Speech on the productivity puzzle

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Jun 6

The text below is rough notes for a speech I gave at the University of Oxford economics society. It was designed to be read out so the writing is a little rough.

Good evening and thank you very much for the invite to come and speak. I studied economics here at Oxford so I was very honoured to be invited back as someone who now is worth hearing. I matriculated back in 2008 and it feels like hardly any time since I studied here.

2008, of course, was the year of the financial crisis. Lehman failed almost exactly at the same time as I was starting my PPE degree here. When I was 18 it all seemed very unimportant. There were much more interesting things going on in my life than the turmoil in the global economy.

However I do remember thinking that three years was about normal for a recession so I was lucky to be going to University. I'd keep my head down and come out just as the economy was hitting its stride again. I'd ride the whole thing out and my career would be unaffected.

In reality the financial crisis has dominated the entirety of my working life. Not only did I struggle in finding graduate employment in 2011, and it likely set me on the path to becoming an economist, but also as a journalist at the FT I have been continuously writing about its aftermath.

For the country as a whole, the crisis is still casting its shadow on wages. We avoided mass unemployment, for the most part, but real wages are still about £8 a week lower than they were a decade ago. That has had knock-on effects on the public finances and, eventually, our politics.

Mostly economists tie this poor wage growth to our weak productivity growth. Productivity is barely higher than it was before the financial crisis.

Since I've returned to an academic setting I'm going to be rigorous and define my terms. By productivity I mean labour productivity. The amount of output produced per hour worked. A simple ratio of output over labour input.

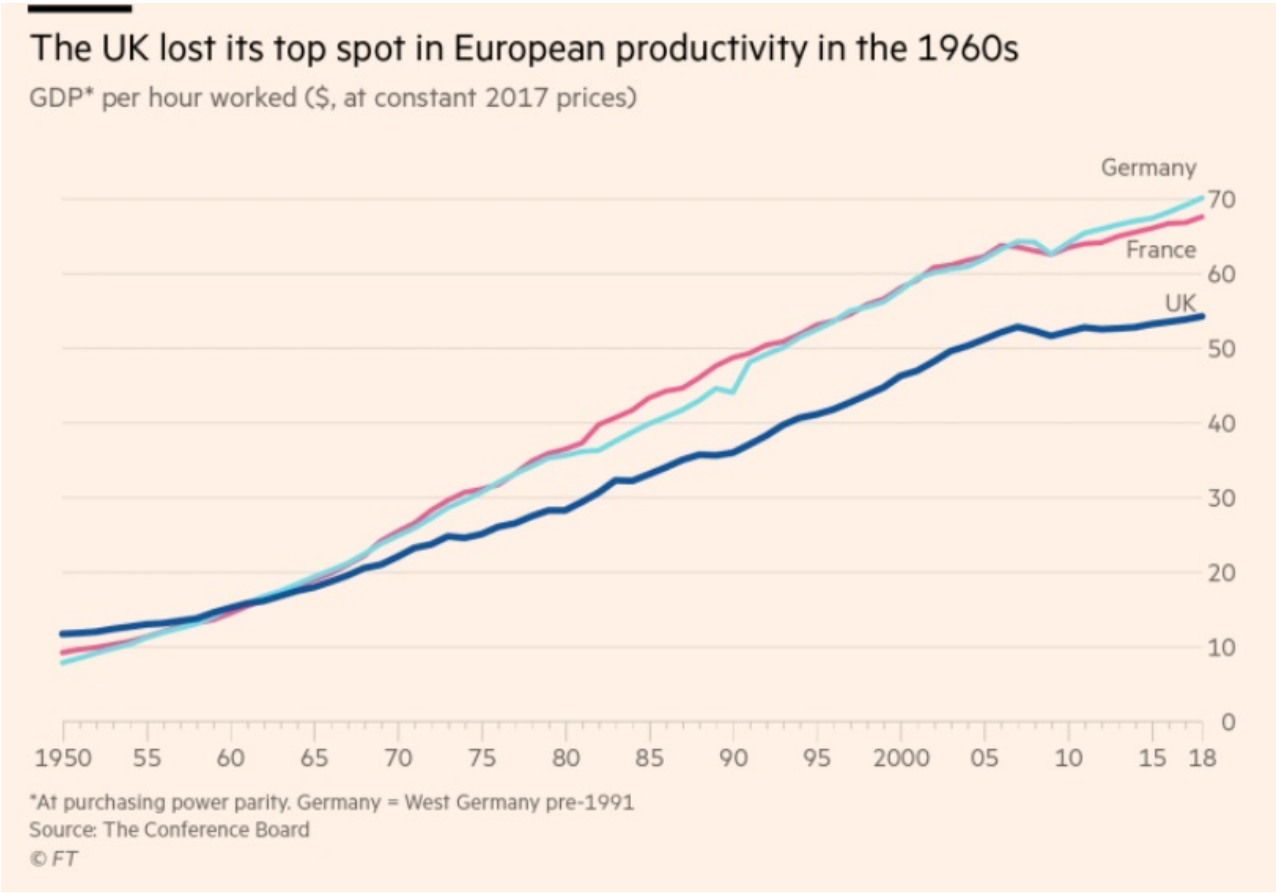
However there are three different things that are referred to as “the productivity puzzle”. They are often confused so I want to be clear exactly what I’m talking about.

