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THE STRUCTURE OF FINANCE

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This whole series has been an attempt to think about the British economy after we leave the European Union or, indeed, after 2019, because we have to think about the deeper problems of the UK economy. For those of you who have come to previous lectures, you will know that I think there are a number of structural problems that the UK economy faces that have not been addressed by successive Governments, and in fact, the problems that were stored up and had built up over a number of years could well be one of the things that explain the decision taken by people, the reasons that they perceived that must have been right in their minds, in June 2016, to seek an exit from the European Union. It would have been nice, following that referendum result, if we had had a very good, high quality debate about what to do with our economy, in or out of the European Union, given the observations we have on the problems of the economy. But we have not, and that is probably my fault and your fault and everyone else's for not getting involved in that debate. So, the motivation for these lectures was, again, to expose these ideas at Gresham College, to an excellent audience who come along to these lectures, but also more broadly, because they are videoed, and then a chance to collect them into some thoughts that I hope, eventually, I will turn into a book on some thoughts about the UK economy, so I very much welcome, personally, the chance to explore these ideas with you. The lectures are also self-contained, which means that you can watch them in isolation, as well as in sequence, and they will still yield many benefits to you, on many repeated watchings, so I say that because I hope people continue to look at them as time goes on.

I am going to focus a little bit today on the problems of finance. I talk about that a lot, probably because it is my main area of research. Many of the problems were revealed after the global financial crisis and what we can see are a number of outcomes on the British economy, some of which I will talk through, and what we have to ask ourselves is to what extent we can blame finance. The outcomes are not ones that I particularly like. What is much higher to try and establish is the extent to which we can blame the financial system for them. We might; we might not. What I want to do this evening is throw open some thoughts with you. I will not give you answers, but I will drive you towards the question of whether we need a Development Bank in the UK. A Development Bank is something that is owned mostly by the state and maybe directs lending to particular sectors. A lot of people find that idea very attractive. I am not going to say this evening, unfortunately, whether I am going to find it attractive or not, but let me just go through some of the ideas with you. And certainly, in my final lecture of this series, I'll come up with some explicit thoughts as to how we might proceed as a country.



“I would rather see Finance less proud and Industry more content. The fact that this island with its enormous extraneous resources is unable to maintain its population is surely a cause for the deepest heart searching.”

Winston Churchill, 1925

“We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.”

T. S. Eliot, Four Quartets, 1943



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I was desperately looking for something that Julius Caesar might have said that made sense in the realms of finance, but it was mostly about crossing bridges and doing other kinds of things that he did, but I remembered this very famous quote by Winston Churchill, in the year that we returned to the Gold Standard, 1925. The first sentence, I am sure many of you would have heard before: “I would rather see finance less proud and industry more content”. Often the remark is left at that point, and it is mostly motivated by politicians, the use of that quotation is mostly motivated by politicians who want to say what we need to do is cut back on finance, reduce bonuses, and make sure that industry can get finance. That is the motivation when they use that quote. But the rest of it puts it into context: “The fact that this island” – I should say, he is talking about Britain – “and its enormous extraneous resources is unable to maintain its population is surely a cause for the deepest heart-searching.” So, he was saying this is a country which has excess supply of goods, and somehow or other, that excess supply cannot provide enough income for people to make the most of their lives. I want to argue that that is the heart of the financial problem: we need the financial sector to allocate resources to those who need them, at terms that they can afford, in a manner that leads to productive use of capacity in the economy, full employment of resources, and the employment of people’s ideas in a way that generates income into the future.

I think it is something, when we look at the UK, we have not done consistently, for a very long time, and indeed, that is why I turn to T. S. Eliot, is that, however we explore this problem, almost exactly from the moment of Churchill’s quote through the Macmillan Investigation, chaired by Harold, through to the Radcliffe Commission in 1959, through competition and credit control in 1971, with a sequence of credit deregulations, very much affecting all of us in the City of London over the next 80 or 90 years, the answer was to liberalise finance further. That was basically the bottom line of the response to this, and yet, we find, after the financial crisis, the need to again regulate finance and ask: is it really delivering what we want? So, in some sense, T. S. Eliot’s metaphor for life, I think, or statement about life, turns into a metaphor for finance: “We shall not cease from exploration, and the end of all our exploring will be to arrive where we started and know the place for the first time”. Just like Churchill nearly 100 years ago, I think the time is upon us again to think about the structure of finance in the UK.

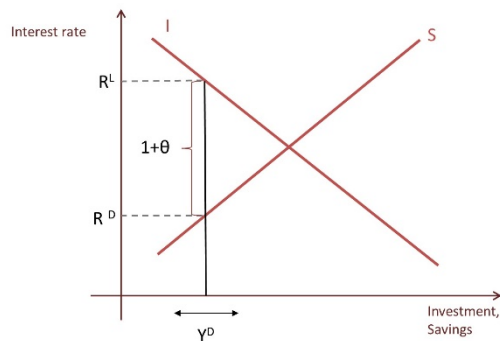
Let me go through some very simple diagrams. I am going to warn you there are some diagrams, and some equations as well, but I will try to not make it too painful. If I can type them up, you can spend a few minutes listening to them, and there will be some points at the end, so just try to bear with me.

So, what are we doing? Well, in an economy where people are saving a portion of their income, they are more likely to save if the interest rate is higher, so the savings schedule is upwards-sloping; and investment or borrowing or whatever we want to call it is more likely to occur at lower interest rates, so that curve is downward-sloping, and it says that, on every investment that I might undertake, if I lay them from the most productive to the least productive, as interest rates fall, the next less productive investment becomes profitable



to me, so I invest in it, so my investment schedule is downward-sloping. But, typically, we do not arrive at the point where the two curves cross, because the people that we ask to intermediate, typically banks, need to think about the monitoring and screening of those that they are lending to and have costs associated with this activity that mean they have to charge a premium over the interest that they pay their savers on deposits.

