an international hub with a high proportion of transfer passengers from other countries makes it economically viable to offer more long distance routes than would be possible if the airport served mainly UK passengers.⁴⁵ As a result, the trade links and economic activity created by Heathrow for the UK likely exceed what it could achieve without this global role.

The nature of international aviation means that London Heathrow's main competitors are hub airports in Europe and the Middle East, rather than other UK airports. This adds a national strategic significance to the performance of these infrastructure assets. The shift from London to Rotterdam as the centre of freight shipping in Europe in the 1960s is an example of how competitive advantage of a global asset can be lost if there is a resistance to change and to adopting new innovations.⁴⁶

Measuring globally significant clusters and infrastructure assets

The Commission could try to measure the impact of its recommendations on the global significance of the UK's clusters and infrastructure assets. The Department for Business, Energy and Industrial Strategy has published analysis identifying industrial clusters in England and the UK, although further research is needed to understand whether these clusters are globally influential as well as important for the UK.^{47, 48}

Cluster success could be measured by growth in the number of firms or workers and global significance of the UK's clusters, and infrastructure assets by their share of global activity or traffic.

Understanding the exact role of infrastructure in cluster success will be more difficult to measure, as successful clusters are usually the result of a unique and complex combination of factors and interactions. It may be possible to measure infrastructure performance in the area of the cluster to support this assessment.

The Commission intends to include supporting globally significant clusters and assets as part of its definition of improving competitiveness. Further work is needed to develop methods to measure the Commission's impact in this area.

4. Productivity

Competitiveness and productivity are often considered together. Productivity is defined as the amount of economic output that is produced per unit of input – for example, per hour worked.

The Commission does not intend to include productivity as part of its definition of competitiveness. For the purpose of monitoring, it is useful for the Commission to maintain some distinction between its objectives, so the role of infrastructure in improving productivity will instead be captured by the Commission's objective to support sustainable economic growth across all regions of the UK.

Nevertheless, this section reviews the reasoning that is sometimes used to connect productivity and competitiveness, and briefly outlines the UK's productivity performance and infrastructure's contribution to productivity. Further detail can be found in the Commission's paper *Economic Growth and Demand for Infrastructure Services*, and will be continued in a future discussion paper on the Commission's economic growth objective.⁴⁹

Competitiveness and productivity

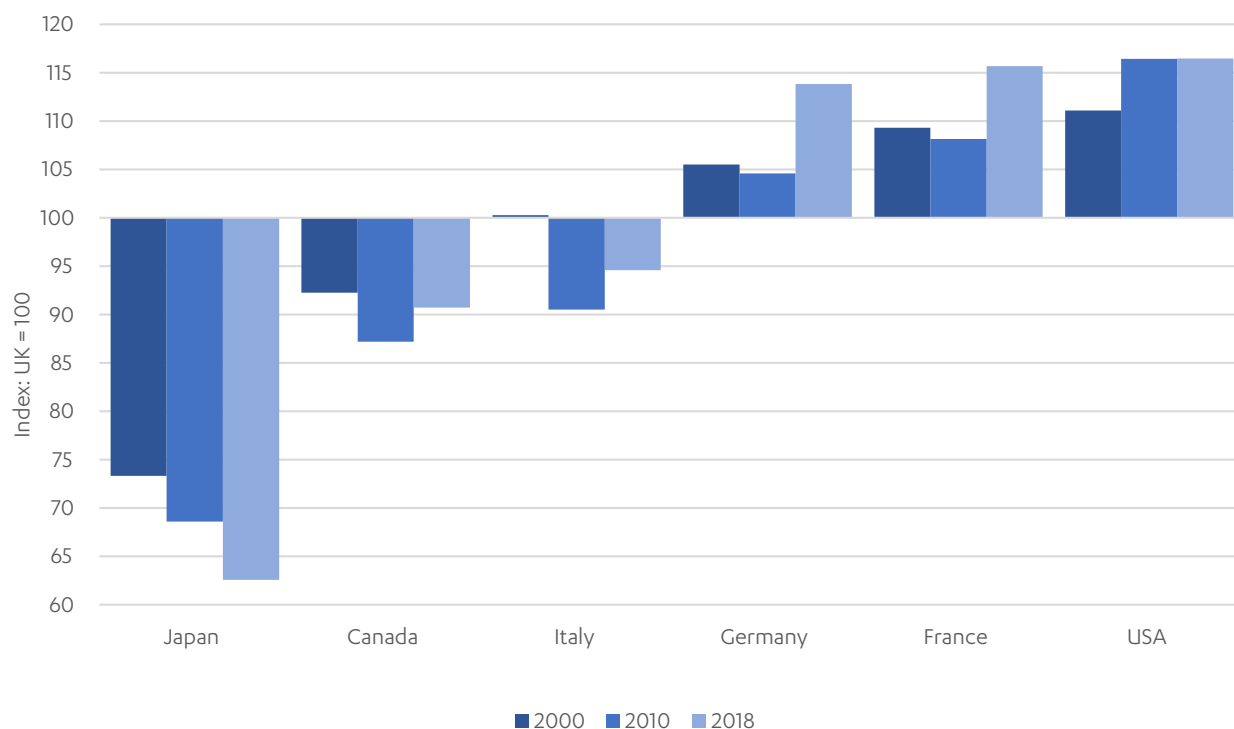
At the level of an individual firm, productivity is an important component of competitiveness because higher productivity enables the firm to produce the same outputs but at a lower cost than less productive rivals.

