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BA: What have policies to boost science, technology and innovation done for productivity? Which policies are most effective? Which countries have been most successful in using them? And what lessons can be learned for a new era of industrial strategy and policy making? We are going to find out. Welcome to Productivity Puzzles.

Hello, and welcome to Productivity Puzzles, your podcast series on productivity brought to you by The Productivity Institute. I'm Bart van Ark and I'm a Professor of Productivity Studies at The University of Manchester and a Director of The Productivity Institute, a UK-wide research body on all things productivity in the UK and beyond.

Welcome to our August show of Productivity Puzzles. We're in the middle of the summer so we thought we would take a bit of a step back and have a somewhat different setup of our podcast. Instead of our usual panel discussing a key hot topic we're taking a step back for some reflections on the impact of policy on productivity and in particular science, technology and innovation policies. And we do so by sitting down with someone who has got 30 years of experience with the making of science, technology and innovation policies.

Dirk Pilat has been at the OECD and Inter-Governmental Research and Policy Organisation for Economic and Development in Paris since 1994. And he has been in various roles, but most of his time in the science, technology and innovation directorate, and since 2013 as a deputy director. About a year ago Dirk left the OECD and he's now a research fellow at The Productivity Institute as well as at the Valencia Institute of Economic Research in Spain, and he works on productivity, innovation and especially also on the green transition.

In the past year Dirk worked on two studies at The Productivity Institute, which we will discuss in the second half of this podcast – one, together with Klaas de Vries and myself on pro-productivity policies across the G20, and another one on pro-productivity institutions such as productivity commissions and national productivity boards. Both papers, as well as some of the other papers on science, technology and innovation policies,

which we'll discuss in the first part of the podcast, are in the show notes and of course on our website at [productivity.ac.uk](http://productivity.ac.uk).

Now, before we go into details maybe, Dirk, you can tell us a little bit more about your various roles at the OECD and how you've always stayed closely connected to the productivity topic in those various roles you had. And by the way welcome to the podcast of course.

DP: Thank you, Bart, it's a real pleasure to be with you, and let me say a little bit about the OECD and what I did there. I've had six different roles. I won't go into all the details, but three of those I was very closely related to work on productivity. From 2000 to 2005 I was basically responsible for a working group that did a lot of work on productivity and productivity statistics. This was really also the time when we spoke about what was called the new economy, a lot of thinking about what is the impact of information communications technologies on productivity, and I was sort of privileged to do a lot of work on that topic in that time.

Later on I became head of division for structural policy, which was basically the same group where that working party was. And there I was more responsible also for trying to sort of build a productivity agenda, looking at issues like entrepreneurship and industrial policy as well. And in that time I was lucky enough to hire my colleague Chiara Criscuolo, who started then to develop a lot of work on micro data. And my final big work where I did a lot of work on productivity was my last role as deputy director, where I was also able to set up, for instance, the OECD's global forum on productivity, where we bring countries together to talk about productivity policy.

So, those are the three more direct roles. There were a couple of other roles where I was more working on the science technology policies and also more on structural policies like labour markets and regulation. And even though I wasn't working on productivity I think those have always been very helpful for me to understand the role and context and really to think about what other influences there are on productivity, even I wasn't working on productivity specifically.

BA: Yeah, and that's why I'm really looking forward to this conversation, partly because you're not just looking at productivity, but certainly at all these related policies and particularly science, innovation and technology policy – which we'll talk about a lot, but also the international comparative perspective. And, you know, Productivity Puzzles we're based in the UK but we also think that the international comparative perspective helps enormously to learn. Because all countries are struggling with their productivity slowdown, they're all struggling with how they can connect science, technology and innovation better to productivity.

So, there's a lot to talk about and I thought that maybe the way to do the first part of this conversation is really to talk about the S, the T and the I –

and begin with the S of science and then talk a bit about technology and innovation, and then later on we'll go back to the productivity topic.

Now, starting with science I think most of us will agree that science is a nurturing ground for new technology and that it will help productivity. But I suspect that many businesses and even perhaps policy practitioners don't necessarily look at science as the main engine of productivity – is that what you sense in your work at the OECD?

DP: I think you're right on that, I think science is probably a little bit far removed from productivity as such, because to some extent the lead times between where scientific research is and then what turns into translated into productivity business activity is sometimes quite a long one. But I do think science is very fundamental for productivity, because in a sense it's basically where you build new knowledge, new ideas, new concepts, new fundamental thinking about many things that matter in society. Like, you know, how we understand the human body, how we understand nature around us, how we understand this under...the whole system around us. And I think if you don't invest there then at some point in time the ideas that you're building on in business will dry out so you have to, I think, invest in that.