Saving and Investment in a closed economy

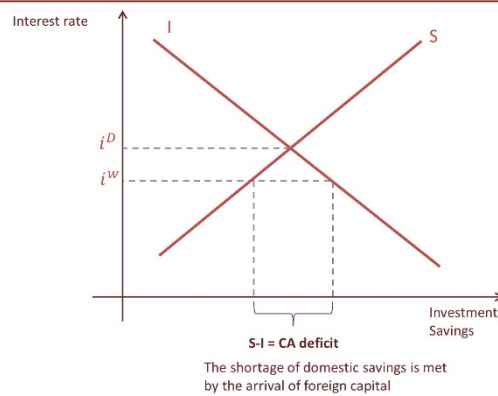


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So, R^D is the deposit rate, and R^L is the lending rate, and the spread, one plus theta, is this notional payment for the costs of intermediation, which might also reflect the riskiness of lending, and so when theta is high, it might reflect more risk in the economy and less lending as a consequence, and when theta is low, it might reflect less risk in the economy and more lending. What you can see is that this particular point, one plus theta, is going to determine, in some sense, the level of demand in the economy. If banks can do monitoring and screening in a more efficient manner, it is less costly, and banks think there is less risk in the economy. What I want to see is that, clearly, if one plus theta is compressing because risk is less or banks become more efficient, the level of demand in the economy can increase because there will be more investment given – the lending spread will compress. Alternatively, if there is more risk perceived in the economy or banks are thought to be less efficient, one plus theta will expand, that will move to the left, and the level of demand in the economy will fall. In some sense then, the financial sector is the one determining, on the margin, the level of activity in the economy, as some function of its ability to allocate the amount that we save back into the economy through investments. That is a closed economy example, so all the savings and all the investment occurs domestically, and we know that, in reality, a large amount of our marginal investment is sourced from overseas, and you can see there that interest rates would be lower – I^W is lower than I^D . At that point, we exhaust the domestic supply of savings and we borrow from abroad. The same principles are at stake, and the same world interest rate, in which there may be a world risk rate, one plus theta, and that might compress or it might expand, depending upon the nature of the world business cycle. But if we are borrowing from abroad, that marginal amount of funding is that which is lent to us in our economy and is going to lead to a current account deficit, that we are not able to supply fully the amount of demand in the economy and we are accessing parts of it from overseas.



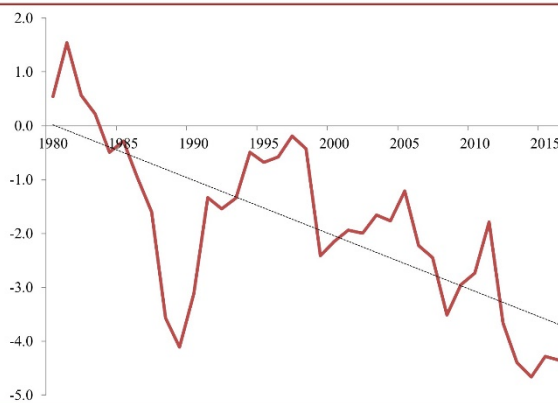
Saving and Investment in a small open economy



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Indeed, alongside this very process of financial liberalisation that I have mentioned in the UK, what we have seen in the last nearly 40 years is a chronic deterioration in the current account position. To go back to the previous slide, it is an increase – this is relative to GDP – almost year by year. The dotted line is a trend line, and you could probably – the trend is whatever you think it to be, but this was an estimation, but clearly, there seems to be, well, certainly since the early-‘80s, there has been no positive year of current account deficit. That means, in every year since 1983 or 1984, we have borrowed from overseas, and that we have imported more goods than we have exported from overseas, and to fund that, we have taken on debt from overseas.

UK Current Account Balance as % of Nominal GDP



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We can interpret that as supply problems: we have got a certain level of demand in the economy, we are not able to supply the goods and services that that demand justifies, so we have imported the balance from overseas. That is one interpretation. Another interpretation is we are borrowing from overseas at the moment because we think we are going to be a lot richer in the future, and when we are a lot richer in the future, we will run surpluses and pay back those debts. That may not be the right answer, but it is one possible explanation of what we see.

We have an idea of finance being liberalised, alongside the way that the financial sector is determining, on the margin, the level of demand in the economy, and if it determines it at a level that is above our capacity to supply, we might run current account deficits. In fact, the other problem the UK has suffered for a long period over this time, but not so much in the last 20 years, associated with excess demand, has been consistent inflationary



pressure, but that has been, to an extent, sorted out, for reasons I have discussed in earlier lectures at Gresham. So, we have some potentially chronic issues there.

I now want to think about how the banking sector is, at a more disaggregated level, allocating those funds, and what I want to explain is exactly the nature of the household problem and the way that banks allocate our capital and what happens when it goes wrong.

Breaking up the problem

	H0	
T=0	S	Household 0 saves (S) 1/3 of period 0 income (Y) in period 0, 1/3 of income (Y1) in period 1 and consumes these savings = 2/3 of period income in periods 1 and 2
T=1	S	
T=2	C	
T=3		Sadly life ends after period 2
T=4		Households are born every period
T=5		Question:
T=6		Save under the bed or friend?
T=7		
T=8		Place it with an institution?



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So, the first column here is time, from zero to time period eight. The second column is a household born in period zero, and this simple household lives for three period, period zero, period one, period two, and deterministically, and very sadly, it will die at the end of period two – nothing you can do about it, no amount of money on the National Health Service will extend their life, that is it. But this household is going to be saving a third of its income in period zero, a third of its income in period one, and then, in period two, it will be able to spend those savings as two-thirds of its income in any one period. So, if you think about that, in every period, it is spending two-thirds of its income, and then, in the third period, the thirds that it's saved allow it to spend in the third period of its life without working. So, the income over the three periods of life is two, but the expenditure in every period is two-thirds. In the first two periods of their life, they're saving a third, and the third period of their life, they are able to spend those savings of two-thirds.

In a second, you will see what happens when households are born every period, but what we need to just understand is exactly that process. The maturity of the savings are either two periods or one period. The savings that I make in period zero are saved for two periods, and the savings that I make in period one are saved for one period. No household is saving for more than two periods because it needs the money in period three because it is going to die at the end of period three. I am not saying these households have any descendants at all – just think of life without kids, how much better off we would all be. No descendants – it is just the end. And so, the question is, if you are going to save in period one and two of your life, or in this case, period T equals zero and period T equals one, who are you going to save your money with? Are you going to put it under a bed or the bed, or give it to a friend who you may not be able to find in two periods' time? In fact, if they are the wrong age, they may be dead. If they have to be the same age as you and there is only one household, so there is no one else you could really give it to who would necessarily be around, or, in fact, it would only be a generation that is not born yet so you will not be able to find them to give it to them. So, all these problems mean of course that we place it with an institution, and the institution that we invented to place it with is called a bank.



The Sequence of Life

	H0	H1	H2	H3	H4	H5	H6
T=0	S						
T=1	S	S					
T=2	C	S	S				
T=3		C	S	S			
T=4			C	S	S		
T=5				C	S	S	
T=6					C	S	S
T=7						C	S
T=8							C



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Here is the story. We have six different sequences of households, all living for three periods, all saving a third and a third in the first and second periods of their lives, and all consuming two-thirds in the final period of their life. None of these savings – or in a minute, I should call them deposits – last for anything more than two periods. At most, they are a two-period deposit, and half of them are one-period deposits. So, how can a bank use this money?

Intermediation

	H0	H1	H2	H3	B1	B2	B3
T=0	S						
T=1	S	S			D=2S		
T=2	C	S	S		D=2S		
T=3		C	S	S	D=2S		
T=4			C	S			
T=5				C			

- Banks always have a stock of savings but the deposits are for two periods only – **maturity transformation**
- By identifying lending opportunities we arrive at **full employment**
i.e. $Y(N)=C(N-2)+C(N-1)+C(N)$



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Well, at a moment's notice, or a moment's thought I should say, by looking across the line, you can see that, in any period, from now until the end of time, there are always two units of savings. So, in period two, the savings are provided by household one and household two; in period three, the savings are provided by household two and household three. They are different households, so there is a turnover in savings, some money going in, some money going out, but the stock of savings is always two. That is the critical point for a bank. Those two bits of savings determine the quantity of deposits that the bank has at its disposal. In every period, deposits equals 2S. The bank, therefore, providing no failures here – and we will talk about those in a minute, from now until the end of time, has 2S to play with and can lend for as long as it wants. It is not constrained to one or two-period lending. It knows it can lend for 100 periods if it wants to, providing we continue to be born, and we will assume within this game that we are continuing to be born. So, B1 here is the bank. In period one, it is only one bank, the bank in period two or the bank in period three.



