Needs for Manston Airport Engineers Oral /Written Specific issue hearing 2

My name is [redacted] I am a local small business owner .
Much has been said by others about air cargo needs ,KNMA wish to make you aware of other UK needs namely Aircraft Engineers..

■ The UK **NEEDS** Aircraft Engineers.

Statistics
- In the next 20 years, airlines will have to add 25,000 new aircraft to the current 17,000-strong commercial fleet
- By 2026, we will need 480,000 new technicians to maintain these aircraft and over 350,000 pilots to fly them

The underlying problem

Simply stated, the demand for aviation professionals will exceed supply. Factors include:
- wholesale retirements in the current generation of aviation professionals
- aviation professions not attractive enough to potential candidates
- competition with other industry sectors for skilled employees
- training capacity insufficient to meet demand
- learning methodologies not responsive to new evolving learning style
- accessibility to affordable training
- lack of harmonisation of competencies in some aviation disciplines, and
- little awareness by the "next generation" of types of aviation professions available.

Source information:
https://www.icao.int/Newsroom/Pages/ICAO-Addresses-Shortage-of-Skilled-Aviation-Professionals.aspx,
See attached pdf

https://www.belfasttelegraph.co.uk/business/news/aerospace-sector-is-hit-by-shortage-of-engineers-28547813.html,
See attached pdf.

https://blog.aviationjobsearch.com/licensed-engineers-shortage/
See attached pdf.

■ Manston can **PROVIDE** Training and Apprenticeships for aircraft engineers .

A reopened Manston Airport can provide training in much needed skills to the UK and Thanet through its proposed Aviation Academy, In conjunction with local collages and University's

See source information:

Azimuth, Riveroak " Manston Airport Aviation Academy ,response to the Thames Estuary 2050 Growth Commission" September 2016.
See pdf attached

Canterbury Christ Church University "Demystifying Apprenticeships"
See attached Demystifying Apprenticeships Canterbury Christchurch University slides

http://www.cotswoldairport.com/cotswold-airport-aviation-scholarships
See pdf attached.

https://www.klmukengineering.com/en/klmuk
See pdf attached

https://www.norfolkchamber.co.uk/news/member/norwich-international-aviation-academy
See pdf attached.

KNMA "Careers for females in the Aviation Workforce"
see pdf attached.

■ In fulfilling these national NEEDS Manston can also solve local NEED (+as defined in S106 TR020002/APP 012 page 12 4.25),Skills Training .

With the exception of Great Britain (other qualifications) ,Thanet skills qualifications are the poorest in Great Britain , a reopened Manston, with a " Manston Airport Aviation Academy" and Recycling facility to provide "hands on training" through apprenticeships and scholarships could redress this imbalance, by providing training in engineering skills to the South East and Thanet

Qualifications (Jan 2017-Dec 2017)

	Thanet (Level)	Thanet (%)	South East (%)	Great Britain (%)
NVQ4 And Above	19,800	25.3	41.4	38.6
NVQ3 And Above	33,700	43.0	61.1	57.2
NVQ2 And Above	49,100	62.6	78.6	74.7
NVQ1 And Above	65,300	83.2	89.5	85.4
Other Qualifications	7,200	9.2	5.3	6.9
No Qualifications	6,000	7.6	5.2	7.7

Source :ONS Annual Population Survey
Numbers and % for those of aged 16-64, % is a proportion of resident population of area aged 16-64
Source Link: https://www.nomisweb.co.uk/reports/lmp/la/1946157320/report.aspx?town=Thanet.

+Source:Centre for Economics and Business Research for the Let Britain Fly campaign

East Kent and in particular Thanet is an area of deprivation ,in terms of education and prosperity.
Riveroak Strategic Partners plans for a reopened Manston Airport provides the **answer to these NEEDS**

ICAO Addresses Shortage of Skilled Aviation Professionals

ICAO recently hosted a five-day event addressing the challenge posed by an anticipated shortage of skilled aviation professionals. Representatives from States, industry, training institutions and students defined and quantified the problem, proposed approaches to solve the problem and outlined the leadership role of ICAO in generating cooperation among concerned stakeholders towards reaching and implementing solutions.

Statistics

- In the next 20 years, airlines will have to add 25,000 new aircraft to the current 17,000-strong commercial fleet
- By 2026, we will need 480,000 new technicians to maintain these aircraft and over 350,000 pilots to fly them
- Between 2005 and 2015, 73% of the American air traffic controller population is eligible for retirement

The underlying problem

Simply stated, the demand for aviation professionals will exceed supply. Factors include:

- wholesale retirements in the current generation of aviation professionals
- aviation professions not attractive enough to potential candidates
- competition with other industry sectors for skilled employees
- training capacity insufficient to meet demand
- learning methodologies not responsive to new evolving learning style
- accessibility to affordable training
- lack of harmonization of competencies in some aviation disciplines, and
- little awareness by the “next generation” of types of aviation professions available.

Solutions

Solutions must be globally-harmonized in nature and include human resource planning tools, accredited training and educational

programmes adapted to the next generation, and wide-ranging cooperation among concerned stakeholders.

ICAO's role in solving the problem and moving forward

In 2009, ICAO established the Next Generation of Aviation Professionals Taskforce, consisting of 29 representatives from industry, education and training providers, regulatory bodies and international organizations. Near-term objectives are to: inventory human resources planning data; identify and support initiatives to reach out to the next generation; and, find ways to harmonize training regulations. The Task Force will also support initiatives relating to the next generation of aviation professionals.

ICAO and the International Air transport Association (IATA) are collaborating on this issue, generating synergy between ICAO's Next Generation of Aviation Professionals Taskforce and IATA's Training and Qualification Initiative (ITQI). IATA is supportive of global harmonized standards and will be implementing evidence-based training and as well as competency-based training for engineering and maintenance.

Looking ahead, the following are planned:

- In 2010, ICAO will develop a new training policy that will allow the Organization to endorse aviation training institutions by 2011.

- By the end of 2011, the Next Generation of Aviation Professionals Taskforce will complete the development of competencies for most of the Annex 1 (Personnel Licensing) functions including: airline transport pilots (ATPLs), air traffic controllers, and maintenance.

Along with all aviation training stakeholders, ICAO is committed to creating an environment that will allow the next generation to lead in the development of aviation's future. This includes maintaining active lines of communication with the students as the Next Generation of Aviation professionals.

Aerospace sector is hit by shortage of engineers

By **Peter Woodman**
July 20 2010

The aerospace industry is suffering from "a chronic and terrible shortage" of advanced engineers, Business Secretary Vince Cable has warned.

This engineering shortage was the thing the industry was most concerned about, said Mr Cable, as he toured the Farnborough Airshow.

He declined to say exactly what effect proposed government cuts would have on the civil and military aviation industries.

But during a visit to the airshow yesterday, he said that one of the ways of supporting the aerospace industry was to help build up apprenticeships.

Northern Ireland's aerospace industry is worth £800m a year, and employs thousands of people.

The Business Secretary said: "There is a chronic shortage of advanced engineers - a terrible shortage. There are different ways of supporting an industry without just injecting cash. One way is through vocational training."

The airshow began yesterday with orders for rival civil aircraft makers, Boeing, and Airbus.

Boeing announced a $9.1bn (£6bn) order for 30 777-300ERs from Emirates Airlines. GE Capital Aviation Services (GECAS), the GE leasing and financing arm, has also ordered 40 737-800s from the US aircraft giant, at a list price of $3bn.

Airbus announced US group Air Lease Corporation is to spend $. 4bn on 51 A320s, Russian flagcarrier Aeroflot is buying 11 A330-300s, and GECAS has signed a firm order for 60 more A320s, taking the leasing group's order backlog to 99.

Mr Cable was shown around the Airbus A380 superjumbo, the world's largest passenger plane.

British Airways and Virgin Atlantic are among carriers due to take delivery of A380s later this decade.

Mr Cable said the A380 had "contributed massively to the UK economy".

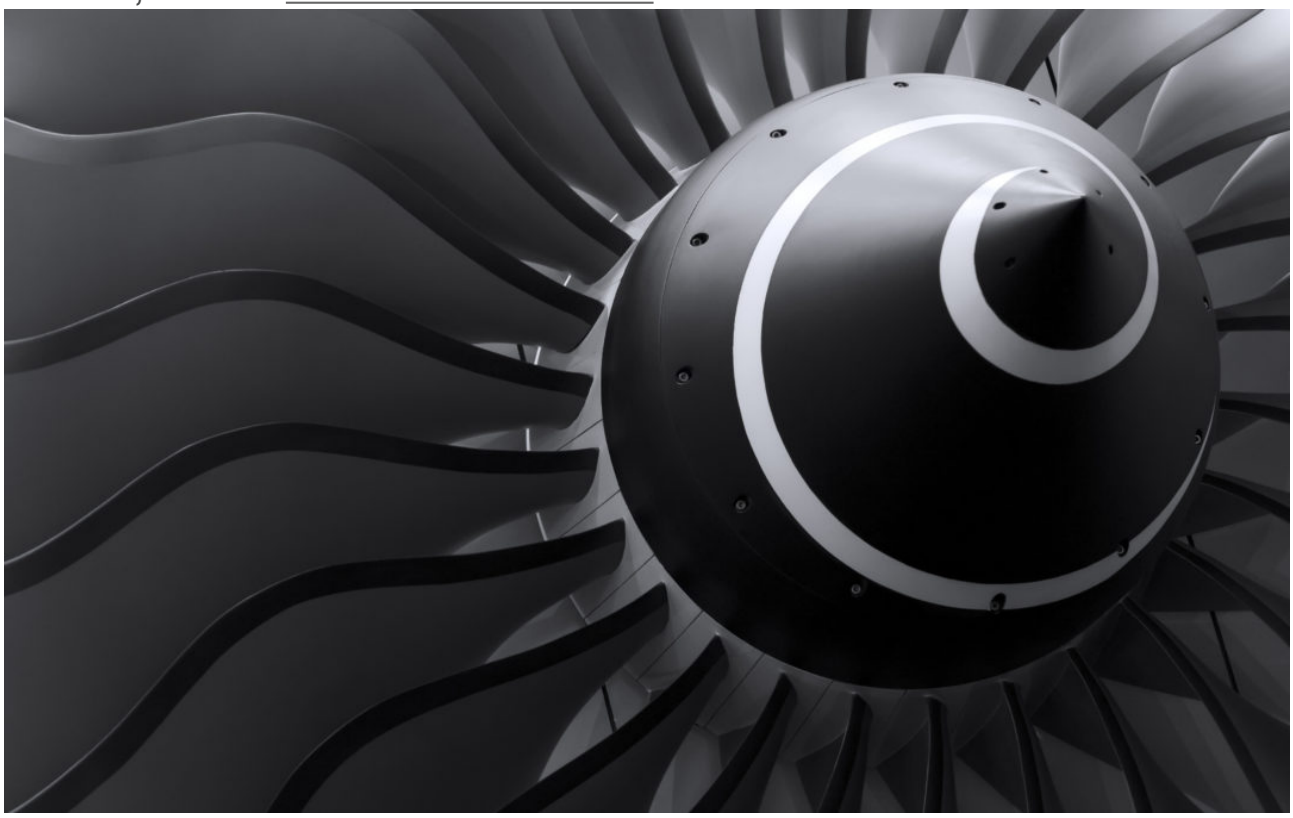
Bombardier Aerospace, which employs around 5,000 people in Belfast, announced its CSeries jetliner programme has captured 50% of net orders in the 100 to 149 seat market segment over the last two years.

The jets are set to enter the market in 2012.

Bombardier in Belfast is designing and manufacturing the complete wing for the CSeries aircraft. Firm orders have been received for 33 of the aircraft, while options have been placed on another 90.

Is there a shortage of good Licensed Engineers in the aviation industry?

Jan 18, 2018 | Recruitment Advice



The short answer is yes. Through speaking with hundreds of different types of aviation businesses everyday, it's not uncommon for us to hear about the shortage of good, Licensed Engineers within the industry. Mike McDaniel, ExpressJet Airlines' general manager of aircraft maintenance training, echoes this stance. He adds that *"the overall quality of [AMT] applicants is not as good as it was 20-25 years ago"* – MRO Network. There is a huge demand for talented engineers, as aircrafts are expected to continuously improve and be redesigned to increase fuel efficiency, lessen noise pollution and maintain high levels of safety. Take easyJet for example, they're not just stopping at flying their new 'super quiet' eco plane from Manchester Airport. They're still aiming to reduce carbon emissions per passenger by 10% by the year 2022. In addition to the ongoing maintenance of modern day planes, the International Civil Aviation Organisation (ICAO) predicted that in the next 20 years, airlines would have to add 25,000 aircrafts to keep in line with the rising passenger demand for air travel. In fact, Boeing anticipates the world will need 679,000 new MRO technicians over the next 20 years. The most worrying part of this is of course, with a

lack of engineers, comes a knock on effect to airlines. With the demand for qualified technicians remaining strong in years to come, as with any marketplace, the supply and demand levels will grow further apart before balancing back out.

What do we mean by a 'good engineer'?

When we talk about the shortage of engineers in the industry, what is it that we're really looking for? Whilst some traits might be more valuable than others, every MRO's ideal worker would have the knowledge, experience, skill, confidence, commitment and motivation to be a successful Licensed Engineer. Someone who might have the experience and skill, might lack the commitment and motivation to better themselves, and as a byproduct, the company.

How has this come about?

The decline of engineers in the industry hasn't just happened overnight. We currently seem to be in a 'drought' that descended from the lack of trained engineers during the late 1970s to mid 1980s. This is reflected in the Civil Aviation Authority (CAA)'s annual 'engineer license holders age profile data', whereby 54 year olds currently have the highest number of Part 66 licenses held. The multiple recessions took their toll on the UK, and by doing so, encouraged Margaret Thatcher to introduce National Vocational Qualifications (NVQs) in 1986. The initial introduction of the new qualification was slow to become a favoured option by employers, so in 1994 the Government introduced 'the Modern Apprenticeship'.This meant there was an 'apprenticeship framework' laid out, enforcing how apprentices were trained and managed. Between 1996 and 2001, the number of apprentices more than doubled in the UK, jumping from approximately 75,000 a year to 170,000. The increase then became more gradual until 2007 (205,000), where a growth spurt in popularity brought the total to 280,000 in 2010 according to notgoingtouni.co.uk. Nowadays, the growth in apprenticeships has seen a range of industries jump on the bandwagon, including health and social care, business and law, and even hairdressing. However, a more stereotypical attitude would still see a 'traditional' apprenticeship as something more along the lines of manufacturing or engineering.

How is the industry correcting itself?

Fortunately, modern businesses are becoming more proactive with addressing the problem. There are a number of companies with successful training programs (both apprenticeships and graduate schemes), such as BAE Systems for example. A company who employs approximately 83,100 people worldwide believes *"our apprentices are our future. So we invest in theirs."* That being said, there is still definite room for improvement when it comes to training curriculums. Phil Miholovich, director of maintenance for C&L Aviation Services, says that students are *"typically given no more than just a general overall knowledge" of composite structures and advanced avionics troubleshooting, with very little in the way of stand-alone courses specifically focusing on those areas."* Miholovich went on to say, *"This is changing, because some Part 147 schools are adding programs in complex avionics. But it is fairly new, and it adds six to 12 months to the curriculum. Because of the time and money involved, not everyone participates."* There is still plenty of room to develop from universities as well – an estimated 58.8% of graduates are in jobs that don't require a degree according to the BBC. Yes, some of these graduates will have taken irrelevant degrees to their desired job, or had a change of heart along the way, but it's fair to assume that a percentage of engineers have left university and haven't gone into an engineering career. This could be down to either students not being educated enough in how to find work, or they're not encouraged to pursue an engineering career. There could also be more room to encourage college students or school leavers to get into engineering. Typically it's seen as a male dominated field, and part of the shortage could be solved by encouraging more women into the industry at a younger age. According to Carbon60's 2018 Salary Survey, just 5% of those surveyed were women. If the industry had just as many women as men, the shortage of Licensed Engineers could potentially be fixed. Some companies have already started to give support to women who are interested in the industry such as Boeing and BAE Systems who are both partnered with The Women's Engineering Society (WES.) The society partners with relevant employers and educators to work towards *"inspiring and supporting girls and women to achieve their potential as engineers."* Whilst many organisations would suggest the number of skilled engineers

has been improving though, it is predicted that in 2017 there was as little as 7.2% of skilled workers making up the entire number of aircraft engineers within the whole aviation industry. This is a worrying 2.5% decrease year on year.*

Top tips for finding your perfect Licensed Engineer

1. **Consider taking on a permanent worker instead of a contractor.** While the recruitment process may be slightly longer, you could save your business money. Not only in salary (the average contractor's salary is 15% higher than a permanent worker according to the Carbon60 2018 Salary Survey), but in cost per hire too.
2. **Look at potential internal applicants.** Unfortunately, no one is born with the skills to be a Licensed Engineer, it is all taught. Whether you have an apprenticeship / graduate scheme or not, could your business have the resource to educate some of your staff with transferable skills?
3. **Use a niche job board or recruitment agency.** Quality should come over quantity when looking for candidates in such a highly skilled role. By using a generic recruitment method, you're more likely to attract applicants who don't have the experience or set of skills to be a fit for the role.

You're not alone

Looking for Licensed Engineers yourself? We hear hundreds of businesses struggle with the same problem. Unfortunately as you've read, the issue isn't just going to go away any time soon. However, here at Aviation Job Search, we pride ourselves on being the World's best aviation job site (no really, we are.) We have over 13,000 B1 & B2 Licensed Engineers registered with us worldwide, so if you're looking to hire a new engineer, there's no better place for you to find one. **Take KLM Engineering for example…** *"After only a few days of posting the vacancies we were inundated with top quality technical and engineering staff of which many successful candidates were recruited. Aviation Job Search is THE must have tool when recruiting high calibre staff for your business."*

How we help

Got a job to advertise? Learn more about using our services by downloading your free online personalised guide today at https://

recruiting.aviationjobsearch.com/. Or if you're recruiting in a rush, you can get started straight away. Post it on Aviation Job Search today from as little as £699 at our online checkout. Looking for a job in the industry? Take a look at thousands of jobs available near you today. **Statistics taken from annual reports of registered jobseekers on Aviation Job Search.*

MANSTON AIRPORT AVIATION ACADEMY:

Response to the Thames Estuary 2050 Growth Commission

SEPTEMBER 2016

AZIMUTH ASSOCIATES

RIVEROAK INVESTMENT CORP., LLC

1. Introduction

As part of the ambitious Thames Estuary 2050 project, a freight-focused airport will provide a considerable boost to the local and regional economies. Providing businesses with the means to import and export high value, time-sensitive and perishable goods, Manston Airport will alleviate some of the trade that is currently lost due to a lack of UK airport infrastructure. Last year, 2015, the UK missed out on at least £9.5bn in potential trade with emerging economies due to the lack of runway capacity[1]. Our submission under the Thames Estuary 2050 Growth Commission's call for ideas is for a Manston Aviation Academy, to run alongside the successful operation of a freight-focused airport on the Thames Estuary in East Kent.

RiverOak

RiverOak, a US-based investment corporation, and its investors want to acquire and redevelop Manston as a freight-focused airport. RiverOak has had prior airport experience fund-raising for Fort Worth Alliance. During this project, RiverOak realised there is a lack of specialist cargo airports in Europe. Manston Airport was identified as the ideal location for a freight-focused airport in the South East of the UK. Manston Airport is able to handle over 10,000 cargo movements per annum without affecting the airspace of other airports.

Aims and objectives

The aims and objectives of the Manston Airport redevelopment project are to:

- Create a world class freight-focused airport with passenger services to connect the people living and working within the Thames Estuary area to the rest of the world
- Create jobs across a range of skill sets
- Inspire young people to continue in their education and training and to provide the facilities to allow them to learn close to home, within the Thames Estuary growth area.

Manston Airport

Manston Airport is located on the Isle of Thanet in East Kent, 17 miles from the Port of Dover, 65 miles from Central London and 60 miles from the Port of Tilbury. The airport's runway has a length of 2,752-metres and a width of 61 metres, heading 28/10. It is capable of handling all types of aircraft, including the A380-800F. Manston had been an airport for 100 years until it was closed to traffic in May 2014. RiverOak are currently in the process of applying through the Development Consent Order process for compulsory purchase of the site.

