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BvA: Why has economic growth slowed down? Have we already exhausted the benefits from the digital revolution? Are the trusted institutions of the 20th century now failing the investments most needed for future growth and productivity? We are going to find out. Welcome to Productivity Puzzles. Hello, and welcome to the 15th episode of Productivity Puzzles, your podcast series of productivity brought to you by the Productivity Institute and sponsored by Capita. I'm Bart van Ark and I'm a Professor for Productivity Studies at the University of Manchester, and the Director of the Productivity Institute, a UK wide research body on all things productivity in the UK and beyond. If you are a regular listener, great to have you back, and thank you for your support as we now have as many as 6,000 downloads on our first 14 episodes. So if you're new to Productivity Puzzles please check out previous episodes at [productivity.ac.uk](http://productivity.ac.uk) or through your favourite podcast platform.

Once in a while we are focusing the show on discussing a newly published book, and today's book is at the heart of what is the Productivity Institute's business, namely how all sorts of new types of capital in the modern economy, often collectively referred to as intangible capital, are not quite contributing as much to growth and especially recovery of productivity growth as we think they should. The book titled *Restarting the Future; How to Fix the Intangible Economy*, provides a new explanation for why growth has slowed and why we need a reset of institutions and policies to strengthen the role of R&D, software, design training and other types of intangible capital. We have two authors of this brand new book following an earlier best seller they published titled *Capitalism Without Capital*, that is without physical capital we have them with us today. First, Jonathan Haskel is a Professor of Economics at Imperial College Business School and external member of the Monetary Policy Committee of the Bank of England, and a member of the TPI overseeing much of our work on intangibles. Jonathan, great to have you on again. I think you were on one of our previous podcasts as well.

JH: Thanks so much, Bart. Delighted to join you.

BvA: We have Stian Westlake who's the Chief Executive of the Royal Statistical Society and a member of the Productivity Institute's productivity commission. Stian, good to have you on as well.

SW: Great to be here. Thank you for having us.

BvA: And finally, we're fortunate to be joined again by I think a regular on our TPI podcast programme, Diane Coyle of the Bennett Institute for Public Policy at Cambridge University, and Diane also leads the Productivity Institute's knowledge capital theme. Good to have you on.

DC: I can't stay away, Bart.

BvA: Right. Exactly. I think we need to start with a bit of a quick crash course on intangibles one on one for those who are not so familiar with this literature and this terminology. It's all because I think the word intangibles, which is now common speak among economists and many policy makers, doesn't flow as easily off the tongue with a business person or a worker. So, Stian, I'd like to start with you. In simple speak for non-experts what are intangibles, why are they important, and what makes them different from the other one which is tangibles?

SW: So intangible capital in a way is something that almost anyone in business will be familiar with but it's perhaps a new way of thinking about it in an economic framework. So capital generally, as we know, is the things that businesses, government, other people invest in, you spend money and resources to get them in the short term and they deliver a benefit in the long term. So a piece of physical capital, for example, would be a machine or a vehicle or a building that your business is housed in. Now, intangible capital has that same characteristic of delivering value over a long period of time but it's something that you can't touch or feel, something that you can't stub your toe on, if you like. So these include a lot of things that would be important to almost any modern business. So software and data, for example. R&D. But not just technological assets, it's also things that are a bit more expressive, a bit more human. Things like artistic originals. The Harry Potter rights are a really valuable and tangible asset. Or the relationships that the company builds up with its supply chain that are in some ways proprietary and deliver value over the period. The skills inherent in a workforce. All of these things, you can't hit them but they all create a huge amount of value for firms. And what's particularly interesting about intangibles is that from an economic point of view they behave a little bit differently from tangible capital, the machines and the vehicles that we're used to talking about.

Jonathan and I have framed this. We've called these ways in which intangible capital differ the four Ss because, handily, they all begin with the letter S. So if I just talk a little bit about those. The first S is scalability. If the firm owns their valuable algorithm or a brand you can scale it, you can use

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it across a kind of an arbitrarily large business. So something like the uber algorithms used to schedule taxis, they can roll them out in city after city. Whereas if you were a taxi firm that owned its own taxis, if you want to serve more cities you need to buy or lease more taxi cabs. The second S we call sunkness. So economists often talk about sunk costs and intangibles often have this characteristic of sunk costs in that if a business goes bust, while its tangible assets can very often be taken over by its creditors or sold on for a decent proportion of their book value, intangibles often can't be. The R&D or the brands of a defunct firm are often much less valuable to other firms afterwards, and, as we say in the book, this creates a lot of interesting dynamics for finance where recourse and security are really important, but that's less easy to do in an intangible economy.