And the interesting thing, I've seen...I think we've seen this quite clearly now with the COVID epidemic, the fact that we had these vaccines which I think, you know, had been thought about for quite some time, suddenly coming out of nowhere and being developed in such a short time, and then sort of having that impact on society. Well, the science for that happened a long time ago, 30 years ago or even more, so I think you need to have that building up of knowledge so then later on that's translated into business activities and productivity.

BA: Yeah, so there's some of this literature now that's arguing that science is progressing but we're a bit running out of good ideas and not around as much as before, right? There's a paper for example in the Economic Review by Nick Bloom and John van Reenen and co-authors showed that research has been rising, but that research productivity, the productivity of the actual research efforts, has been falling. So, could it be that even though there's a long way to go from science to productivity that actually, at the basis of it, there is a problem with the amount of new ideas that we're generating and that that could be an explanation for the productivity slowdown?

DP: I think at first it's a very important paper and I think it's a paper that really is worth thinking about and worth reflecting on. And I think it hits the nail on the head on a couple of issues. I'm not sure if the issue is about we're running out of ideas, I think people will always have ideas. I think perhaps the way we are translating scientific effort into, sort of, new ideas or so on is perhaps being threatened a little bit. And my former colleagues at the OECD put out a book a little while ago on the impact of artificial intelligence

on science and there they had a summary a little bit of some of the problems that we may be facing.

One is I think that perhaps the science system itself is perhaps more focused on really small changes and steps all the time, rather than really big sort of changes. So, how do we make science perhaps more focused on breakthroughs, on really path-breaking areas of research? And that's probably about funding, about the systems that perhaps we have in place – but there maybe also other things.

I mean, for instance if you're thinking about particle physics, where you have in Switzerland and France you have this big CERN installation, well, people are trying to find new particles all the time but the only way to find even other particles is to build even bigger and expensive installations. So, at some point in time, the costs are increasing for some of these efforts as well.

And then finally, I mean, another one is perhaps the fact there are probably only so many laws of physics that you can probably discover, so perhaps we're running out of these things a little bit as well. There are a number of other things, but there are probably some reasons why it is harder to translate all the research that is being done globally into the same amount of technological progress that we might be seeing. And hopefully – that's I think the other message of that book that I just mentioned – is perhaps that artificial intelligence maybe will help us a little bit with that in the future.

BA: Yeah, and both that book AI in Science as well as the paper we were referring to on good ideas running by Boom and van Reenen and co-authors, both of them are in our show notes, so you can see them if you want to take a look at that. The OECD book is particularly good, I took a look at it myself and it's really great fun to read.

Yeah, it's definitely difficult to not agree with the viewpoint that the first and the second and the third industrial revolutions were driven by major scientific breakthroughs, like the steam engine and electric power generation and the combustion engine, but that there are these incremental innovations where science still plays a big role. It's sort of building on these breakthrough innovations. And maybe in the case with the computer age we haven't seen it and maybe AI is just the next step here. But that's just all something to discuss on other occasions.

Now nevertheless, you know, despite the importance of science we don't see policy makers always really embrace science with great enthusiasm and it doesn't seem to be a way for politicians to win the election, so to say, it doesn't seem something that is a key topic. How do you bring that connection with economic performance and productivity growth, how do you improve that in the discussion that you've had with policy makers?

DP: No, I think that's a concern and it's a challenge. And partly I think, you know, science is a topic that, sort of most people who are electing policy makers or electing politicians will be voting for. They will be voting for education, for cost of living and so on and science is something that's a little bit in the background here.

So, I think...partly I think, of course, analysis and, you know, econometric or, sort of, more quantitative research can help us to basically show how important science really is for productivity – but not only for productivity, also for things like health. You know, and if you...I mentioned...we mentioned COVID earlier on, I mean, not everything happening in science will be translated into growth or GDP or productivity. Some of it is also sort of going into other really important things, like, you know, basically the accumulation of more knowledge. I mean, we're creating more knowledge, we're learning more about society, about health, about environment and so on – so that is important too.

So, I think research can help us to basically build that story, build that evidence base for saying, well, this is how important it is. But I think you also need to really get into storytelling, basically showing how important something is. So you need to look at a more qualitative story as well. So, that's where the COVID story I think is important.

At the moment artificial intelligence is one of those technologies as well, it's all the hype at the moment, it's really important. But if you go back basically it was really the 50s and the 60s when some of the foundation for that was already laid by basically some of the basic research that was moving in these areas. So, I think you need to basically bring it back a little bit and show how important that is, again and make that case as to how important it is to invest here.