Before its closure, Manston managed all airport activities including Air Traffic Control, fire cover, security, ground handling, catering, duty-free and slot allocation. The airport focused on the cargo market whilst also providing a number of passenger flights. In terms of cargo, Manston established a reputation for speedy handling of perishable goods, with unloading and throughput times much faster than competitor airports. Manston was previously carrying around 30,000 tonnes of cargo per year. Our forecast shows Manston will be able to attract and handle around freight 10,000 movements and 145,000 tonnes per year by its fifth year of operation. We will also aim to provide a service to more than 1.2 million passengers by that time.

[1] Centre for Business Research (2016), *The Importance of Air Freight to UK Exports: The impact of delaying the runway capacity decision on UK international trade growth*. Report for Let Britain Fly Campaign, available from http://londonfirst.co.uk/wp-content/uploads/2016/09/Importance-of-air-freight-to-UK-exports-PDF-FINAL.pdf

Vision for the future

Our vision is for a vibrant freight-focused airport, employing local, well-trained people and supporting local, regional and national businesses. In order to meet this challenge, it is essential that we train and educate local people in line with the needs of the business. However, the opportunity exists for a much more comprehensive vision of an academy designed to bring together the aerospace industry with academia (universities, colleges and potentially schools), in line with UK and European government policy. As such, RiverOak are keen to establish an aviation academy close to or on the Manston Airport site.

2. Manston Aviation Academy

For many years there has been discussion about skills shortages in the UK workforce and the significant impact this makes on business. Between 2013 and 2015, the number of skill-shortage vacancies rose by 43%[2]. This was particularly noticeable in the field of engineering[3]. Additionally, poor careers advice in the UK is causing students to drop out of school, college and apprenticeships[4].

In terms of the EU's strategy for aviation, the Commission says:

> "*It is [also] crucial to maintain leadership in aviation through a highly educated, qualified and experienced workforce. Partnerships between research, universities and industry on education will facilitate the movement of experts between these sectors, which at the end would be very beneficial for the development of the European aviation sector.*
>
> *New skills and competences, some of which are not yet broadly available, such as those of drone specialists and flight data analysts will have to be developed. Training should be given priority. In this respect, the European Aviation Safety Agency Virtual Academy will further develop a true European network of aviation training institutes.*[5]

The concept for this project brings together the UK (and potentially the European) aerospace industry, government and academia, providing a focus through which to develop effective and sustainable channels of communication. The aim is to ensure the structures and provision of education, training, and life-long learning support the needs of the aerospace industry. The project will help move the industry forward and address concerns over innovation and skills shortages. There is a requirement for the industry to adopt best practice in learning, people management and continuous professional development whilst also promoting itself so that it will attract and retain the highest calibre talent.

East Kent is an area of particular deprivation, a measure that includes the educational level of its residents. In October 2015, Thanet ranked as one of the poorest parts of the Country, with deprivation having worsened over the previous five years[6] This project will therefore help to realise the full economic and social potential of East Kent and the wider Thames Gateway areas.

Previous owners of Manston Airport developed and funded a highly successful BSc Business Studies with Airport Operations degree at the Broadstairs Campus of Canterbury Christ Church University. The success of this degree course lay in the ability of the course to attract local students from first generation university families. These highly motivated students were attracted by the involvement of the airport with their local Higher Education provider. The course acted as a pilot for a dedicated Aviation Training Academy, which will match the need for skills by industry with provision by Higher and Further Education and training institutions in the area. In addition and given the Government's agenda for 14 to 19 year olds, this may also include schools.

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[2] Employer Skills Survey 2015, p. 4 available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/499047/UKESS_Summary_report_-_for_web.pdf

[3] http://www.huffingtonpost.co.uk/news/skills-shortage/

[4] http://www.bbc.co.uk/news/education-31061905 and http://www.huffingtonpost.co.uk/news/skills-shortage/

[5] European Commission (2015), *An Aviation Strategy for Europe* (Brussels, 7.12.2015), p. 10

[6] http://www.kentonline.co.uk/thanet/news/thanet-among-most-deprived-areas-44113/

3. Thames Estuary 2050 Growth Commission

In response to your invitation to input to the Thames Estuary 2050 project, we believe Manston Airport can play a key role in the growth and prosperity of our region.

Connectivity and high productivity clusters

Thanet and the County of Kent have a long history of excellence in the agricultural sector. Promoting a competitive and integrated food supply chain, responsive to the needs of consumers, is essential to ensure the cluster maintains and develops high productivity. Air transportation is a vital resource for importers and exporters in this sector, allowing perishable goods to reach the customer at their peak, thereby demanding the maximum price possible for growers and suppliers. Manston Airport has a lengthy history of supporting this cluster and has plans to extend its services to include flowers, fruit, vegetables, and fish and shellfish. It is expected that business in the supply chain will cluster around the airport to produce value-adding products for customers.

Air transportation also supports Just-in-Time practices, particularly for high weight-to-value goods with short product lifecycles. The manufacturing sector in Kent is a key sector with potential to expand, particularly as the UK prepares to leave the EU. Engineering is also an area where the presence of the airport stimulates interest. High tech engineering clusters inevitably grow up around airports, since the airport is a key user of engineering services. In addition to the usual maintenance and repair facilities, plans for Manston include a recycling operation on the airport site, which will demand a large number of skilled engineers to refurbish and certificate aircraft parts for reuse.

High productivity clusters need high quality transport links but with air freight constrained in the UK, particularly in the South East, there is an enormous impact on our economy, job creation and contribution to GVA. The East Kent area is additionally suffering from congestion around the Channel Crossings, exasperated by the migrant issues at Calais and problems with strikes by French transport workers. The Freight Transport Association together with Transport for London predict that, by 2050, more than two million tonnes of freight will have to cross the Channel in trucks to be flown from airports in Northern Europe[7]. This figure equates to some 100,000 truck crossings. A fully functioning airport at Manston will go some way to alleviating this congestion, freeing up haulage companies to transport to and from the airport rather than suffering the delays of the Channel Crossings.

Securing investment

RiverOak is a specialist investment corporation. Investment in an airport is a £multimillion project and RiverOak have already spent many £millions preparing their submission to the Planning Inspectorate and developing a robust Master Plan. The presence of an airport encourages large employers to locate nearby. Studies show a 10% increase in the supply of air services at an airport was associated with a 4% increase in the number of large firms headquartered nearby[8], that air connectivity is one of the four most important factors affecting

[7] York Aviation (2015), *Implications for the Air Freight Sector of Different Airport Capacity Options*. Available from http://content.tfl.gov.uk/air-freight-implications-from-new-capacity.pdf

[8] Bel. G and Fageda, X. (2008), Getting There Fast: Globalization, intercontinental flights and location of headquarters, *Journal of Economic Geography*, Vol. 8, No. 4.

location decisions[9], and that IATA firms change their investment decisions due to constraints on air services[10].

Airports are also linked to increases in business investment and Foreign Direct Investment (FDI). Studies show that a 10% increase in air transportation usage increases business investment by 1.6%[11]. A 1% increase in international seat capacity is associated with a 0.47% increase in FDI inbound and a 0.19% increase in FDI outbound and a 10% change in the growth rate of seat capacity in the UK leads to approximately a 1% change in the growth rate of the UK's GDP[12].

Centre of Excellence

An Aviation Academy at Manston would allow the Thames Estuary 2050 project to develop a Centre of Excellence in a globally attractive field. This inspirational location, close to a vibrant airport, and the ability to study near home should attract young people from across the Thames Estuary area. The purpose of the Manston Aviation Academy is therefore to:

1. Harness local enthusiasm for the airport and use this to encourage young people to enter Further and Higher Education as well as a wide range of other training opportunities
2. Match education and training provision with the needs of the aerospace industry
3. Raise the profile of the Thames Estuary as a vibrant, growing and innovative economy in the local area, with industry and with Central Government
4. Support businesses within the Thames Gateway area by providing fast, reliable access to the rest of the world for freight and passenger movements
5. Help to attract inward investment by increasing the attractiveness of the Thames Gateway area by providing a vibrant freight-focused airport with passenger services and upskilling the local and regional workforce

[9] Arndt, A. et al. (2009), *Economic catalytic impacts of air transport in Germany: The influence of connectivity by air on regional economic development*. ATRS Conference.
[10] IATA (2006), *Airline Network Benefits*, IATA Economic Briefing No. 3.
[11] Cooper, A. and Smith, P. (2005), *The Economic Catalytic Effects of Air Transport in Europe,* Commissioned by EUROCONTROL and available from https://www.eurocontrol.int/eec/gallery/content/public/document/eec/report/2005/025_Economic_Catalytic_Effects_of_Air_Transport_Europe%20.pdf
[12] PWC (2013), *Econometric Analysis to Develop Evidence on the Links Between Aviation and the Economy*, Report for the UK Airports Commission.

4. Conclusions and recommendations

Treating the area from Thanet along the Thames Estuary on both the Kent and Essex sides of the river as well as including the London Docklands area is a wonderful opportunity for the South East and for the UK. Investment and regeneration are badly needed and the presence of a freight-focused airport, missing at present from the transportation network, will make a huge difference to the sustainable regeneration of the area. Previous attempts to lift this area from its 'poor cousin' relationship to the rest of the South East have largely failed. Now, under the leadership of Lord Heseltine, we have the opportunity to get it right.

Using the airport as a focal point for various initiatives including creating, expanding and upskilling the high productivity clusters in the Thames Gateway area, improving connectivity, increasing investment, and creating a Centre of Excellence at the airport we hope will play a major role in the success of the project. RiverOak welcomes the opportunity to discuss this project further with the Commission.

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Canterbury Christ Church University

CANTERBURY CHRIST CHURCH UNIVERSITY

Demystifying Apprenticeships

Dr Ken Powell
Director of Curriculum

Dr Anne Nortcliffe
Head of School of Engineering, Technology and Design

What Are HDAs?

- Introduced by the coalition government of 2010-15
- Higher apprenticeships at Levels 4 and 5 (equivalent to an HE Certificate and a Foundation Degree)
- Degree apprenticeships at Levels 6 and 7 (equivalent to a Bachelors Degree and a Masters)
- Apprentices work full-time (at least 30 hours a week)
- 20% study release time (equivalent to 1 day a week)
- For new or existing employees of any age group

Canterbury Christ Church University

What are HDAs?

All apprenticeships specified by:

- Apprenticeship Standards (details behaviours, knowledge, skills, entry requirements, level, minimum duration and qualifications)
- Assessment Plan (details outcomes to be achieved, grading and how assessment will operate)
- Once both these are approved the apprenticeship can be delivered by any training provider which can offer the qualification
- Overseen by Institute for Apprenticeships (IfA)

FUNDING

- Apprentices are paid by employers – at least the minimum wage
- Training paid by employer – with some government price setting
- Levy paying firm – paid using digital account
- Non-levy paying firm – government pays 90% of the training cost as long as provider has been allocated places in competitive bidding round
- Cashback available from government

Apprenticeship Levy

- Employers in England with an annual paybill >£3 million will pay 0.5% of their paybill into a 'levy pot' (started April 2017)
  - 20,000 employers
  - £2.3bn annually
- An employer in England with annual paybill <£3 million will be eligible for generous government incentives (100% cost)
  - 98% employers
  - Estimated 25% of SMEs will employ 1 apprentice
- The levy pot, known as the DAS, is then to be used to train apprentices (including higher and degree apprentices)
- 10% of levy pot can be shared with suppliers

Apprenticeship Levy

- Employers will be able to drawdown on this ‘pot’ of money from May 2017
- Levy pot funds will expire after 24 months if not spent on apprenticeship training
- Oldest money is spent first
- Predicted that levy funds will mainly be used to upskill the existing workforce (20% time for study during employed hours)
- L2 English and Maths as part of apprenticeship

Our Offer

- Co-design of curriculum with employer groups
- Delivery at any of our campuses or at employer locations (depending on numbers)
- Work-based learning and assessment fully integrated
- Mentor training programme including accreditation if desired
- Link tutor support in the workplace
- Completion of degree in 3 years with no prior experience (as opposed to 5-6 at some HEIs)

EDGE Hub Vision

Growing the economy through engineering, science and technology

Secured £13M in government funding (SELEP and OfS)

Delivery in partnership with local companies to:

- Provide holistic and inclusive engineering solutions to meet societal challenges and local companies needs
- Provide access to high quality – staff, teaching, research, and facilities
- Industry 4.0, Biomedical, Chemical, Product Design
- Create facilities in key locations across Kent reflecting the needs of the sector

EDGE Hub Facilities 2020

Canterbury Christ Church University

EDGE Hub Facilities 2020

www.canterbury.ac.uk/apprenticeships

Canterbury Christ Church University

Professional Status

- Shortfall, 22,000 Engineers per year (EngineeringUK, 2018)
- Professional status:
  - Successful apprentices can apply for EngTech/IEng/CEng (depending on apprenticeship)

Institution of Mechanical Engineers

IChemE
Institution of Chemical Engineers

CCCU Engineering Apprenticeships

- 45 days a year of training and assessment
- Delivered as 1 day a week for 45 weeks or in week long blocks
- Academic assessments based on work at employer
- Prepares apprentices for EPA

www.canterbury.ac.uk/apprenticeships

Canterbury Christ Church University

CCCU Engineering Apprenticeships

- Manufacturing Engineer (degree) (£27,000, L6)

- Science Industry Process/Plant Engineer (degree) (£24,000, L6)

- Improvement Practitioner (£6,000, L4)
- Improvement Specialist (£9,000, L5)
- Improvement Leader (£15,000, L6 without degree)

Example Manufacturing Engineer Programme

Manufacturing Engineer (Degree Apprenticeship) incorporating BEng Mechanical Manufacturing (Professional Practice)

	Mechanical Engineering Dynamics		Systems Engineering	Maths	Material and Manufacturing Engineering	Design Engineering	Engineering Professional Practice
Level 4			Introduction to Electro-mechanical Building Systems **20 credits** **Trimester 2**	Mathematics and Computing for Apprentice Engineers **20 credits** **Trimester 1**	Introduction to Material & Manufacture **20 credits** **Trimester 2**	Introduction to Design Engineering **20 credits** **Trimester 1**	Professional Practical Maintenance Engineering Project **40 credits** **Trimester 3**
Level 5	Dynamics of fluid and thermal systems **20 credits** **Trimester 1**	Dynamics of Solid Mechanics and Materials **20 credits** **Trimester 2**	Manufact'g Systems (Sensors, Comms and Control) **20 credits** **Trimester 1**			Integrated Mechanical and Electrical Design for Manufacture **20 credits** **Trimester 2**	Engineering Product Lifecycle **40 credits** **Trimester 3**
Level 6	Dynamic Modelling (Material, Fluids and Thermal Dynamics) **20 credits** **Trimester 2**		Manufacture Logistics and Supply Chain Engineering **20 credits** **Trimester 2**		Applied Manufacturing Industry 4.0 **20 credits** **Trimester 1**	Designing for applied Manufacturing **20 credits** **Trimester 1**	Professional Engineering project **40 credits** **Trimester 3**

EXAMPLE SIPPE PROGRAMME

Science Industry Process/Plant Engineer incorporating BEng Process Engineering(Professional Practice)

	Applied Science		Chemical Engineering Dynamics	Maths	Process Design	Process Operations	Engineering Professional Practice
Level 4	Applied Physical Chemistry and thermodynamics 20 credits Trimester 1	Applied Chemistry to Chemical Engineering 20 credits Trimester 2	Applied Heat and Fluid transfer 20 credits Trimester 2	Applied Chemical Engineering Maths and computing 20 credits Trimester 1			Introduction to Applied Chemical Engineering 40 credits Trimester 3
Level 5		Applied Process Engineering of Chemical Reactions 20 credits Trimester 2	Further Applied Heat and Fluid transfer 20 credits Trimester 1		Introduction to applied process design and control 20 credits Trimester 1	Applied process operations of separation 20 credits Trimester 2	Professional Applied Chemical Engineering 40 credits Trimester 3
Level 6	Applied Biotechnology for manufacture 20 credits Trimester 2	Advance Applied Process Engineering of Chemical Reactions 20 credits Trimester 3	Advance Applied Heat and Fluid transfer 20 credits Trimester 1			Applied Process Safety, Sustainability and Environment 20 credits Trimester 1	Professional Applied Engineering project 40 credits Trimester 2&3

SUMMARY

- Opportunity for staff and business:
  - Staff apply their learning to make tangible difference while learning
  - Up-skilling of staff
  - Provide career progression for Level 3 apprentices and other staff
  - Invest in staff and provide sustainable pipeline (reduce churn)
  - Utilise the Levy to invest in business
  - Influence the curriculum and resources

QUESTIONS

Canterbury Christ Church University

Scholarships

We are thrilled to announce that the hugely popular Cotswold Airport Aviation Scholarship will open for 2019 applicants on 1st February 2019. Candidates must be aged 15 - 18 years old (not reaching their 19th birthday until after 9th August 2019) and be resident within Gloucestershire, Wiltshire, Oxfordshire, Berkshire, Bristol & Avon and BANES.

Founded in 2007 with the aim of introducing young people to the exciting career opportunities within aviation, this unique industry scholarship programme offers participants broad exposure to the aviation world. The scholarship offers hands on experience across a broad range of aviation areas and includes time flying in different types of aircraft.

Since its inception, the Cotswold Airport Aviation Scholarship programme has changed the lives of over a hundred young people; many previous scholars used this opportunity to launch their successful and exciting aviation career, from engineering to flying instructors and commercial pilots.

2019 will be no exception and successful candidates will be offered full and varied programme. Between the 29th July to 8th August 2019 (weekdays only), attendees can look forward to on-site and off-site engineering visits, visits to RAF Stations, air traffic control, air operations and a period of flying experience. The flying experience is likely to include, gliders, microlights, light aircraft (including aerobatics) and helicopters.

Suzannah Harvey, CEO of Cotswold Airport, said "*The ongoing success of the Cotswold Airport Aviation Scholarship is something which I am very proud of. It gives me great pleasure to see past scholars excel within the aviation industry and I continue to encourage any young person with an interest in a career in aviation to apply for a place; not only is it a fantastic experience but it really helps the*

students take their first steps towards what can be a very rewarding career in aviation, whilst allowing them to build contacts and make new friends at the same time. I would also like to thank World Fuel Services for their continued sponsorship of the Cotswold Airport Aviation Scholarship programme, making it possible to continue to enhance the programme for all of the youngsters who take part."

There are only 10 places available on this sought-after experience and applications open on 1st February 2019 and close 15th March.

KLM UK Engineering Limited is a **leading UK based Maintenance Repair Organisation (MRO)** offering a **high quality service and products** from its head office location in Norwich, at **Norwich Airport**. With 5 fully equipped modern heavy maintenance bays across 3 hangars and over over 40 years of experience on many aircraft types, including **Embraer 170/190, Boeing 737 All Series, Airbus A320 Family, BAe 146 & Avro RJ and Fokker 70/100 types**, KLM UK Engineering has a solid customer base. Included in our MRO capability and experience is the ability to carry out heavy modifications either at our Norwich facility or at the operator's home base.

There is an extensive on-site Component Repair Centre supporting all base maintenance **MRO** activities, delivering a high quality of modifications, repairs, overhaul, NDT, Paint Shop, Trim Bay, Composite and component repairs.
KLM UK Engineering has been based at **Norwich Airport** for 40 years and employs approximately 370 people and provides line maintenance support throughout the UK. The Company prides itself on having an experienced and skilled work force, delivering a superior service and high quality product at a competitive price.
KLM UK Engineering has an **on-site Part 147 Technical Training College** delivering Apprenticeships, BSc (Hons) Professional Aviation Engineering Practice, Aviation Engineering, EASA CAT A, B1.1 & B2 Type Training / Basic courses, Compliance and e-learning training.
Working in **partnership with Universities & Colleges** to deliver Aircraft Engineering degree programmes, which incorporate EASA courses, students benefit from on-the-job training in the main facility including hangars & component repair centre. The facility is located within the new International Aviation Academy Norwich. This facility is a pioneering centre of excellence and will inspire individuals to become highly skilled in their chosen field.

NORWICH, UK, Tuesday 17 September 2013

Norwich Airport and aviation engineering firm KLM UK Engineering launch the

Norwich International Aviation Academy

New state of the art facility will provide a centre of excellence to the aviation industry for education and skills training, delivered in partnership with the region's education groups and local authorities

Norwich International Airport has teamed up with its largest tenant operator, aircraft engineering firm KLM UK Engineering ("KLMUKE"), to develop the concept of an Aviation Academy to be based at the Airport site. The concept is supported by a core group of founding partners which includes the University of East Anglia, the TEN Group, New Anglia local enterprise partnership, EAGIT training, Norwich City Council and Norfolk County Council.