The third S is spill overs, and what spill overs refers to is the idea that if a business invests in a new idea or a new brand it's sometimes not always possible for that business to be sure it will get all the benefits of that investment. It's easy to copy ideas, it's easier to borrow them, even with intellectual property law, with these hedges that we often try and put round intangible assets, ideas are often in the air. The final S is synergies. I guess what's interesting about synergies is that intangible capital is sometimes wildly disproportionately valuable when you combine it in the right way with other intangible assets. I think when we think about some of the value that a lot of the big technology platforms capture, the value doesn't come just because they've got one important bit of source code or one important network, it's the interaction of the network of users with their community of developers with their source code, and it's almost as if these intangible assets are multiplicatively valuable. They're really valuable if you get the right combination.

So these things, intangible assets are all kind of disproportionately four S. They all have these four S characteristics in a way that tangible assets generally have less so, and what the book really talks about is how this changes almost everything in the way the economy works, the way competition works and the way policy has to work in response.

**BvA:** Well, that's an amazing introduction and a really good crash course, and for those listeners who say well, I want to hear that again please listen to it again because I think it's really in a nutshell what you want to know about intangibles. But let's go to the book now, and the new book, because the starting point of your new book, Jonathan, is really building on the earlier work, and that is that in advanced economies like the UK but basically across the OECD, intangible assets are now more important in terms of investment intangibles, and this transition has been critical for productivity growth in the past maybe half century or so. But your key hypothesis in the book is that this process has slowed, perhaps even stopped, and that we need to understand what is going on, why intangibles are not driving growth and productivity as much as they were in the past, and you have a specific explanation that you think is critical to address here. So please explain this to us.

JH: Indeed, Bart, thanks. And just to give the listeners a sense of that relative importance, essentially for every pound or dollar or euro of tangible investment there's about £1.15, \$1.15, one euro 15 of intangible investment at the moment. So that's the background behind that. But the pace of that investment has slowed quite markedly since the financial crisis. So if you were to extrapolate a trend line before the financial crisis and ask where would we have got to on the amount of intangible capital had we followed that trend line we'd have about 25 per cent more intangible capital in Europe and about 15 per cent more in the US.

And what we say, Bart, as you say, is that what we worry about is that the institutions that we've got are primarily designed for a tangible economy and they're ill-suited to an intangible economy. If I can just walk the listeners a little bit through that, and it goes back to exactly the four Ss that Stian was wonderfully explaining just a second ago, so just to try and bring those to life a little bit. So Stian mentioned many of these intangible assets are sunk which means it's very difficult for firms to go to a bank and borrow money against them. So when we say gosh, the institutions of an intangible economy haven't kept up what we mean by that in this particular example is that the institution of bank lending against collateral of tangible capital, that hasn't kept up, we don't have the right institution for that. Take spill overs, as Stian mentioned, many of these spill overs the benefits of intangibles accrue to lots of other people and the synergies as well. Those are more likely to be realised in cities. So if we have tight planning policy for environmental reasons, and I completely understand all of that, the penalties to that tight planning policy in an intangible economy are going to be more acute.

Scale, likewise. Stein is suggesting these companies can scale up. Well, that puts a question mark over competition policy. Often competition policy reacts against very large firms. Well, maybe those large firms are just scaling up. And then finally on science policy, that's designed to help with the spill overs, help with the synergies, but if it's too directed maybe it won't have the flexibility to deal with that as well. So the book tries to suggest that we need to move those types of institutions, as I say, designed for the tangible, into a more intangible age.

BvA: Yeah, we're going to talk a little bit more about these institutions, because institution is a very broad term, so we need to dive a little bit more into that. Before we do that, Diane, I want to hear from you. This new explanation, it's institutions and intangibles that are causing that slowing growth that we've been seeing for more than a decade now. How does that compare to some other familiar narratives? One storyline is that the golden age of a continuous stream of productivity enhancing innovations has ended, perhaps it's just more difficult to implement new technology and it's just a matter of time. There's a whole other storyline that's very dominant in literature as well as in the media which is that the fabric of capitalism isn't working that well because the system is rigged or because the nature of

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new technology is benefiting winner take all kind of effects and increased concentration. So how do you position this revisionist view that looks at intangibles in institutions and the appropriateness of these institutions to support intangibles with other narratives that have been around for quite a while?

