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Host:

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Guests:

- **Josh Martin**, Economic Advisor at the Bank of England and Research Associate with the Economic Statistics Centre of Excellence.
  - **Mary O'Mahony**, TPI Research Director and Professor of Applied Economics at King's Business School.
  - **Catherine Mann**, External member of the Monetary Policy Committee at the Bank of England and Honorary Professor at Alliance Manchester Business School and The Productivity Institute.
  - **Chander Velu**, Professor of Innovation and Economics at The University of Cambridge.
- Kate Penney**, Research Fellow at The Productivity Institute.

**Bart:** Productivity is the key to economic growth and living standards. But has the productivity puzzle been solved yet? Have we been asking the right questions? And what's next? Five years of TPI research. Five big themes and still big questions ahead. Welcome to productivity puzzles.

**Bart:** Hello, and welcome to the fourth season of Productivity Puzzles, your podcast series on productivity, brought to you by The Productivity Institute. My name is Bart van Ark, and I'm a professor of 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.

**Bart:** Welcome back to productivity puzzles and welcome of course, to the first episode of a brand new season. We are thrilled to be launching season four. When we started this podcast, we thought it might be a bit of a niche topic, but we've received so much good feedback. Thank you for that and we much appreciate it.

**Bart:** So we thought we'd continue with a four season of 12 episodes, and as always, we'd love to hear from you. So if you have ideas for topics or panelists and just drop us a line at [tpi@productivity.ac.uk](mailto:tpi@productivity.ac.uk). We're kicking off this season with reflections from our recent international research conference on Productivity, which was held at the University of Manchester on four and five September.

**Bart:** It was a fantastic gathering. Over 250 attendees, 80 papers being presented, and you can find your agenda and many of the papers and presentations on our website at [productivity.ac.uk](http://productivity.ac.uk). And of course, we also include a link in the show notes.

## The Productivity Puzzle: Lessons Learned and What's Next?

In our opening panel at the conference, we took stock of what we've learned from five years of TPI research along insights from our collaborators. And we focused on five major themes: the measurement of productivity, the evolution of skills and human capital, the challenge to raise investment.

**Bart:** The question how new technology is changing business innovation. And finally the critical role of place-based productivities and strategies for regions, cities, and towns. You, of course, recognize these themes from previous seasons, and you'll likely recognize the voices of the panelists too. After the panel, I caught up with each of them to ask them two questions related to their area of expertise.

**Bart:** First, what have we learned from all of the research of the past five years? And second, what should be the key issues on the research agenda for the next five years? So let's dive in. We start with the topic of measurement because in today's increasingly complex economy, understanding what goes into production and what comes out is more challenging and more important than ever.

**Bart:** Our first panelist is Josh Martin. Josh is currently serving as an economic advisor at the Bank of England, and before that he was with the Office for National Statistics. So he's had a front row seat to see how we measure productivity and how we track the trends, and that makes him the perfect person to kick off the conversation.

**Bart:** Josh, thanks for joining us. Nice to be here, Bart. You recently published a piece in the International Productivity Monitor, which is the Productivity Institute's house journal and, and will provide a link of course to that piece in the show notes. And that piece takes a fresh look at the data from a UK perspective.

**Bart:** So I think the question to ask is, what have you recently learned about the productivity slowdown that we didn't already know here in the UK. And how does that compare to what we're seeing, uh, in other OECD countries?

**Josh:** I think something that we've learned in the measurement community over the past few years is that the productivity slowdown in the UK is not quite as bad and not quite as unique as we once thought it was.

**Josh:** For many years, we thought the UK was the international outlier with by far the slowest productivity slowdown in the developed world. And while it's still quite a large slowdown and, and towards the bottom end of the pack internationally, the UK slowdown doesn't look quite as unique and quite as bad as we previously thought.

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**Josh:** And the main reason for that is a revision that the ONS made to the way they measure GDP in 2021. They introduced something known as double deflation, which is international best practice for measuring GDP. I don't wanna get into the gory details, but it's basically about how best to measure the prices of the things that businesses buy and sell.