First, the UK is less productive than similar countries, most importantly France and Germany. This is a long standing feature of the British economy. In about 1960 France and Germany overtook us in terms of output per hour.

Second, productivity growth, has slowed since the 2008 financial crisis. Before 2008 output per hour worked was increasing by about 1 per cent a year. Since the crisis it has grown by 2 per cent in a decade.

Lastly we have the third derivative. The slowdown in productivity growth has been more rapid and steeper in the UK than in any other developed economy.

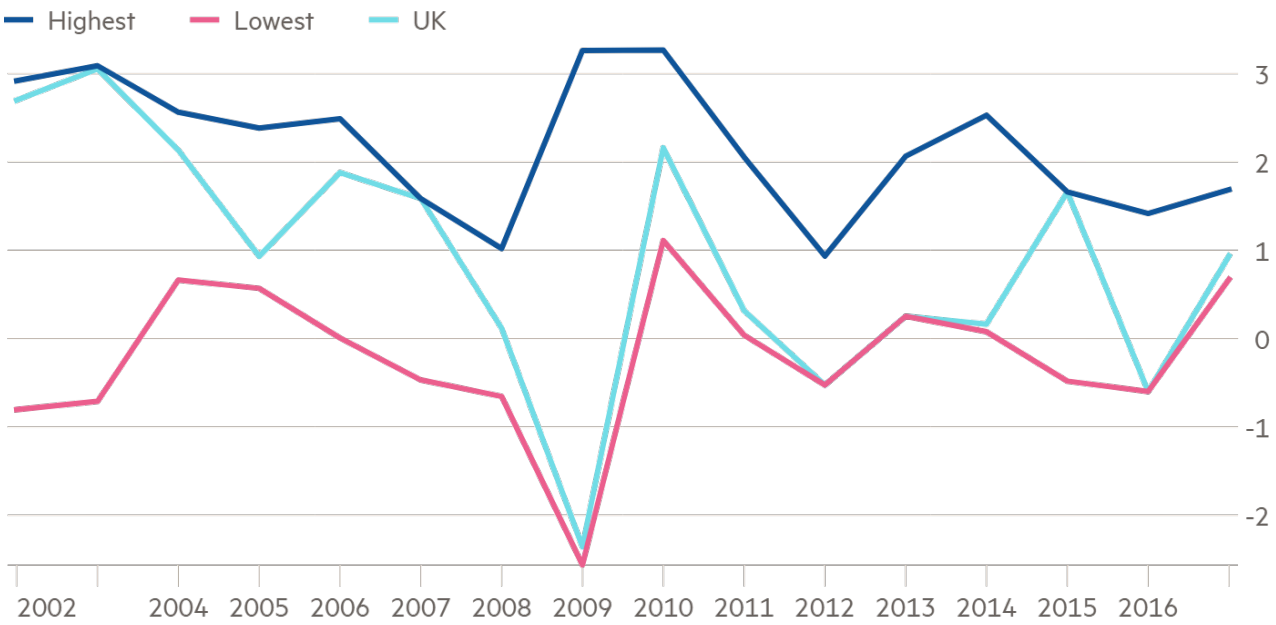
You can see these three puzzles on the next two charts. We were more productive than France and Germany in the early 1960s but they overtook us and stayed ahead. And then at the end of the chart you can see the slowdown since the crisis.



And then here’s the third productivity puzzle. This chart shows the highest and lowest productivity growth in the G7 group of rich countries. The UK was at the top before the crisis and it’s mostly been at the bottom since.

UK has gone from having one of the highest G7 productivity growth rates to the lowest