At the national level, growing productivity is the main cause of higher living standards.⁵⁰ Improving productivity is also beneficial for a country regardless of how it compares to other countries, avoiding the implication discussed above that competitiveness requires one place's success to be at the expense of another. This lack of rivalry and importance for living standards led the business economist Michael Porter to argue that the only meaningful concept of competitiveness at national level is productivity.⁵¹

Others have also defined national competitiveness as productivity. Literature produced by the World Economic Forum⁵² and the European Union⁵³ link a competitive economy to a productive economy, or one with a high rate of productivity growth.

The UK has a large and longstanding productivity gap compared to the highest performing countries. Figure 2 shows percentage differences in countries' labour productivity relative to the UK. The UK's productivity is below average for G7 economies and it is less productive than France, Germany and the USA. Measured as GDP per hour worked in current prices, a worker in Germany produces 14 per cent more per hour than a worker in the UK. In the USA, this is 16 per cent more.⁵⁴

Figure 2: Differences in labour productivity between the UK and G7 countries (GDP per hour worked)⁵⁵



Infrastructure and productivity

The UK's poor productivity performance is sometimes blamed on the country's infrastructure.⁵⁶ This has led to attempts to measure the quantity and quality of the UK's infrastructure assets in comparison with other European economies.⁵⁷

The channels through which infrastructure is thought to impact productivity growth are discussed in detail in the Commission's paper on economic growth and infrastructure.⁵⁸ Infrastructure can support productivity growth by lowering the cost of inputs into production such as the cost of energy; enabling technological change; and facilitating the efficient working of housing and labour markets, ensuring people can move between where houses and jobs are located.

Costs of infrastructure services to households and businesses could be thought of as a component of competitiveness, particularly as they relate to affordability and profitability respectively. However, they could equally be considered as factors affecting quality of life and economic growth: lower costs increase the amount of infrastructure services that can be consumed, or the savings can be redirected towards other types of consumption.

For mature sectors such as water and energy, effective operation and maintenance is likely to be particularly important for supporting growth by delivering an affordable, predictable and resilient service. For transport and broadband, other factors such as speed of service and technological innovation are also likely to affect productivity.

Marginal improvements such as higher capacity trains or faster broadband may have a much smaller impact on productivity and growth, compared to major innovations such as the original establishment of railway, telegraph and power networks.

Infrastructure is a necessary but not sufficient condition for growth. Even if relatively poor provision of infrastructure in the UK is partly to blame for the gap in productivity with other countries, it is unlikely to be the sole explanation.

Productivity in the Commission's objectives

As explained, although national competitiveness is commonly equated with productivity, the Commission does not intend to include productivity as part of its definition of competitiveness. Productivity is better captured within the Commission's objective to support sustainable economic growth across all regions of the UK. This includes the impact of infrastructure on business costs, while costs to households will feature in the quality of life objective.

Instead, the competitiveness objective can usefully capture aspects of the UK's economic performance that are not simply equivalent to productivity.

5. Benchmarking

The interpretations of competitiveness discussed above focus on infrastructure's role in economic outcomes. As will be explained below, the Commission also considered whether competitiveness could be defined as how the performance, quality and cost of the UK's infrastructure compares internationally, either using performance measures or competitiveness rankings.

However, the Commission has decided that comparing and benchmarking the performance of infrastructure is not the best way to interpret competitiveness and infrastructure's contribution to it. Different countries have different infrastructure contexts and priorities, which limits the usefulness of direct benchmarking comparisons. It is also not clear how the Commission's recommendations would translate into a change in the UK's position in world competitiveness rankings, as the components of these rankings are often subjective or lack relevance to the infrastructure of high income countries.

The Commission's performance measures

Measuring infrastructure performance is important to the Commission, so it developed a framework to assess the performance and quality of the UK's infrastructure services. This framework was designed to measure the performance of infrastructure in relation to the Commission's objectives and can help to reliably inform the Commission's assessment of the UK's future infrastructure needs.⁵⁹

These performance measures consider factors such as consumption, service quality, system efficiency, resilience, environment and cost for the sectors within the Commission's remit. The full dataset can be found at <https://www.nic.org.uk/publications/performance-measures-data/>.

The current performance measures are not a definitive list and the Commission will continue to improve this performance data as new measures are developed or better data becomes available. The Commission is also working with the relevant bodies in other countries to explore the development of similar performance measures to enable better international comparisons of infrastructure performance and quality.