**Josh:** And when the ONS made that revision, it changed the size of the slowdown slightly. It made the slowdown slightly less aggressive, but it also changed the pattern of the slowdown across different industries and made it look more like other countries. So the slowdown in the UK on the latest data is characterized by predominantly a slowdown in total factor productivity or TFP as well as a contribution from.

**Josh:** Capital shallowing, that's less capital assets available per worker. And across the industry dimension, it's characterized by those industries that were previously the biggest contributors to productivity growth before the financial crisis, typically manufacturing and others, which are the ones that have slowed down the most, and that's a common finding across countries.

**Josh:** So there is still a productivity puzzle that's still a productivity slowdown, but it's less a UK specific puzzle. Rather, the global frontier slowed down and the UK slowed down more or less in tandem.

**Bart:** So, so one question that I get a lot, and I'm sure you are getting it too, is what we do with the measurement of the digital economy, particular, you know, rapidly declining prices over all sorts of information technology, equipment, but also IT services that becoming cheaper over time.

**Bart:** Can we really measure this well? And is the UK doing this now equally well or equally badly as in other countries?

**Josh:** So the measurement of the modern economy is definitely still challenging because of digital changes and so forth. The UK ONS has fairly recently made a, a big change to the way they measure the price of telecommunication services, which now shows a very rapid decline in those prices relative to the previous way of measuring it.

**Josh:** And what's important is not the sticker price of these various services, but rather what you get for them. So the quality adjusted price has fallen dramatically. The ONS captures that in their GDP measures and is in fact one of a world leader in terms of capturing that sort of measurement.

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**Bart:** Looking ahead, if you think about the research agenda and what we should be doing as TPI, what are the key measurements areas that you think we are still falling short, maybe particularly in the UK, and how can we improve the tools and the approaches we use to address those?

**Josh:** Well, there's no shortage of things that we'd like to measure better in the economy and in the productivity sphere. One area that I've worked on, and there's always lots of interest in, is capital of various types. Tangible capital and natural capital, institutional capital, social capital. All of those would, you know, really improve our understanding of productivity if we could measure them better.

**Josh:** And there's a lot of good work going on there. But the thing I'd like to focus on is in fact the slightly more simple input of labour, of hours of work, of people, which is arguably the largest and most important factor of production. And you would think that would be relatively easy to measure, but it turns out it's harder than we thought.

**Josh:** The way we measure labour input in the UK is in fact, not in line with international best practice, uh, work by the OECD finds that there's two broadly different ways of measuring hours worked in the economy. One way is just adding up all the hours that people say they're working on the surveys, and that's.

**Josh:** What we do in the UK. And the OECD find that on average, that tends to overstate the number of hours worked in an economy and therefore understate the level of productivity. So additional work to improve the way we measure hours worked, that very fundamental bit of the productivity equation, would go a long way in improving how we understand the level of productivity in the UK relative to international peers.

**Josh:** And indeed how that might have changed over time.

**Bart:** So there's been a lot of hoo-ha around the measurement of the labour force survey and so on. Are these measures also affecting the measures, and the problems in those measurements? Are they also affecting the measures of productivity at the moment in the UK?

**Josh:** That's definitely having an effect on our current productivity measures and the ONS is doing some work to see what would be the productivity statistics if you used a different set of labour measures such as those from the administrative payrolls data. They paint a more or less similar picture, but there's definitely challenges caused by the current issues with the labor force survey.

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**Josh:** But those issues I was describing previously are much more long-term and structural issues associated with methodologies rather than the current issues of the survey and the low response rates.

**Bart:** Thanks Josh.

**Bart:** So there's lots of developments there. So let's move on to some of the drivers of productivity and starting with skills. Mary O'Mahony is the Professor of Applied Economics at Kings College London, which is one of TPI's lead institutions, and she also serves as the Research Director at the Productivity Institute.

**Bart:** Mary, welcome to the show.

**Mary:** Hello.

**Bart:** Your work over the years has consistently focused on skills and human capital, which remains one of those enduring themes in the productivity debate. But in recent years, we've had access to much richer data sets and new analytical tools. So I think what have we learned with this new wave of data about the role skills and human capital in driving productivity that we didn't know about before?