This of course is the heart of maturity transformation. Banks can take one or two period deposits and lend them for long periods, knowing that they will be continually funded by successive generations who will continue to conform to this process.

There are some well-known problems that then emerge. What if households in period one lose faith in the bank and they turn up at the bank and they say, “I don’t trust you anymore, you’re called Northern Rock, and I want my savings back”, and the bank says, “I can’t do that – I’ve just lent it for 10 years to some people who’ve bought some rather nice property in Dublin on the River Liffey”, for example. And the bank says, “I can’t give you the money back – it’s tied up.” Now, what is your reaction going to be if you knock on the bank’s door and they say, “I haven’t got your money”. Are you going to say, “Oh, that’s fine, I’ll walk away” or you’re going to say, “Hang on, I’m going to wait here and try and get some of the money back”? Well, it is perfectly rational to say, “I’m going to wait here and see if I can get my money back”. It is not irrational at all.

There have to be mechanisms to stop you wanting your money back, and a standard solution to this is for you to know that your deposits are guaranteed, and of course – and I’ll come to that later on – but if your deposits are guaranteed, you do not need to stand in front of the bank asking for your money back because you know the Government will give you your money back if you require it.

That may not be a brilliant answer because, if you have ever tried to get a refund from your train ticket, it is not very liquid and it can take a very long time and have to fill in various forms, so you may say it is not quite a perfect substitute but it is not a bad substitute. So, one way to deal with this problem of illiquidity is for the Government to provide a guarantee on deposits so that we do not have to queue up every time a bank called Northern Rock springs into existence.

But to return to the point, if in periods one and two, or in period one, let us take period one, for example, household zero is saving a third of its income and household one is saving a third of its income, if the bank did not recirculate 2S back into the economy, demand in the economy would be below its full employment level – demand would be less than Y. The bank, by circulating those savings back into the economy, is ensuring that demand is as near to Y as it can be. That is why I make the argument that banks determine the level of demand in the economy. It may not be the way that we always think about it, but it seems to me pretty close to a passable exposition of the truth.

Intermediation

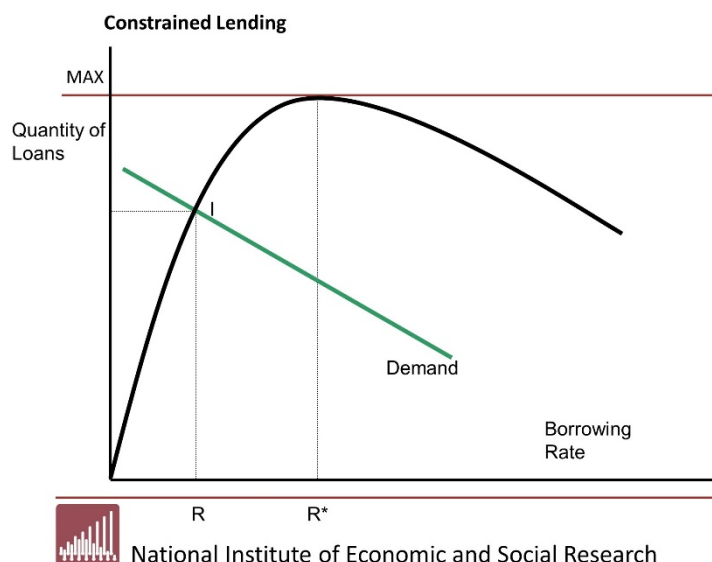
	H0	H1	H2	H3	B1	B2	B3
T=0	S						
T=1	S	S			D=2S		
T=2	C	S	S		D=2S		
T=3		C	S	S			D=2S
T=4			C	S			
T=5				C			

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I have talked about one set of problems that might lead to banks not being able to help full employment to obtain. There is another set of problems and they’re to do with what economies call asymmetric information.



I am the bank. I am holding these deposits, and I want to lend to someone else. I cannot have perfect information about that person. When they turn up at my bank and knock on the door, they are going to put their best suit on, brush their teeth, and give me a wonderful story about how they are going to pay me back. I should treat that information...certainly not with contempt but with caution. I should be a little bit uncertain about whether this person is really going to pay me back.

Indeed, there are a number of people who would argue that banks will only lend up to a certain quantity. Now, to understand this, let us look again at this form of supply and demand analysis here. The demand curve is simply saying that, as interest rates fall, I will demand more loans, and as interest rates rise, I will demand fewer loans, and you can see that, the way the demand curve is sloped there. The black line is the supply curve, and it says that, as interest rates rise, I am prepared to lend more to individuals. But it also might say, there may be a limit, R^* , beyond which I will not lend to an individual because I will think to myself, no matter how much of an expensive suit they present to me and how much of a dazzlingly white smile, I shall to myself, if they are prepared to pay something above R^* , they must be doing something so risky, so difficult, that I think that is not something I want to finance – it is something I am going to be concerned about. The very fact that I am prepared to pay such a high interest rate is revealing to me something rather smelly about them, in the sense in which I am not going to lend to them. So, at that point, there may well be a constraint to lending.

One solution to this is to ask for collateral. If I say, look, if I am going to lend you anything above max or even up to max, I am going to want some multiple of that in my pocket to provide backing against the loan that I give you. So, in that sense, I do not need any private information about you. If I am going to lend you £1,000, I am going to hold £2,000 of your property against that loan, which I will return to you when you pay me off, so I do not have to worry about finding out about your plans or your capabilities. That is all well and good, but what if you haven't got collateral? You are then excluded from lending markets. You might be a perfectly, and I am sure I know that you are, a perfectly reputable person I should be lending to. You may have some very good ideas. You may be able to be the absolutely perfect person to run an entrepreneurial activity, and yet, if you do not have collateral, you will not be able to access asymmetric information markets, and that could well mean that the economy is not allocating funds to those who should be having it. It is allocating it more to those people who have collateral.

If we go further, if we imagine an economy in which there are large amounts of wealth inequality and collateral is essentially tied down to the amount of wealth that you have, if wealth itself is something that's unequally distributed, then lending itself will tend to follow those who already have wealth rather than those with new ideas. Now, by itself, that is not necessarily a problem, only the extent to which the talent for entrepreneurship is correlated with initial wealth or not – it might be, it might not be. But if it is not, the lending the process will



further exacerbate wealth inequalities in the economy, and, again, may not be leading to the best allocation of loanable funds across an economy.