DC: I think the institutions narrative is very persuasive actually. I'm not somebody who thinks that we are running out of ideas, and if you think of ideas as combinations of other ideas there's no reason you would expect us to be. It seems to me that they're getting harder to use, they're not getting harder to find. And that's all about the institutions that surround how they're being used. If you're talking about the system doesn't work, the fabric of capitalism doesn't work, that's really just another way of saying that the institutions we have for organising economic production and allocation aren't delivering the kind of benefits that we used to get from them. And so that too points us towards thinking about organisation. If I can flag up a recent TPI working paper that I did with my colleague here in Cambridge, Jen-Chung Mei, we did a decomposition looking at sectors of the economy, which of those contribute the most in an accounting sense, productivity slowdown, and among them is pharmaceuticals, computer software, highly intangibles intensive sectors. And I think it's very plausible that... It might partly be that we're not measuring things well, but I think it's also very plausible that they're not well structured.

So if you think about an intangible that I've done some work on databases as an asset, they feature all of the four Ss, the scalability, spill overs, sunkness, synergies and big time, and they're a public good. So one of the questions is about how do you ensure access to data that people can then use to do things better, to be more productive, and we don't really have a good framework for thinking about that. We've fallen into the habit of assuming that it's like property and companies can have exclusive rights over the data, and that limits the economic benefit that you can get from it. So that's partly about intellectual property and have we got the right kind of framework, should data be just like any other kind of property? The answer's probably not. There's a lot of economics around how do you make intellectual property work for bad productivity. But also I think questions about organisations. Who gets to use what information? What are they allowed to decide? Those really take you to the heart of organisational questions or what some people would call social capital, how do we collectively organise access and use of the assets that we have as a society.

BvA: So let's talk a little bit about these institutions, because, as I mentioned earlier, this is a very broad based word. So why have these institutions filled and not serving these intangibles anymore? Jonathan, I think in the book there's a fantastic example that you were describing on lighthouses, and maybe that helps us a little bit to understand why particularly these two Ss are so important.



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JH: Yeah, thanks, Bart. So in 1851 there was a royal commission on why it was that Britain was so technologically backwards. Now, this will sound a very familiar story to listeners of this podcast, and we've been worrying about this for all this time. This particular example was around lighthouses, and it turned out that not only did Britain have rather few lighthouses but they had particularly bad and out of date technology. And of course to make things even worse the commission were particularly irked by the fact it was the French who had more lighthouses and better technology. So, as you can imagine, that was particularly difficult.

And how does it relate to what we were talking about? It is this. There had been quite a profound technological change in the early 19th century with the invention of the Fresnel lens by a French inventor which made lighthouse technology much better in terms of casting light. Before the Fresnel lens the point about lighthouses is they actually hardly cast any light, and so you could put them at the mouth of a port and you could charge the fee for the lighthouse in the port fee when the ship docked. So the institutional solution to the market problem was private enterprise with private ownership, just as Diane was just saying, and the market problem being an information problem - information being really important. Which is to say who knows whether port A or port B will support a lighthouse, whether there's enough traffic, whether there's enough people to pay, we'll leave it to the market sector to do the investment, they have the private property, they'll reap the benefits, and some lighthouses will work and some won't, and that's the end of it.

Once the lens had been invented the light was cast many more miles and so the problem changed because it changed into a spill over problem, which is to say that the ocean going ships who weren't going to dock at the port could benefit from that light. That spill over problem therefore required a collective action problem. You can't just rely on the individual market to provide the lighthouses because who's going to pay, as I say, when those ships go past? It turned out that the French had a different institutional set up, namely public ownership and general taxation. So that's an example where we move from an information problem with synergies and so forth, to a spill over problem. In Britain we didn't have the right institutions and in other countries which did. So it's a kind of a mini example of what we think is going on now.

BvA: So, Stian, how does that example translate to the specific problems with information and collective action on intangibles today?

SW: So to me the big takeaway from this lighthouse example is the institutions you need for a growing and fair economy are, you might say, technologically contingent. They depend on the type of technologies that are around at the time. It's interesting, certainly when we read the economics literature about this that's an idea that's sometimes present and is sometimes not so present. A lot of the talk about institutions sees them as these things that are kind of eternal, like property rights or fair competition rules. I think what

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we're saying is that there is at least some subset of institutions where what the right institution is depends on the suite of technologies available to society and to businesses at the time. So the lighthouse, also need to come back to Diane's example, if you live in a world where databases are extremely valuable and extremely useful in lots of ranges of business you probably need a different approach to data ownership that you did when the Royal Statistical Society was set up in 1834 and databases were these happy things that people wrote down in quill pen in leather books.

Now, interestingly, if you worked in the tech sector there is a kind of term of art for this. People in the tech sector talk about tech governance fit, what is the right governance framework for AI, what is the right governance framework for crypto. I suppose in some ways we are just being milkmen here, we're taking an idea from the tech sector and moving it elsewhere. But I think what we feel is that time and time again when it comes to intangibles, whether it's finance, whether it's competition policy, whether it's things like urban planning policy, the fact that capital has changed means that we need to urgently upgrade our institutions.