And I think some countries are more convinced about that, I think there's some countries that invest a lot in science and research, like Korea for instance, Israel, a couple of Nordic countries as well, whereas a lot of investment, both public and private, in other countries, perhaps it's a little bit less of a story that this is something that's really important for the country.

BA: Yeah, building on that, there's this kind of sentiment I think that some countries are better at science than others. For example, the UK is generally seen as one of those countries being very good at science, lots of really good universities – generally better at, sort of, the R of research and development rather than the D of development. How do these differences arise? Why is it that some countries are more science focused and other countries are just better in sort of, incremental/developmental innovation activities?

DP: That is a key question, I'm not sure if I have all the answers to that. I think you need to probably look a little bit as well into the history of a country. But, you know, to some extent the institutions that are in place make a difference as well, and to the extent that you're funding science, how you're steering it, how you're providing incentives for researchers, how you're training them.

An interesting difference is a little bit as well between countries to the extent it's universities or research institutes, we do see differences here. In some countries research institutes play a very large role in the science system and in other countries like the UK it's more universities. And I think there may be a difference there in some cases.

An interesting case I think the UK has just set up a new institute, ARIA, which is basically the Advanced Research and Invention Agency and I think which is modelled on US sort of agency which is linked to the department of defence, DARPA. And that is really about breakthrough sort of science, to really try and see, well, how can we develop more breakthrough science? And I think if you want to have an impact also on economic activity, you probably need more of that breakthrough science, because that can help you build new industries, new sectors of activity and everything, whereas the more general science may be a little bit less linked to some extent to economic activity that is taking place in the country.

So, I think to think about, well, what's the mix of more perhaps what some people call mission oriented research, where you're really just focusing on sort of, we want to try and do something in our country, we want to try and sort of make a difference in our area; or the more general research, which is also very important. Where's the balance there and how do you set that up to try and sort of get both that general knowledge, you know, which you're trying to see – and do you need to invest there as well in people who have really good ideas – or where you're also trying to focus on things that have a more direct impact on society and on the economy. And I think perhaps that is one reason why we see differences between how science in some countries gets translated into innovation or productivity and so on.

BA: There's a lot of discussion now in the UK after it sort of left the EU about how to participate in international scientific networks, there's a whole discussion about how to participate in Europe's Horizon programme. And generally, it seems to me that some of these big scientific breakthroughs require a lot more international cooperation than was the case in the past. If we think for example about the climate challenges, I mean, these are major scientific challenges that countries are facing. So, are we moving a little bit in the wrong direction by sort of, you know, disintegrating the global science system rather than, you know, making sure we actually integrate it a bit more? What's your view on that and what has the OCED done around this?

DP: One point I always try to make is if you look at a country like the UK, I mean, there's quite a lot of investment in research and development going on in the UK, but still, it's probably about five per cent of all the investment that is happening in the OECD area and about four per cent or even less of what is happening globally. So, it means that 95 per cent or more of all R&D is happening outside the UK. So how do you connect to that, how do you engage with that? And I think if you can engage with another major area like the European Union, where probably 20 per cent of global R&D is taking place, then that's probably not such a bad thing.

So, I think yes, the UK of course is involved a lot in collaborations more globally, but I do think you need to try and do more of that. It helps in terms of saving costs; it helps you try and sort of connect with other knowledge that is happening across the world.

And yes, in some cases...I mentioned CERN earlier on but, you know, there was a paper in Nature where 5,000 people were authors. So, it shows a little bit, you know, the scale of some...hard to imagine in economics, but it's something that you see in certain areas where the scale of the type of research that's taking place is a different one. And you need to collaborate more to share costs but also to bring in other knowledge sometimes from other sorts of disciplines and scientific areas as well to really make progress on specific issues.

BA: Yeah, and there's some recent work by Paul Nightingale at Sussex University and James Phillips at UCL, arguing that you can only be good in a few areas in a country, right? So, the UK has lots of strength in AI but a lot of that is basically covered by one single institute, Deep Mind, and has a lot of strength in synthetic biology, but again it's basically concentrated in the Cambridge Laboratory of Microbiology. So, it is this, you need to sort of connect to other places to really sort of scale up these kind of findings from science. And again, this is an interesting paper that we will include in the show notes.

Now, let's move from the S to the T, from science to technology, and then perhaps the connection becomes a little more concrete, right? I mean, the connection with technology, you know, it's sort of easier to understand how a technology or a technique can drive productivity growth.