Bank and Central Bank Insurance

Bank A		Bank B	
Assets	Liabilities	Assets	Liabilities
Reserves	Retail Deposits	Reserves	Retail Deposits
Loans	Wholesale Deposits	Loans	Wholesale Deposits
	Capital		Capital

OFI		Monetary Authorities	
Assets	Liabilities	Assets	Liabilities
investments (low)	Pensions	Bonds	Central Bank Money
investments (high)	Insurance claims	Capital	

- Money markets allow ironing out of liability wrinkles - central bank stands at centre.



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Another problem facing banks... OFI is “other financial institutes”, but I want you to concentrate on Bank A and Bank B. Bank A has the retail deposits, these two Ss that I talked about earlier on, and let us suppose that you go to Bank A and you remove some of your retail deposit but Bank A still has these loans to Dublin out there. That means the bank is not fully funded itself at the moment because you have removed some of its deposits, but the good news is you have taken your deposits from Bank A and stuck them with Bank B. This then means that Bank B is more than fully funded and Bank A is underfunded, and so Bank A can insure itself against that internal drain by going into the interbank market and saying, “I just need a little bit of money”, and Bank B will say, “Well, actually, I have got a bit too much money because the person who took it from you has put it in my bank, and therefore I am going to borrow for you on the wholesale markets”. This is an interbank market that allows self-insurance for the banking sector, providing the shocks are specific to individual banks. Bank A and Bank B, all the way up to Z, can insure each other, providing the interbank markets can reallocate any liabilities that move around those markets from one to the other. That is fine, providing the banks think that each other bank is going to be in existence at the end of the loan, and, as a result of that trust, are willing to enter the interbank markets and lend to each other. That is not something that has happened particularly well since 2007, and to the extent to which that has not happened, or indeed, more problematically, as a general shop to the whole banking sector, we would then turn to the monetary authorities, the Bank of England and the Treasury, to provide lending to the whole system in the case in which liabilities were not sufficient to provide funding to the banks. We will come to that problem a little bit later on.

In a nutshell, we have thought about finance from the real economy side all the way up to the actual structure of the banking market. The observations, the story so far... The UK has a persistent, chronic current account deficit, which implies or says that we have been borrowing from abroad. It might imply we are borrowing from a richer future, but it might be telling us something about supply constraints in the economy, which I will come to later on. That said, the net international investment position is about in balance. The net international investment position is the cumulated assets and liabilities, at home and overseas, from this sequence of current account deficits. Even though we have had a sequence of current account deficits, the value of our assets overseas have appreciated in their own terms, in terms of market value, and as a result of depreciations in the exchange rate since 2016 to mean that we do not, on balance, owe the rest of the world very much money at all. So, that is a fortunate thing at the end of this process, so I am not so concerned about the net international investment position, but I think the sequence of chronic current account deficits is telling us something about the supply side of the economy.



So, to what extent then are the problems on the supply side of the economy a result of some failure to match savers to borrowers? To what extent might we ascribe those failures to asymmetric information, our particular way of dealing with that through collateral and property-based lending? Can we think of other ways of selecting, by trying to understand potential borrowers in a different kind of way? To what extent that the problems might relate to network effects or externalities, that the whole system tends to work together well or together badly – “Is that something that we could break up with other kinds of structure?” is a question to ask ourselves. How important is the need to hold liquidity as a factor in explaining the problems on the supply side of the economy? And might it be the case that, because banks are not holding sufficient capital – in fact, we will see in a minute that the amount of capital they are holding has been falling over time – does that mean that they are not prepared to undertake the risky form of lendings that might be required to help the supply side of the economy? And, finally, to what extent the fact that the central bank stands behind the system has also altered the nature of the banking system to act in a particular way that it might not otherwise act? These are extremely big questions for us to consider.

Commercial Bank Balance Sheet

Assets (A)	Liabilities (L)
Reserves or Liquid Assets = $R = (1-\lambda)A$	Deposits = $(1-\mu)L$
Loans = λA	Capital = μL



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Let me start with a simple exposition. We will have a couple of equations here, but there are pretty pictures afterwards, so just bear with me here. So, let us take the central bank problem and think about the assets and liabilities. The liabilities is how a commercial bank funds itself, through deposits and capital – that is the equity held by the owners in the bank, and capital can also be loss-absorbing, so if a bank loses money, it can be taken off the capital stock, so liabilities are L . μ is the fraction of capital held in the banks, so the amount of capital in the bank. The ratio of A to μL is bank leverage – you must have heard of banks being highly-levered. That means A is very high relative to μL . That is something we have talked about in previous lectures and I will not talk about that too much today. And on the asset side, we can think of two types of assets: liquid assets, so this could be T-bills or cash held at the till in the bank to deal with those idiosyncratic people who say, “Can I have my money back?”, the small amount of money. The more that we hold in reserves as the liquid assets, the less we can lend out, the less of a profit we can make for a bank, so it is an allocation problem for banks. I could hold everything in liquid terms, but then I would not make any money to give people a rate of return that would give them the same amount of goods and services that they would require in retirement that they have when they are working. There needs to be a positive rate of return to give people sufficient spending power later on in life. So, this is an idealised bank balance sheet, and let us see what that means for bank choice.



Bank Problem

$$R^L = (1+\theta) R^D \quad \text{Loan rate is a spread over the deposit rate}$$

$$A = L \quad \text{Assets equal liabilities}$$

$$\lambda = \text{fraction of illiquid assets}$$

$$\mu = \text{fraction of capital/equity on bank balance sheet}$$

$$\pi = R^L \text{Loans} - R^D \text{Deposits} - F \quad \text{Flow profits are interest received on loans} \\ \text{- interest paid on deposits - fixed costs}$$