The need for such a facility was originally identified by KLMUKE and the Airport in order to enhance and expand KLMUKE's existing training operations on the Airport industrial estate. KLMUKE currently employ over 375 members of staff, made up in excess of over 200 skilled engineers at the Airport and have up to 40 apprentices in training at any given time. Their future expansion in Norwich is partly dependent on the availability of skilled workers.

A further catalyst for the concept is the Airport's ambitious Aeropark project, which received planning permission in July 2013. This development project on the north side of the airfield kicks off with a 160,000 sqft hangar and head office development for Air Livery, the leading aircraft painting firm. Latest figures show the Aeropark could create 1,400 jobs and generate over £50m of benefit in the local economy when fully developed. To realise this benefit, the ability to provide a skilled workforce is crucial, and the Aviation Academy will form a vital part of the strategy.

The needs of the wider industry underpin local demand for skilled aviation workers. The 2013 Boeing Pilot & Technician Outlook, a respected industry forecast of personnel demand, projects a requirement for 556,000 new maintenance technicians to maintain the new airplanes entering the world fleet over the next 20 years. In Europe that would be 108,200 in addition to the exciting jobs in Maintenance not to be mistakenly mixed-up with the labour demand in the aircraft new build industry.

The concept for the Norwich International Aviation Academy is one of a pioneering centre of excellence for education in aviation skills. The Academy will enhance the region's reputation and lead the training and development of the next generation of aviation professionals.

The partners hope that the Academy will inspire individuals to become highly skilled in their chosen field and be ready to take on leadership and expert roles in the aviation community throughout the world.
Through creating a 'real world' learning environment that includes a full size aeroplane and using innovative teaching techniques, the Academy will raise the standards of learning within the aviation industry, while offering a broad education that will attract both local and international students.
[redacted] CEO of Norwich International Airport, said, "One of the Airport's core strategic objectives is to become a thriving centre of excellence in the aviation Maintenance, Repair and Overhaul business. This objective is core to the Airport's long term sustainability for the benefit of the region, at a time when many regional airports across Europe are struggling and some are closing their doors for good. To achieve this objective the Airport must be able to offer the complete package to attract new business. That means flexible flight operations, which are available now. It means bespoke, affordable facilities, which the new Aeropark development can provide. Lastly, and crucially, it means the settled, skilled workforce that any business looking to relocate or grow will require. The Aviation Academy will demonstrate to new business that these skills can be delivered efficiently, cost effectively and locally. At the same time the Academy will help businesses like KLM UK Engineering who are already at the Airport to realise their potential".
[redacted] MD of KLM UK Engineering, comments, "To flourish our business we are highly relaying on the support of the local community. Therefore we are keen to interest people in the community for a career in general engineering and also specifically in aviation. We would particularly like to encourage young girls and boys to consider our apprenticeships or aviation graduate programs as a start for an inspiring career. However, to meet the learning requirements of a new generation means a fundamental change in how education and training is approached in aviation. An inspiring learning environment and innovative solutions focused on new digital technology will be needed. The integral approach with education experts, local government and industry is an ideal start for success. I am very excited about the Norwich International Aviation Academy, it will position Norwich firmly on the Aviation Industry map. To interest future generations for jobs in Aviation is crucial for a sustainable growth for our industry".
[redacted] MP adds, "This is a good move and very important for Norwich. As founder of Norwich For Jobs, the local campaign to get young people into work, which is backed by KLM UK Engineering and fifty other firms so far, I strongly support the proposals for an Aeropark which could create thousands of jobs in the local economy. To do that, we need more skilled engineers and the Aviation Academy will show we can

do this in Norwich. I applaud the partners for working together to achieve this. I'd urge people interested in a great career to sign up."
Alongside the Airport and KLMUKE, a core group of founding partners has been established who will develop the Aviation Academy concept. This group includes:

- EAGIT training, who are currently based at the Airport industrial estate and who work with KLMUKE to fulfil their current apprenticeship training needs
- The TEN Group - The Transforming Education in Norfolk (TEN) Group, which incorporates City College Norwich, a number of local academies and the new engineering-focussed University Technical College Norfolk (opening September 2014)
- The University of East Anglia (UEA), currently top ranked for student experience in the UK and offering degree courses in energy engineering
- New Anglia Local Enterprise Partnership (LEP)
- Norwich City Council
- Norfolk County Council

Partners Quotes

[redacted] managing director of the New Anglia Local Enterprise Partnership, said "We see clear growth potential for the aviation cluster around Norwich International Airport and it is vital local people are given the chance to gain the skills they need to work in this growing industry. That is why the aviation academy is so important to raise the profile of the sector locally and nationally, and lead the training and development of the workforce. This is a really good example of industry and academia working in partnership and a project we are delighted to support".

Norwich City Council - Councillor Brenda Arthur, leader of Norwich City Council, said: "The launch of this project is a positive step forward in creating high quality apprenticeship and training opportunities in the area. We look forward to working with partners in realising the benefits the Aviation Academy will bring, both to the job market and the wider economy."

Norfolk County Council - [redacted] Cabinet Member for Economic Development and Leader of Norfolk County Council, said: "The Aviation Academy is really exciting news and is the sort of thing we're working towards at Norfolk County Council. I salute the Airport and KLM UK Engineering. This is fantastic news for Norfolk. In the fullness of time it will provide important skills for young people and will become the European centre for aviation engineering. When we talk about improving skills, the aviation academy is a perfect example of what we mean. I believe that the aviation academy will grow and grow to provide lasting benefits to young people and prosperity to the county and region as a whole. Norfolk County Council is 100% behind it!"

[redacted] dean of UEA's Faculty of Science, said: The University of East Anglia is proud to be one of the founding partners of the Norwich

International Aviation Academy; this is a very exciting and important initiative. In this new Academy the UEA will work with KLM UK Engineering, Norwich International Airport, and other partners, to deliver top class aviation engineering training in Norwich which we expect to boost local employment and the local economy. A particular goal for UEA will be to ensure that students working at the new Academy receive education and training of the highest possible standards and quality. This will build on the UEA's recent programme of investment in new staff and facilities for its new engineering Undergraduate and Post-graduate degree programmes, the latter of which is now in its' second year. This new partnership provides a similar opportunity for the University to contribute to regional business and commercial needs for of a highly skilled workforce including graduate engineers in the aviation industry. The initiative will benefit from academic expertise within our existing engineering programs as well as within our Schools of Mathematics and Computing Science at the UEA.

[redacted] Chief Executive at EAGIT, said "EAGIT is delighted to be working with KLM UK Engineering and the other partners to develop this important project. Engineering skills are key to our economy and the Aviation Academy will ensure that Norfolk is central to the development of skills provision in this critical area."

[redacted] Group Chief Executive Officer, Transforming Education in Norfolk (TEN) Group, commented: "The Aviation Academy will provide an invaluable addition to Norfolk's expanding training capacity in a cluster of key growth sectors - aerospace, advanced engineering and energy - where there will be a long-term demand for local people with the skills needed by these industries. TEN Group is delighted to be part of this exciting development and to be able to offer our experience and expertise in support of the new Academy."

Careers for Girls in the Aviation Workforce

A very interesting fact that needs to be brought to the public attention in today's world, Is that some of the largest regional airlines, especially those with more than 400 aircraft averaging around 2,000 flights daily, have working amongst the workforce of aviation mechanics, only ten percent female mechanics.

For some companies, according to the FAA (Federal Aviation Administration) women now make up around 4.10 percent on average over the previous one percent, for the male dominated careers. which include Mechanic, ground instructors, dispatchers or flight engineers. There is only one exception to this, Flight Attendants is still dominated by females, but that also is now starting to change.

What is happening , Aviation Companies are now looking to hire a more diverse workforce, the past male dominated profession of aviation maintenance is now providing ample opportunity for women as well as men in aviation .

After all. during WW2, women played quite a vital part in working in munitions factories and shipyards, helping to produce munitions and war supplies, even helping to build aircraft. These women some of whom took entirely new jobs, replaced the male workers who had been called up for military duty. Women volunteered to work in Aircraft factories and airfields, maintaining aircraft and loading ammunition as well as flying aircraft to military bases all over. I am sure some can remember or have heard about 'Rosie the Riveter' who encouraged all women to help out during the war. she became so famous that a song and Hollywood film

was made about her. (If you don't know about her , ask your parents/ grandparents. her name lives on to this day.

Many girls feel that they are expected to go into what they think of as a traditionally female - dominated career; which more than often turns out to be retail, office work, education or health care. Some set their sights on other horizons, the need for something different, exciting, with the 'sky's the limit' attitude, these girls often enter the military and the Aviation sectors.

It has been seen in the Aviation Maintenance programs all across the world, a slow but surely increasing number of women entering into these programmes over the past twenty five years plus. It used to be that women were led to believe that Aviation careers were just for men, this has changed and now women have realised that they too can excel in this field.

Every company today is required to cultivate diversity within their employment ranks. It is not only illegal to discriminate, but companies have realised that along with this cultivation of diversity, women can excel when it comes to ideas, creativity and accomplishing within the workforce.

Today's recruiting techniques are now just starting to include the process for reaching out into senior schools, which also in turn, reaches out to female students and has resulted in an increase in students.

There still is the problem in a lot of senior schools, females are completely unaware of all the opportunities in the aviation field, and especially within the mechanical and electronic repair areas. In fact, when recruiters make girls aware of the opportunities that are available to them, they are amazed at the excitement and aspirations they show, at being given a chance to reach these goals.

Women have been, and are still greatly under-rated and unrepresented in the aviation and aerospace sectors, this has started to change, Women were always visible in customer service and administrative roles, here in the UK, around two thirds of ticketing and sales personnel are females, whereas behind the closed doors of cockpits, the hangars and board rooms was always a different story.

The answer is, introducing young females into the opportunities in aviation, which is an important key to filling the needs for today's Aviation Industry. Schools can help them to understand that in any engineering career, for male or female, they should study subjects in science, technology, mathematics, and also engineering where this subject is available, this is important if they want to succeed in the Aeronautical Engineering Industry.

Roles for Aircraft Maintenance Mechanics or Engineers-Male and Female in the Aviation Industry involve;

Checking and being responsible for maintaining the systems on both Aircraft and Helicopters in between flights to ensure the aircraft is safe to fly.

To work in aircraft maintenance, you will need to get qualifications and certification. There are two types of maintenance:

Line duties such as pre-flight checks, refuelling, minor avionics, electrical and mechanical maintenance.

Base maintenance in the Aircraft hanger, when you will be required to do a more thorough checks, diagnose faults and carry out repairs.

If you work in mechanics you would service the fuselage, engines, landing gear and airframe systems which include the electrics associated with these systems.

If you have focused on Avionics, you would be checking the electrical and electronic systems used in navigation, communications and flight control.

Your job would be to check the parts and systems, find any faults and decide if they can be fixed, you'd then have to organise or carry out the repairs. A very responsible job; you'd need to check very carefully and be meticulous with your repairs.

What type of person do you need to be, Firstly- You will need a responsible attitude, and good concentration. Secondly- you would need a methodical approach to what needs to be done. And lastly, Good eyesight with normal colour vision.

If you are skilled at, working as part of a team, being able to follow instructions, Accuracy, working with your hands, repairing and fixing as well as finding solutions to problems, you will have no trouble, especially if you like attention to detail.

Another thing which is important to male and female, is the ability to work both indoors and outdoors, as so many of the jobs involve either maintenance inside a large hangar or outside on the airport ramp.

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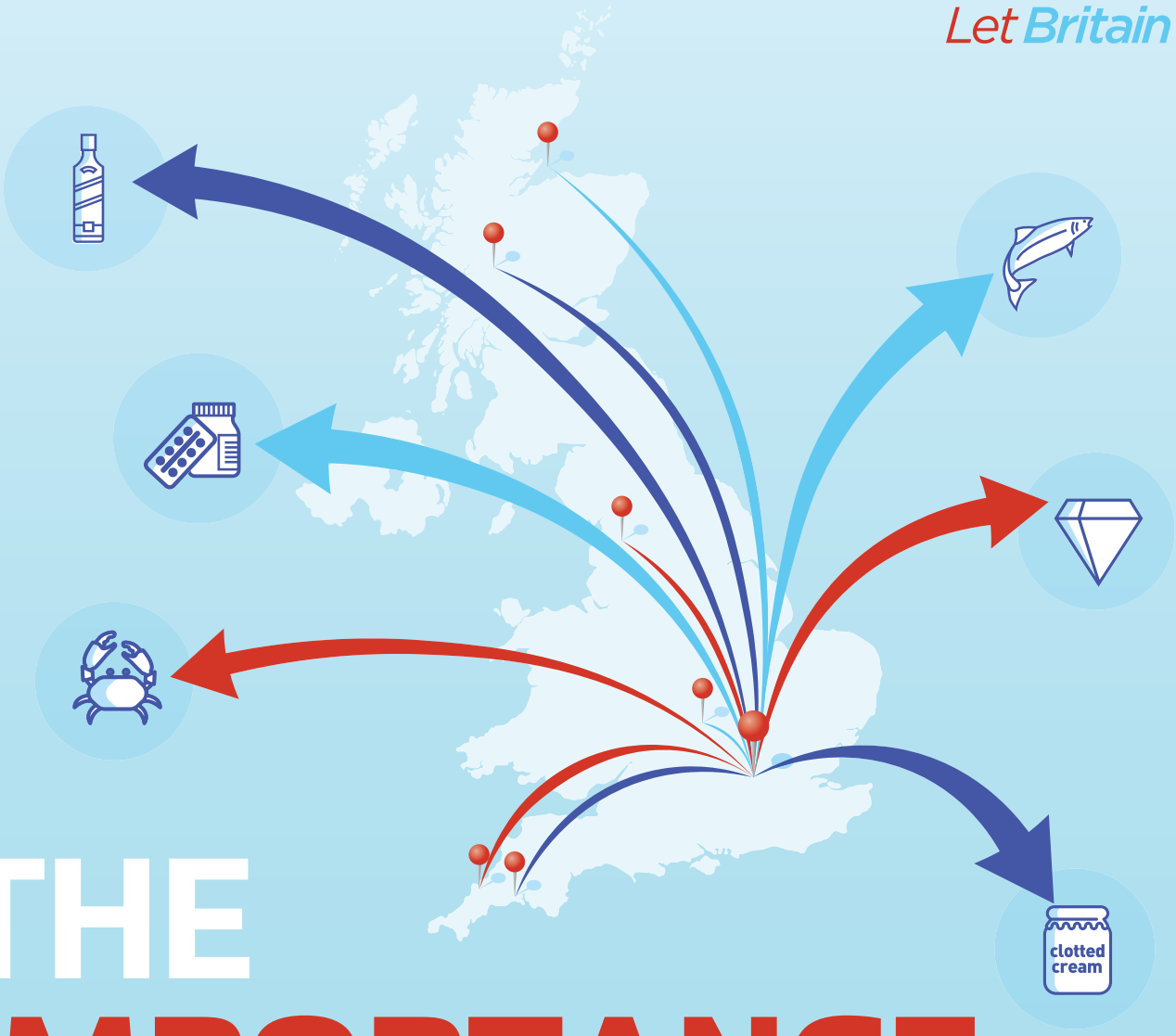
Let Britain Fly



THE IMPORTANCE OF AIR FREIGHT TO UK EXPORTS

The impact of delaying the runway capacity decision on UK international trade growth

A report by the Centre for Economics and Business Research
for the Let Britain Fly campaign
September 2016

Disclaimer
Whilst every effort has been made to ensure the accuracy of the material in this document, neither Centre for Economics and Business Research Ltd nor the report's authors will be liable for any loss or damages incurred through the use of the report.

Authorship and acknowledgements
This report has been produced by Cebr, an independent economics and business research consultancy established in 1992. The views expressed herein are those of the authors only and are based upon independent research by them.

Let Britain Fly is the campaign to build cross-party political support to expand airport capacity in London and the South East. It is an independent campaign coalition whose founding statement has support from more than 100 senior business leaders from Britain's top companies, trade and professional associations, unions and educational institutions, along with business organisations including the British Chambers of Commerce, London Chamber of Commerce and Industry, London First, Institute of Directors, Federation of Small Businesses and the British Hospitality Association.
For more information visitletbritainfly.com

@LetBritainFly

FOREWORD

David Sleath,
Chief Executive, SEGRO

Whilst we come to terms with the vote to BREXIT there has never been a more important time for the Government to send out a positive message to the rest of the world that Britain is open for business.

A quick and decisive decision on airport expansion provides that opportunity in a time of economic uncertainty. Because, one of the most compelling arguments for building a new runway is the role it would play in promoting UK trade, in particular boosting British exports.

It may come as a surprise, but air cargo accounts for forty per cent of the value of Britain's exports. From Scottish salmon to pharmaceuticals, Brompton bikes to formula 1 cars, the UK products that are valuable, perishable or are required just-in-time, will travel by air and probably via Heathrow the UK's only hub airport.

In fact, over a quarter of all our exports go via Heathrow. Recommended by the Airports Commission as the preferred airport for a new runway, more goods leave Britain via Heathrow than all the other UK airports combined. With 95% of these goods carried in the belly-holds of passenger planes, the UK's success in exporting both services and products are intrinsically linked.

The world is changing. Whilst Europe will remain an important market for UK exporters, most of the future growth in the world is in Asia, Africa, North and South America. By value 51% of UK exports to non-EU countries currently go by air and for the UK to succeed in the global economy we need more frequent and direct flights to these destinations. We trade twenty times more with countries with whom we have a direct air link. So it is clear why investment in our airports infrastructure is critical to the UK's economic success.

UK businesses are already losing out to their French and German rivals in the race to do business with China. Paris and Frankfurt have 60 weekly flights to China compared to 40 at Heathrow, making it more difficult for many British firms to compete effectively. To rebalance and strengthen the economy, the UK needs a hub airport that can compete with our unconstrained hub rivals abroad, providing direct air links to new markets and opportunities.

Decades of uncertainty on airport expansion is putting Britain at an economic disadvantage. As our research suggests, for every year that passes without a new runway in operation, the UK could be losing out on as much as £9.5bn in trade with the top ten fastest growing emerging market economies. One year has already passed since the Airports Commission published its final report and we still don't have a final decision. Can the Government afford to delay further?

We believe the results of our research send a clear and compelling message to politicians that further delay on this issue will undoubtedly impact on the British economy and UK exporters both large and small. Indecision on this nationally important issue needs to end.

The simple question for government to address is this: what type of country does Britain want to be? Do we want to be a global player, operating seamlessly for business, helping exporters to grow and attracting inward investment? Or do we want to fall further behind our European competitors?

So the message from businesses right across the UK is clear. The Government must make a final decision quickly and back the Airport's Commission recommendation to build a new runway.

EXECUTIVE SUMMARY

The decision of where to build a new runway in London and the South East has proved to be a highly contentious issue. Whilst there is general agreement that there is a requirement for new runway capacity in London, the decision of where to build it has divided public, and political, opinion.

The Airports Commission was tasked with recommending to government where airport capacity should be expanded. It narrowed down the potential options to three at two airports - London Heathrow (LHR) and London Gatwick (LGW). In July 2015, the Commission published its final report recommending the northwest runway option at LHR. However in December 2015, due to environmental concerns, the Government delayed its final decision until *at least* summer 2016. Following the vote to leave the EU the Government has announced a *further delay* until *at least* October 2016.

Further delaying the decision has clear implications for UK trade, which is what this study, by the Centre for Economics and Business Research (Cebr) on behalf of London First and the Let Britain Fly campaign, seeks to examine. Based on the analysis and conclusions set out in this report, the message is clear. The Government needs to get on with building a new runway in order not to stifle further growth in trade and FDI between the UK and the fast growing emerging market economies. Not doing so is, and will, ultimately be to the benefit of the UK's European competitors that have plenty of spare airport capacity at their key hub airports.

Aviation plays a key role in facilitating international trade in both goods and services. It provides businesses with a rapid and global transport network, crucial where speed of delivery is of the essence. It also affords businesses access and entry to new markets and enables them to better manage their supply chains. It is most often high value goods which are transported by air, with HMRC's overseas trade statistics illustrating that over half (51%) of the UK's exports to non-EU countries by value were transported by air in 2015, but just 1% by volume.