DP: I think that's true even though, and we'll probably come back to that later on, even a technology itself... You know, I'm sometimes a little bit frustrated when people say, oh productivity is driving technology. Yes, technology plays a role but you typically need to do lots of other things in a company as well if you want to translate a technology like artificial intelligence into productivity. You probably need to change the skills of your work force, you probably need to reorganise, you probably need to think about how you're innovating in processes and so on.

So, I think technology is a tool and a very important tool to help drive productivity, but it needs to be, I think, put in a certain context within a firm to really sort of drive that economic activity and growth. I think technology policy is something that we did a lot of work on at the OECD, specifically linked to technologies like digital technologies, but also things like biotechnology, nanotechnology, neurotechnology. Lots of new technologies coming up that all raise their own issues, their own questions that policy makers I think need to sometimes think a little bit more about.

Just to give you a couple of examples of why this is important for policy makers, if you're thinking for instance about an area like digital technology, the OECD has been working on this for 30–40 years already and it started with things like electronic commerce but there were always some really fundamental areas you needed to think about. For instance, if you want to make sure that digital technologies work, and that they have a good role to play in the economy, you need to think about things like digital security, you need to think about telecommunications policy. Increasingly, we've had to think about things like privacy when it's starting to affect also people's personal life. We had to think about people's access to data. So, you have all these framework policies linked to digital technology that I think need to be thought about.

And of course, the people working in this area know that very well. Economists – and I'm an economist by training – tend to sometimes ignore these things, even I think though they're really important as a framework condition to make a technology work. So, I think we need to perhaps focus more on those things. And the whole discussion at the moment for instance on the regulation of artificial intelligence is also something we did a lot of work on at the OECD, to try and sort of see how you can try to think about these technologies. And not regulate them too early because you want to make sure that they develop, that the market develops and so on, but think about how can we make them safe, how can we make them function in society in a sense that people can be happy with? So, I think these are very important areas that need to be worked on internationally to try and sort of move forward and try to get some agreement also across countries.

BA: Yeah, the artificial intelligence example is of course a great one, right, because there we now see, sort of, the different regulatory frameworks occurring. And I think understanding how different countries, US, Europe but also China is actually doing these kinds of things I think there's lots of lessons to be learned. There's actually a recent work by one of our co-Is, Chander Velu, who's at the Institute for Manufacturing in Cambridge, where they've been looking at a bit of the first mover advantage that the UK has had when it comes to national quantum technologies.

But again, to your point, they face now big challenges around market demand and adoption and ecosystem and funding, so it's indeed much broader than just the technology itself. And you're probably right that, you



know, in the academic profession and certainly the economics profession we need to pay a little bit more attention to that.

So, now let's talk a little bit about the I – the I of innovation, at least nowadays the I of STI is linked to innovation. And maybe we can pick up on your remark that economists often don't pay too much attention to how technology policy relates to productivity. And that's really about the need to address innovation much more directly, right, separately from science and technology?

DP: Yes, I think it is and I think one important point to me as well, what do we mean by innovation? I think it's still a topic that there's a lot of variation in what people mean by innovation. Some people mean invention when they talk about innovation, so they basically mean, okay we're discovering something new, so you have something new, a new tool, a new technology or something like that.

Whereas at the OECD we specifically spoke about innovation as something that is really about how you develop, and in the market how it defuses. So it's much broader, right? And I think that makes it also something that's much more closely related to productivity, because it's really about not only technology but it's also about all these other things that need to happen to make the technology work. So it's also about processes of innovation. It's about, you know, how you change organisations in a company and how you change skills even. So I think it gets you into a much broader set of issues, which also sometimes makes it a little hard to comprehend how you deal with this topic in policy making terms.

I do think there we do know that there is a fairly close link between innovation and productivity, so we do know that there is...you know, quite a lot of good evidence that innovation is important for productivity growth and that it is something that we need to think about quite a bit.

BA: And that actually brings up an interesting issue there are now these activities around measuring innovation. And, as you say, it has multiple dimensions and the OECD has done this STI scoreboard for quite a long time. But there are other indexes like the Royal Intellectual Property Organisation is publishing this sort of global innovation index, as they call it, where they combine innovation inputs and outputs. And the last one that they published last year put the UK in the fourth place in the world, only behind Switzerland, the US and Sweden. It turned out that the UK scored particularly well on innovation outputs, like knowledge and technology inputs and creative outputs, as we discussed earlier, more average on the innovation inputs like skill and education, and very weak on business sophistication and institutions.

The question over that is how you square that with the fact that we do have this big productivity challenge in the UK? If we're doing well on innovation but we are not doing so well on productivity, how does that actually work?