$$\pi = (1+\theta) R^D \lambda A - R^D (1-\mu) A - F$$

$$\frac{d\pi}{dA} = 0 : \quad \frac{(1-\mu)}{\lambda} = 1+\theta$$

Choice on liquidity and capital pins down the finance spread/premium



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R^L , as we have already looked at, is a multiple of the deposit rate. The deposit rate is that interest rate we pay people who put their money on deposit in a bank. So, you can think of it, R^D , as the cost of funding. I need the liabilities, the deposits in the bank, to fund the loans, and what I pay people is R^D . But what I am looking to charge people when I lend them money is one plus theta – that is my spread to deal with riskiness and the costs of doing what I do. In any good balance sheet, assets equals liability, so I can substitute A for L when I require. λ is the fraction of illiquid assets. Illiquid assets are the ones that make you money. They are the ones that I am lending to people in firms, in corporates or on mortgages, so they are the ones on which I am making a spread – that is the things I want to try and make as large as possible. μ is the fraction of capital or equity held in the bank, and that's the paid-up element there. So, what are the flow profits of a bank? Well, simply, they are the interest rate on loans times the amount of loans, minus the interests on deposits, times the quantity of deposits, minus some fixed costs, which we will assume are not bonuses or whatever they are, they are just rent, IT equipment, advertising, sponsoring football matches, whatever it is that banks do these days, I have no idea. Well, I have actually, but that is a question for another time. Now, if we substitute the expressions that I have at the top into there, it means the profits are then the spread or the lending rate over the deposit rate, times the fraction of assets that are illiquid, that I am lending out at profit, minus the fraction of liabilities, but I have substituted assets back in there because it is a little bit easier to play with that, and then our deposits in the bank times the cost of funding, R^D , in there, minus the fixed rate, so that gives me a simple expression there for the profitability of the bank. To maximise it, I differentiate with respect to the size of the bank's balance sheet, set that to nought, and I get this nice expression that simply says the choices on the level of capital, μ . One minus μ is the quantity of lending that is from deposits. μ is the quantity of lending that is from capital. And the choice of the fraction of liquid or illiquid assets will pin down the financial spread. So, the bank itself will want to choose theta as some function of the quantity of capital it has and the quantity of loans that it makes – that is just a choice for the bank. Now, it could be that theta cannot be chosen by the bank. It might have to be set by regulatory conditions or competitively or as a result of the business cycle. So, the extent to which it cannot be set by the bank itself, the bank will be off equilibrium, at some level not maximising its profits. That is a question perhaps for another day.



Bank Problem II

$$\frac{d\pi}{dA} = 0 : \quad \frac{(1-\mu)}{\lambda} = 1+\theta$$

Choice on liquidity and capital pins down the finance spread/premium

- If banks can have higher fractions of loans compared to liquid reserves, λ , then they can lower the loan rate spread
- If banks can reduce their capital (or equity) then there is less pressure to increase the spread to fund activity
- But $\frac{\pi}{\mu L}$ i.e. rate of return on capital will fall

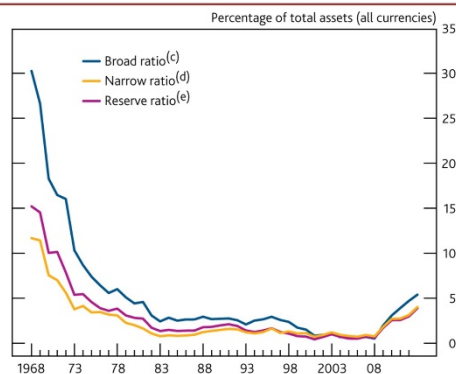
Long run falls in capital and liquid assets might offset each other and lead to little change in mark-ups



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Let me just take that expression that I have got there and carry on with it, just so we can remember it. So, we have got some expression here that says that the spread the bank would like to charge – let us look at lambda. If I increase the quantity of illiquid assets, the quantity of loans, providing they do not default, then I can reduce the finance premium, theta, and that is the chart that I had earlier on, simply saying that, if I can lend more to people, I can charge them less – that is all that is saying there. And if they can reduce their capital, then there is less pressure to increase the spread on activity, and that has aspect whereby the quantity of capital that they have at their disposal will also impact on the optimal spread that they will choose. But then, also note that the profits over the account of capital will fall if μL increases. So, even if I am maximising profits, if I increase the quantity of capital in the bank, the rate of return on capital will fall. The bank will again be trading off two aspects in choosing its level of capital. It will want to have enough capital to deal with the possibility of losses but not so much capital so the rate of return offered to shareholders will fall and the price of the bank or equity will fall as well.

Sterling liquid assets/total asset holdings in UK

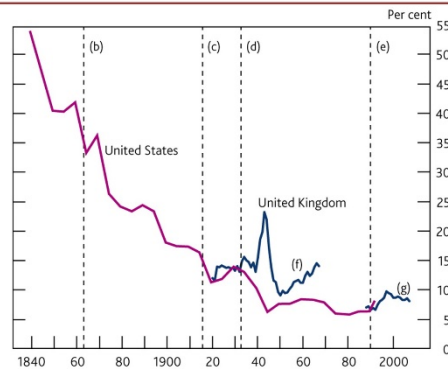


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It will be interesting to see whether the pattern of changes in capital liquidity have any information content for the mark-up in the market. In the long run, let us remind ourselves what has been happening in the UK, the banks have tended to reduce liquid assets, and that means increase illiquid assets. Lambda has gone up over time. Liquid assets have fallen. Illiquid assets have gone up. So, more of a bank's balance sheet is being lent out to people at high interest rates. That trend was reversed after the financial crisis, where you can see that banks' liquidity has gone up somewhat to deal with the kinds of problems I outlined as a result of Northern Rock.



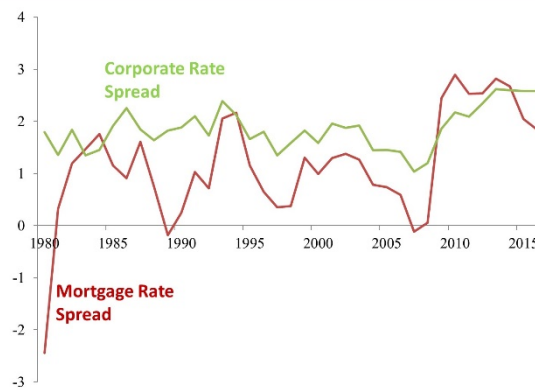
Long-run capital levels for UK and US banks



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And, similarly, bank capital has tended to fall over time, so banks have stopped holding 30% or 40% of their liabilities as capital, and that has fallen to around 5% in the most recent period, and a reduction in bank capital has meant that more and more of the funding of banks has been through deposits, either retail or wholesale, which, to some extent, is costly and will tend to drive up the required external finance premium. But the two trends together, we might ask ourselves, as a result of them both falling, what has happened to the spread? Well, we would predict that it would mean the spreads have been fairly constant, that the two have offset each other.

Corporate and Household Borrowing Spreads

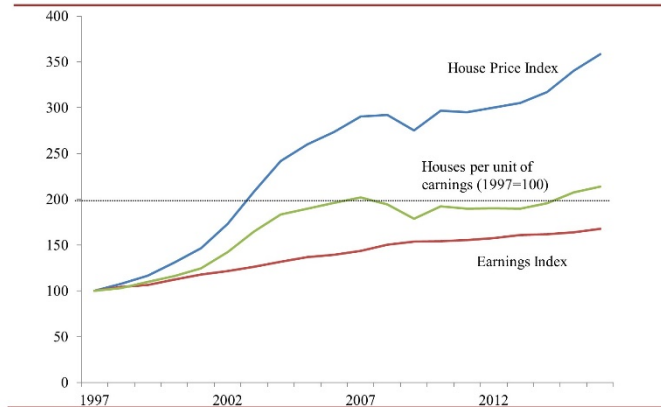


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And, not quite constant, but over the 40 years since the start of the financial liberalisation period, it seems to be hovering, both the mortgage rate spread of the bank interbank rate and the corporate bond rate spread of the bank interbank rate, have been reasonably steady, suggesting that banks may be targeting a given mark-up when they lend to people, and that may mean, if they are targeting a given mark-up, they may not be allocating funds according to conditions – they may just be saying, whatever the borrowing rate is for them, they want a 1% margin above it, no matter what the state of the economy is or what the quality of the individual may be. There may not be appropriate levels of differentiation by price or state of the economy out there. It is not anything like as cyclical as what one might have expected.