The importance to trade of the London airports

Exports

- In 2015, the total volume of goods exported from the UK amounted to 154 billion kilograms (kg) with a total value of approximately £305 billion. Of the total by volume, 30% went to non-EU countries (45.7 billion kg), of which 1% (479 million kg) was sent by air. By value, exports to non-EU countries accounted for 56% of the total (£171 billion), of which £87.2 billion (51%) was transported via air.

- The proportion of total exports by air to non-EU countries that travelled from the London airports was 74% in 2015. By value, LHR accounted for the largest proportion of total exports by air to non-EU countries at 77% (or £67.3 billion) in 2015. The value of exports travelling through London's airports has increased rapidly since 2009, from £35.5 billion to £72.8 billion in 2015 (growth of 105%).
- Historically, the largest export market by volume for goods travelling by air is Asia and Oceania, followed by North America. LHR carried 77% (134 million kg) of the total UK aviation goods exports, by volume, to Asia and Oceania in 2015.
- By value, the majority of exports travelling by air from London are destined for Asia and Oceania. 32% of non-EU exports by value from London went to this continent in 2015, worth approximately £23.4 billion.

Imports

- In 2015, the total volume of goods imported to the UK was approximately 287 billion kg. The total value of goods imported into the UK amounted to £412 billion in the same year.
- Of the total imports by volume, 61% arrived from non-EU countries, with 0.4% of this arriving by air. By value, non-EU countries accounted £192 billion (47%) of the total value of goods imported, of this, £67.1 billion (47%) was transported via air.
- By volume, the proportion of imports from non-EU countries arriving in the UK via London airports amounted to 72% of all imports arriving by air from non-EU countries in 2015. The majority were from Asia and Oceania and arrived at LHR.
- By value, in 2015, the London airports accounted for the largest proportion of non-EU imports arriving by air – 78% of the total in 2015, with LHR accounting for 69% (£52.6 billion) of this. The majority of imports from non-EU countries arriving by air in the UK come from North America (38%, with a value of £28.8 billion in 2015).

Goods trade from London and the South East

- In 2015, approximately 52% of the UK's exports by value were destined for non-EU countries (£146 billion). The majority of these came from businesses based in England (76%), with 28% coming from the economies of London and the South East, compared with 48% from the other English regions – from the North East to the South West. For instance, 12% of all UK exports by value destined for non-EU countries originated in the West Midlands in 2015, amounting to £12 billion. The remainder, 24%, comes from elsewhere in the UK – Wales, Scotland and Northern Ireland.

- By volume, the majority of exports to non-EU countries originated in London in 2015 (18% of the UK total). For those exports destined for the EU, the majority by value again originated in London and the South East (24%).
- 11% of exports to the EU by volume originated from businesses located in London in 2015 (12.2 million tonnes), an increase of 71% on the previous year. A significant volume of exports to the EU also originated from businesses based in the North West and Yorkshire and the Humber, at 8% of the UK total.

Trade from other regions passing through London

- We have estimated the value of exports to non-EU countries from the regions other than London and the South East that are moved through the London airports. With goods worth £41.2 billion of exports to non-EU countries originating from businesses located in London and the South East, we estimate that approximately £24.6 billion of this was moved through London airports in 2015.
- HMRC records £72.8 billion worth of goods being exported through the London airports system to non-EU destinations in 2015. On this basis, it is clear that a significant proportion of this originates from the other regions of England and the rest of the UK – including Wales, Scotland, Northern Ireland, as well as the northern English regions, the Midlands and the South West. Our estimates suggest that in 2015, £48.2 billion worth of the goods exports that passed through London airports, destined for non-EU countries, originated in businesses located outside London and the South East.
- This very clearly highlights the importance of runway capacity in London and the South East in supporting exporting businesses located throughout the UK, not just those in London and the South East.

Goods trade with non-EU countries by product category

- For the UK as a whole, across all ports, the largest export by value in 2015 was machinery and transport equipment. However, for the London airports, the largest export by value was commodities/transactions not classified elsewhere, which amounted to £25.3 billion in 2015.
- In 2015, the other main categories of export by value transported through the London airports included machinery and equipment (£18.6 billion, 62% of total UK exports in this category) and miscellaneous manufactured articles (£14.3 billion, 30% of the total from the UK in this category).
- By volume, the largest export category across all UK ports was mineral fuels, lubricants and related materials

(18.5 billion kg exported in 2015). However, by air, the most significant categories were machinery and transport equipment and miscellaneous manufactured articles.
- The London airports are prominent. For example, 86% of food and live animal exports by volume to non-EU countries were moved through the London airports in 2015 (70.3 million kg), and 84% of miscellaneous manufactured articles.

UK trade in services

Beyond being important for trade in goods, aviation also plays a major role in trade in services, as well as in supporting tourism. For the UK, aviation is particularly important for its services sectors, which are highly dependent on fast, timely business travel enabling face-to-face contact both with existing clients, and when establishing new ones.

According to the Pink Book, the UK's services exports have been steadily increasing over time, with a significant portion of these exports coming from London. In 2014, service exports from the UK amounted to £220 billion, with £115 billion of this originating from businesses located in London.

According to ONS International Trade data, total services to the USA far exceeded those to any other country in 2014. In that year, services exports to the USA amounted to £27.8 million. Meanwhile, exports to the EU consistently account for around 35% of the total services exports.

Foreign Direct Investment

Aviation is an important and well-recognised contributor to encouraging FDI. The link between aviation connectivity and FDI largely relates to the requirement to move staff around the globe, thereby facilitating the transfer of knowledge. Aviation connectivity helps inward investment by creating a more favourable environment for foreign firms and their workers.

For the UK, FDI is attracted to regions such as London for reasons including the quality of its aviation links. It has been estimated that FDI contributes more than £52 billion each year to London's economy.

The relationship between trade, FDI and air transport links

We undertook econometric modelling to establish a statistical relationship between aviation connectedness, trade and investment flows. To do this, we drew on a number of different data sources, including HMRC on UK goods trade, Eurostat's Balance of Payments database for trade in services data, and the Civil Aviation Authority (CAA) for data on routes, flights and

passenger numbers. The CAA data spans a ten-year period from 2002 to 2012, the time period that this part of our study examines. Although the period of analysis is limited, there are good reasons for choosing one that ends in 2012. These are:

- *The 'dither clock'*: The analysis in this section leads ultimately to the 'dither' clock developed in Section 5 below. This imagines trade growth being spread smoothly and continuously through time, and considers what is potentially being lost in trade terms by delaying the runway capacity decision. The Airports Commission was established in 2012, and this represents the start date of the dither clock – the year the Government decided to create a lengthy commission rather than reach a decision itself.
- *Minimising distortions of the relationships*: with LHR operating at capacity and LGW close to capacity, and the fact that new routes tend to push others out, it made sense to go back in time a little to minimise the potential for routes dropping in and out to distort the relationships we are endeavouring to establish.

In developing the econometric model, we considered the number of routes, flights and passengers travelling between the UK and two groups of ten partner countries, referred to in this report as the 'mature-trade' markets and the 'emerging markets'. The countries included in each list are presented in Table 1 below.

Table 1: UK trade partner countries, defined as 'mature-trade' markets or 'emerging markets'

Mature-trade markets	Emerging markets
Belgium	**Poland**
France	**Turkey**
Germany	**South Africa**
Ireland	**Nigeria**
Italy	**Mexico**
Netherlands	**Brazil**
Spain	**India**
Switzerland	**China**
USA	**Malaysia**
Hong Kong	**Thailand**

Source: Cebr analysis

The 'mature-trade' markets group refers to the ten partner countries with which the UK has the most mature trading

relationships in goods and services. This was identified through an examination of historic trends in trade between the UK and its partner countries. The 'emerging' markets group refers to ten economies that are among the fastest growing in the world, and according to the IMF's and Cebr's own forecasts, are expected to contribute an increasing proportion of the world's economic growth over the next 5 years. In particular, by 2020, the contribution to world GDP of the mature-trade markets is expected to decline to 37% while the emerging markets' share is estimated to rise to 28%. By as early as 2029, we estimate that the contribution to world GDP made by the emerging markets group could overtake the mature-trade markets' contribution.

As the balance of economic strength and significance shifts away from the mature-trade markets towards the emerging markets, strong connectivity to the UK will become imperative for the UK to capitalise on new export and investment opportunities.

Our econometric analysis of the data for the mature-trade group confirms a statistically significant relationship between aviation connectedness and the level of total trade, and between aviation connectedness and the level of total FDI. We estimate that a 10% increase in the connectedness variable (the product of routes, flights and passengers by country) across the mature-trade markets can be associated with an increase in UK trade of 1.2%. Similarly, we estimate that in any given year, a 10% increase in connectedness has the potential to increase total UK FDI flows by 0.7%.

Estimated potential boost to UK trade in goods and services

Our analysis suggests that if aviation connectedness between the UK and the emerging markets group reached similar levels as that seen between the UK and the mature-trade economies, the UK could benefit from a boost to trade of approximately £28.2 billion per annum by 2030.

This prediction is based purely on the estimated statistical relationship. However, at the aggregate level, there are a range of factors requiring consideration that are beyond what a statistical model can take into account, such as political institutions, historic links and so forth that make it easier or harder to trade with these countries. By accounting for these factors we calculate a lower bound estimate of the trade that could be sacrificed by not having additional runway capacity. In reality, the true impact is likely to lie somewhere in the range of this lower bound and the upper bound suggested by the unadulterated statistical model.

Accounting for such factors that may increase or constrain any potential trade gains to the UK, such as varying trading conditions, economic growth, political stability of individual emerging markets, we estimate the UK could benefit from a boost to trade of approximately £8.6 billion by 2020, and £10.1 billion by 2030.

But this includes exports and imports, so narrowing the focus on exports (using the current UK export-import split) gives lower bound estimates of £3.2 billion by 2020 and £3.7 billion by 2030.

Estimated potential boost to UK FDI

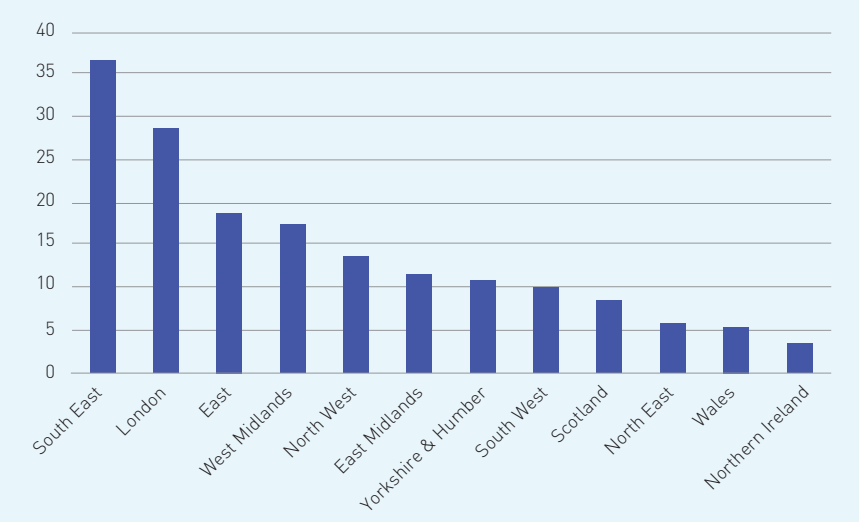
In 2012, the value of total (inward and outward) FDI flows between the UK and the emerging markets group totalled approximately £8.0 billion. If the average level of aviation connectedness between the UK and the emerging markets were to reach parity with that between the UK and the mature-trade economies, our analysis suggests that the UK could benefit from a boost to total FDI flows of approximately £1.7 billion per annum.

The 'dither-clock'

We use the analysis above to estimate the value of lost trade due to a lack of connectedness between the UK and the emerging markets. We consider this over the time period in which connectedness with emerging markets would grow if additional runway capacity were made available. This has been coined as the 'dither clock'. The 'dither clock' imagines trade growth being spread smoothly and continuously through time for illustrative purposes.

Given this, we estimate the total value of potential exports that the UK could gain from could reach a cumulative £63.6 billion over the 18 years from 2012 to 2030. Based on current trends in regional trade, we estimate that the South East of England could be hurt the most, as the region could potentially lose out on approximately £36.6 billion of total trade over the 18 year period (Figure 1). London could also be disadvantaged, losing out on roughly £28.6 billion of trade between 2012 and 2030.

Figure 1: The value of lost potential trade over the 18 year period, by region (£ billions)



Source: HMRC, Cebr analysis

To illustrate what this means by unit of time, we have produced the 'dither clock' shown in Table 2 and Table 3 below.

This analysis suggests that the UK could be losing out on as much as £9.5 billion for each year that passes without runway capacity expansion. For every month that the level of air connectedness between the UK and the emerging markets remains under-developed due to a lack of new runway capacity, the UK could be losing £790 million of trade, equivalent to approximately £182 million per week. On a daily basis, the loss is approximately £26 million worth of trade with the emerging markets group. This is equivalent to a loss of approximately £1.1 million per hour, or £18,000 per minute.

Table 2: The 'dither clock': the value of lost potential trade over time

Value of lost potential trade, £	Per unit of time
£9.5 billion	**Year**
£790 million	**Month**
£182 million	**Week**
£26 million	**Day**
£1.1 million	**Hour**
£18,000	**Minute**

Source: Cebr analysis

Narrowing the focus to exports only gives the 'dither clock' estimates shown in Table 3, which is based on the current ratio of exports to imports to the emerging markets group.

Table 3: The 'dither clock': the value of lost potential exports over time

Value of lost potential trade, £	Per unit of time
£3.5 billion	**Year**
£294 million	**Month**
£68.0 million	**Week**
£9.7 million	**Day**
£0.4 million	**Hour**
£6,700	**Minute**

Source: Cebr analysis

ONE
Introduction

This study, by the Centre for Economics and Business Research (Cebr) on behalf of London First and the Let Britain Fly campaign, examines the importance of air freight to UK trade. It also considers the implications for international export growth of delays in making the decision on where to deliver new runway capacity in London and the South East of England.

1.1. Background and context

On 7 September 2012, the Government announced its intention to create an independent commission, chaired by Sir Howard Davies, to identify and recommend options for maintaining the UK's status as a global aviation hub. In July 2015, the Airports Commission published its final report which set out its recommendations to government for expanding airport capacity in the UK. It narrowed down the potential solutions to three options at two airports – London Heathrow (LHR) and London Gatwick (LGW) – and recommended the new northwest runway option at LHR. However, the Government has now delayed the decision as to whether a third runway could even be allowed at LHR until summer 2016, as a result of environmental concerns.[1]

In response to political procrastination on the issue and in an attempt to help break the political deadlock, in September 2013 London First initiated the Let Britain Fly campaign. The aim of the campaign is to build cross-party political support to build new runway capacity. It is supported by a broad strategic campaign coalition that includes business leaders, business organisations, trade and professional associations, trade unions, think tanks, academics and economists.

Aviation connectivity plays a key role in facilitating international trade in both goods and services. It provides businesses with freight access to export markets, as well as enabling business travellers to meet new and existing clients. Given the Government's initiatives around exporting for growth, aviation can provide businesses with important routes to market for their goods and services, supporting growth and employment in the UK and ensuring that the UK remains internationally competitive.

1 www.bbc.co.uk/news/business-35062739

Therefore, this study seeks to help London First and the Let Britain Fly campaign illustrate the importance of air freight to UK exports and in turn, the negative consequences for export growth of delaying airport expansion in London and the South East.

1.2. Structure of the report

The rest of the report is structured as follows:

- **Section 2: London's airports and their role in UK trade**
  Cebr illustrates the share of goods trade passing through airports in London and the South East and where the goods originate from in the UK. It also considers how this picture varies by industry sector.
- **Section 3: The relationship between trade, FDI and air transport links**
  Using econometric analysis we establish relationships between aviation connectivity, trade and investment flows for the UK. We specifically consider the ten partner countries with which the UK has the most mature trade and FDI relationships and how these correlate with air transport routes and their density in terms of both flight frequency and passenger throughput.
- **Section 4: The growth potential and cost of delaying the new runway decision**
  An analysis of how trade could be impacted if the amount of air links to the ten fastest-growing economies were to increase to varying degrees.
- **Section 5: The 'dither clock'**
  We present the estimated value of trade lost per year, month and day over the period of time taken for the ten fastest growing economies to reach similar levels of trade as existing links with the ten partners with which the UK has the most mature trading and investment relationships.

TWO
London's airports and their role in UK trade

Aviation plays a key role in facilitating international trade in both goods and services. It provides businesses with access and entry to new markets and enables them to better manage their supply chains. This section illustrates the importance of trade from the UK to both EU and non-EU countries and the role of the London airports in this trade.

Aviation links provide businesses with a rapid, worldwide, transport network, and as such, it plays an important role in facilitating trade, particularly where speed of delivery is crucial. In addition, air freight is more sensitive to weight than other options of transportation, such as rail or sea. Therefore, it is smaller, lighter and higher value goods that are transported by air. This is echoed in HMRC's overseas trade statistics (OTS) which show that in 2015, over half (51%) of the UK's exports to non-EU countries by value were transported by air, but just 1% by volume.

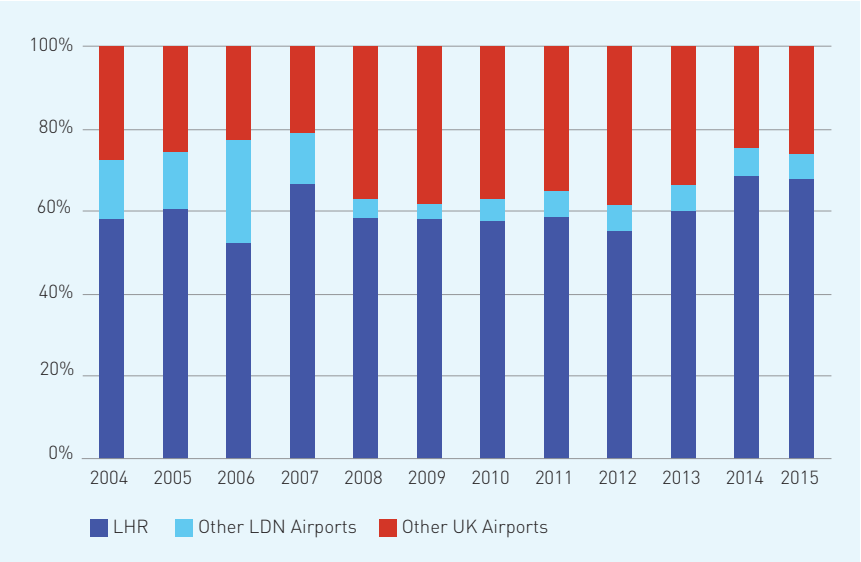
2.1. Value and share of goods trade to non-EU countries travelling through airports in London and the South East

Using the OTS, we have built up a picture of the value and volume of trade passing through London airports which is destined for, or arriving from, non-European Union (EU) countries. The equivalent data (at port level) for trade with EU countries is not currently made available by HMRC.

Exports by volume

The total volume of goods exported from the UK in 2015 was approximately 154 billion kilograms (kg). Non-EU countries accounted for 30% of this total volume exported, that is, 45.7 billion kg. Of this, 479 million kg (1%) was transported by air. Figure 2 below breaks this down by the airports from which the goods were exported.

Figure 2: Proportion of exports to non-EU countries transported by air, through London vs. rest of the UK, by volume



Source: HMRC, Cebr analysis

The share, in volume terms, from the London airport system[2] has been steadily increasing since 2009, after declining significantly as a result of the global recession. Between 2009 and 2015, these volumes have increased by 29%, from 286 million kg to 368 million kg. But this is still below the pre-recession peak of 463 million kg.