DP: Yeah, no, as you said we've...we did what we call the STI scoreboard for more than 20 years and we already started in 97, and we put pretty much all had the same sort of indicators as also WIPO is putting in their GGI index together. We never wanted to turn that into a single index because I think the problem for us was, how do you combine them, how do you weigh them, what is the most important? Is it...are the skills the most important? And how do you also weigh, sort of, indicators of innovation inputs of the investment that you're making with indicators of innovation output? So, I think analytically we found it quite difficult to make these, sort of, single indicators even though on the World Economic Forum, a lot of these places also have indicators like that, single indicators, and have rankings.

I think the more fundamental problem I have a little bit is, well, what does it mean? What does it mean if the UK is fourth in that ranking when we also know, as you just mentioned, well, on productivity it's been pretty poor for a very long time, it's been pretty poor on investment for quite some time? So, if that innovation performance isn't showing up in productivity and investment, where is it supposed to show up? What does it mean if UK is fourth in its ranking?

There are other countries like that, you know, Switzerland is also a country that's very high in these rankings but if you look at productivity growth it's very poor. So, I'm just trying to look also for, you know, a story, a consistent story that we can tell and basically say, well, okay, it's the ranking, but this is basically how it shows up in economic performance, this is how it shows up in society. And that I have difficulties in doing with some of these indicators because I just don't know how they actually work out in reality and real life and what I see in countries.

BA: Yeah, and the rankings, as you say, they're very dependent on the weights that you're putting on it. And they're perhaps more useful for media bites, but it's probably better to look at if we can agree on the details better, the scoreboard or the underlying indicators and see where the relative strengths and weaknesses are when it comes to the relationship with productivity. Alright, now we've dealt with the S, T and the I, so after the break I want to focus a little more now on the direct link to productivity and how we can raise productivity directly. But before we go there let's first hear about what else is going on at The Productivity Institute.

Voice: The Productivity Institute is a UK-wide research organisation that is dedicated to understanding and improving productivity. Research covers a wide range of topics, including business and innovation, skills and further education, foreign direct investment and trade, and the transition to Net Zero. The Institute also provides detailed analysis of productivity in the

English region, Scotland, Wales and Northern Ireland. Visit [www.productivity.ac.uk](http://www.productivity.ac.uk) to access The Productivity Institutes resources, including research papers, blog posts, insights and regional productivity scorecards.

BA: Welcome back to Productivity Puzzles, discussing pro-productivity policies and especially the role of science, technology and innovation policies with Dirk Pilat, a research fellow at The Productivity Institute and former Director for Science, Technology and Innovation at the OECD.

Now, Dirk, before the break we spoke about the I in STI standing for innovation. But interestingly, you told me that previously at the OECD the I instead stood for industry. And I think that gave more recognition to the fact that science and technology policies were directly connected to industrial policy or the industrial strategy at the time. And these days industrial strategies are sort of coming back into fashion again with the emergence of for example the Inflation Reduction Act in the US and the Green Transition agenda in the European Union. Have you seen the mindset on that changing at the OECD as well?

DP: It's a great question. There's a lot of attention on this at the moment, but we've always worked on industrial policies at the OECD. And some of that was looking at what we call the, let's say, bad industrial policies, which is really sort of, you know, protecting industries that were in decline. This is, you know, steel, shipbuilding, where a lot of countries have a lot of policies in place sometimes to protect these industries and so on. And that always led to discussions on, well, how many subsidies do you need? And a lot of discussion on trade policies linked to that, a lot of action between countries on trade.

So, there was that discussion. But I think it was also a discussion in many cases about more industrial policies focusing on how can you build new industries, how can you build new strengths in your economy – so, more dynamically focused, sort of, industrial policies that were more looking at, well, new growth areas productivity, rather than sort of protecting declining industries. And of course there's always been a lot of, you know, discussion around those but I do think we have examples in the past that they've worked.

And I think perhaps now with climate change in particular, but also even with COVID, I think there's been a lot of discussion about these types of policies now and basically how can you make them work, how can you avoid perhaps some of the pitfalls that we know about? And they've always been characterised as a little bit like, well, we're... industrial policy is picking winners. But I think a former UK official I used to work with always said, well, it's not picking winners, it's about backing races. It's really about sort of trying to find areas where you see... you know, can we sort of put some

money on the table here and try to develop a strength that is already there but we need to support it to really try to move it forward?