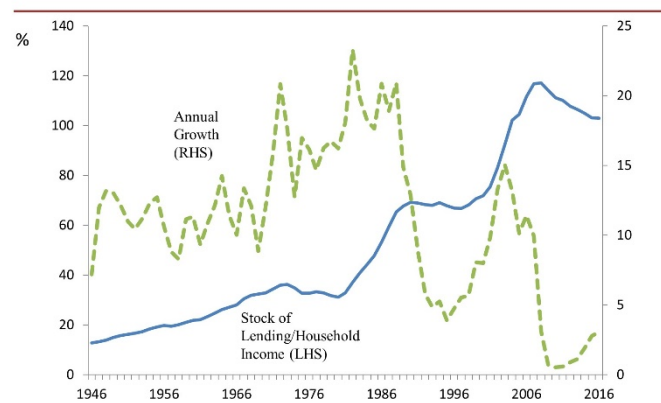
Affordability of Housing in the last 2 decades



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The question then is: where have banks been lending if they haven't been trying to find the individuals who need the money? Well, it will not surprise you to learn that a large amount of lending has been to the household or property sector. In my previous lecture, we looked at the affordability of housing over the last two decades, and if we take a house price index from around 20 years ago and we base it to 100, we can see that, by about now, it is not far off 400, about 350, so there has been about a 3.5-fold increase in house prices as more and more funds have been driven towards the housing sector. Now, in my lecture from last time, I also explained that one of the reasons house prices have gone up so much is the lack of supply in house completions but also the demand side, through extra finance available, has also been part of the story. I refer you to my previous lecture for the full story here. And yet, at the same time, the earnings index has gone up from around 100 to 150, and the dotted line there is the point at which house price affordability halved, or the ratio of house prices to earnings doubled, by around 10 years ago, and it has hovered around there since then, suggesting that houses are now half as affordable as they were 10 years ago, 20 years ago, and a large part of the reason is this increase in lending towards that sector that has made it more unaffordable, or "less affordable" might be better English. A lot of these decisions stem from the factors I have just been talking about: do not select on risk, think about lending on the basis of collateral, think about loans that you can make that will give you a reasonable or 1% return over your borrowing rate, and generate profits for your shareholders. It seems to be a fairly easy machine for banks for the last 20 years to have carry out. So, the question is: have they really been allocating to the people who require their lending?

Secured Lending to Households and NPISH



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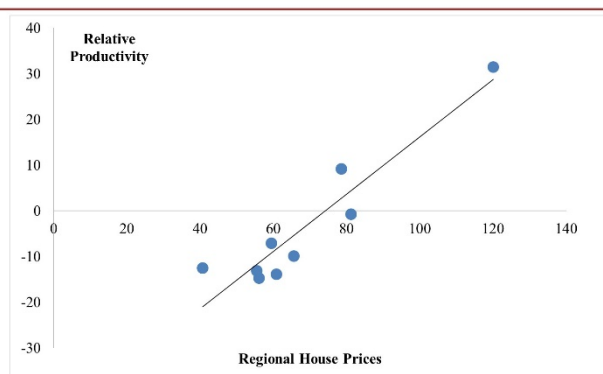


Let me back up that point about the stock of lending. The blue line shows you the stock of lending relative to household incomes, and you can see, in the early period of liberalisation, it was 20% or 30%, and sometime over the last 20 years, it crossed the 100% threshold, it went to about 120% at the time of the financial crisis, and has fallen since then, but the stock of lending, secured lending, to household income is around 100% today, compared to a much larger fraction in the past. That is telling you about this wall of capital that the banking sector has allocated to households rather than alternatives in the economy - well, I say that as a value judgement – “possibly” rather than alternatives, let me be fair to our friends in the banking sector.

You can see large amounts of growth, particularly, if you go to the right-hand side, if you look in the period leading up to the financial crisis, from 1996 through to 2006, rates of growth of 5, 6, 7, 8, up to 15% a year in the growth of secured lending to households. These are tremendously large increases. Let me be absolutely clear to you: the increase in households is not 15%. It is a very, very small increase in households over that period, so this is very much a quantity per household rather than an increase in households for that period.

And all that said, we can go further along the same thought process and ask ourselves, how much do house prices, if that is the asset that is being driven, also be explained as their variableness across the country by relative productivity in the country? So, I imagine productivity itself is some function of investment in the economy, some function of firms developing workers and their skills and getting them to employ and do things better, through better management practices, and transport links, and confidence in the economy – all those kinds of things are the things driving relative productivity in the economy.

Regional English House Price Rises versus Relative Productivity

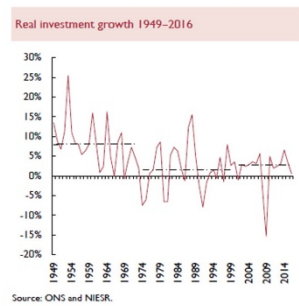
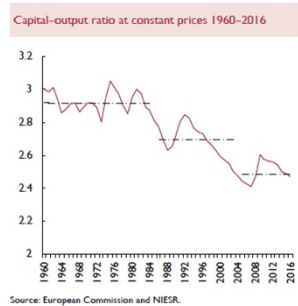


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What we can also see is that, if we take the nine planning regions in the UK and scatter relative productivity to the average of 100 so that the top right-hand side is London, where productivity is some 30% more than the average, which in this case is zero, and the least productive areas are 10% to 20% below the average, and look at that against the increase in house prices over a 15-year period, from 2013 to 2018, or is it 2012 to 2017 you see that the relative difference in house prices is well explained by relative productivity, suggesting that if the lending had itself helped productivity in the different regions catch up to the average, if there had not been the difference, we would not necessarily have had the wide disparity in house prices we have in the country as well. So, another aspect of lending that might be going on, it might be too concentrated in the South and the South-East, driving up house price differentials rather than, again, sorting out lending to different parts of the economy to try and equalise productivity differences. Some of these issues have been talked upon over the public policy analysis of the question of regional policies, and also industrial policies, to even up these productivity differences. But charts such as this demonstrate the extent to which things like productivity, which are some function of the supply of capital, are themselves helping to understand house price differences as well.



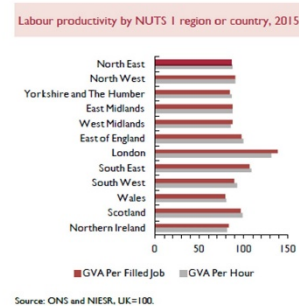
Capital Employed Dwindling



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And so, this question mark about a lack of investment in the economy is further highlighted by these charts that I showed in the lecture prior to the Election last June. If you looked at the level of capital employed in the economy relative to income, we see that that has been falling on a [circular/secular??] basis, and investment growth, on a decade to decade basis, has been falling. Let us be clear about the capital stock. We might be under-measuring the capital stock because we may not be dealing with intangible investment particularly well, but certainly, there does not seem to be any evidence of an increase in the capital employed in the economy relative to output – it seems to be falling. And investment growth, at 2% or 3%, is below the replacement ratio of the capital stock relative to output – that is why that is falling. And the fact that investment is only just above zero, at zero real interest rates, must be a further cause of concern and another question mark to be asked of our financial sector.