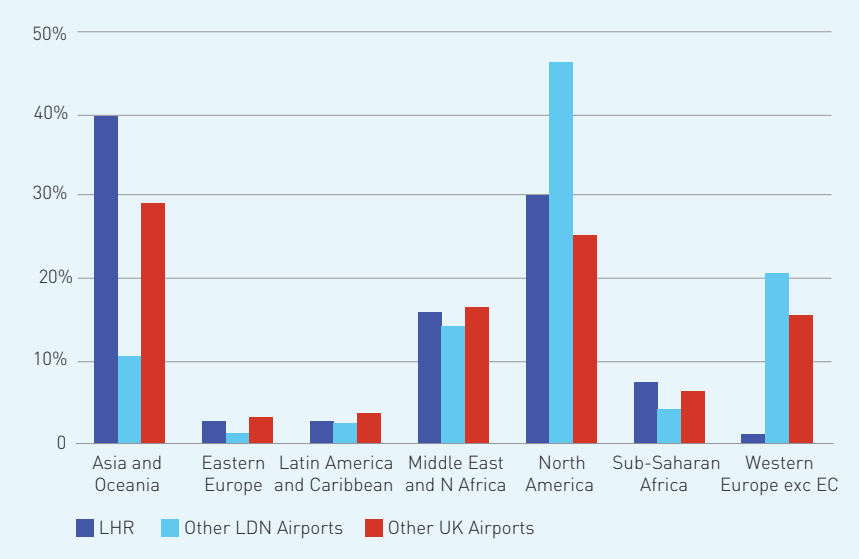
The proportion of exports to non-EU countries from London airports, relative to total exports by air, peaked in 2007 at 79%. After remaining at around 63% in the following years, London's share increased again in 2013 and 2014 (to 67% and 75% respectively) before falling back slightly in 2015 to 74%.

LHR individually accounts for the largest proportion of aviation export trade in both London, and the UK as a whole. In 2015, LHR exports by volume amounted to 68% of total exports by air to non-EU countries.

The proportion of exports which travel by air to different non-EU regions follow broadly the same pattern for London as for all UK airports. Historically, at LHR and at the non-London airports, the largest non-EU export market by volume for goods travelling by air is Asia and Oceania, closely followed by North America (Figure 3). For the other London airports, the largest share goes to North America, followed by Western Europe (excl. the EC) and the Middle East and North Africa.

2 The London Airports system consists of London Heathrow Airport (LHR), London Gatwick Airport (LGW), London Stansted Airport (STN), London Luton Airport (LTN), London City Airport (LCY) and London Southend Airport (SEN).

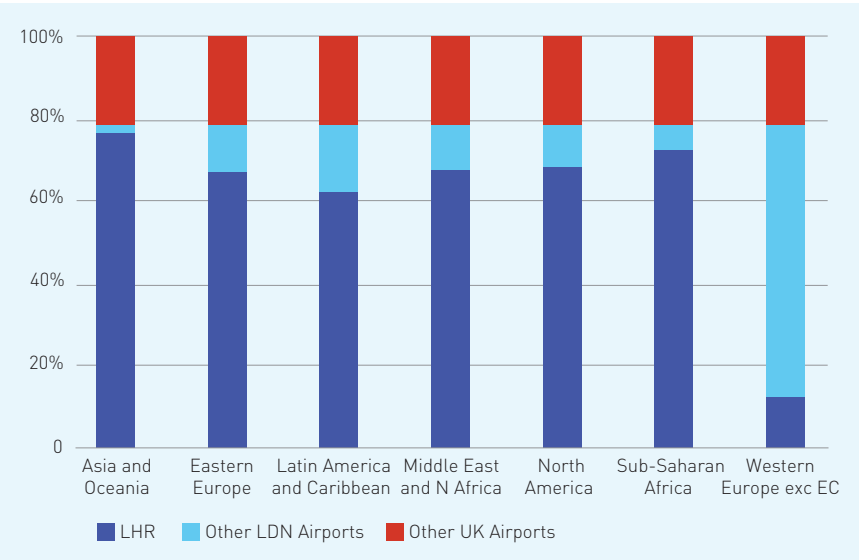
Figure 3: Proportion of UK's air exports by volume, by UK airport and non-EU destination, 2015



Source: HMRC, Cebr analysis

As illustrated in Figure 4 (which provides the non-EU regional breakdown of the 2015 data presented in Figure 2 above, LHR carried 77% (134 million kg) of the total UK goods exports by air to Asia and Oceania, and 72% (25 million kg) of those to sub-Saharan Africa.

Figure 4: Share of exports travelling by air to different non-EU regions by airport, volume



Source: HMRC, Cebr analysis

Exports by value

The total value of goods exported from the UK in 2015 was approximately £305 billion. Non-EU countries accounted for

56% of this, that is, £171 billion. Of this, £87.2 billion (51%) was transported by air.

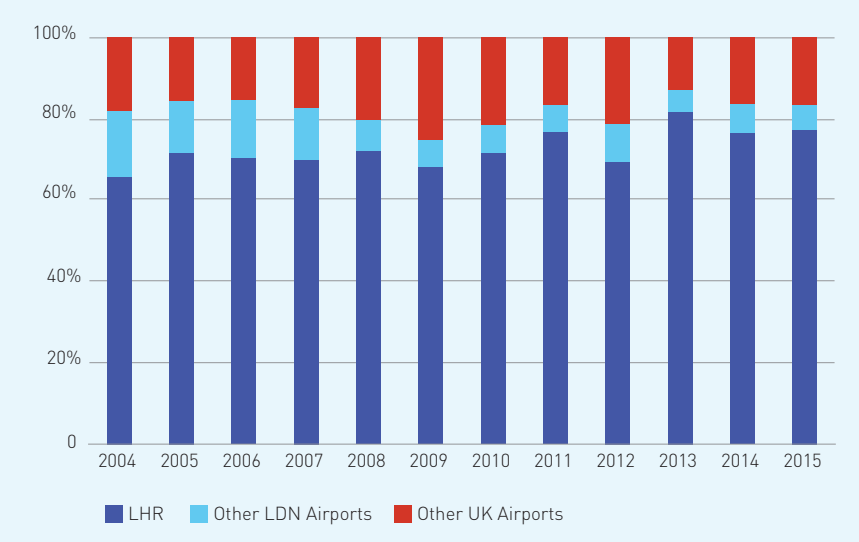
As with the volume of exports travelling through the London airports to non-EU countries, the value has increased rapidly since 2009, although at a faster rate than volume, from £35.5 billion to £72.8 billion in 2015 (representing growth of 105% over the entire period).

The London airports system accounted for more than four-fifths of the total value of exports transported by air to non-EU countries from the UK in 2015 (84%). This is slightly down on 2013 when they accounted for 87%. This is illustrated in Figure 5.

By comparison, LHR accounted for the largest proportion of total exports via air by value from the UK, making up 77% (or £67.3 billion) in 2015. This represents growth of 108% since 2009.

On these measures, 39% of the total value of all UK exports to non-EU countries (£171 billion) were transported through LHR, up by 8 percentage points from its share in 2009.

Figure 5: Proportion of exports to non-EU countries travelling by air, London vs. rest of the UK, by value

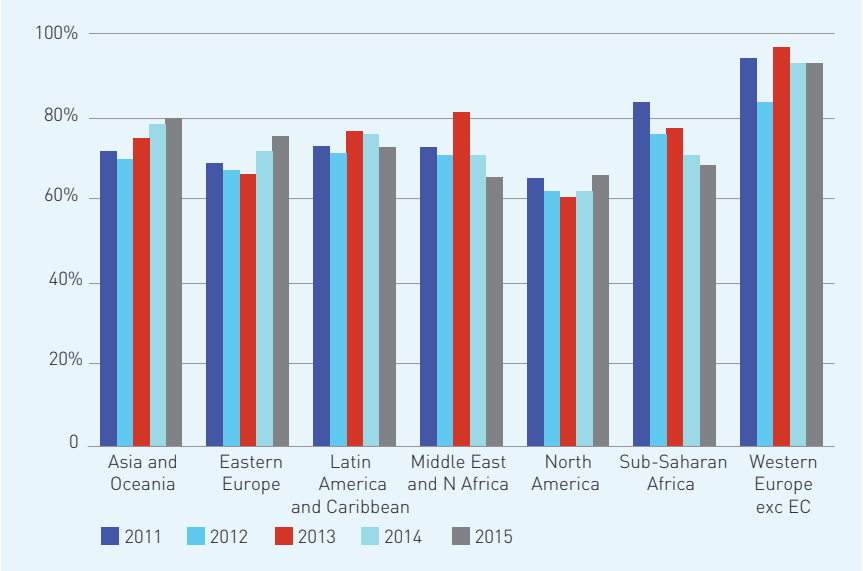


Source: HMRC, Cebr analysis

The majority of exports by value travelling by air from London go to Asia and Oceania. In 2015, the total value of exports to this region from the London airports were worth approximately £23.4 billion. This amounted to 32% of total non-EU exports by value from London's airports, which was £72.8 billion in 2015, as noted at the beginning of this subsection.

As illustrated in Figure 6 below, in value terms LHR accounts for significant shares of goods being transported by air to the various non-EU markets for which UK airport-specific data were available. Figure 6 shows how the 2015 data on LHR in Figure 5 above breaks down across the non-EU regions.

Figure 6: Proportion of UK exports to each non-EU region which travel from London Heathrow Airport, by value



Source: HMRC, Cebr analysis

Imports by volume

The total volume of goods imported to the UK in 2015 was approximately 287 billion kg. Non-EU countries accounted for 61% of this total volume, that is, 174 billion kg. Of this, 775 million kg (0.4%) were transported from non-EU countries to the UK by air.

Imports by volume to London airports amounted to 560 million kg in 2015, 72% of all imports from non-EU countries arriving to the UK via air. The total volume of imports arriving to the UK via air declined significantly as a result of the global financial crisis, but London's share of the total has remained high. This is despite the absolute value of imports by air declining in 2015, both in the UK as a whole, and in London.

The majority of imports arriving through the London airports come from Asia and Oceania, with the total volume of imports arriving at London airports from this region amounting to 257 million kg (46% in 2015). Of these imports, the vast majority arrived at LHR, with imports from this region amounting to 247 million kg (that is, 96% of the total from this region passing through the London airports or 44% of the total volume of imports by air arriving at the London airports from all non-EU regions).

Imports by value

The total value of goods imported to the UK in 2015 was approximately £412 billion. Non-EU countries accounted for 47% of this total value, that is, £192 billion. Of this, £67.1 billion (47%) was transported by air from non-EU countries to the UK.

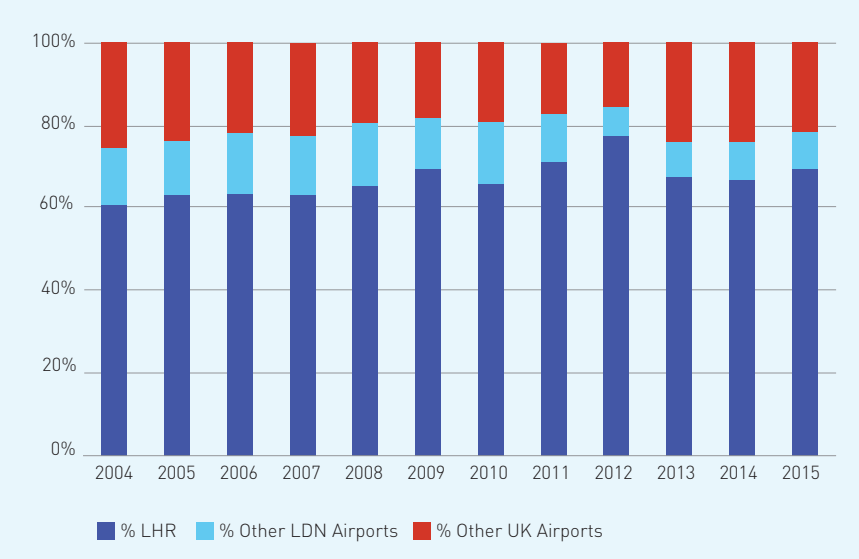
London airports consistently account for the largest proportion of all UK imports from non-EU countries arriving by air. In 2015, they accounted for 78% of the total, with LHR accounting

for 69% – the latter amounting to £52.6 billion worth of goods in absolute terms. This amounts to a share for LHR of over 27% of the value of all imports to the UK from non-EU countries.

Figure 7 illustrates the proportion of the value of imports from non-EU countries arriving via air to the UK which come through the London airports, LHR specifically, and the other airports in the UK.

Underlying the picture in 2015, 97% of UK imports arriving by air from Sub-Saharan Africa arrived at London's airports, with 99% of the total at London airports arriving at LHR.

Figure 7: Proportion of imports by value which arrive by air at the London airports vs. other UK airports



Source: HMRC, Cebr analysis

The majority of imports from non-EU countries arriving by air to the UK come from North America (38%). The story is similar looking at the London airports specifically, with 36% of total imports by value from non-EU countries at London airports coming from North America. In 2015 imports by air to London airports from North America were worth £28.8 billion.

2.2. Goods trade from London and the South East

Non-EU exports

According to HMRC's regional trade statistics (RTS), in 2015, approximately 52% of the UK's exports by value were destined for non-EU countries (amounting to £146 billion).[3] In that year, of all the exports from the UK headed for non-EU countries, the

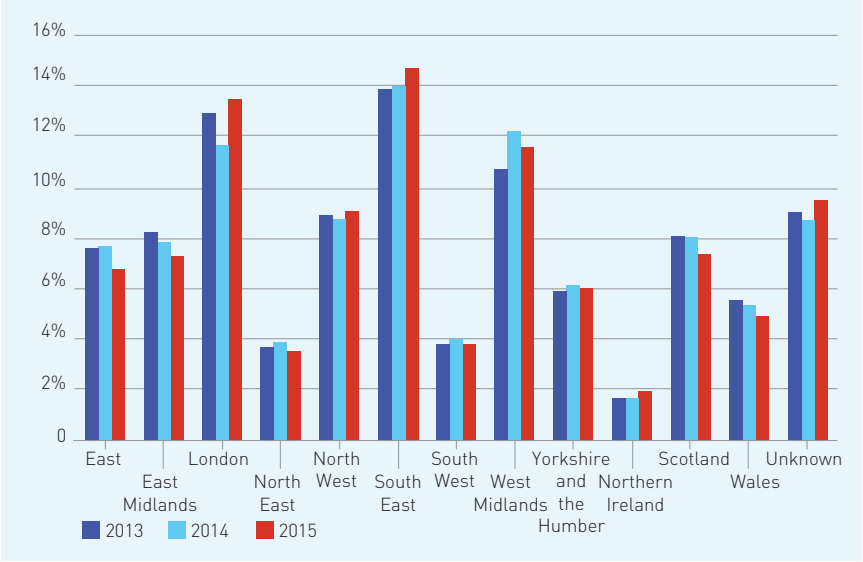
3 We note the difference between this number and the £171 billion noted in Subsection 2.1 ('Exports by value'). The lower £146 billion is taken from the Regional Trade Statistics (RTS) dataset, which excludes certain items that are included in HMRC's Overseas Trade Statistics (OTS). The items excluded from RTS are, specifically, trade in non-monetary gold and what are called 'late response estimates', an estimate of exports by businesses that have responded too late to the relevant survey to have the data included in RTS. See HMRC (2016), "Regional Trade Statistics: Fourth Quarter 2015", London. Available at www.uktradeinfo.com/Statistics/RTS/Pages/default.aspx

majority were from businesses based in England (76%), and over a quarter (28%) came from the economies of London and the South East.[4] This means that 48% originated from businesses located in the North, Midlands and South West of England and that 24% originated in Wales, Scotland and Northern Ireland.

In absolute terms, the value of exports from the South East amounted to £21.5 billion (15%) in 2015, the highest value since 2012, when exports from this region amounted to £22.5 billion. In 2015, the value of exports from London amounted to approximately £19.7 billion (13%). A significant amount of exports by value also originated in the West Midlands in the same year – £12.0 billion or 12% of all UK exports destined for non-EU countries.

The proportion of total UK exports to non-EU countries originating from businesses in each of the UK regions has remained reasonably stable over time, as illustrated in Figure 8.

Figure 8: Proportion of exports to non-EU countries by UK region, by value 2013–15



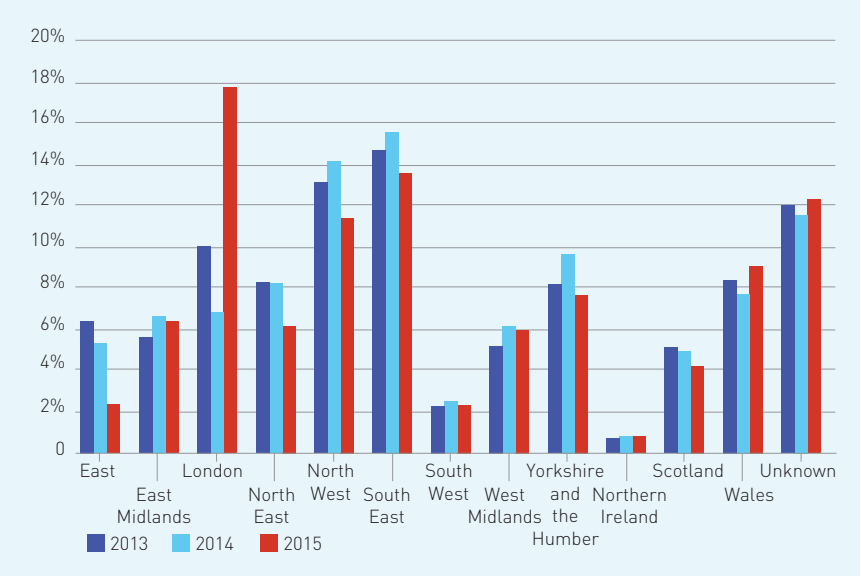
Source: HMRC, Cebr analysis

In volume terms, the vast majority of exports to non-EU countries in 2015 were from businesses based in London (18% of the UK total and 24% of the England total). This was a marked increase of 177% on 2014, increasing from 2.9 million tonnes to 8.1 million tonnes. This was primarily driven by a significant increase in the volume of exports of petroleum, petroleum products and related materials to South Korea. Over the same period, the volume of exports originating in the South East declined by 0.5% to 6.2 million tonnes. Exports from that region have also seen a more general decline over time.

4 The Regional Trade Statistics (RTS) take data primarily from Customs systems for non-EU trade and the Intrastat survey for EU trade. HMRC does not receive information in respect of goods that move wholly within the UK, nor in intangibles and services such as banking or tourism. In RTS, trade is mainly allocated to regions according to the postcode associated with a company's VAT registration.

74% of exports from the UK to non-EU countries originated in England in 2015, amounting to 33.6 million tonnes, a 5% increase since 2014. Figure 9 illustrates the share of the volume of UK exports originating in each of the regions heading for non-EU destinations over the past three years.

Figure 9: Proportion of exports to non-EU countries by originating UK region, by volume, 2013–15



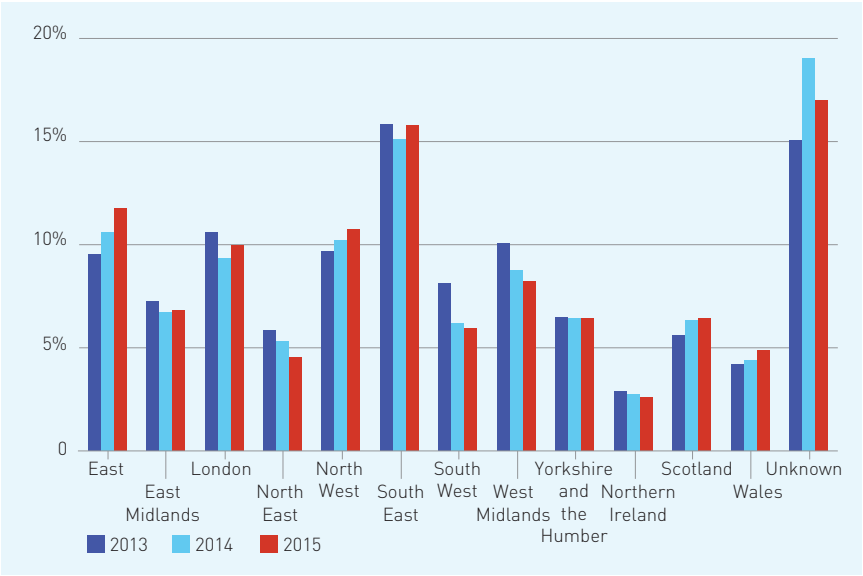
Source: HMRC, Cebr analysis

Exports to the EU

By value, the South East and London are the originating destination for a large proportion of the UK's exports to the EU. In 2015, these two regions were the originating location for 24% of all UK exports to the EU by value. However, exports originating in the South East were noticeably higher than those originating in London, £19.0 billion (or 14%) as opposed to London's £12.7 billion (or 10%) in 2015.

As with non-EU export destinations, the proportion of exports originating in different regions has remained fairly stable over the past five years. However, there are a few regions that have seen a more noticeable decline in the value of goods originating there, as shown in Figure 10. Most noticeably, the North East, South West and the West Midlands.