Annual percentage change in output per hour



Source: OECD
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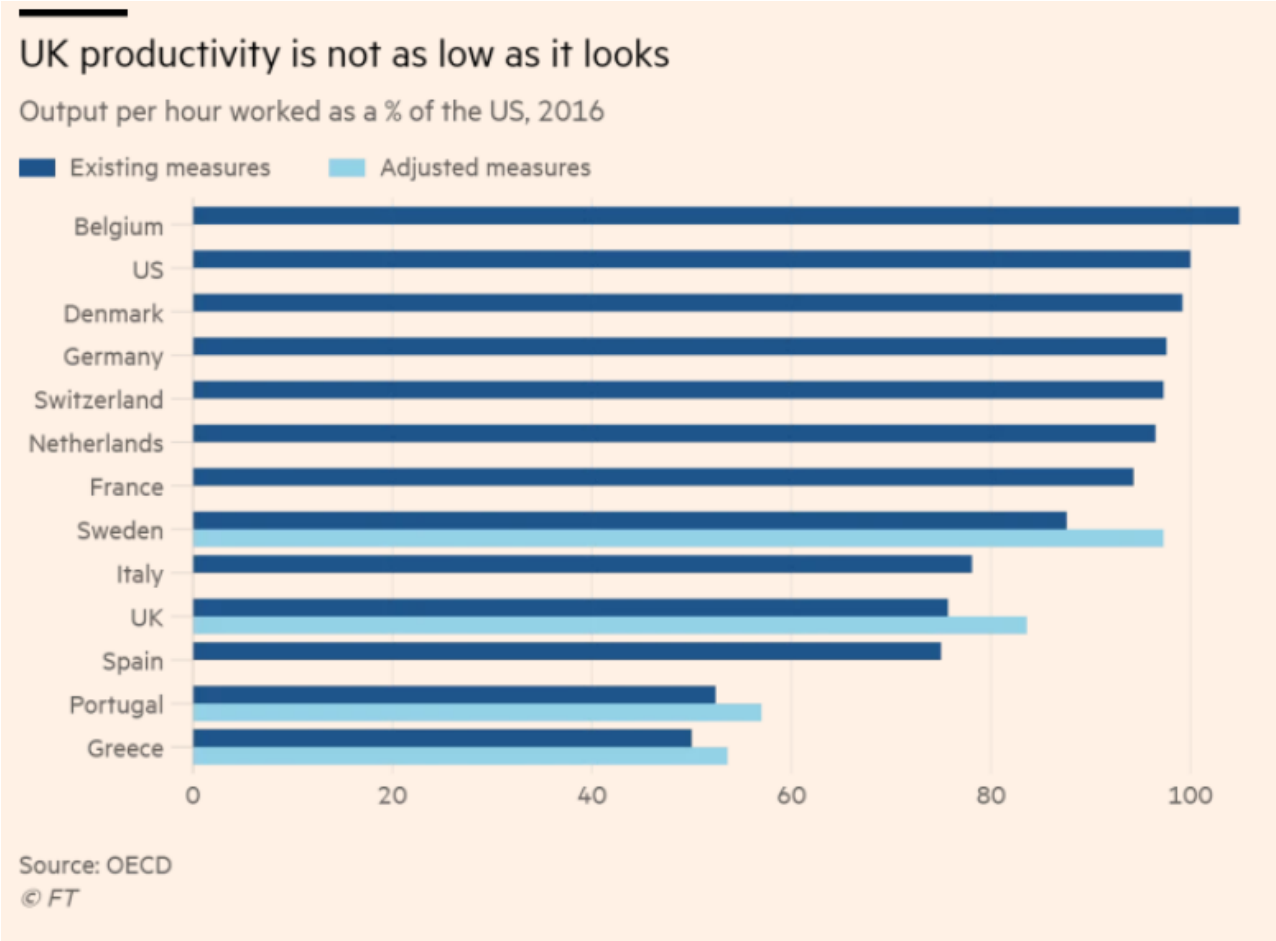
I'm going to largely focus on the second puzzle. What happened to the British economy in 2008 that is still affecting it 10 years later and I want to set forward my theory on why.

However I do want to make two remarks on the other problems that are referred to as the productivity puzzle.

First, a lot of the productivity puzzle is about measurement. Most of the focus on measurement has been on the numerator, we ask whether we are measuring output correctly given the rapid changes in the kinds of goods and services that have been produced.

But the denominator is equally important. This chart shows what happened when the OECD tried to measure hours worked on a consistent basis. Which, surprisingly no one had asked until last year. The UK's national statistics agency just accepts self-reported accounts of hours worked while the French agency corrects them for strike days and bank holidays.



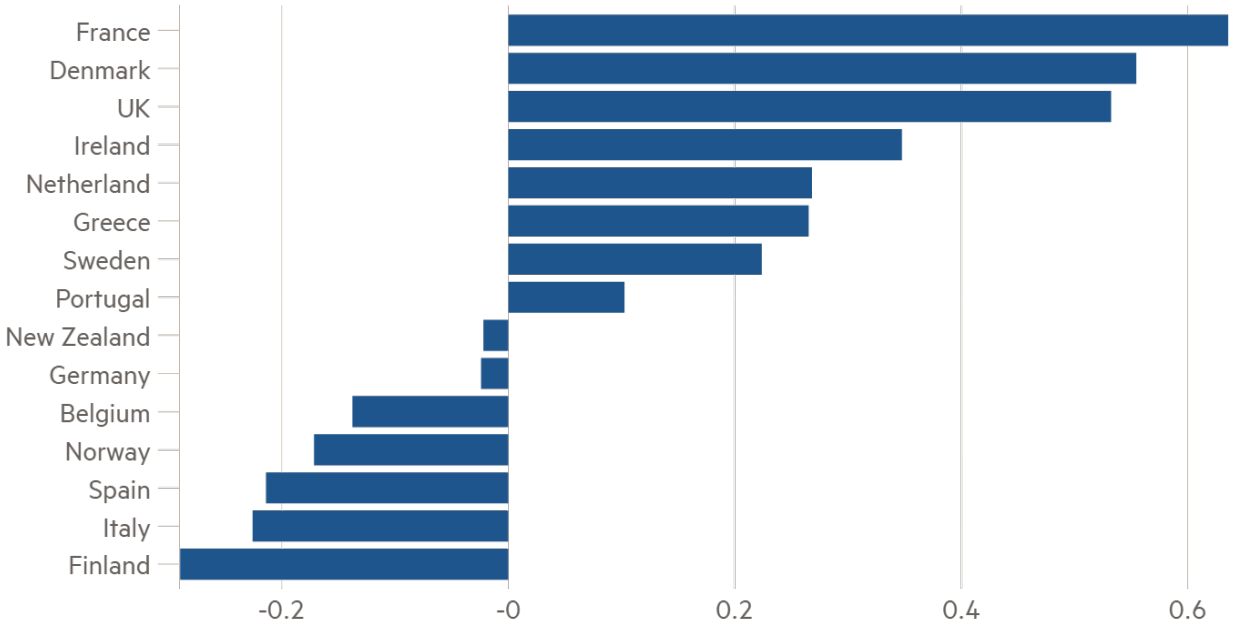
Doing the same for the UK reduces the gap in productivity to about 10 per cent, rather than 20 per cent. That halves this shortfall that economists have been debating for decades. So do not underestimate the role of measurement.