**Mary:** First to start with, there's no doubt there's a labor force skills and a well-functioning labor market impact on productivity. And there's substantial evidence from a large body of literature carried out by TPI and elsewhere showing that skills are a significant barrier to adoption of new technology.

**Mary:** So we do know that skills matter, but this has always been the case. If you remember back to our early career, Bart, you and I started at the National Institute of Economic and Social Research where Sig Prais and his team were working on skill shortages. So what has changed? And I think what has changed is that the current period.

**Mary:** The pace of technological change is very fast, and the kinds of skills that are required for modern technology are changing very rapidly. And this is especially the case since the advent of generative AI. So in the past we relied very heavily on qualification data to measure skills. It's a proxy for skills.

**Mary:** And what's new now is we have these new sources of big data that allow us to look more granularly into what kinds of skills are demanded by firms. And the main

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source of data that we have to do this is job platform data. And these are data that show what type of workers firms are looking to hire.

**Mary:** And this allows us then to measure skill rather than qualification. So what we find from these data is that there's a large and increasing demand for particular types of skills, particularly technical and STEM skills. But there's also, as emphasized by the recent Pissarides review, significant demand for softer skills such as communication and leadership skills.

**Mary:** What's important here is that both are needed, and we need a lot more of them. Firms do find it difficult to hire the people with the right kinds of skills.

**Bart:** There's been a lot of debate around skill mismatches, either you know, too many overqualified people or too many underqualified people. Have you learned anything from this new data that helps us to understand these skill mismatches better?

**Mary:** Well, what we've focused on in these data is that there's large geographical variation in the skill mismatches, particularly in the UK. I'm sure this is true of other countries too. But there's large demands for these skills, but also large supplies of the, the required kind of stem skills in places like London and the Golden Triangle.

**Mary:** But there's lots of areas where there's demand for the skills, but the supply of these skills is lacking due to poor education provision or the fact that the lots of areas do not attract graduates. And therefore we are learning a bit more about what, you know, what underlies these skill mismatches.

**Mary:** What's interesting is you get these two types of skill mismatches happening in the same labor market. So you get overeducation, some people, graduates and non graduate jobs, and at the same time you've got firms with, you know, very widespread shortages of particular types of skills. Then the question arises, how do we get more of these skills?

**Mary:** In the UK and elsewhere education policy has been particularly focused on university education, but there is increasing evidence that firms are looking beyond qualifications themselves and looking at skills through alternative routes. So the idea that a good degree from a good university guarantees a job may not be true anymore.

**Mary:** Young people need to upskill more maybe through online learning or different routes.

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**Bart:** Particularly in the light of the rise of generative AI, which is clearly shaping the landscape.

**Bart:** How can we better understand and anticipate the skill needs that are emerging? And also I think a question I have, is there any sort of meaningful skill forecasting truly within reach.

**Mary:** The answer is, in short, is that it's very difficult to predict. So we've had lots of waves of technological progress throughout history, and in each of those the skill mix have changed radically.

**Mary:** Of course there is no evidence of any net destruction of jobs, with any of these technological changes. It's very difficult in the midst of a technological revolution, and that's what's happening in particular with generative AI which has only been around for a couple of years, to predict what's going to happen.

**Mary:** So we know there's going to be a change and we're not quite sure what that change is is going to look like. We can see from the job platform data, data that there has been a big drop in demand for very technical software skills in 2023 and 24. This might partly be due to COVID as there was a big rise in hiring once COVID hit.

**Mary:** But this is also likely to have arisen from, from generative AI. So we do see something happening and I think within five years from now, we will have a better sense of what's happening. But what seems to be the case with the generative AI is it seems to be substituting for some very high level skills, and particularly amongst professional people.

**Mary:** And it's a very long time possibly since the Industrial Revolution, where demand seems to have gone away from the very high skilled. So we don't know yet, but there does seem to be something happening that is a bit different from previous waves of technological revolution. But I should also mention there's another transition going on, and this is the demographic transition, the aging society, which is really coming at us of very quickly.