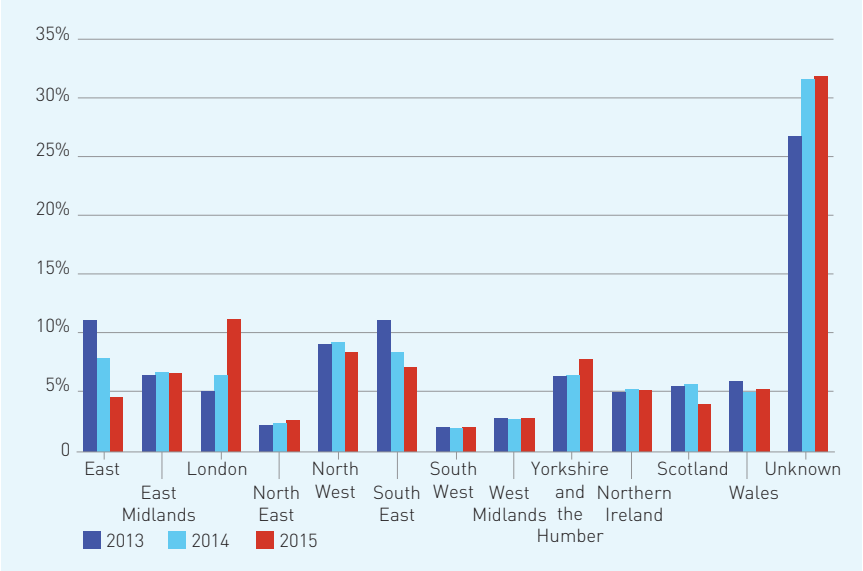
Figure 10: Proportion of exports to EU countries by originating UK region, by value, 2013–15



Source: HMRC, Cebr analysis

By volume, 11% of exports to the EU originated in London in 2015 (12.2 million tonnes), a 71% increase on 2014. Its share has increased substantially from 2013, when it accounted for just 5% (5.6 million tonnes) of total UK exports to EU countries in that year. Exports by volume from the South East to the EU comprised a smaller portion of the total, accounting for just 7% in 2015. This is significantly down from 11% in 2013. In absolute terms, this is a decline in volumes from 12.3 million tonnes to 7.7 million tonnes.

Figure 11: Proportion of exports to EU countries by originating UK region, by volume, 2013–15



Source: HMRC, Cebr analysis

However, in volume terms, there were a significant amount of exports from businesses based in the North West and Yorkshire and the Humber (both 8% of the UK total). Furthermore, businesses in the East used to account for more of UK exports to the EU than London (11% in 2013) but has since declined to just 5% of the total.

2.3. Trade from other regions passing through London

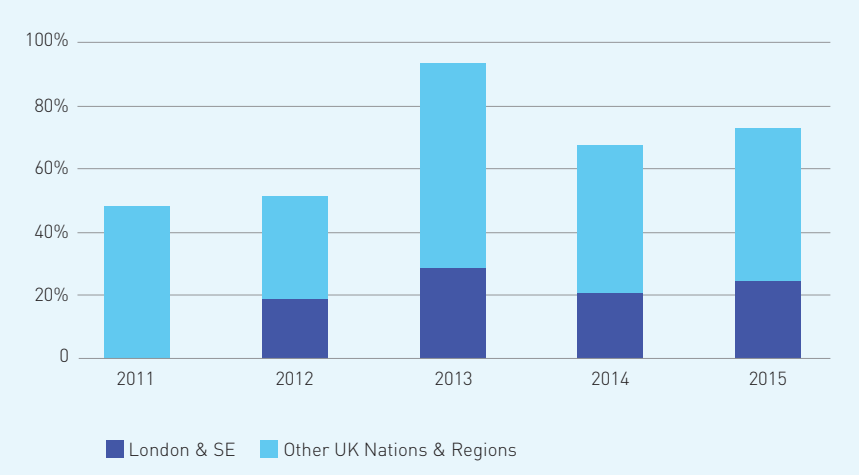
Combining the analysis from the earlier two sub-sections, we have estimated the value of exports to non-EU countries from other UK regions which travel through the London airports. Our analysis is based on the simplifying, yet reasonable, assumption that all trade from London and South East regions passes through the London airport system. We focus the analysis on exports by value, given that high value goods are invariably transported by air and the more representative picture that it paints.

Goods worth approximately £41.2 billion were exported from businesses based in London and the South East to non-EU countries in 2015. By applying the proportion of all exports that travel via air to non-EU destinations (by value), based on data from HMRC, we estimate that £24.6 billion worth of exports from London and the South East travelled through London airports.

However, HMRC records £72.8 billion worth of goods being exported through the London airport system to non-EU destinations in 2015. On this basis, it is clear that a significant proportion of the total exports that travel via air from the other UK regions to non-EU countries pass through the London system.

Based on our estimate of the amount from London and the South East, the residual of £48.2 billion of the exports by value passing through the London airports (over 60% of the total) originate from other UK nations and regions in 2015, as illustrated in Figure 12.

Figure 12: Exports by value travelling through the London airports, by originating regions, £ billion



Source: HMRC, Cebr analysis

This very clearly highlights the importance of runway capacity in London and the South East in supporting exporting businesses from elsewhere in the UK, as well as London and the South East.

2.4. Goods trade across product categories

In this section we consider the types of goods that are transported via air to non-EU continents. The equivalent data for trade with EU countries is not available.

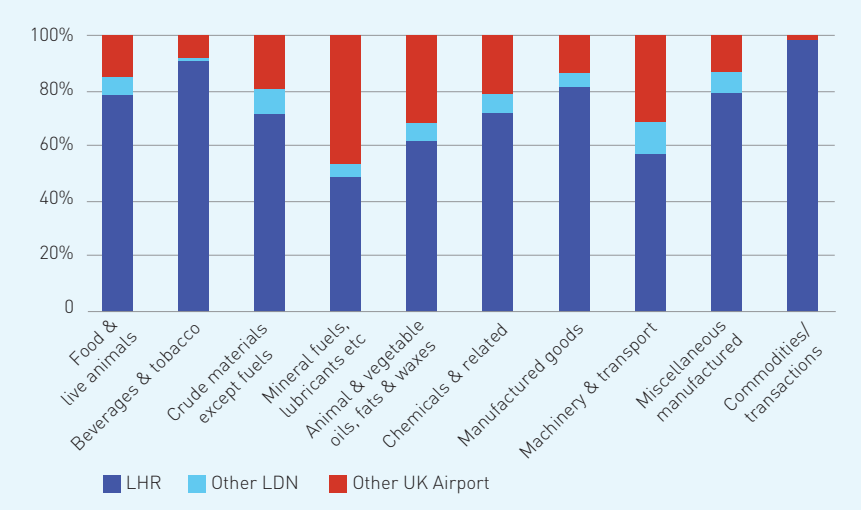
Exports by value

For the UK as a whole, across all ports, the largest export by value in 2015 was machinery and transport equipment.[5] The value of these exports amounted to £62.4 billion in 2015. However, for the London airports, the largest export by value was commodities/transactions not classified elsewhere,[6] which amounted to approximately £25.3 billion in 2015. Exports through the London airports in this SITC category accounted for 95% of the UK total (through all ports).

The other main categories of export transported through the London airports include machinery and transport equipment (£18.6 billion, 62% of the UK total) and miscellaneous manufactured articles (£14.3 billion, 30% of the UK total).

The vast majority of exports transported via the London airport system leave through LHR. This is clearly illustrated in Figure 13 below, in which LHR accounts for significant shares of total exports by air under all of the SITC categories and 99% in the largest category (commodities/ transactions not classified elsewhere).

Figure 13: Total aviation exports by value travelling by air in 2015, by SITC



Source: HMRC, Cebr analysis

5 This category includes power generating machinery and equipment, machinery specialised for particular industries, metalworking machineries, general industrial machinery, office machines, telecoms and sound recording, road vehicles, other transport equipment.

6 This category includes special transactions and commodities not classified according to kind; coin (other than gold coin) not being of legal tender; gold, non-monetary (exc gold ores and concentrates) and gold coin not of legal tender; military arms and ammunition.

As highlighted previously, the majority of exports from LHR to non-EU destinations travel to Asia and Oceania. The most sizable amount of exports to this continent are of commodities/transactions not classified elsewhere (£8.4 billion in 2015), followed by machinery and transport equipment (£6.0 billion). However, exports from LHR of chemicals and related products mostly go to North America, with their value totalling £5.2 billion in 2015.

Exports by volume

By volume, the largest export category across all UK ports is mineral fuels, lubricants and related materials, with 18.5 billion kg exported in 2015. However, when considering exports carried by air, the most significant categories are machinery and transport equipment (151.2 million kg) and miscellaneous manufactured articles (129.7 million kg).

London's airports transport over half of the exports which travel via air in each SITC category, aside from crude materials. Most significantly, London airports transported 86% of food and live animal exports by volume (70.3 million kg) and 84% of miscellaneous manufactured articles. LHR accounts for over 90% of the exports for each SITC category travelling by air from London, highlighting LHR's importance for exporting a variety of different goods, not just high-value items.

From LHR, the largest volume of exports are destined for Asia and Oceania. Of these exports, the most significant in volume terms were miscellaneous manufactured materials (40.7 million kg) and machinery and transport equipment (39.1 million kg) in 2015.

2.5. UK trade in services

Aviation is not only important for trade in goods, it also plays a major role in trade in services, helping businesses to establish and maintain fruitful business relationships. Being an island nation, aviation is also crucial in supporting tourism and labour supply, creating the conditions necessary (the ability to fly to visit friends and relatives) to incentivise productive inward migrants to work in the UK.

The UK has a very strong services sector, including financial services, insurance and the creative industries. These businesses are highly dependent on fast, timely business travel enabling face-to-face contact both with existing clients, and when establishing new ones. This led to the Airports Commission highlighting that the services sector is particularly reliant on aviation, as the industry is dominated by highly-globalised firms which serve an international client base.[7] This is reflected in the high degree of expenditure related to aviation within these sectors.

According to the Pink Book, UK services exports have been steadily increasing over time, with a significant portion of these exports coming from London, as illustrated by Figure 14. In 2014,

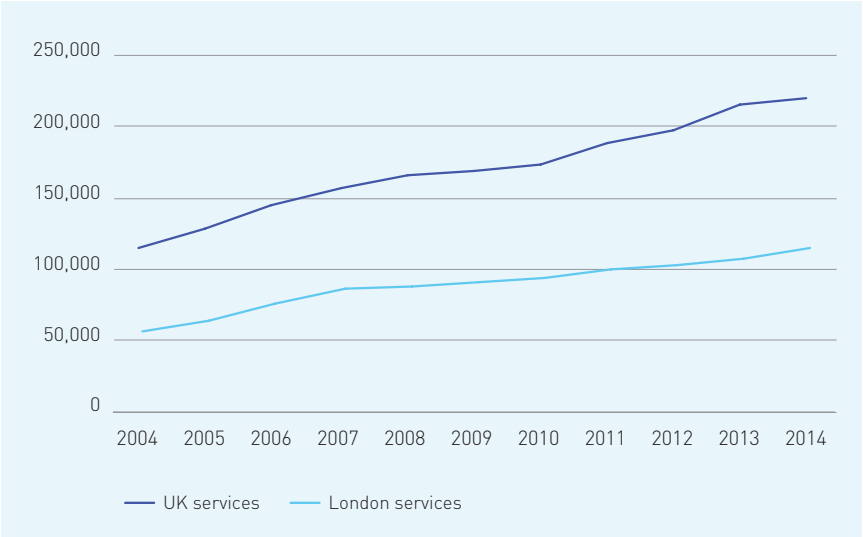
7 Airports Commission (March 2013), 'Discussion Paper 02: Aviation Connectivity and the Economy'. Available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/138162/aviation-connectivity-and-the-economy.pdf

services exports from the UK amounted to £220 billion, with London's services exports accounting for over half of this, approximately £115 billion. For the UK as a whole, services exports have increased steadily over time, from £129 billion in 2004. The majority of exports come from financial and other business services, amounting to £49.2 billion and £57.1 billion in 2014, respectively.

Given London's high level of services exports, it is essential that there are strong aviation links in place to support the city's services industries. Furthermore, as some international routes are only served by LHR, it is likely that for service-based businesses throughout the UK, without strong aviation links from London, it would be difficult for them to trade abroad.

Meanwhile, services imports have not grown as strongly over the same ten year period. In 2014, total services imports to the UK amounted to £130.6 billion, a 2% decrease on 2013. The UK consistently runs a trade surplus in services. Strong aviation links are essential to ensure that the UK's strength in this area continues.

Figure 14: London and UK services exports, £m, 2004–14



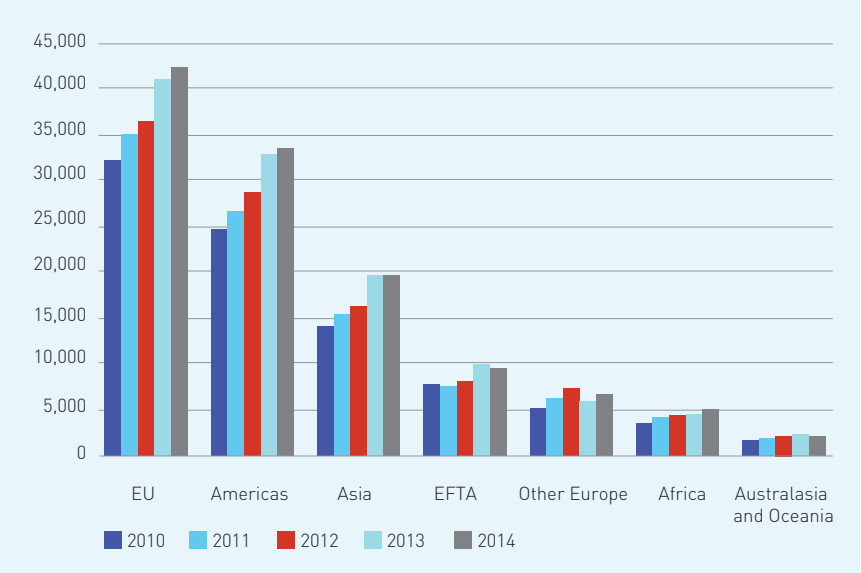
Source: ONS Pink Book, GLA Economics

According to ONS International Trade data,[8] total services exports to the USA far exceeded those to any other country in 2014. In total, services exports to the USA amounted to £27.8 billion in that year, the largest amount of services exports to an individual country. Total services exports to the EU amounted to £42.5 billion in 2014, equating to 35% of the UK total.

Figure 15 illustrates the absolute amount of UK services exports flowing to each continent and how these amounts have changed over the past five years. Over time, the proportion of services exports to each continent has remained fairly constant, with exports to the EU consistently amounting to around 35% of the total, and the Americas 28%.

8 Note that in this dataset, trade in services excludes travel, transport and banking.

Figure 15: UK services exports, by destination continent, £m



Source: ONS, Cebr analysis

Similarly to exports, the majority of services imports come from Europe, specifically the EU. Services imports from there amounted to £24.6 billion in 2014. This was followed by imports from the Americas, which amounted to £14.9 billion, with a significant portion of this comprised of the US (£12.9 billion).

2.6. Foreign direct investment

Aviation is also an important, and well-recognised, contributor to encouraging FDI. The air connections made between cities and markets can produce an important element of the infrastructure required to attract FDI. Previous research by Banno, Mutinelli & Redondi (2011)[9] suggests that FDI increases by 50% after a first direct air connection to a foreign region is established.

The link between aviation connectivity and FDI relates in large part to the requirement to move staff around the globe, thereby facilitating the transfer of knowledge. Aviation connectivity helps inward investment by creating a more favourable environment for foreign firms and their workers. A survey by the European Cities Monitor found that transport links (including predominantly by air) are an essential factor in the location decision of 52% of companies.[10] Oxford Economics (2013)[11] has also highlighted the importance to businesses of considering aviation connectivity in investment and location decisions. Increased aviation connectivity also enables UK firms to more easily invest outside of the UK.

9 Banno, M., Mutinelli, M., & Redondi, R. (2011). 'Air connectivity and Foreign Direct Investments, the economic effects of the introduction of new routes'.
10 Heathrow Airport Ltd, (2013), "Airports Commission Discussion Paper 02: Aviation Connectivity and the Economy". See www.heathrow.com/file_source/Company/Static/PDF/Companynewsandinformation/Aviation_connectivity_and_economy.pdf. The highest ranking factor is generally the availability of a highly-skilled workforce.
11 Oxford Economics, 2013, "The Economic Value of International Connectivity".

For the UK, FDI is attracted to regions such as London for reasons including the availability of a pool of skilled labour and the quality of its aviation links. It has been estimated that FDI contributes more than £52 billion each year to London's economy.[12] In 2014/15, the UK attracted 1,988 FDI projects, an increase of 12% on the previous years. This strong performance saw the UK's inward FDI stock i.e. the value of accumulated FDI in the UK, exceed £1 trillion for the first time. This is the highest amount of FDI in a single country in Europe, and the third highest in the world behind the US and China.

Statistics from UKTI show that FDI into the UK came from more than 70 countries, including emerging markets. However, the majority of the UK's inward investment continues to come from the US, with a total of 564 projects in 2014/15, followed by France and India.

The US investment position in the UK amounted to £253.0 billion in 2014, whilst the EU countries as a whole had an investment position amounting to £496 billion in the same year.

12 The Mayor of London's Response (2011), 'Developing a sustainable framework for UK aviation: scoping document'. Available at: http://content.tfl.gov.uk/developing-a-sustainable-framework-for-uk-aviation-scoping-document-full.pdf

THREE
The relationship between trade, FDI and air transport links

This section of the report presents the findings of our econometric analysis which aimed to establish the relationship between aviation connectivity, trade and investment flows in the UK. We begin by detailing the approach taken to the analysis before presenting the results.

3.1. Mature vs. emerging markets

In developing our econometric model to assess the relationship between aviation connectivity, trade and investment flows, we drew on a number of different data sources. We relied on HMRC to obtain UK goods trade data, Eurostat's Balance of Payments database for trade in services data, and the Civil Aviation Authority (CAA) for data on flights, passengers and routes. The CAA data spans a ten-year period from 2002 to 2012, the time period that this part of our study examines. Although the period of analysis is limited, there are good reasons for choosing one that ends in 2012. These are:

- *The 'dither clock'*: The analysis in this section leads ultimately to the 'dither' clock developed in Section 5. This imagines trade growth being spread smoothly and continuously through time, and considers what is potentially being lost in trade terms by delaying the runway capacity decision. The Airports Commission was established in 2012, and this represents the start date of the dither clock – the year the Government decided to create a lengthy commission rather than reach a decision itself.
- *Minimising distortions of the relationships*: with LHR operating at capacity, LGW close to capacity, and the fact that new routes tend to push others out, it made sense to go back in time a little to minimise the potential for routes dropping in and out to distort the relationships we are endeavouring to establish.

In developing the econometric model, we considered the number of routes, flights and passengers travelling between the

UK and two groups of ten partner countries, referred to in this report as the 'mature-trade' markets and the 'emerging markets' (see Table 4 for the list of countries included in each). The former group refers to the ten partner countries with which the UK has the most mature trading relationships in goods and services. This was identified through an examination of historic trends in trade between the UK and its partner countries. The latter group refers to ten economies that are among the fastest growing in the world, and according to the IMF's and Cebr's own forecasts, are expected to contribute an increasing proportion of the world's economic growth over the next 5 years.