And do not underestimate how many very basic things the economics profession is likely still missing and getting wrong.

Now this chart shows what has happened last year. The eurozone growth rate slowed substantially while employment growth continued. The effect of this is to make productivity growth right across developed Europe look a lot more British. We're not quite the outlier we once were.

No longer lonely at the bottom...

Hourly productivity growth, 2017-18 (%)



Source: OECD
© FT

But back to my main focus. Why has UK productivity growth slowed since 2008? It's tempting to think that there is one big explanation, but what I want to persuade you of in this lecture is that there are a whole set of different shocks that happened to hit the UK economy in 2008. There are multiple causes that just happened to all occur at about the same way.

This table comes from a great paper from the Economics Statistics Centre of Excellence, this new institute that was set up in London to improve economic measurement and help us get to the bottom of what's going on with productivity.

Table 6.2 Decomposition of annual labour productivity growth gaps by Industry Group: Market sector, 2001-2015.

Industry	Contribution to LP growth gap 2011-2015 (average per annum)			Contribution to LP growth gap 2008-2015 (average per annum)		
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A: Agriculture, forestry and fishing	0.1	0.0	0.0	0.0	0.0	0.0
B: Mining and quarrying	-0.1	0.2	0.0	-0.1	0.2	0.0
C: Manufacturing	-0.8	-1.3	-0.5	-0.7	-0.9	-0.5
D-E: Utilities	-0.1	0.0	-0.1	-0.2	0.0	-0.1
F: Construction	0.0	0.1	0.1	0.0	0.2	0.1
G: Wholesale and retail	-0.2	-0.3	0.0	-0.4	-0.4	-0.2
H: Transportation and storage	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1
I: Accommodation and food service	-0.1	-0.1	0.0	-0.1	-0.1	0.0
J: Information and communication	-0.3	-0.6	-0.2	-0.2	-0.5	-0.2
K: Financial and insurance	-0.6	-0.2	-0.2	-0.6	-0.1	-0.2
M-N: Professional and administrative	-0.2	0.0	0.1	-0.3	0.1	0.0
R: Arts, entertainment and recreation	0.0	0.0	0.0	0.0	0.0	0.0
S: Other service activities	0.1	0.1	0.0	0.0	0.1	0.0
Allocation	0.0	0.0	0.0	0.0	-0.1	0.0
Market Sector (total)	*-2.4*	*-2.2*	*-0.8*	*-2.7*	*-1.5*	*-1.1*

Source: EUKLEMS 2017 release (August 2017), authors' calculations.

It shows the British, European and American productivity slowdown since 2008 by sector. What I want to draw your attention to is these two numbers. Together finance and manufacturing explain over half of the productivity slowdown. They were the two leading sectors before the crisis, but since 2008 they've been laggards.

Now that happened to finance in 2008 has been discussed at length. I don't think we need to go over it again. There was a boom, then a bust. After the bust, policymakers tried to make the sector safer and it did not grow at the same rates as it did before. Banks have added a lot more compliance officers and the sector is safer but less "productive" than it used to be.

Manufacturing is more interesting. It's a bit of a puzzle why that should have slowed so much since 2011. The financial crisis certainly led to a demand shock: the bust hit demand for goods worldwide and merchandise trade volumes have grown only modestly since the crisis. But productivity growth has been much slower, even after the economy recovered from the initial hit.

I believe that a supply shock hit Britain's manufacturing sector at around the same time as the global economy was recovering.

This chart shows output in the pharmaceutical sector. The UK has a relatively big pharma sector, we have GlaxoSmithKline and AstraZeneca two of the five biggest drug companies in the world. This is something we specialise in, or I should say we did

specialise in before the crisis.

Since the crisis you can see that pharmaceutical manufacturing has collapsed and what was one of the most productive sectors became one of the biggest drags on productivity growth.

So what happened? Almost certainly there was a demand element, but output did not recover once the global economy stabilised. Car manufacturing did—we approached our previous record for car production in 2016. But pharmaceuticals did not.

Well it just so happened that Astra and Glaxo faced patent cliffs shortly after the global financial crisis hit. From about 2011–2014 a huge number of drugs lost their patents.