**BvA:** So, Diane, do you think it's a regular pattern when you look at this historically that institutions are always responding late to these new technologies, or is there something specific that is causing that institution particularly now to catch up with the new technologies that are emerging?

**DC:** It's a bit of both I think. There are certainly always delays. If you think back to the industrial revolution it took something like half a century for the wave of institutional innovation that ensured that those new technologies started to deliver broad based benefits for the economy, and if you think about unions or mutual societies or mutual insurance companies, building societies, that huge wave of institutional innovation, I don't think we've seen anything like that in the current wave of technologies in the same way. But also I think intangibles are literally harder to get your mind around. Our intuitions about the economy and about how things should operate are very strongly shaped by tangibility, and there does seem to be something, it's just harder to think about when you're in the world of intangibles. I suppose an illustration of that is the kind of images that people present on the news for the economy and it's almost always somebody at an exciting looking machine building an engine because otherwise you've got pictures of people sitting at computers and how boring is that? So I think the answer to your question is it's a bit of both.

**BvA:** There's so many interesting explorations for which kind of institutions need to be fixed, in this book, to revive the contributions of intangibles in our economy. It's really got my head spinning somehow. There's a fabulous explanation about the financial architecture, especially how intangibles are difficult to collateralise, to support loans or on how synergies and spill overs work so well in cities that it creates very important chances in regard to planning. But I thought I would choose two institutional families or settings that I think are key to productivity. One are institutions that support a

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knowledge economy, and the other is on how the right rules of competition can make a difference for more or less productive growth. So let's start with the institutions for the knowledge economy, Jonathan. To be clear, intangibles, as we defined earlier, certainly are not just about knowledge or digital technologies, it's not just the knowledge economy, but it's a big part of it.

A key proposition in the book is that institutions have to adapt to this new technology that we just discussed, and that is hard. We've just seen the example you described with the lighthouse. So in this context talk a little bit more about intangibles specifically for science policy and intellectual property rights and those kind of issues that seem to be so critical for this knowledge creation type of the issues.

JH: Let me talk about those again trying to use some examples. Often people have two visions of science policy. One vision of the science policy is the space race or possibly the iPhone, namely, all the inventions that came...like the miniaturisation from the space race to the iPhone. Under this view the key problem with generating intangibles is spill overs. No one company, with the exception of some eccentric billionaires, would have developed the space race. They just couldn't harness all the benefits then spread out to all of the other sectors of the economy, miniaturisation of computers, materials and all that kind of thing. The government therefore has got to step in. The government has therefore got to direct everything. Or possibly the government has got to offer a series of very strong intellectual property rights in order for that one company to realise the benefits of making these enormous investments. So that's one kind of vision about what governments ought to be doing.

The other vision is the wheelie suitcase. The wheelie suitcase is a terrific example of the synergy between two rather elderly inventions, namely the suitcase and the wheel, and for some reason nobody until the 1970s thought of the wheelie suitcase, the panel of famous NASA scientists – these would have been the greatest scientists in the world – none of them could come up with the idea of the wheelie suitcase. So that's quite a different model. And that goes again back to Stian's four Ss. That goes back to a more synergies type of model where what you want is you want the combination of these ideas together, and Diane just mentioned that as well. So those are the two kind of rival models, and what we think is that we've probably gone a bit too far, at least in the UK, of putting science policy around the centralised directed side, too many metrics, too much specificity, and what one loses by having those centralised kind of directives is the type of synergies and the type of serendipitous encounters that, as I say, a person who thought of the suitcase and the person who thought of the wheel kind of bring forward. So that's one of the dilemmas around science policy. I think it reflects back to the earlier discussion about getting one's head around all of this. Quite often one has an outmoded model in one's mind about what's required, and we found that contrasting those two



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models might help people think about where there might be an improvement.

DC: It's an even sharper dilemma than you're suggesting, isn't it, Jonathan, because if you've got the first science policy, strong intellectual property rights model you're actually reducing the possibilities for the serendipitous invention in the second model. I think in many sectors the fact that copyright protection has got to be so incredibly long it can't possibly be incentivising new creation and it's halting a lot of the new creation that comes from mix ups, from taking those different combinations like the wheels on a suitcase.

JH: Yeah. And in the book we've got a possibly excessively long discussion about exactly that issue, Diane, which you've enunciated very well, which is the trouble with a centralised direction, which big projects and big science projects have to assume, is you need lots of rules and regulations because otherwise there's just endless lobbying activity. And unfortunately those rules and regulations might build in the type of inflexibilities that prevent those synergies being realised, so we think this is an important trade off indeed.