Table 4: UK trade partner countries, defined as 'mature-trade' markets or 'emerging markets'

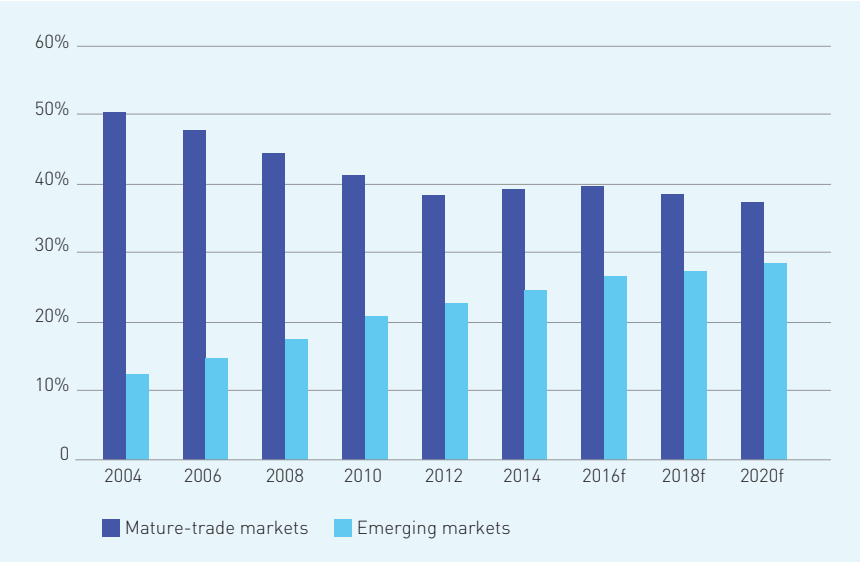
Mature-trade markets	Emerging markets
Belgium	**Poland**
France	**Turkey**
Germany	**South Africa**
Ireland	**Nigeria**
Italy	**Mexico**
Netherlands	**Brazil**
Spain	**India**
Switzerland	**China**
USA	**Malaysia**
Hong Kong	**Thailand**

Source: Cebr analysis

3.2. The growing importance of aviation links to emerging markets

It is increasingly important for the UK to be well connected with emerging markets. In 2014, the mature-trade markets accounted for almost two-fifths (39%) of the world's GDP, compared with the emerging markets group, which contributed 25%. By 2020, the mature-trade markets' contribution to world GDP is expected to decline to 37% while the emerging markets' share is estimated to rise to 28% (as illustrated by Figure 16). We estimate that emerging markets' contribution to world GDP could surpass mature-trade markets' contribution to world GDP by as early as 2029.

Figure 16: Mature-trade markets' and emerging markets' share of global GDP, 2004–2020



Source: Cebr analysis

As the balance of economic strength and significance shifts away from the mature-trade markets towards the emerging markets, strong connectivity between the UK and these emerging markets will become imperative for the UK to capitalise on new export and investment opportunities.

3.3. Connections, trade and investment with mature vs. emerging markets

Trade

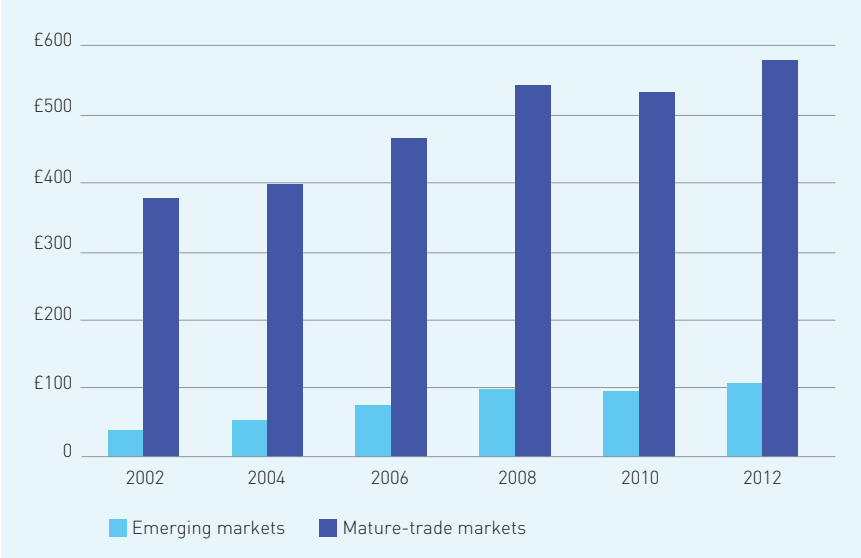
The value of trade in goods and services between the UK and the emerging markets are comparatively lower than the value of trade between the UK and the mature-trade markets (Figure 17). The total value of trade in goods and services between the UK and the mature trade markets reached approximately £580 billion in 2012, this includes exports and imports.

By comparison, the value of trade between the UK and the emerging markets was almost 5 times lower, totalling approximately £107 billion. Despite a time lag in the fall in trade following the financial crisis in 2008, by 2012 the value of UK trade between both groups of markets had surpassed 2008 levels.

Growth in trade between the UK and countries such as South Africa and India (93% and 88% respectively between 2002 and 2012) has driven trade with the emerging markets group. Such high growth rates are a reflection of the low base from which UK trade with these countries is increasing from. By comparison, while trade growth between the UK and mature-trade economies is comparatively low, this is a reflection of the much

higher base from which it is increasing and the maturity of the trade relationships involved.

Figure 17: Total trade (exports and imports) in goods and services between the UK and the emerging markets group and the mature-trade markets group, (£ billions), 2002–2012



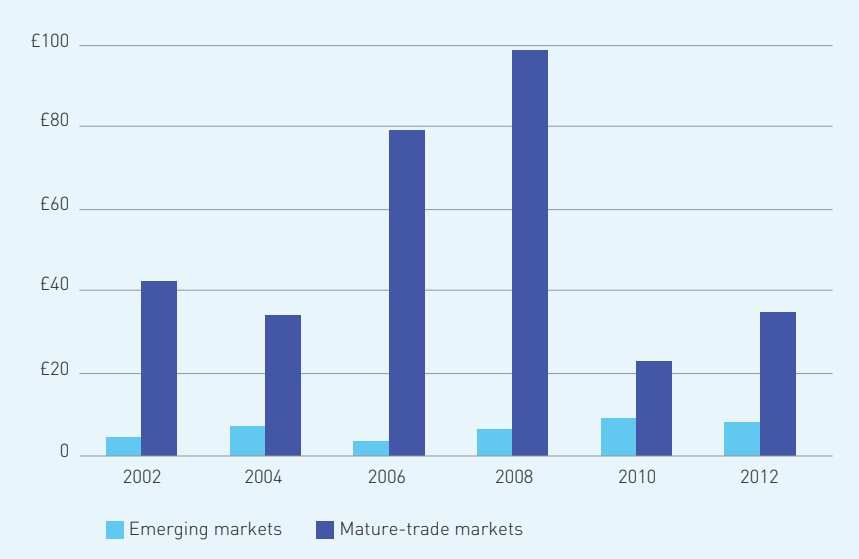
Source: HMRC, Eurostat, Cebr analysis

Foreign direct investment

In 2012, the value of total (inward and outward) FDI flows between the UK and the mature-trade markets was approximately £34.9 billion (Figure 18). By comparison, in the same year, the value of total investment between the UK and the emerging markets was almost 4 times lower, at £8.0 billion. Similarly to the value of trade between the UK and mature-trade markets, by 2012 the value of total investment flows had yet to reach the levels experienced in 2008. In contrast, the value of total investment flows between the UK and emerging markets in 2012 had exceeded pre-financial crisis levels.

Furthermore, the value of investment flows between the UK and the mature markets declined by almost 77% between 2008 and 2010. Over the same time period, investment between the UK and the emerging markets increased by 40%, and only declined relative to 2010 levels in 2012. This trend could be indicative of the UK's shifting focus of investment opportunities away from the mature-trade economies and towards the emerging markets, in particular after the financial crisis, which arguably affected Europe and the US more immediately than it affected the emerging markets.

Figure 18: Total (inward and outward) FDI flows between the UK and emerging markets and mature-trade markets each, (£ billions) 2002–2012



Source: OECD, Cebr analysis

Aviation connections

In 2012, approximately 83,000 flights travelled between the UK and the emerging markets. By contrast, in the same year almost 11 times more flights (904,000) travelled between the UK and the mature-trade economies. Figure 19 illustrates the higher number of connections between the UK and the mature economies and the emerging markets, respectively.

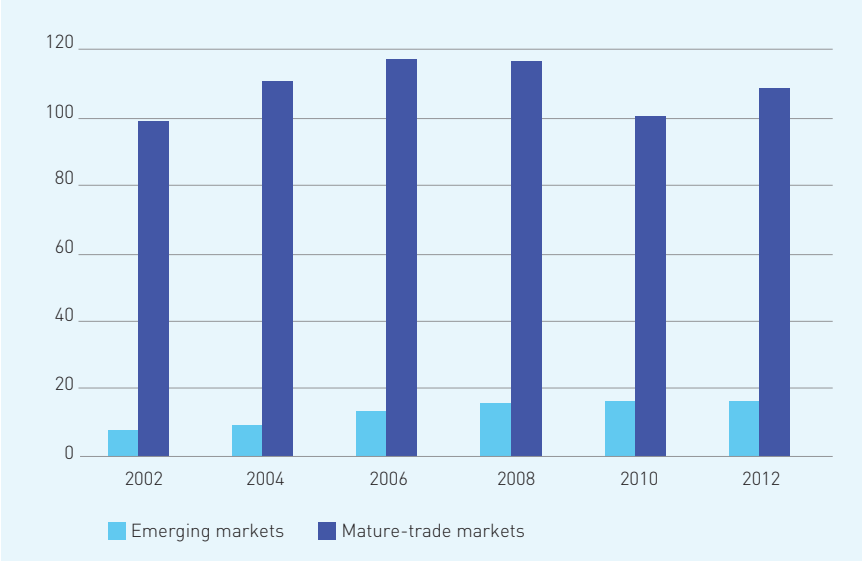
Figure 19: Total flights between the UK and emerging markets and mature-trade markets each, (thousands) 2002–2012

Source: CAA, Cebr analysis

Between 2002 and 2012, connections between the UK and both groups of markets followed a similar pattern to that of the associated levels of trade and investment. The number of flights travelling between the UK and both mature-trade and emerging groups fell following the financial crisis, and by 2012, levels had yet to reach those experienced before the global economic slowdown in 2008.

The numbers of passengers travelling between the emerging and mature-trade economies followed a similar trend to that of the number of flights between 2002 and 2012 (Figure 20). However while the number of passengers travelling between the UK and mature-trade economies peaked in 2006 (117 million), the number of passengers travelling between the emerging markets and the UK has increased steadily since 2002.

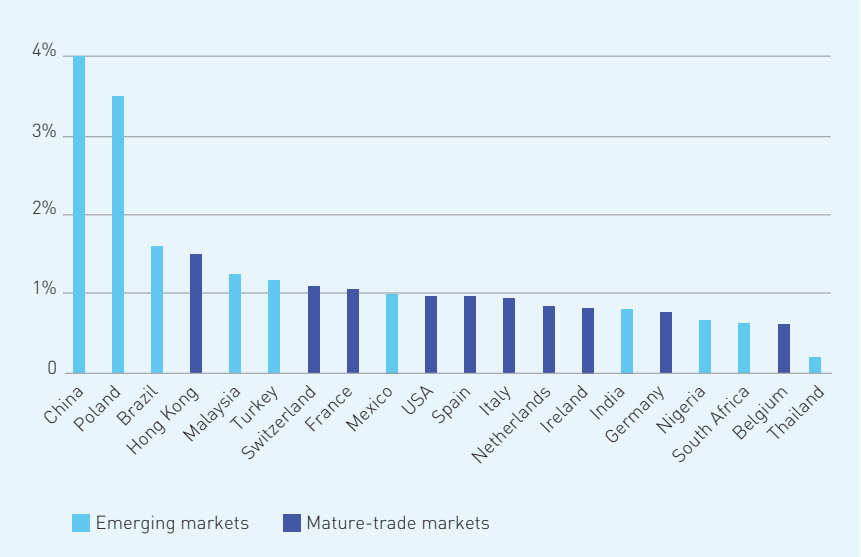
Figure 20: Total passengers travelling between the UK and emerging markets and mature-trade markets, (millions) 2002–2012



Source: CAA, Cebr analysis

Figure 21 illustrates the growth in the number of new routes between the UK and the emerging markets and mature-trade economies. Following the trajectory of China's economic and export strength, the number of new routes between China and the UK expanded by 4.0% between 2010 and 2012. Several emerging markets feature at the top end of the scale, such as Poland and Brazil, where the number of new routes to the UK grew by 3.5% and 1.6% respectively.

Figure 21: Percentage growth in the number of routes between the UK and emerging markets and mature-trade markets between 2010 and 2012



Source: CAA, Cebr analysis

3.4. The relationship between aviation connectedness and trade and investment

In undertaking the analysis, we chose to use a panel data econometric modelling approach.[13] This enabled us to capture trends in the relationship between air links, and trade and investment across both time and between countries. By analysing the data, we identified a strongly statistically significant relationship between total trade and an 'aviation connectedness' variable constructed as the product of routes, flights and passengers. We also identified a statistically significant relationship between this variable and total Foreign Direct Investment (FDI) flows.[14]

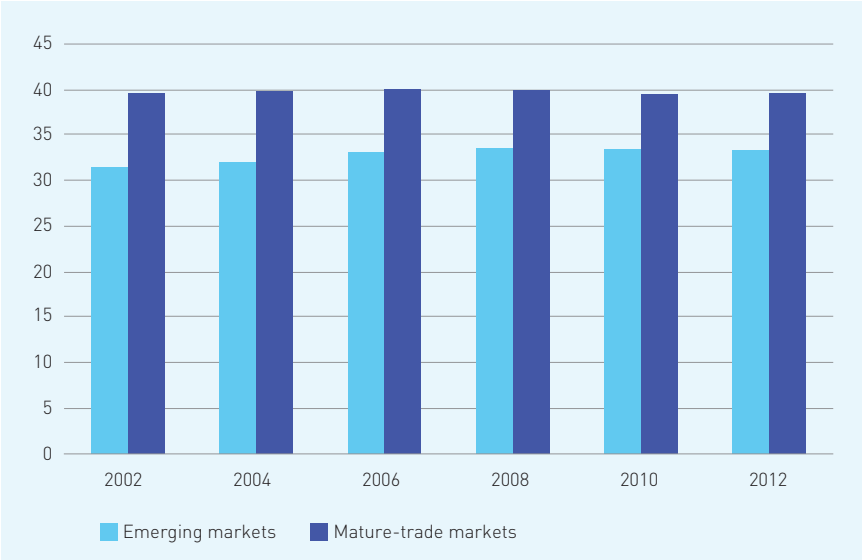
Our econometric analysis of the data identifies a statistically significant relationship between the number of flights and the level of total trade, and the number of flights and the level of total FDI. We estimate that a 10% increase in the number of flights between the UK and the mature-trade economies is each associated with a 1.2% increase in UK trade in goods and services, and a 0.7% increase in FDI (all other factors remaining constant).

The number of flights, passengers and routes between the UK and the emerging markets and the mature-trade markets is illustrated in Figure 22.[15] While in absolute terms the level of connectedness between the UK and the mature-trade markets remains significantly higher than between the UK and the

13 Details on the econometric approach used in this study can be found in the Appendix.
14 FDI flows denote the new investment made during the year, and capture equity capital, reinvested earnings and the borrowing and lending of funds.
15 Throughout the remainder of this report we refer to the product of the number of flights and the number of passengers (effectively all passengers) and routes as a measure of connectedness.

emerging markets, Figure 22 suggests that this trend may not continue in the coming years. This presents our connectedness variable on a logarithmic scale, and illustrates the narrowing of the gap in the UK's connectedness with the emerging markets group and the mature trade markets group.

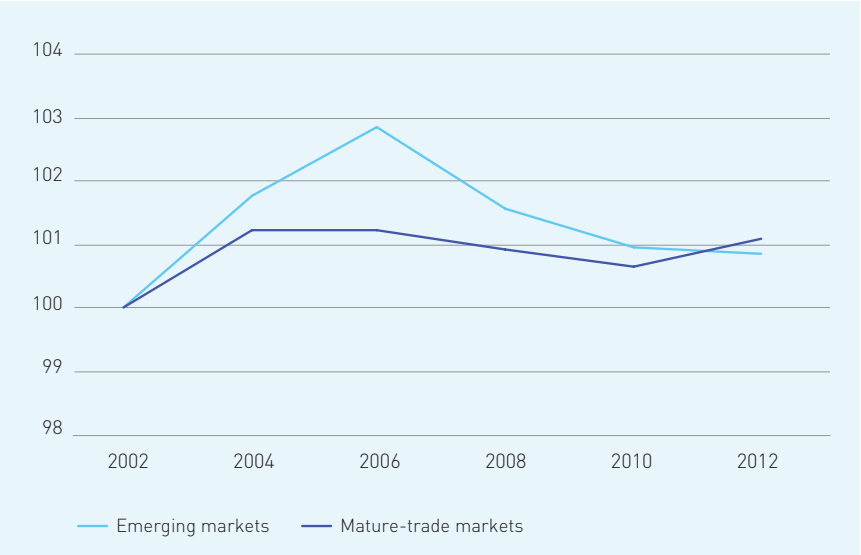
Figure 22: The logarithm of the number of flights, passengers and routes between the UK and emerging markets and mature-trade markets respectively, 2002–2012



Source: CAA, Cebr analysis

Figure 23 illustrates that between 2002 and 2012, growth in the level of connectedness between the UK and the emerging markets was, on average, higher than the average growth between the UK and mature-trade markets, as illustrated in Figure 22. The low growth rates in connectedness with the mature-trade markets reflect, as noted earlier, the high base of existing air links from which they are growing. This is in contrast to the connectedness with emerging markets, where the higher growth rates reflect the fact that each additional air link represents a larger proportion of the much lower base of existing connections.

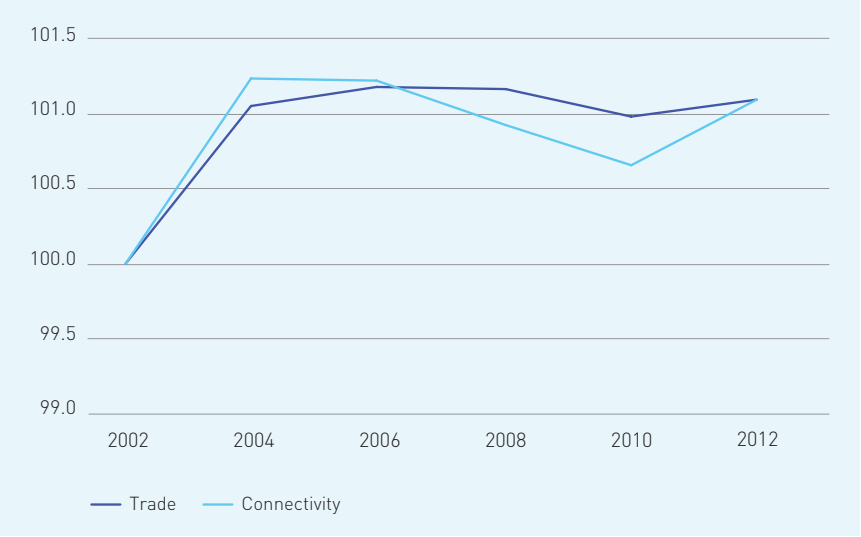
Figure 23: Growth of flights, passengers and routes between the UK and emerging markets and mature-trade markets respectively, (index = 2002), 2002–2012



Source: CAA, Cebr analysis

While bi-lateral trade is driven by a range of factors such as each country's economic growth, labour costs, historical ties and proximity, a highly positive relationship between UK trade with the mature-trade markets and connectedness with those markets is illustrated in Figure 24.

Figure 24: Growth in total UK trade with mature-trade markets and growth of total flights, passengers and routes, (2002 = 100)

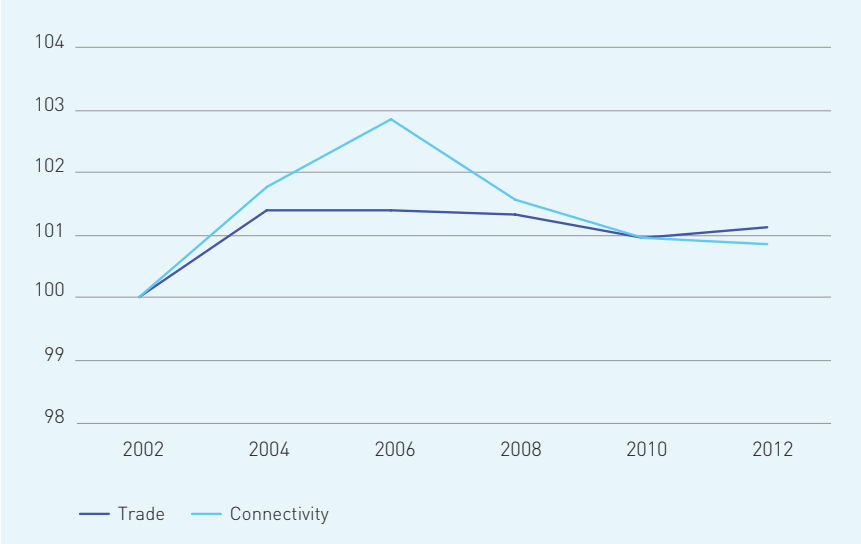


Source: HMRC, CAA, Eurostat, Cebr analysis

A positive relationship between the UK trade with the emerging markets and connectedness with those markets can be observed in Figure 25. Growth in trade and connectedness between the UK and the mature trade markets appear relativity stable, reflecting

the established relationship between the UK and individual mature-trade partners (Figure 24). By comparison, growth in connectedness and growth in trade between the UK and the emerging markets appears to be slightly more volatile (Figure 25).