So, I think we've learned things about these things and I also think that more analysis and quantification here is needed. And my former colleagues at the OCED have just put out a paper a little while ago where they've quantified industrial policies for about ten OECD countries including the UK, where actually the UK is spending quite a bit on industrial policy. It's more on R&D, it's about SMEs, it's also about skills to some extent. The OECD... So, the UK is also a country that is actually spending on these areas but perhaps not as much focused on really changing industrial structure, but more on trying to support certain areas and strengths.

BA: Yeah, and spending is one thing, the other thing is to make that spending work and I think that's where the UK is challenged, right? I mean, in that sense it's a shame that the Industrial Strategy Council that started in 2017 was then abandoned in 2021 – it takes time to actually make that spending on this sort of new thinking around industrial policy work. But it is what it is. We should be clear though that pro-productivity policies, and I think that's what this discussion just in the last two minutes shows, it's not just about science, technology, innovation. It's...even when including industrial policy, it's about much more than that.

So, I'd like now to move the discussion a little bit to the two papers that you've been working on with The Productivity Institute in the past year – one being sort of on a broad range of pro-productivity policies across the G20, so not just the advanced economies but also some of the emerging markets. So, let's start on that one because I think in that paper that you wrote together with Klaas de Vries and myself, we sort of developed a typology of pro-productivity policies, showing the breadth of policies that are impacting on productivity and how important it is that these policies are being seen in conjunction. Can you describe how you would sort of look at these various types of policies that are important for productivity?

DP: Yeah, no absolutely and I think, I mean, a lot of this was based a little bit on looking at what countries are actually doing in this area and what they also say are sort of influencing productivity and the analysis that we've done in this area. So, I think we've already spoken about one of the components, which is really technology, innovation, industrial policy and all the things that you're trying to use to change to some extent the structure of the economy. So, I think that's one important category.

Another one, a really fundamental one and I think the one economists probably focus on the most is really about accumulation. So, it's basically about how do you invest, how do you develop new skills and education in your country, and also how do you develop resources, so which is natural resources in your country. So, this is really about, sort of, the main

components of we economists typically look at and when you're talking about production so it's capital, labour and then also resources.

The third one is really about markets so basically how do you also shape markets around these issues? So, financial markets, labour market policies, policies linked to regulation or competition policies or product markets, so this is also I think a very important sort of area of policy where you're trying to also look at, sort of, the efficiency of how resources and so on are allocated within an economy.

And the final and fourth category is really the international dimension of that. I mean, all economies play in an international landscape. And international policies like trade policies, like foreign direct investment, but also migration policy are also quite important for productivity. I mean, think about migration policies, for instance something a lot of countries are looking at at the moment because they have shortages. They're dealing with shortages in the fact that there are not enough people any more for certain skill areas so you're looking at migration to bring in new skills for the economy.

So, it's a very wide landscape of policy and of course they interact, I mean, there are all these different categories, but I think it is important to try and understand what are the tools that countries are using at the moment to strengthen productivity and what are the policies that are actually being considered there?

BA: Yeah, and when you look at those G20 economies it's a very diverse group of countries, I guess a couple of dimensions that determine which policies could be most important. One is obviously the level of development – are you sort of an emerging economy, or are you very advanced and therefore perhaps showing a somewhat more sophisticated but slower growth environment. So, I think that is one factor, but then the other factor is that time is changing and therefore, as we discussed earlier, new technologies are coming around and new ways of international collaboration are arising. So, do you see a bit of a pattern or differences between individual countries in the G20 that are interesting to address?

DP: Yeah, no, I thought it was interesting in the paper or analysis that you really could see quite different groups of G20 countries. So the advanced economies that were probably not doing...having a lot of growth any more but were already at very high levels of economic activity. You had a group of catch-up countries like China, India, Korea, Turkey and Indonesia that were actually doing quite well coming from very low levels. And we had a third group which was the ones that were not doing so well, Brazil Argentina, Mexico, but also Russia, South Africa and Saudi Arabia that were sort of a little bit in the middle. And I do think we see really quite different patterns in terms of what countries are doing in terms of their policies. In some cases, also policies that are really not helping to

strengthen productivity, because too much of macroeconomic instability, sort of, perhaps not enough focus on things like competition, problems on the skills side.

So, I think we do see quite different stories across countries and these change over time. So, we looked specifically at a couple of countries, to give you an example of Korea and one I...a country I know a little bit more about is where, you know, a country really moved from very high levels of poverty in the 50s and early 60s and then developed a strategy which was very much about export promotion trying to develop new industries but in a very competitive way. And build on very strong foundations and things like strong government, very good thinking about skills of the civil service, a lot of selectivity and competition in terms of the firms that were actually getting support. And that led to growth I think in that country. So, and that...of course Korea, as other countries, go through different phases of economic development and policies change as, you know, some of the old sources of growth like low wages or an abundant work force run out and you need to move to other sectors, new technologies, new industries and so on.