SW: An interesting little story, while we were working on the book we had a fascinating conversation with one of those bits of the economy that you don't normally think about very much. This was what you could call an intellectual property family office. So this was the estate of a famous children's author who I won't name, but someone you would have heard of especially if you have children, and the author had passed away a long time ago. This office was basically responsible on behalf of his heirs for maximising the revenue from the estates of stories and creations that this author had come up with. It was fascinating because some of the activities were to do with creating synergies and you would probably argue were probably productive. These were value adding activities, so they were saying how do we adapt this into a musical, how do we make sure that when we do a film deal that it's a really good film rather than a film that's a travesty or whatever.

But some of them really related to spill overs and they basically looked to me a little bit like at least some of them were just about how do you make sure that you do things to extend the copyright or to prevent people impinging on the copyright. So it turns out that if you create various types of derivative works you can extend the copyright of these works. So finding a good illustrator but one who wasn't too picky about their own intellectual property was really valuable. You get some illustrations done that extend the brand and allow you to assert control for a longer period of time. So it was a fascinating example of some really conscientious people working to the best of their ability and a really interesting mix of productive entrepreneurship and what might have been arguably unproductive entrepreneurship.

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DC: Well, it sounds like pure rent seeking because you can't incentivise dead people to write new things.

SW: That's certainly true.

BvA: So what's really interesting about the discussion, and we'll come back to that a bit also after the break, there's a continuous trade off in a way where you have the spill over and synergies in trying to get the institutions right. On the one hand create these spill over environments so that you have these mission oriented programmes, and then on the other hand you've got these synergies where quite often the private sector needs to just have the opportunity to find each other and look for these new combinations. The other key family of institutions I want to explore is about the rules of the game and competition, because productivity does require competition to allocate intangibles to those where they can be used most productively. But in turn that can also be a source of inequality that can become quite persistent. So that we'll discuss first after the break, but before we go there let's first take that break to hear about what else is happening at the Productivity Institute.

[Advert plays]

BvA: Welcome back to my discussion with Diane Coyle, Stian Westlake and Jonathan Haskel on intangibles, institutions and productivity. As mentioned before the break, another critical family of institutions are around institutions and rules of the game to support competition. When we discuss competition I'm always reminded of the two faces of Schumpeter one of the most influential economists when it comes to thinking about innovation and capitalism and who is of course most well-known for coining the term creative destruction. So there is a Schumpeter mark one which is the Schumpeter who stresses the importance of low concentration of innovators, lots of new entry, and a low stability in the ranking of the most important players. So it's very quick turnover of who's the biggest and the most important innovator. So you could say this is a widening pattern of innovation.

But there's also a Schumpeter mark two which stresses that all the opposites, that innovation is done by really large companies who rank consistently high in the league, so you could say it's a deepening pattern of innovation making it more difficult for smaller players. Jonathan, it seems that today it looks like the world of intangibles is increasingly like Schumpeter mark two. Intangibles are highly concentrated, large companies tend to benefit from these winner take all effects has been widely discussed, and many are saying this is a bad thing for recharging growth and productivity because concentration leads to high profit shares that aren't helping that creative kind of destruction. But much of this is exactly because of the rise of intangibles. So should we be concerned that the intangible economy is not necessarily the victim but is actually the cause of the problem?

JH: I think that's exactly what's going on, and what we cite in the book is some research which has been done recently which documents essentially that the rises in concentration that we've seen in many European and America as well, those rises in concentration are most marked in intangible intensive industries, and that to us goes back to the four Ss that Sian was outlining earlier on. If you are in an intangible intensive industry and you can scale up then you're going to have high concentration in that industry. So where that takes one, and this is I think where your question is going, Bart, is, is that necessarily a bad thing? That might be market dominance, but is that an abuse of that market dominance. And from a scale and synergies point of view it might actually be a good thing. Maybe these large companies who've scaled up, who've brought all these synergies together are actually serving their customers pretty well. After all, the reason that our teenage children are on Facebook and a large Facebook is they all want to talk to each other. We don't want lots of little Facebooks. So they like the scale of all of that.

So we are a little bit cautious about some of the more trenchant and possibly more strident calls that there's been to break up these large companies, or, more accurately, if you're going to break up these large companies we think that we'd better have a good reason for doing so if we're going to sacrifice some of these synergies and some of these scaled effects.

BvA: So, Diane, the sort of knee jerk reaction of policy makers now is to respond to this problem by saying let's break up these large businesses, but the question is whether that's the only option I have and whether there are other options around that I should consider more seriously.