This slide shows an FT story from 2012. AstraZeneca suffered an 18 per cent fall in revenues in the second quarter that year as a drug went off patent. Something similar happened to Glaxo, which lost exclusivity on a HIV drug, an asthma drug, alongside a few others.

> The falls were steepest in the second quarter, when sales fell 18 per cent to $6.7bn over the quarter. The loss of exclusivity on drugs such as Seroquel and also Arimidex, which treats breast cancer, accounted for more than 80 per cent of the drop in revenues.
>
> AstraZeneca, which is the second-largest pharmaceutical group in the UK, has a larger patent cliff than its rivals, with approximately half of its $33bn in annual revenue expected to disappear by 2016 as the patents on some of its most successful products come to an end. Another drug in this category is Nexium, which relieves heartburn.
>
> Seroquel alone accounted for 80 per cent of the group's decline in US revenues, which sank 29 per cent in the second quarter to $2.3bn. Overall, profit before tax fell 36 per cent to $3.8bn in the first half of 2012.

This was a substantial hit to these two companies. And they weren't alone. Big pharma in the US faced similar patent cliffs. For whatever reason, it seems to be much much harder to come up with new drugs these days than it was 30 years or so ago. The number of researchers has exploded, the number of new drugs has not.

You'd have to ask a scientist about why this happened. What I hear is that drug research has changed, there's more focus on diseases like cancer which come in hundreds of different variations. I think a lot of the big medical breakthroughs have been in genetics, which is about tailoring medicines rather than mass-producing a few blockbuster drugs.

So these two shocks seem to be to be a big reason why we slowed down, and why we slowed down more than our peers. We specialised in finance and pharmaceuticals before the crisis and they both happened to face big supply shocks almost simultaneously.

But that's not all. These two sectors explain over half of the slowdown but not the whole thing.

So what else is going on. Here's telecoms. Now this is weird, given the technological advances of the past decade we would expect telecoms to be rocketing ahead: the iPhone made its debut in 2007, the year before the financial crisis. I find it almost completely implausible that there has been no productivity advances in telecoms.

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C: Manufacturing	-0.8	-1.3	-0.5	-0.7	-0.9	-0.5
D-E: Utilities	-0.1	0.0	-0.1	-0.2	0.0	-0.1
F: Construction	0.0	0.1	0.1	0.0	0.2	0.1
G: Wholesale and retail	-0.2	-0.3	0.0	-0.4	-0.4	-0.2
H: Transportation and storage	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1
I: Accommodation and food service	-0.1	-0.1	0.0	-0.1	-0.1	0.0
J: Information and communication	-0.3	-0.6	-0.2	-0.2	-0.5	-0.2
K: Financial and insurance	-0.6	-0.2	-0.2	-0.6	-0.1	-0.2
M-N: Professional and administrative	-0.2	0.0	0.1	-0.3	0.1	0.0
R: Arts, entertainment and recreation	0.0	0.0	0.0	0.0	0.0	0.0
S: Other service activities	0.1	0.1	0.0	0.0	0.1	0.0
Allocation	0.0	0.0	0.0	0.0	-0.1	0.0
Market Sector (total)	*-2.4*	*-2.2*	*-0.8*	*-2.7*	*-1.5*	*-1.1*

Source: EUKLEMS 2017 release (August 2017), authors' calculations.

This seems to be purely measurement error. To measure output the ONS deflate the revenues of companies like Vodafone and BT by some measure of price. It appears they screwed up on this deflator. The idea is to capture the real amount of "telecoms services" that these companies produce, that means measuring the price of a unit of this output. But the nature of the output has changed over the last decade.

Here's an FT story from last year. Essentially the statistics agency failed to account for changes in quality and was using the same concept of telecoms output as it did in 2008, back when people still made voice calls. If it instead used price per bit of information prices would have fallen by 90 per cent and output in the sector would be higher.

> Britain's statistical agency has made mistakes in its measurement of the telecoms sector, failing to spot huge cost-efficiencies of up to 90 per cent over a five-year period, it admitted this week.
>
> The error, which covers the period from 2010-2015, means that inflation statistics may have been significantly too high and economic growth figures too low, calling into question the consumer price index and retail price index, which help determine pay and pension increases.
>
> The revelation could prompt a rethink in the measurement of national income.
>
> Highlighting a "disconnect between the technical performance and the economic measurement of the [telecoms] industry", Richard Heys, the deputy chief economist of the Office for National Statistics, said the agency would seek to correct the errors in the national accounts in 2019, but had to think hard about how widespread the changes should be.
>
> The change in measurement means the telecoms sector will be transformed from a productivity laggard to a leader, but the ONS will also face difficult decisions about whether to change past and future inflation statistics and the historical record of UK economic growth. Any change could deepen existing tensions in its headline statistics.

The next one I've picked out is my favourite. Productivity in utilities has done very badly since 2008. Something else happened that year, as well as the financial crisis. The UK passed the Climate Change Act. It's not fair to blame that act really, but it is symbolic. We started to take the environment more seriously, with consequences for productivity.