So, I think it's a very dynamic landscape in terms of how policies move over time and evolve and where some countries are probably better able to really find the right type of policies to support productivity.

BA: Now, what I find interesting about the case of South Korea is that, you know, there've been successes and failures there as well, I mean, it's not like they had a great ride throughout, you know, the past 50 or 60 years or something like that. I...you know, they had to make significant changes. And I think that's where the comparison with the comparison with the UK comes in, right, because what I find interesting is that somehow Korea was better able to make these changes when it was necessary. In the UK we seem to struggle to actually make the change and if we make the change, we only make it partially and don't really adjust entirely. So, there seems to be an underlying way of the way government is functioning, right, and I think you made a remark about how the civil service was getting engaged with this. Maybe you can say a few more words about that? What did Korea specifically do to make rapid change possible?

DP: I think one of the interesting things with Korea, very early on they tried to headhunt, sort of, people, bring them back from the US in those days to...in the 60s already to try and sort of support their civil service and really build a very competent system. They also developed quite a lot of institutes linked to the different ministries that were providing advice so you had this sort of a link, in a sense, between, sort of, more policy-supporting institutes and then the ministries which were really executing policy. So, I think there were a couple of interesting things there. I mean, how to translate that into UK context? These are very different countries and I think it's always hard to do that in a simple way. But I do think that strong foundations, that we also spoke about in the paper you and I and Klaas de Vries did, is really

important because I think you build your other policies on that. And strong governance as well, you know, how you bring policies together is something that can play an important role.

BA: Yeah, that is the transition to the other paper I wanted to talk about because when you described this typology of policies – science and technology, innovation, skills and human capital, forms of markets and internationalisation – underlying that in that typology we make a very strong point about institutional foundations to actually drive these policies. And we already got a little bit into that, talking about the Korea case. Because I think the complexity about policies to support productivity is because it is so broad. There is no silver bullet, as we quite often say, to raise productivity. There is also not a productivity ministry or department in government. It always needs to be coordinated across many policy domains, horizontally across different ministries, but also vertically and you talk about central government and regional government which is a big issue in the UK as well.

So, the other paper you did for The Productivity Institute is actually looking at how different countries deal with these institutions around productivity. And there's quite a bit of history there, you know, some countries have had productivity commissions for quite some time. But particularly in the last few years we have been seeing quite a bit of activity, also in the European Union, for example, where we have now more national productivity boards. And you've been doing some national comparative analysis, so can you describe a little bit – what are the different models of these productivity related institutions, and what are some of the strengths or weaknesses that you've been identifying in their work?

DP: I think at the moment in the OECD area there are probably about 20 or so government supported or government founded productivity institutions or productivity boards/commissions. The oldest one is the one in Australia which exists since the late 90s basically and then a few other countries like New Zealand and Chile established one quite early as well. And then we have this wave when the European Council basically recommends the setting up these productivity boards and that's led to a lot more being established in Europe. And that continues to this day, and Austria set one up last year and Sweden only this year in April.

I think they are all focusing pretty much on the same thing, they're all trying to say, well, we need to sort of try and provide advice on productivity policy, we need to try and do research. We also need to sort of be a voice in policy making in terms of, well, what do we think is the long term agenda around productivity? So, it's this constellation of things where these productivity boards are playing a role.

And they're still a bit of an experiment I think in most cases. The Australian one has been, sort of, around for a long time and I think is widely recognised as sort of being important and having played an important role – good or

bad is not what I want to talk about, but I think it has been quite an effective instrument in providing advice on policy.

We don't know yet about I think some of the European ones because most of them have only operated for about four years, two of the years of which were during the COVID period, so it's very hard to see, well, how they are influencing the long term agenda. So, I think that there will be really now a question, well, can we really understand how this works? And I think the fact that we now have 20 of them around means we can learn, we can start to look at comparative experience and try to see a little bit what works.

I think there are some components that are important to make these things work. It's why I think independence is really important to make sure that they're really statutorily independent of government, that they have an independent role, so I think those are things that perhaps we need to think about a little bit more.

BA: Yeah, because I think a lot of the listeners to this podcast will say, really another commission, is that going to make...change the needle very significantly? And it's an interesting question in the UK because we don't have a government institutionalised productivity commission in the UK and so the question is, you know, should we do this? What would make a productivity commission effective in what it does? You mentioned independence but are there other things in their remit, in the way they're being organised that would matter?