Income Inequality and Regional Productivity

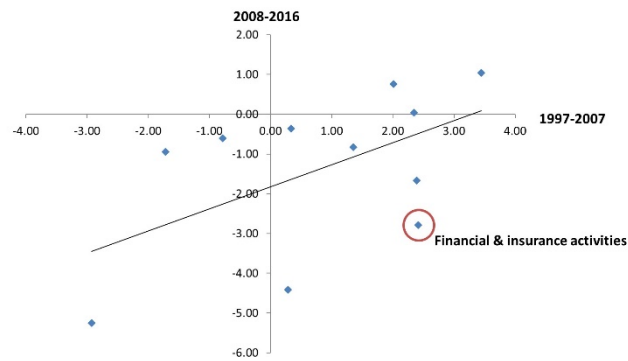


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The labour productivity numbers that I talked about are really related to here, and here is the point that backs up the point about house prices, is that, if we look at the 100, which is the average across the country, we have two regions above 100, London and the South-East, and everywhere else, in terms of labour productivity, is below. So, to the extent to which, only the extent to which productivity is some function of capital employed in the economy, some function of getting labour to act more efficiently and produce goods better, the financial sector doesn't seem to be evening out this production across the country. We are not bringing all the regions up. The financial sector seems to be concentrating in London and the South-East rather than everywhere. So, it is a question mark to be asked of our financial sector.



MFP contribution to GVA growth before and after the crisis



Source: ONS and NIESR



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If we look at the whole of the financial sector, it seems, again, to be one that has played a role in the overall productivity slowdown. This is a slide from a lecture I gave on productivity last Autumn. But what we are doing here is looking at the nine or ten different sectors of the economy and understanding their contribution to productivity prior to the financial crisis and then after the financial crisis, and what I want you to see is that – GVA is gross value added, MFP is multi-factor productivity – is that prior to the financial crisis, financial insurance activities, on average, were somewhere between 2% and 3% per annum in their growth rate – they were positive. After the financial crisis, they have been negative of 2% to 3%. So, I just want to say, they certainly seem associated – I am not saying they are causal but associated with the productivity slowdown. When we cross the Y-axis there at minus two, it tells you that productivity growth has, on average, in the 10 years since the financial crisis, been 2% below where it was before the financial crisis, and it seems to me that the activities, the financial insurance activities, may have a large part to play, but the causality is a question for another day. I just wanted to say it is definitely in there somewhere, it seems to me, as part of the story.

Measuring Financial Sector Output

Table 5. Financial intermediaries output measure

Sector	Measurement method
Banking sector ^(a)	Fees and commissions receivable Net spread earnings Other operating income Financial Intermediation Services Indirectly Measured (FISIM)
Non-banking financial intermediaries	FISIM Value of funds under management for investment funds

Source: Burgess (2011).

Note: (a) Deflation made using AWE series for the financial services industry, excluding bonuses and adjusted for changes in productivity.



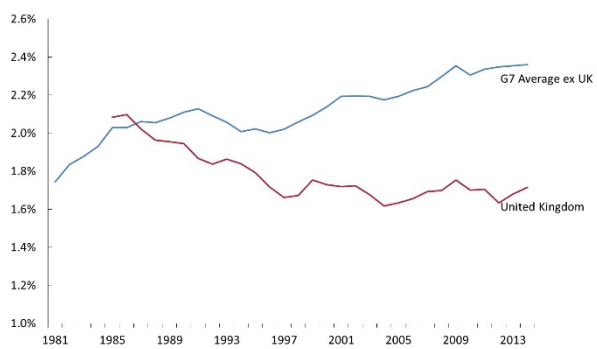
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But, that said, measuring financial sector output is questionable. The way we measure productivity or value-added in the financial sector is itself open to, I think, many question marks. We measure it by fees and commissions. Fees and commissions are going to be higher in a boom than they are in a recession. That is not necessarily measuring value-added. Spread earnings... Earnings will be higher in a boom than they will in a recession, and it is going to look like productivity has fallen. There are all kinds – in fact, for non-bank financial



intermediaries, its actual value of funds under management that seems to explain gross value-added. If the value of funds is high in a boom and low in recession, it will look like financial sector productivity is playing a very important causal role. So, I want to just attach a warning light to my previous statement that the financial sector may be driving things – I am simply saying it is associated with it. We certainly need better measures of the contribution of the financial sector. And what we may have been doing, that said, prior to the financial crisis, is overestimating the contribution of the financial sector to the economy because it may have been doing easy things, very well and very mechanically, and engineering a large amount of money from it.

R&D expenditure to GDP ratio in the UK and rest of G7 average, 1981-14



Source: OECD, NIESR



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What is another damning indictment of where we are on the financial sector? Well, R&D expenditure, research and development expenditure, is thought to be a very important cause of not only overall investment in the economy but, ultimately, productivity, and this, as a fraction of GDP, you can see that the UK lags well behind the G7 average over the 30 years of financial liberalisation. We are about 1.7%, 1.8%, compared to the G7 average excluding the UK, so I suppose I could call it the G6, of 2.4%. It may not seem like a large number, but year on year, differences of this magnitude will have material impacts on income per head. In general, around half of R&D is public and half is private, but somehow or other, our financial structure is not leading to sufficient development of research and development expenditure.

Estimates of the stock of external finance for UK businesses

Source	Bank lending ^(b)				Bonds Markets (public)	Insurance companies and pensions funds	Asset-based finance (eg factoring and leases)	Peer-to-peer lending
	PNFCs ^(c)	Total non-financial ^(c)	SMEs ^(c)	Large ^(c)				
Type								
Code	B4VR	B4H3 Z8YJ	Z8YH	Z8YI	KLB6	RLKA		
2009	531	583			268	22	14	
2010	479	536			265	23	15	
2011	450	504	189	315	300	31	16	
2012	427	472	176	296	328	34	17	
2013	406	448	166	282	336	35	18	
2014	390	435	167	268	330	38	19	0.6
2015	387	430	164	265	313	38	20	1
2016	402 (Aug.)	445 (Aug.)	161 (Aug.)	284 (Aug.)	351 (Q2)	39 (Q2)	20 (Q2)	1 (Q2)



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One final table and then I will sum up. A further indictment, to some extent... I want you to look at SMEs, small-medium enterprises. This is the stock of external finance provided to UK businesses around two or three



years ago – it is 164 billion. That is around a tenth of the stock of loans held by households against their properties. So, we tend to lend 10 times more to households to buy their houses than we do to people setting up small and medium-sized enterprises. That may be fine. It may be fine. I think my value judgements here maybe imply it may be something that is also a problem if we think that is where we are in the economy.