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C: Manufacturing	-0.8	-1.3	-0.5	-0.7	-0.9	-0.5
D-E: Utilities	-0.1	0.0	-0.1	-0.2	0.0	-0.1
F: Construction	0.0	0.1	0.1	0.0	0.2	0.1
G: Wholesale and retail	-0.2	-0.3	0.0	-0.4	-0.4	-0.2
H: Transportation and storage	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1
I: Accommodation and food service	-0.1	-0.1	0.0	-0.1	-0.1	0.0
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M-N: Professional and administrative	-0.2	0.0	0.1	-0.3	0.1	0.0
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Source: EUKLEMS 2017 release (August 2017), authors' calculations.

Electricity output, sector D, started declining in about 2009. Partly that will reflect the demand shock but there was a supply shock too. We began to use more energy efficient appliances and we insulate our homes better. Productivity also began to decline because we switched to renewables, which tend to require more labour input than big coal-fired power plants.

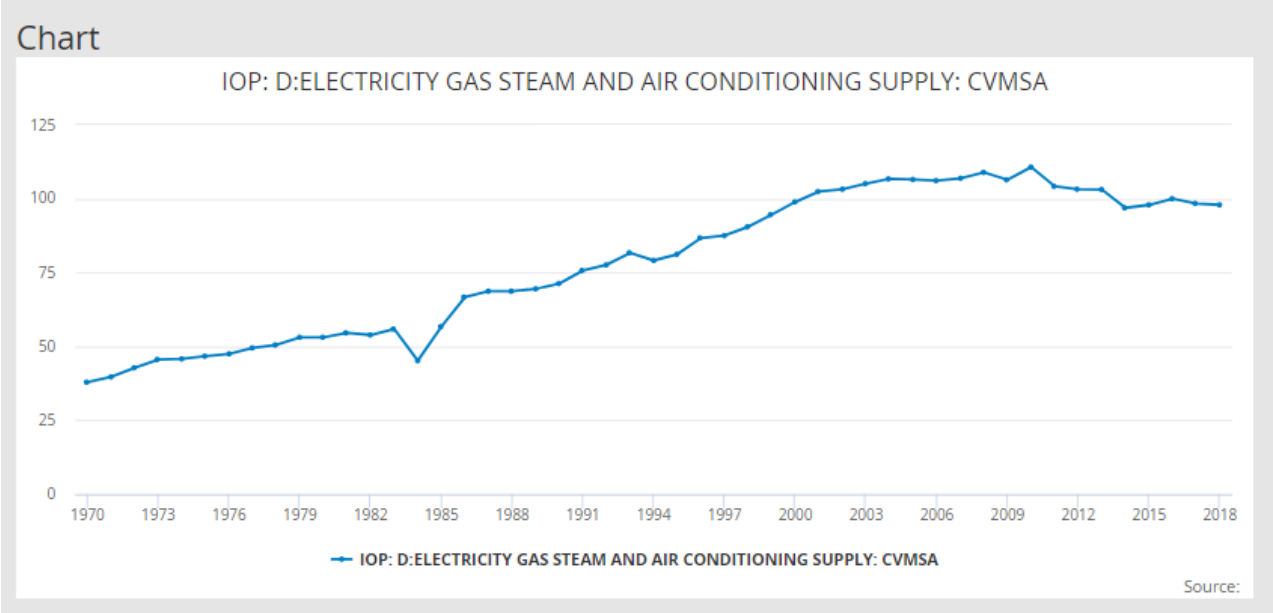
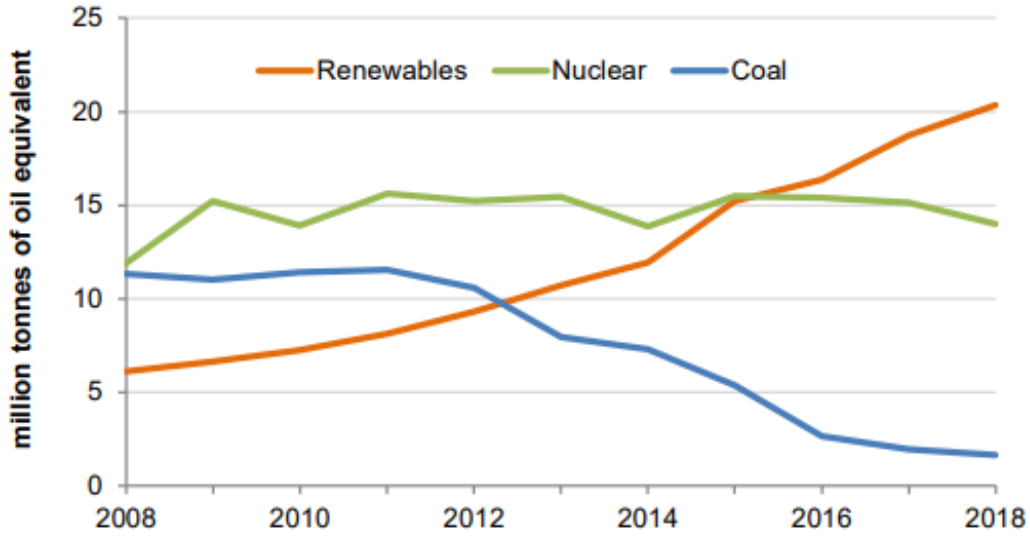


Chart 3: Other UK energy production



Productivity in water supply and waste management, sector E, declined as well. This is basically because we started recycling a lot more. That means we need workers to sort glass and plastic, make sure it gets sent to the right place. The amount of "waste management services output" stayed roughly the same, but we needed more workers to do it.