**Mary:** The big problem is going to be reduction in labour supply. And it might be that AI helps on this, so AI can substitute some tasks and mean that we don't need as many people in the workforce as before, given this change in labor supply. And so it might be that it all turns out quite.

**Mary:** positive it's just very, very difficult to predict. However, to my mind, there's one really important thing that we need to get right here. And that is who gains from



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AI and how do we ensure, ensure that the gains are shared in the wider population. And finally, I'd just like to say, another transition that is happening, a very worrying trend is the rise in mental health amongst younger people.

**Mary:** And it changes in their attitudes to work for rapid technological change, you need a lot of well-motivated, engaged young people. And if the trend is going in the opposite direction, then that is a worry.

**Bart:** Yeah. And parallel to that, there is also, you mentioned this earlier, the importance of software skills in today's economy.

**Bart:** You know, collaboration skills and conflict management skills and all those kind of things. So do the data now, allow us to get a much better understanding of that as well, about how important these kind of software skills are relative to the sort of harder cognitive skills. The

**Mary:** data we've been using are not so useful for that.

**Mary:** Now, maybe that there are other sources of data that we can look at and, and access in the future. The problem with the job platform data that we use is that soft skills are everywhere. Every job advert asks for good communication, good leadership. So it's very difficult to really pinpoint. We're trying to do some work on this.

**Mary:** The other problem is on the supply side, you know, we can look at degrees and STEM subjects. What proportion of school children are taking STEM subjects? But software skills, there are no degrees on soft skills, so it's very difficult to identify. So a lot of the evidence is kind of anecdotal talking to firms, but there does seem to be something, some suggestion that people who are using generative AI need to communicate the results and what they're doing to other people.

**Mary:** And that becomes more important over time. And, as I said, this trend in rise in depression, anxiety amongst young people is, is, is a worrying trend in that regard.

**Bart:** Okay, thanks Mary.

**Bart:** Okay, so let's move on from human capital to the sort of more regular types of capital, which is investment in machines and equipment and structures, but also all sorts of intangible capital such as software and organizational capital.



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**Bart:** And it's a great pleasure to discuss that with Catherine Mann, who's an external member of the Monetary Policy Committee to Bank of England, and an honorary professor at the University of Manchester and very much involved with TPIs program on finance and investment. Hi Catherine. Very glad to be with you, Bart.

**Bart:** Yeah, well, good to have you. As I mentioned earlier, investment hasn't been going particularly well at the time when, you know, we really urgently needed across the board. So I think the question I have is what are the main barriers that we are actually now really observing from all the resource that you've done in others, TPI and elsewhere, about what is holding back investment at the time that you would expect it to accelerate given all the technology that's around?

**Catherine Mann:** Let's start with standing back just a little bit. You know, I'm a central banker, and you know, why is a central banker on a productivity puzzles podcast. And of course the reason is that central bankers do care a lot about productivity growth because it's a central component of the speed limit of the economy, the supply side of the economy.

**Catherine Mann:** And that is critical when we make our decisions. And so that's why there's a dovetailing of the work that I do on investment and productivity with sort of my day job as a central banker. But to be concrete, you know, in answering what holds investment back in the UK, I think it's important to focus on both aggregate data, but importantly in order to understand the drivers and the inhibitors of investment, we have to look at micro data.

**Catherine Mann:** That's the firm level data. Now on the macro data. I think one of the things that's interesting in the Blue Book revision that just came out about a month ago, investment was revised up. Consumption down, investment up. And now that tells us something about the challenges of measuring investment. Now you mentioned structures.

**Catherine Mann:** We can find those. We can measure machines. We can see where those are. But intangibles are an increasing importance in the investment profile of firms. And that's much harder to measure. So in some sense, revisions aren't surprising, but it's always important to always have this stock take which the Blue Book does every year.

**Catherine Mann:** In order to investigate this sort of situation at the macro level. Turning to micro, which is where we can understand the drivers or inhibitors of investment. Let me focus on some work that I've been doing with the postdoc at Alliance Manchester. And in that work we have data on 45,000 UK businesses.