DC: It's certainly not the only option, and I tend to agree that break up is not the best way to tackle these winner take all markets where there's a dominant player, for exactly the reason that Jonathan gives, that there are benefits to all the users from the fact that there are so many users using the same platform. That's not to say that there are not other kinds of interventions. I was on a panel here in the UK chaired by Jason Farman that looked at what different approaches to competition policy might tackle this kind of dominance. Because, although, as you say, Bart, they produce great services, people really love them, if they don't face the prospect of competition at some stage then they're likely to get lazy, the service quality will degrade or there'll be other detriments to consumers.

So you can think about other approaches. You can think about, for example, requiring services to be interoperable, as we do with the telecoms network, and we know that that can happen because it's been engineered inside the companies to make services interoperable. They can do it between them. Access to data I think is another really interesting question, because the big tech companies had many years now of accumulating large quantities of data about their users that enables them to both raise more money and invest in better services and also personalise or target services better or

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just make them more closer to what consumers want. In banking in the UK we've had an experiment in open banking where through open APIs application programming interfaces new entrants can get access to some of the data. Should we be thinking about that kind of remedy in other markets too?

But there are, as well as the great services, considerable harms to consumers that come from these tech monopolies, and if it came to the worst then perhaps we should think about breaking up some of the mergers that happen, like Facebook acquiring Instagram. Or perhaps we should think about more direct regulation as we do for other natural monopolies, because the four Ss are features of what in old economics language we'd have called natural monopolies.

**BvA:** So, Stian, let's do a little though experiment here. We have a lot of listeners on this podcast who are business executives in small, medium size type of firms. So suppose somebody in this firm has a great idea for an online platform for a specifically niche function that's one of the big players, it's perhaps not offering as targeted an audience as you would like to do. What are the institutions you think that entrepreneur needs most in order to be able to enter that very difficult market? Give me a few examples of the ones where you think if you were in the seat of the entrepreneur you'd say we will really benefit from this or that institution to make entry possible or easier?

**SW:** So I think the first thing, as we said earlier, one of the great things about intangibles is when you get it right you can scale up very quickly, and obviously this is one of the reasons there are so many hopeful entrepreneurs in this field. So I guess one really important thing is you want good access to risk capital. So if you're starting a business in this area you want it to be relatively easy to access finance. Now, traditionally that's been through venture capital. But I guess if we're thinking about intangibles across the economy we're increasingly going to be getting to areas where the traditional model of venture capital, which demands a very high return, may not work. It's interesting to look at well, how could you get models of equity capital for other parts of the economy that don't quite have the explosive growth potential of internet services business.

So the first thing is you want good access to finance. It's easy to come by. I think the next question, and this comes back to this point about competition, is you want a competition authority that has sufficient understanding of what's going on in your industry so that they can intervene helpfully. Again, coming back to what Jonathan was saying earlier, what does successful competition policy look like in an intangible rich economy? I think we would argue that if there are lots of temporary natural monopolies in this area what you would hope to see is a kind of punctuated equilibrium model where you will at any one time have some very large businesses that look quite monopolistic or oligopolistic but that over time those change over and the titan of today gets eclipsed in five years' time.

Now, there's an interesting question. What would that mean for start ups? You probably don't want if you're a start up a regulator that, for example, is so opposed to large companies buying small companies that it becomes harder to access finance, because actually for a lot of start ups being bought by Google or being bought by Facebook is a very satisfactory outcome and may often be a satisfactory outcome for the economy as a whole because it helps those synergies be manifested. But really what you want is a regulator that is informed enough about the sector to know under what circumstance an acquisition by Facebook or Google is likely to be destructive and in which circumstances not. Now, obviously this brings back a very familiar old economic problem because how can you proof against government failure, how can you get competition authorities that have the skill and knowledge to do that, because it is much harder than just looking at concentration ratios and intervening on that basis. I think the argument would be that you need more state capacity. If there's one thing you would immediately do you would invest more in the government organisations responsible for these kind of policies.

DC: I agree with you about that, Stian, but I think there's an even more challenging issue, because if you're talking about markets with these kind of dynamics where they tip towards one company rather than another then any decision the competition authority makes is going to be market shaping, whether you want the merger to go ahead or not. Whichever way you decide you are going to be determining which company it is that dominates that market, and that's, I think, a rather uncomfortable territory for competition authorities. That's not what they've been used to doing. In fact, they would have stepped away really from that kind of decision making authority. So it's a really difficult institutional question I think, partly because of the role that lawyers also play with their very different standards of evidence which are back looking rather than forward looking.