Personally I think this is a mismeasurement thing as well. We did not measure the bads, all the environmental costs, we were producing properly before the financial crisis so now we're putting in effort to get rid of them, that effort does not appear as extra output.

Okay, last one. Mining and quarrying. This sector has not done well since the crisis either. There's no climate change or mismeasurement thing here. This appears to be due to geology. Since 2008 our reserves of oil in the north sea have begun to run dry, it's become far harder to get them out and so the sector's productivity has declined.

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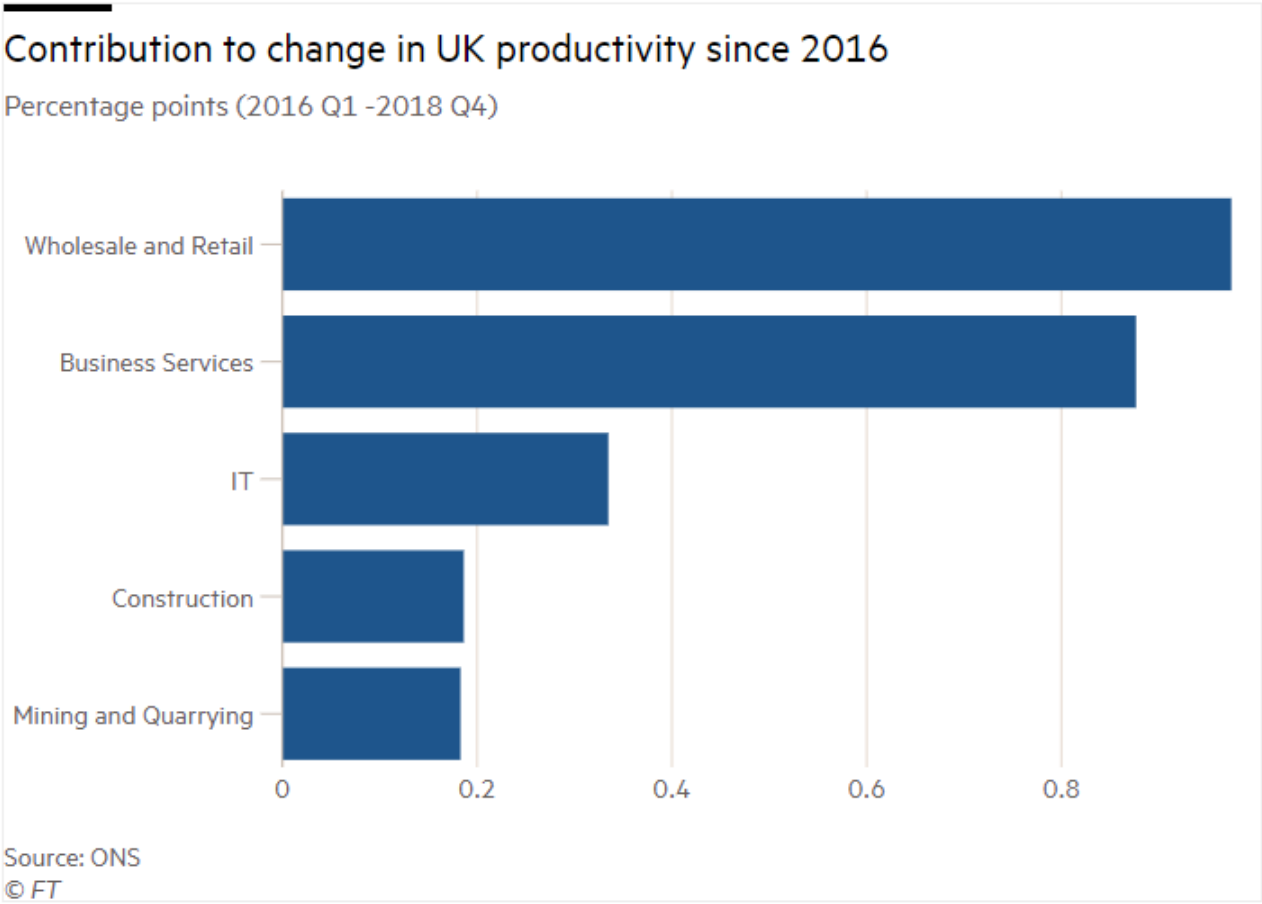
Source: EUKLEMS 2017 release (August 2017), authors' calculations.

In the US, as you can see, productivity in the sector has actually got better since the financial crisis. I don't know why this is, but I'd wager it has got something to do with shale gas. The US embraced fracking to an extent we did not in Europe. Partly the productivity puzzle is about the absence of new sectors as well as the decline of existing ones.