World competitiveness rankings

Organisations such as the World Economic Forum and the Institute for Management Development rank the competitiveness of countries. These rankings may be valuable to understand international perceptions of the UK's infrastructure quality, which could influence international investment and trade decisions.

The World Economic Forum describes its competitiveness ranking as an annual assessment of the drivers of productivity and long term economic growth. It defines competitiveness as “the set of institutions, policies and factors that determine the level of productivity of a country”.⁶⁰

The Institute for Management Development defines competitiveness as the “ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people”.⁶¹ A director at the Institute’s World Competitiveness Centre states that “competitiveness... determines how countries, regions and companies manage their competencies to achieve long term growth, generate jobs and increase welfare. Competitiveness is therefore a way towards progress that does not result in winners and losers – when two countries compete, both are better off”.⁶²

In its 2019 rankings, the World Economic Forum placed the UK in 9th out of 141 countries, down one place since 2018.⁶³ In 2019, the Institute for Management Development ranked the UK 23rd out of 63 countries, a reduction of three places since 2018.⁶⁴

These competitiveness indicators use a weighted combination of performance measures and survey questions answered by business executives in the country. The difference in the two rankings highlights the sensitivity to the criteria and methodology used. The rankings are formed using a different number of criteria, with a different split between survey data and performance measures for each ranking.

In these league tables, infrastructure is just one component of overall competitiveness. Specific infrastructure performance measures used by the World Economic Forum include road connectivity (the ratio between distances ‘as the crow flies’ and total driving distances, for which the UK ranks 11th), railway density (for which the UK ranks 12th) and airport connectivity (6th) as well as the surveyed perceptions of infrastructure quality (36th).⁶⁵ Overall, the World Economic Forum ranks the UK 11th in its infrastructure pillar and the Institute for Management Development placed the UK 14th.⁶⁶

However, the subjective nature of the survey data used means that it is not clear how the Commission’s recommendations would translate into a change in the UK’s position in these rankings, so it would be difficult for the Commission to measure how its recommendations have improved competitiveness by this measure.

Furthermore, some of the criteria used are not aligned with measures of infrastructure performance that are relevant to high income economies. For example, the World Economic Forum reports on metrics such as the percentage of the population with access to electricity or exposed to unsafe drinking water, whereas the Commission focuses on measures which are more relevant to the UK such as service quality, emissions and costs.

Benchmarking and competitiveness

The Commission has decided that comparing and benchmarking the performance of infrastructure is not the best way to consider how infrastructure contributes to the competitiveness of the UK.

There are currently few consistent and comparable cross-country performance measures, which would make it challenging to assess the relative impact of the Commission's recommendations. Different countries have different infrastructure contexts and priorities, which limits the usefulness of direct benchmarking comparisons. Cross-country rankings of infrastructure performance do not tell the whole story; they do not reflect trade-offs between quality, affordability and value for money that are likely to have been considered by national governments in making policy choices about infrastructure investment. Variation in countries' geography and institutions also make direct comparisons of infrastructure performance more difficult.

Although the Commission is not defining competitiveness in this way, it will continue to use the international comparisons of infrastructure performance that are available as an input to its assessments of the UK's infrastructure needs. It will also continue to develop its own infrastructure performance measures and support international efforts to improve infrastructure data and statistics.

Conclusion

There are multiple ways that the Commission's objective to improve competitiveness could be interpreted. The Commission has assessed the evidence supporting each definition, how the definitions relate to infrastructure, and whether progress in meeting the objective could be measured by the Commission.

Rather than aiming to summarise competitiveness in a single definition, the Commission will seek to measure competitiveness using a 'balanced scorecard' approach, which will include the following categories:

- Improving access to markets: how infrastructure makes it easier and cheaper to trade by improving connectivity within the UK and with other countries
- Access to mobile labour and capital: the role of infrastructure in accessing inward migration and investment, moving people and investment to where they are most productive, and the role of the Commission in providing a stable environment for investment in the UK's infrastructure
- Supporting and being a source of globally significant clusters and assets: infrastructure's role in supporting agglomeration and trade in the UK's clusters that have international significance in terms of their share of the sector's activity or innovations; growing clusters based around infrastructure industries; and infrastructure assets that are relied upon to provide infrastructure services outside the UK.

Other interpretations of competitiveness discussed in this paper are important outcomes for the Commission. The role of infrastructure in productivity will be assessed as part of the Commission's objective to support sustainable economic growth across all regions of the UK. Benchmarking the performance and quality of infrastructure assets will be part of the Commission's ongoing work on developing infrastructure performance measures.

The Commission would welcome comments on this discussion paper, including evidence on how infrastructure affects competitiveness and ways that the Commission could monitor and measure its impact. Please send any comments to NICdiscussionpapers@nic.gov.uk by 30 September 2020.

Endnotes

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