JH: I think what makes it additionally difficult is, going back to Stian's example about mergers and being bought out, a competition authority typically looks at mergers and very often doesn't like mergers, but a country where the capital markets are inadequate for start ups and where a merger, in other words the prospect of being bought up by a large company, is exactly what provokes start ups, puts those two public policy points of view directly in opposite. So I think as if the job of the competition authorities wasn't hard enough, having that additional aspect to it as well is an additional complication.

DC: And, Jonathan, I feel this because we were members of the competition commission at the same time in the 2000s, so we know it's a pretty hard job anyway.

JH: We do, and reflecting, if I may, just for a minute. I was involved with the break up of the British Airports Authority, who back then owned all the airports, and it is a very nice example, Bart, of what we've been talking



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about of having a sort of tangible mind-set or an intangible mind-set. In that mind-set there really weren't any scale economies. Each airport with its own distinctive feature, there were very few spill overs. It turned out the airports didn't even share ICT capacity where you'd think that would be something. So in that type of economy of no spill overs and no economies of scale, breaking the airports up was a completely obvious thing to do. Much less obvious in an intangible economy.

BvA: Yeah. Really interesting example. So let's spend our last couple of minutes to wrap this up a little bit, because we're actually talking about what are the key features of good institutions that are fit for that intangibles economy. But in the final chapter in the book you kind of bring this together, and I think there are two key principles you talk about which I'd like each of you to raise one of them. So, Stian, to start with you first one really is improving state capacity.

Now, for the non-attentive listener or the quick reader that sounds like more government, and I'm sure that if I say that you will say no, no, that's not what we mean, we mean better government. But then I think the question is what are the characteristics of better government and avoiding that it doesn't become too much government?

SW: The way Diane framed the issue for competition authorities just now is a really good example of this because we're requiring competition authorities to make judgments which are, firstly, more informationally difficult. So, for example, how do you form a judgment about whether a merger is likely to distort the economy in the future? That is just a qualitative different type of question for the concentration in the industry. And, as Diane pointed out, it's also a politically charged question. Now, that is particularly difficult in a world where over the last 30 years by virtue of things like public management, we have basically made a lot of organisations like the Competition Committee or our monetary policy setting authorities independent of politics. That was very good in many ways in helping them resist influence activities, but it suddenly becomes quite tricky if you're suddenly expecting them to do things that are, as Diane put it, inherently political. So you're asking them to do two things, you're asking them to do harder things and you're asking them to do things which typically would require more political legitimacy.

Now, those two things I think are orthogonal. They are different questions from the question of how big should the state be. I think there are some things in the book about the need to fund more R&D because it has spill overs that do suggest in some areas the state needs to be bigger. But on the whole creating, say, a competition commission or a competition authority that has the ability to make fine judgments and is politically structured in ways that seem to have legitimacy to do those things, that's not so much a question of how big this organisation is, it's a question of its intellectual and analytical capacity and its political capacity. Some of those things will cost a little bit of money, so you might be making the state a little

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bit bigger because you're spending more on individual salaries. But in the grand scheme of what states are spending on it's relatively small. But it's quite a different type of thing than the standard debate that we've had over the size of the state.

**BvA:** You talk in the book in various places we need more analytical capacity, we need more smart people thinking this through, and I couldn't agree more on this of course. But it is as much also about communication, right? Because I think one of the main worries of the people out there is okay, those are more complex rules or harder to understand and more specific to any kind of specific circumstance. So what's your view about the clarity of roles and the way that governments are communicating these roles and the consistency of these roles in the longer term? It seems to me a critical part of better government.

**SW:** You're absolutely right. And I think coming up with clear ways to make these rules understood by the participants is really important. But there's an interesting question about how do you get clear rules. One way to create clear rules is simplicity. So you have government makes up, say, an inflation target for a central bank. That is so simple that anyone on some level can understand it if they know what inflation is. It's simply a number and an effort to make the best efforts to achieve it. But there is another way to get systems that are well understood which is by making them deeply embedded and making them to some extent shared by the industry. So if we think about some very long standing systems that are very effective, so we as economists often love to talk about, say, the German skills and apprenticeship system, which is I think in some ways extremely well understood by its participants, but having seen lots of attempts by the UK government to try and communicate it to make it copy, it's very hard for people from outside the system parse it.

So this reminds me a little bit, Diane earlier mentioned the extreme burst of institutional productivity that we saw in the 19th century as a response to the industrial revolution, and what was interesting about that was that although some things were delivered by royal commissions like Britain trying to improve its lighthouse governance, many of them were emergent. Many of them were created by people who were very involved in industry through institutions like the Royal Society of Arts, for example, or, even in my world, the Royal Statistical Society. It was people coming together, working to some extent with government, but it was a period of fecund institutional design moreover. And in some ways it's sort of what we saw in the late 20th century in the venture capital sector, the one bit of the economy where you actually do have pretty well designed institutions for the intangible economy. A lot of those were experimentation by people who were involved in the sector, so maybe that's another way of getting this clarity that you're looking for.