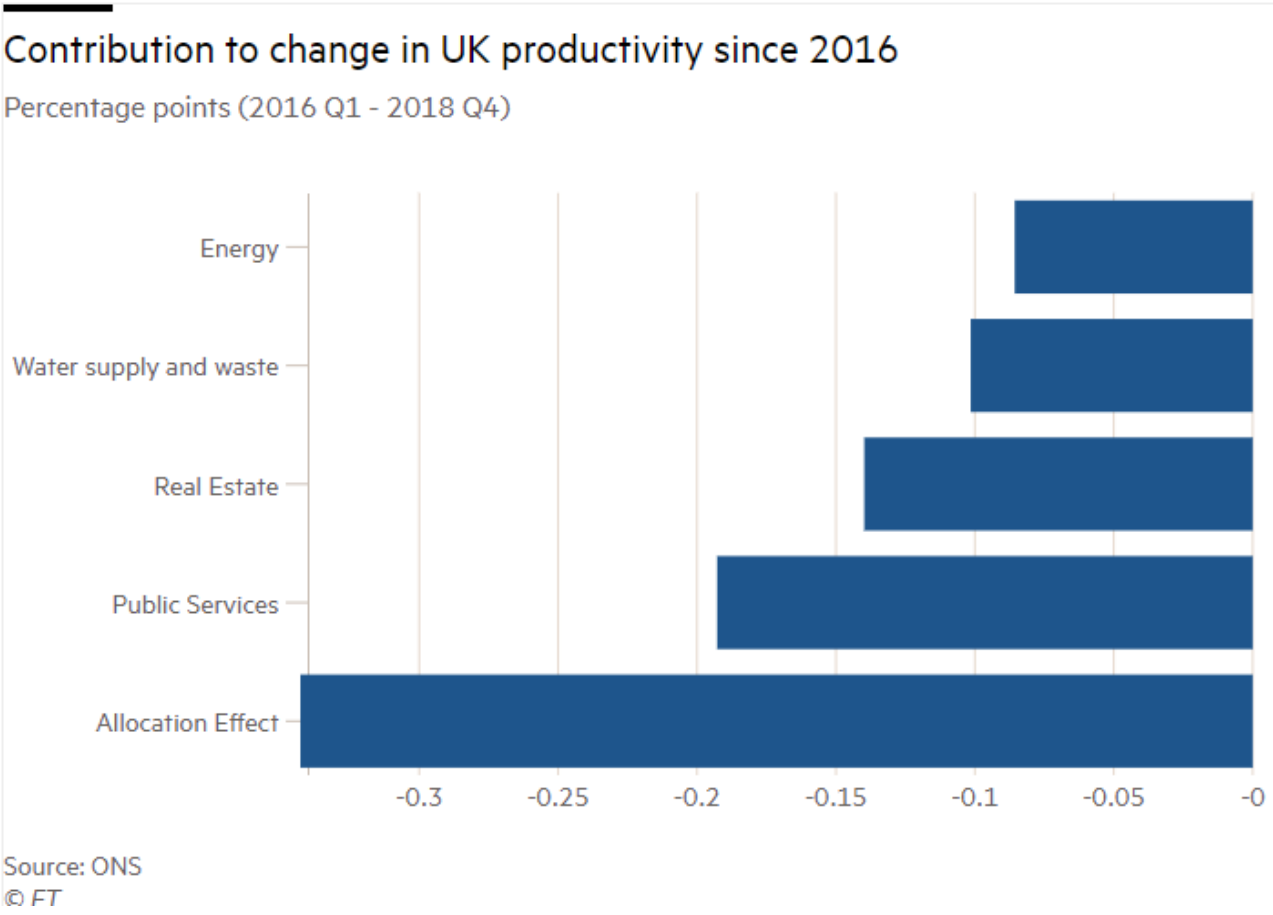
So I've given you five reasons why UK productivity has slowed — changes in financial regulation, the patent cliff, mismeasurement of telecommunications, attempts to cope with climate change, and the troubles with getting more oil out of the north sea. I hope I've persuaded you that there is not a single origin of this problem, but many.

I was asked to talk about policy solutions. I'm not sure there are any really. I don't know what we can do to, for example, make it easier to come up with new drugs. But I do want to talk about what could come next. That ESCOE paper, while brilliant, only goes up to 2015. Since then we've kind of entered into a new stage of the productivity.

As you can see from this chart. Retail, IT and business services are now providing the biggest contribution to productivity growth. I think we can put this down to the digital revolution starting to pay off. This retail figure is the flip side of the decline of the high streets and those stories about Arcadia and Debenhams and so on shutting down.



Here's the other side. You can see that finance and pharmaceuticals are no longer shrinking in the way they once were. Energy and waste management are still dragging down productivity but the biggest thing is this "the allocation effect". What that means is there has been an increase in low productivity jobs, more workers are being allocated to low productivity industries. Hospitality, delivery drivers, care workers that kind of thing.



So what can we do. I don't think we can or should go back to the past. We do not want to go back on environmental on financial regulation, as the US is doing right now. But what we can do as a society is try to be open to new opportunities and technologies that are coming along and that means investing in the basics of education, infrastructure and research to make sure that we are able to make the most of things like e-commerce and working out what to do about those who lose out from these transitions.

Thank you very much for having me. Any questions?