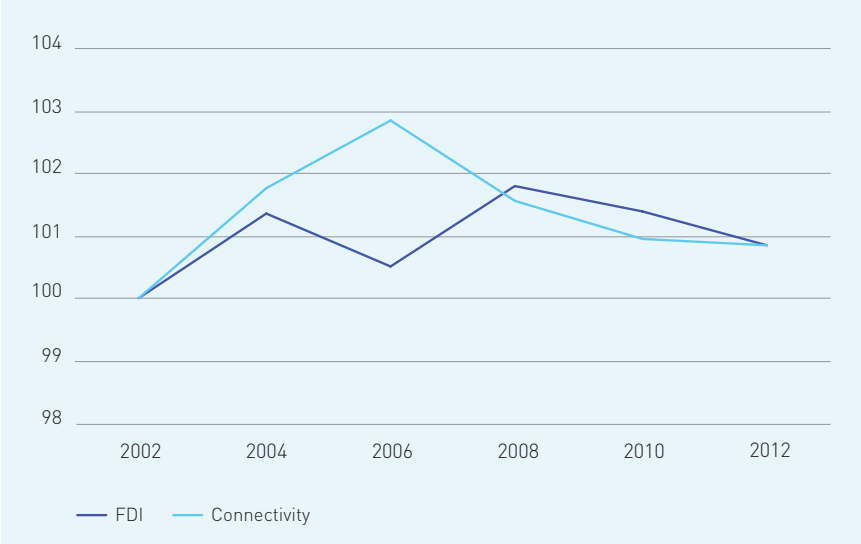
Figure 25: Growth in total UK trade with emerging markets and growth of total flights, passengers and routes, (2002 = 100)



Source: HMRC, CAA, Eurostat, Cebr analysis

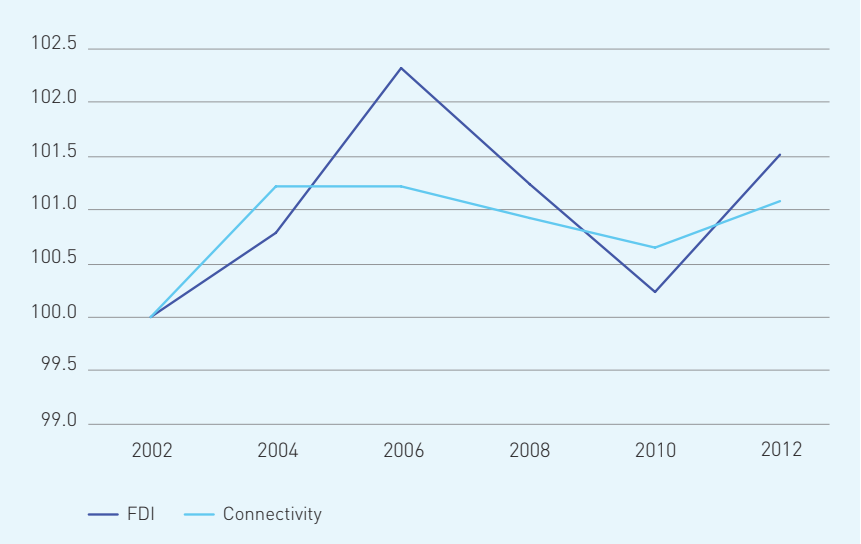
The relationship between total UK FDI and connectedness, as illustrated by Figure 26 and Figure 27 for each of the emerging markets and mature-trade markets, is not as clear as the association between trade and connectedness. This is to be expected and is a reflection of the volatile nature of FDI, which is driven by a range of factors such as market concentration and regulatory and institutional frameworks.

Figure 26: Growth in total UK FDI flows between emerging markets and growth of total flights, passengers and routes, (2002 = 100)



Source: CAA, OECD, Cebr analysis

Figure 27: Growth in total UK FDI flows between mature-trade markets and growth of total flights, passengers and routes, (2002=100)



Source: CAA, OECD, Cebr analysis

FOUR
Growth potential and the cost of delaying the runway decision

Given the Government's focus on exports as a source of UK economic growth, it is imperative that the Government supports UK businesses in moving beyond domestic markets and developing connections with high-growth and new emerging markets. However, for this to happen, the required airport infrastructure needs to be in place. At present, the runway capacity constraint in London and the South East risk seriously impacting the UK's ability to grow new routes, establish these business relationships and serve new markets.

In this section, we consider the impact on UK trade and investment opportunities if there were an increase in the number of air links to the ten fastest growing economies under a range of scenarios.

We assume that, as LHR is operating at capacity and is also the principal freight airport in the London system (and in the UK as a whole), the trade impacts we identify here can be equated with what could be lost as a result of not having a new runway in place in the London area. In the current circumstances, in order to create new air links, old links would have to be sacrificed, resulting in losses elsewhere.

4.1. Estimated potential boost to UK trade in goods and services

As in the 2011 Frontier Economics report for Heathrow Airport,[16] we first present the results suggested by our econometric modelling. We use these results to calculate a number of benchmarks around potential trade growth that could arise with various types of increase in the number of air links to the ten fast-growing economies (our emerging markets group). These benchmarks are comparable in magnitude to those produced by CBI in its 2013 report.[17] However, at the aggregate level, there are a range of factors requiring consideration that are beyond what a statistical model can take into account, such as political institutions, historic links and so forth, that make it easier or harder to trade with

16 Frontier Economics (2011), "Connecting for Growth: the role of Britain's hub airport in economic recovery", report prepared for Heathrow, September, London.
17 CBI (2013), "Trading places: Unlocking export opportunities through better air links to new markets", London.

these countries. By accounting for these factors we calculate a lower bound estimate of the trade that could be sacrificed by not having additional runway capacity. In reality, the true impact is likely to lie somewhere in the range of this lower bound and the upper bound suggested by the unadulterated statistical model.

From our econometric analysis of the data, we estimate that in any given year, a 10% increase in our measure of aviation connectedness with the mature-trade markets can be linked with an increase in UK trade with those markets of 1.2%. This result was highly statistically significant, thus confirming the positive correlation between air links and trade. We used this relationship to quantify and examine the potential impacts on UK trade under various scenarios that boost the UK's connectedness with the emerging markets group, all other factors remaining equal.

In 2012 the UK traded £107 billion with the ten emerging countries examined in this study. Based on the statistical relationships established above, our analysis suggests that an additional average flight to one of these emerging markets has the potential to boost UK trade by £57,000 (Table 5). By facilitating an additional 1,000 passengers to one emerging market, UK trade has the potential to rise by £307,000. We estimate that creating an additional route to one emerging market with existing average flight density has the ability to boost UK trade by £34.2 million. An additional route to all ten emerging markets with a daily flight on each has the potential to increase UK trade by as much as £0.4 billion.

Table 5: Potential boost to UK trade (£) from scenarios involving additional flights, passengers and routes from the UK to emerging markets

Scenario	Potential boost to UK trade
1 additional flight	**£57,000**
An additional 1,000 passengers	**£307,000**
1 additional route	**£34.2 million**
1 additional route and 1 additional flight	**£0.41 billion**
Flights-parity with mature-trade markets	**£28.2 billion**

Source: Cebr analysis

We then assume a scenario in which average levels of aviation connectedness between the UK and the emerging markets reaches the same levels as between the UK and the mature-trade economies. In this scenario, the analysis suggests that the UK could benefit from a boost to trade of approximately £28.2 billion. This assumes that the economies and trading conditions in the emerging markets continue to improve to resemble those of the

mature-trade economies. As a result, our findings do not account for the other factors that could constrain the ability to grow trade to this extent, such as institutional, regulatory and market openness issues.

In addition to conducting standard robustness tests to ensure the statistical significance of our results, we used an alternative methodology to sense-check our approach. This test involved comparing the level of UK trade with 24 emerging markets with at least one UK daily flight, with the level of UK trade with 8 emerging economies without a daily UK flight connection.[18] The discrepancy, after adjusting for the size of each emerging market's economy, provided results similar to our findings above, thus broadly confirming the robustness of these calculations.

At the aggregate level, as noted earlier, we took account of a range of factors that the statistical model cannot capture, factors that can make it easier or harder to trade with these countries. In other words, we attempt to account for the extent to which trading conditions between individual emerging markets and the UK is expected to develop over the next 15 years. This was informed by Cebr's propriety forecasts of world trade and those of other institutions like the IMF. This approach suggests a lower bound for the trade that could be lost as a result of poor connectedness to emerging fast-growing economies of £8.6 billion by 2020, growing to £10.1 billion by 2030. However, this includes exports and imports, so narrowing the focus to exports (using the current UK export-import split) gives lower bound estimates of £3.2 billion by 2020 and £3.7 billion by 2030.

4.2. Estimated potential boost to UK FDI

A similar approach to identifying the relationship between air links and trade was adopted to examine the association between air links and FDI. We estimate that in any given year, a 10% increase in the number of flights, passengers and routes across the mature-trade markets has the potential to increase total UK FDI flows by 0.7%. We used this relationship to quantify the potential impacts on UK FDI flows under several scenarios that boost connectivity between the UK and emerging markets, all other factors remaining equal.

In 2012, the value of FDI flows between the UK and the ten emerging markets examined in this study totalled approximately £8.0 billion. Our analysis suggests that an additional average flight to one emerging market could potentially boost UK FDI flows by £4,000 (Table 6). By facilitating an additional 1,000 passengers to one emerging market, the value of UK FDI flows has the potential to rise by £23,000. Alternatively, creating

18 For this test we assume an average of 5 flights per week between the UK and each emerging economy.

a new route to one emerging market with existing average flight density has the ability to boost total UK FDI flows by £2.5 million. Creating a new route to all ten emerging markets a daily flight on each route has the potential to increase UK FDI flows by as much as £29.7 million.

Once again, we assume a scenario where the average number of flights between the UK and the emerging markets reaches parity with the average number of flights between the UK and the mature-trade economies. Our analysis suggests that the UK could benefit from a boost to total FDI flows of approximately £1.7 billion. Our approach assumes that the economies and trading conditions in the emerging markets continue to improve to resemble those of the mature-trade economies. As a result, our findings do not account for the other factors that influence investment.

Table 6: Potential boost to UK FDI (£) from scenarios involving additional flights, passengers and routes from the UK to emerging markets

Scenario	Potential boost to UK FDI
1 additional flight	**£4,000**
An additional 1,000 passengers	**£23,000**
1 additional route	**£2.51 million**
1 additional route and 1 daily flight	**£29.7 million**
Flights-parity with mature-trade markets	**£1.70 billion**

Source: Cebr analysis

We have not sought to produce a lower bound figure for FDI flows as the manner of producing the estimates above (driven off existing trade with the emerging markets) has resulted in what we deem to be reasonably conservative estimates that are not inconsistent with other studies.

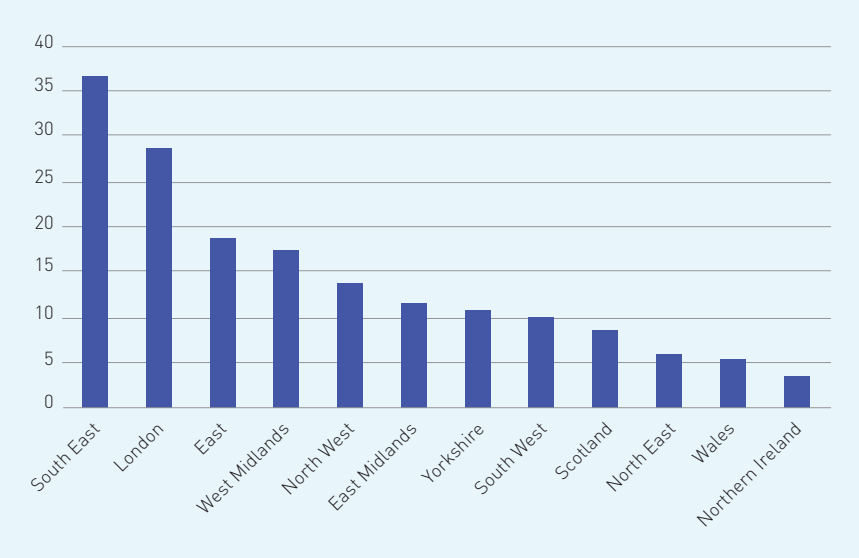
FIVE
The 'dither clock'

We use the analysis above to estimate the value of lost trade due to a lack of connectedness between the UK and the emerging markets. We consider this over the time period in which connectedness with emerging markets would grow if additional runway capacity were made available. To do this, we have calculated the value of additional trade that could be lost without new runway capacity up to 2030.

We estimate that if similar levels of connectivity could be achieved by the year 2030 at least, the total value of potential trade that the UK could gain from could reach approximately £170.6 billion (over the 18 year period, from 2012).

Given this, we estimate the total value of potential exports that the UK could gain from could reach a cumulative £63.6 billion over the 18 years to 2030. Based on current trends in regional trade, we estimate that the South East of England could be hurt the most, as the region could potentially lose out on approximately £36.6 billion of total trade over the 18 year period (Figure 28). London is also estimated to be heavily disadvantaged, losing out on roughly £28.6 billion of trade up to 2030. These, and the potential losses to the other regions of the UK, are illustrated in Figure 28 below.

Figure 28: The value of lost potential trade over the 18 year period, by region (£ billions)



Source: HMRC, Cebr analysis

To illustrate what this means by unit of time, we have produced the 'dither clock' shown in Table 7 and Table 8 below. This analysis suggests that the UK could be losing out on as much as £9.5 billion for each year that passes without runway capacity expansion. For every month that the level of air connectedness between the UK and the emerging markets remains under-developed, due to a lack of new runway capacity, the UK could be losing £790 million of trade, equivalent to approximately £182 million per week. On a daily basis, the loss is approximately £26 million worth of trade with the emerging markets group. This is equivalent to a loss of approximately £1.1 million per hour, or £18,000 per minute.

Table 7: The 'dither clock': the value of lost potential trade over time

Value of lost potential trade, £	Per unit of time
£9.5 billion	**Year**
£790 million	**Month**
£182 million	**Week**
£26 million	**Day**
£1.1 million	**Hour**
£18,000	**Minute**

Source: Cebr analysis

Narrowing the focus to exports only gives the 'dither clock' estimates shown in Table 8, which is based on the current ratio of exports to imports to the emerging markets group.

Table 8: The 'dither clock': the value of lost potential exports over time

Value of lost potential trade, £	Per unit of time
£3.5 billion	**Year**
£294 million	**Month**
£68.0 million	**Week**
£9.7 million	**Day**
£0.4 million	**Hour**
£6,700	**Minute**

Source: Cebr analysis

SIX
Conclusions

This report clearly demonstrates the links between aviation connectedness, trade and foreign direct investment. In doing so, it has provided illustrative figures on what could be sacrificed in terms of trade and FDI growth by delaying the runway capacity decision in London and the South East.

On this basis, the message is clear. The Government needs to get on with building a new runway in order not to stifle further growth in trade and FDI between the UK and the fast growing emerging market economies. Not doing so is, and will, ultimately be to the benefit of the UK's European competitors that have plenty of spare airport capacity at their key hub airports.

Without the new runway, the UK could be sacrificing a cumulative £63.6 billion in new export growth over the 18 years to 2030. This could amount to:

- An average of £3.5 billion of exports per annum;
- £294 million for every month that the UK does not have a new runway in London and the South East;
- £68.0 million for every further week of dithering; or
- £9.7 million per day.

On 7 September 2012, the Government announced its intention to create an independent commission, chaired by Sir Howard Davies, to identify and recommend options for maintaining the UK's status as a global aviation hub. In July 2015, the Airports Commission published its final report which set out its recommendations to government for expanding airport capacity in the UK. It narrowed down the potential solutions to three options at two airports - LHR and LGW - and recommended the new northwest runway option at LHR. However in December 2015 the Government delayed the decision as to whether a third runway could even be allowed at Heathrow until summer 2016, as a result of environmental concerns, following the vote to leave the EU the decision has now been further delayed until *at leas*t October 2016.

In response to political procrastination on the issue and in an attempt to help break the political deadlock, in September 2013 London First initiated the Let Britain Fly campaign. The aim of the campaign is to build cross-party political support to build new runway capacity. It is supported by a broad and wide strategic campaign coalition that includes business leaders, business organisations, trade and professional associations, trade unions, think tanks, academics and economists. This report provides objective evidence on which *Let Britain Fly* can draw to support the campaign's message.

Aviation plays a key role in facilitating international trade in both goods and services. It provides businesses with access and entry to new markets and enables them to better manage their supply chains, as well as enabling business travellers to meet new and existing clients. Given the government's initiatives around exporting for growth, aviation can provide businesses with important routes to market for their goods and services, supporting growth and employment in the UK and ensuring that the UK remains internationally competitive.

Aviation links provide businesses with a rapid, worldwide, transport network, and as such, it plays an important role in facilitating trade, particularly where speed of delivery is important. In addition, air freight is more sensitive to weight than other options of transportation, such as rail or sea. Therefore, it is smaller, lighter and higher value goods that are transported by air. To facilitate continued growth in the export of these high value goods in particular, as well as of high value-adding services, the Government must accelerate the decision-making process and get whatever site is chosen shovel-ready as soon as possible.

APPENDIX
Methodology

In undertaking the analysis presented in this report, we choose to adopt a panel data econometric modelling approach. This enabled us to account for information in our data that varies both over time and between countries. Furthermore, a panel data approach allows us to account for any relevant but unobservable or difficult to measure information in our data such as cultural links, regulatory frameworks and international agreements. Our data covers the time period 2002 to 2012 and the mature-trade economies defined in Section 3.1.

We conducted several statistical tests to confirm the relevance and robustness of our chosen model. The results of the Hausman test strongly confirmed our use a Random Effects panel data approach, in order to control for unobservable variables that vary over time but are constant between countries, and other unobservable variables that are constant over time but vary between countries. The Breusch-Pagan test confirmed the presence of random effects in our data.

In addition, several correlation tests were conducted to avoid any bias imposed by multicollinearity in the model. Due to the limited time series element of our model, autocorrelation tests were not conducted. Throughout our analysis we controlled for any presence of heteroscedasticity.

Following this, we estimate Equation 1 using STATA:

1. $$trade\ growth_{j,t} = \alpha + \beta_1\ product\ of\ routes, flights\ and\ passengers_{j,t} + u_{j,t}$$

Where $trade_{j,t}$ represents growth of total trade of goods and services between the UK and an individual mature-trade market j and time t. In addition a represents a constant over time and individual country, and $ß_1$ represents the relationship between trade growth and our measure of connectedness between the UK and an individual mature-trade market j and time t: the product of routes, flights and passengers.

The results enable the identification of the contribution of additional flights, passengers and routes to total UK trade growth. By applying the results to observed trends in aviation connectivity between the UK and the mature-trade and emerging markets, the potential boost to UK trade from greater connectivity with emerging markets from increased airport capacity can be estimated.

We estimate that in any given year, a 10% increase in the product of flights, passengers and routes across the mature-trade

markets has the potential to increase UK trade by 1.2%. This result was highly statistically robust and thus confirmed the relationship between air links and trade. We used this relationship to quantify and examine the potential impacts on UK trade under various scenarios that boost the connectivity between UK and emerging markets, all other factors remaining equal.

Following a similar approach, using STATA, we estimate Equation 2 to identify the statistical relationship between growth in total (inward and outward) FDI flows and connectivity growth:

2. $$FDI\ flows\ growth_{j,t} = \alpha + \beta_1 product\ of\ routes, flights\ and\ passengers_{j,t} + u_{j,t}$$

We estimate that in any given year, a 10% increase in the product of flights, passengers and routes across the mature-trade markets have the potential to increase total UK FDI flows by 0.7%. We used this relationship to quantify the potential impacts to UK FDI flows under several scenarios that boost connectivity between the UK and emerging markets, all other factors remaining equal.

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