Government Support

- **Recapitalisation of Lloyds Banking Group (Lloyds) and Royal Bank of Scotland (RBS)** through a series of transactions eventually acquiring 83 per cent of RBS (but 68 per cent of the voting rights) and 41 per cent of Lloyds (of both ordinary shares and voting rights).
- **Lending money to the Financial Services Compensation Scheme (FSCS)** so it could guarantee customer deposits of up to £50,000. The limit has been increased since then, most recently in January 2017 it was increased to £85,000.
- **Lending directly to insolvent banks so they could repay customer deposits of over £50,000**, including to London Scottish Bank, Dunfermline Building Society and the Icelandic Banks – Heritable, Kaupthing Singer and Friedlander, and Landsbanki.
- **Nationalising Northern Rock and Bradford & Bingley (B&B)** to protect their depositors and facilitate the orderly unwinding of their obligations and HM Treasury's guarantees.
- The **Special Liquidity Scheme**, introduced in April 2008 and lasting until January 2012, to increase the liquidity of UK banks. It was a Bank of England (BoE) scheme, supported by a HM Treasury guarantee, under which banks swapped assets for more liquid Treasury Bills in return for a fee.
- The **Credit Guarantee Scheme**, introduced in October 2008, to help restore investor confidence in bank wholesale funding by guaranteeing certain unsecured debts in return for a fee. The scheme closed in 2012.
- The **Asset Protection Scheme**, announced in January 2009, to protect assets on banks' balance sheets. RBS and Lloyds initially agreed in principle to join, but in the end only RBS joined. The scheme closed in 2012.



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The financial sector overall had very large degrees of support after the financial crisis – recapitalisation of a number of our banks, increasing the deposit insurance scheme that I talked about when we thought about Northern Rock a few minutes ago, some nationalisation of banks, a special liquidity scheme, credit guarantee scheme, and asset protection scheme. So, clearly, in crisis times, the Government has to have sufficient fiscal backstop to support the recapitalisation of the banking system. That is one form of involvement in the financial sector, and the Government is moving away from that as the recovery itself and the time since the financial crisis increases. These are things that we are slowly moving away from, but I am pointing out that, from time to time, the Government will have to come in and support the financial sector in a particular way, as we saw during the financial crisis.

What are the economics issues? Well, lending looks heavily property-based, either because of collateral problems or our preference for holding housing in the UK. As I said in my previous lecture, the housing sector looks overweight in housing wealth, some five trillion in housing wealth in the UK, and the stock of loans secured against housing is about 1.7 trillion, about the same as household income, one for one. There seem to be, as an economy, significant regional distributional issues. Productivity is unequally spread throughout the economy. Regional productivity is also poorly spread throughout the economy. In aggregate, the capital stock is low. Investment looks low, even though, I have got to say, they are both very hard to measure in an economy that is increasingly digitalised. So, a large part of the shortfall might well be our economy is increasingly doing things in a different way. But so are all the other economies in the world, so relatively speaking, we are still looking worse off across these dimensions. But we are trying to do a lot more to measure these things, and in fact, there is a centre at the National Institute, the Economic Centre of Excellence, funded by the ONS, trying to do a better job of measuring these parts of the economy. But that said, even relative to other economies, our productivity levels also seem to have fallen short. So, we need a way of establishing a direct link between those outcomes and the financial sector.

My lecture has tried to persuade you that the financial sector determines the level of output, but what it does ultimately is subject to informational constraints, network externalities – it cannot self-insure itself, it needs liquidity, it needs capital. It cannot necessarily always get us to the highest level of output without Government support. And, overall, productivity in the sector seems to have fallen following the crisis. So, it might be argued to be a sector that might need a bit more help, but it has had a lot of help already, has it not?



So, what is the case for a Development Bank? I am not going to persuade you that the case has been made – I am not even sure of it myself - but let me just sort of outline what a Development Bank is. It would be wholly Government-owned or have a significant capital stake by the Government. If it were owned by the Government, it could be directed to invest in particular areas, the SMEs, for example, start-ups of a particular sort, or even venture capital – it could be called the Dragons’ Den Bank, for example. Such a bank could have a regional bias or flavour. It could be called the Liverpool Development Bank, rather than London Development Bank. That is just ideas that could be floated out there.

But here are the questions. We do not want to subsidise the loans, so the projects that it finances must be able to provide a market rate of return. How are we going to otherwise do it? Who is going to judge whether the project was feasible if it does not make a market rate of return? So, at some point, this idea only floats if the current financial system is not delivering loans to people who can make a market rate of return, which would be an odd state of affairs in a capitalist economy. Why would it be that they are not? Is it the case that they only lend to people who are members of the same golf club? Or do they go out and look for people who can make that market rate? So, there must be a further rigidity out there in information that means that the current banking system is not allocating capital to people who can provide a rate of return. I do not think we should be arguing for subsidised lending because, again, that leads to queuing and lending to people who are known to the lenders – I think it is something we want to avoid if we can.

Could it be the Development Bank could emphasise the screening and matching function that a commercial bank can’t? Maybe a commercial bank is going to do this in a relatively mechanical manner. Maybe the Development Bank could be encouraged to do a deeper dive into the qualities of a potential borrower and do a better job – could that be one aspect of what it could do? Indeed, a British Business Bank was set up in 2012, with around a billion pounds of Government funding, and I think has an asset size at the moment of around 10 billion, which is about half a percent of GDP. Bank assets in the UK are about six times GDP, so it is a fairly small player at the moment, but I naturally wish it well.

Could it be that the macro prudential instruments that I have talked about in previous lectures and the centralised rules of modern banking – there are algorithms you have got to go through, your age, your sex, what car you drive, where you live, how much your last credit card bill was, what your utility bill is, and then there is the answer, gamma to the power of three, you can have the loan, you cannot have the loan. It could be that these average algorithms don’t allow those of us who are more idiosyncratic, but nevertheless perfectly good risks, from accessing finance. It could be there is something wrong with those average algorithms. They may not be helping those in different regions and in different areas or with the wrong accent or those who can’t play golf, I do not know. There could be problems out there. By the way, I cannot play golf.

So, what we need to do before we get in a Development Bank is to identify shortfalls in lending independently of the state of the economy. One of the really difficult problems with thinking about the level of loans, whether it is to SMEs or households, is how much of it is conditioned by the state of the economy, which may be good or may be bad, and how much of it is genuinely a function of the supply curve of finance. This is a very hard identification problem. These are the kind of proofs we may need before we go further down the route of a Development Bank. But I want to tell you, I am concerned about some of the outcomes that I see, but I am not convinced that we need a Development Bank immediately.

That has been a rattle through many issues of finance there. I hope you were able to follow all the arguments. I almost followed them all myself while I said them out-loud. But I want to just thank you for coming, thank you for listening to me this evening. Do come along to my final two lectures. It has been nearly a four-year slog, and I have loved every minute of it, coming here to Gresham, but in the next two lectures, I will go further and start to make some proposals, as well as just ask you some questions.

Thank you very much.