**BvA:** Yeah, but I think you're still putting a lot of emphasis on collaboration, on participation of the private players into this, which really gets me, Jonathan,

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to the other key principle. Your recommendations go way beyond just improved state capacity, it also focuses on deeper societal traits that we need to improve, like trust and common purpose and the cultural improvement, if you like, cultural strengthening of participation by the various players. So that's a key element of this as well, right?

JH: Indeed. And we talk in the book going back to a little time in history about what happened before European settlers came to the Americas and how Native Americans, first Canadian people, arranged themselves. There were no property rights, there weren't any lawyers suing other lawyers and patent attorneys choosing the best courts to sue the other patent attorney and all that kind of thing. That was all trust. And a lot of that emphasis disappeared as we had a more impersonalised international economy where one was interacting with people often supplying goods from thousands of miles away and you had no idea who they were. Maybe the intangible economy with its emphasis on spill overs and synergies requires us to go back to those more trusting, more trustworthy types of social norms. And to add to the institutional discussion you were just having maybe there's a straw in the wind there around the open software movement actually, which I think is another interesting institutional innovation where people got together, shared software, and they did it for those more societal, more trustworthy reasons. If we could get a bit of that going as well that would help especially, as I say, in a world of intangibles, spill overs and synergies.

BvA: Diane, I want to wrap up with this comment made earlier about synergies and spill overs that we're trying to find in shaping these new institutions, the right trade off between those. And of course we love the term policy experimentation, let's just try and see what works and so on, but it is also the kind of policy churn that we're very concerned about in the case of the UK. So my question is, are there more determined steps, a clear guide towards fixing the institutional fabric? In other words, how do we get from here to there with such a complicated agenda?

DC: It's going to be a mixture. I think we need a lot of experimentation in terms of collective institutions that are not run by the state, like the old mutual societies and unions. But I would argue for a more active state, because the four Ss are all about public goods, natural monopolies, market failures, and the intangible economy has just massively more extensive market failures, to use that language than a tangible economy does. So I think we will need to go back to a world where we expect the government to be directing some things. We've talked about competition policy. You might also talk about the structure of the welfare state, if you like, the benefits and pensions and how they ought to work for a world where people are approaching their jobs in a much more flexible way and changing jobs more frequently through their careers.

And also placing bets. We talked about competition policy, and alongside that you need to think about the industrial policies. So placing bets about which new emerging industries we are good at in this country and the

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government aligning people's efforts around those and funding the R&D effort that's needed, and some of it might be obvious, like some green technologies or AI, but the fact that it's obvious doesn't mean that the government can be let off the hook in terms of making it happen. And we have, as some of the Productivity Institute papers have pointed out, a terrible problem about policy inconsistency and chopping and changing in the UK that I think is part of the story about the productivity slowdown and why it's been worse here than elsewhere.

BvA: Well, the richness of this discussion should probably be the best endorsement for this book. *Restarting the Future; How to Fix the Intangible Economy*, is available through big and small distributors, including your local book shop and their online functions that all still exist in today's intangible economy, given our earlier discussion. Thanks to Jonathan Haskel and Stian Westlake. Congratulations with this fantastic piece of work. Very well written. It was a real pleasure to read. And thank you for explaining all this to us. And thank you also to Diane Coyle for a very supportive but critical look at this fantastic piece of work. It's great to have you all three on.

Our next episode of Productivity Puzzles will be a special one on global productivity which we will coproduce with the Conference Board, a global business think tank headquartered in New York. Over the past 50 years the Conference Board has maintained productivity metrics for as many as 125 countries which are updated annually. As they've just released their latest estimates including figures as recent as 2021, I'll have a conversation with the Conference Board CEO and president, Steve Odland, on what we can learn in terms of the impact of, for example, the COVID-19 pandemic on global productivity. We'll also discuss the outlook for productivity in '21 and '22 in the light of rising inflation, cost increases, et cetera, and how the transition to a net zero economy might impact productivity in the long term. So join us for this special episode. You can sign up for the entire Productivity Puzzles series from your favourite platform to make sure you also don't miss any other future episodes. If you'd like to find out more about upcoming shows or any other work by the Productivity Institute please visit our website at [productivity.ac.uk](http://productivity.ac.uk) or follow us on Twitter and LinkedIn. Productivity Puzzles was brought to you by the Productivity Institute and sponsored by Capita. This was me again, Bart van Ark, at the Productivity Institute. Thanks for listening and stay productive.

**End of transcript**