DP: No, I think there are other things. I think it's very important to look at, well, who's on that commission, I think you need a strong chairperson and probably a well recognised chairperson. You probably need to think about the composition on that commission. In the paper I found basically there are some that are mainly academic, some are more government focused, some are really a mix where you also see businesses playing a role.

So, what's the composition of that commission, how do you make that work? I think you need a secretariat, you need basically a group of people that can support that commission with some research, with some analysis, to bring also what exists already together and in the UK there's a lot around already of course. But you also need to have a couple of people who can sort of really make...you know, try to do a little bit of their own research, really focusing on the questions the commission are struggling with.

So, I think you need to have support, a budget and a clear mandate for what that group is doing. And then a group link to the policy making circuit itself, so basically into Treasury but also the cabinet office, into government at highest levels to really have that play a role. And yes there are many of these commissions around, but the interesting thing is that even countries that didn't have one in the European Union recently are still deciding to set one up. So, I think there are several countries that still see this as something



that matters at the moment. We do have this slowdown in productivity, we do have a problem in productivity particularly in the UK, so perhaps it is worth setting one up to also help look at ways of strengthening productivity growth in the UK.

BA: Okay, and we'll take that advice – we're debating this in the UK and you'll be part of that. So, wrapping this up, Dirk, making these connections between science/technology innovation, a broad range of other policies including industrial policy, and make that link to productivity. You know, we see productivity slowdowns pretty much across the OECD, but some countries are slowing more than others and some countries are actually doing pretty okay on productivity growth.

So, the question remains...there's no silver bullet but when you sort of pull this all together and you think back over, sort of, 30 years of work you've been doing on this, what are the things that you really want to emphasise as being important, from the perspective of sort of reviving productivity growth, that we need to take into account when thinking about these questions?

DP: Well, the first thing to say is, of course you know, situations will differ by country and I think that's also what you clearly see also from the analysis that is going on across countries. There's not the same story everywhere. But I think one thing that I found also on the paper on productivity institutions that I did, and what's really on the mind of lots of countries at the moment is the skills side of things. So, basically the fact that a lot of firms are struggling at the moment with not having the right skills, really shortages of people – in many areas, not only the, sort of, the really advanced high skills tech but also more intermediary skills. And sometimes even basic skills, you know, in some cases where people just don't have the skills that are needed in society.

And I think this is so difficult for...at the moment for policy to deal with because we know education policy, we know how to get people to a certain level, but then to change what...the skills that people have in their working life is a lot harder, and most countries are actually still struggling how to figure that out. So, I think the skills side is really important for me.

The second side is where I think we need more focus is what we spoke about is basically technology policy, industrial policy, because I think that's where you can really change the needle. We've thought a lot about making markets work and this is where countries have really focused on quite a lot how to improve the function of the labour market, of the goods markets, of financial markets. Perhaps there is more to be had there. But I think to really change things a little bit I think we need to do more around technology policy and industrial policy, because that can hopefully sort of help to change also our focus on new growth areas. And particularly in areas like climate change at the moment we will need that really, that focus.

And I think another point here is...a final point, is the issue of scaling. I think, you know, we are really...we are struggling in many countries with good ideas but difficulties in scaling. And of course Europe already has problems with that because it doesn't have a fully integrated European single market. And unfortunately for the UK by leaving the European Union it's turned into an even smaller market then that means that scaling is even harder. So, we see scaling taking place in the United States, we don't see a lot of scaling taking place in the European area including the UK. And that I think is a real problem if you want to have impact with technology, with ideas, with knowledge on the economy and on society – you need scale.

BA: Yeah, and that suggests that the UK needs to go full out with making sure that international collaboration does happen. And OECD is one area where you can do that but there are many other organisations where the UK can play that role. And it's probably even more important now being outside the EU than it was before. So, that's a really good message – skills, thinking hard about the industrial and technology policy and scaling things up. So, those are some really good messages putting it all together. Dirk, thanks a lot. We covered a lot here in the past 50 minutes or so and we're looking forward to see a lot more of your work coming along. Your work it's been, as I mentioned included in the show notes. First paper on pro-productivity policies – that's still to come but it will be there soon. We also discussed a lot of other references and articles and they all appear in the show notes or on our website at [productivity.ac.uk](http://productivity.ac.uk). Thank you for joining us.

PB: You're welcome, it was a pleasure.

BA: You can sign up for the entire Productivity Puzzles for your favourite platform to make sure you also don't miss any future episodes. If you'd like to find out more about upcoming work 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 this was me again, Bart van Ark at The Productivity Institute. Thanks for listening and stay productive.

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