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**Catherine Mann:** Most of them are small, they're unlisted, and so they are kind of the meat and potatoes of the economy and understanding their investment choices and outcomes is critical for the underpinnings of this aggregate investment behaviour. Now we can look at different kinds of financial constraints. And that's important because what we do find is that.

**Catherine Mann:** Intangible capital, stuff that's harder to measure, doesn't seem to be at all responsive to financial constraints. Whether we measure that as bank rate, which is my monetary policy tool. Or credit from the banks or equity markets. So across the board, what seems to matter to drive intangible investment is the availability of demand for the product.

**Catherine Mann:** So that's a very important first thing to note. On the other hand, if we also want to look at tangible capital and the implication of that. That within the investment profile, the cost of debt, which is say a bank loan, for example, it's a relatively tighter for smaller firms, for lower productivity firms and for firms that are not classified as high growth enterprises.

**Catherine Mann:** So that is kind of our profile how financial constraints interact with characteristics of firms with regard to their tangible investment profile.

**Catherine Mann:** There are other findings from this research that I think is important when you think about what is the characteristics of the firms and how that relates to investment. We do find that this cost of debt constraint is U-shaped.

**Catherine Mann:** In other words, there are firms who do access bank credit, so they're not priced out of the market completely. The smallest firms are priced out completely. The largest firms don't need to go to a bank. So there are these firms in the middle who do access bank credit, but for them, the financial constraints seem to be more important in affecting their investment decisions.

**Catherine Mann:** In other words, higher cost of credit is negatively associated with their investment profile.

**Bart:** In some of the work, you also find that these hurdle rates, which are essentially sort of the rates of return that the company set themselves they want to achieve, seem to be relatively high compared to the actual cost of the actual debt.

**Bart:** So what's the explanation for that sort of big gap. And has that gap been widening?

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**Catherine Mann:** So we do talk about these internal rates of return that are demanded by managers. They can call them hurdle rates.

**Catherine Mann:** These hurdle rates could be demanded by managers internal to the firm, or they could be demanded by multinational managers, which is outside the home country. And so these are different groups who effectively say when they are undertaking an investment decision. They look at credit and they say, I actually think from my investment decision.

**Catherine Mann:** I have to have a hurdle rate much higher than the cost of capital. They may do this as a signal that fiduciary responsibility, they may do this because they only want to take on investments that on average will have a higher rate of return than bank credit allows. You know, if we say that bank credit is not pricing in the risk, then we are saying something about the financial markets and their ability to price in the risks of businesses that are in the sort of a medium sized size. Now,

**Catherine Mann:** other topics in our meetings that we had as our annual meeting of the productivity forum, we talked about Fintech. And the role that Fintech could play in improving the assessment of credit risk for exactly these firms.

**Bart:** So now in going forward, what is it you think we really need to get a better understanding in order to make sure that investment can actually begin to accelerate and improve?

**Catherine Mann:** So in addition to a U-shape on financial constraints, in other words there's a group of firms in the middle who are financially constrained when they make their investment decisions.

**Catherine Mann:** That could be an internal constraint, it could be an external constraint, but it's there. There's also a U-shaped relationship between market competition and business investment. And I think this is important because we can talk about market competition, meaning profit margins or productivity growth. And what we find here is, if we cut all of our sample into high productivity firms

**Catherine Mann:** Middle productivity firms and lower productivity firms, the one where market competition is most important is the middle productivity firms. These are the ones who, in principle, they face competition and they're undertaking an investment in order to improve their position in their market. So I think we have to.

**Catherine Mann:** marry our sense of the cost of capital with the return to capital and market competition plays an important role in return to, making an investment.

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**Bart:** So those are those sort of new technology in the financial sector. Uh, you know, there's of course all this stuff on FinTech and so on. Is there anything there that we still do not quite understand

**Catherine Mann:** when we think about the challenges of pricing in appropriate credit risk for these middle tier firms?

**Catherine Mann:** These ones that are middle productivity and wanna undertake investment, or they are accessing capital but they're not able to get as much as they think that they should have. If we think that the market is not pricing in risk appropriately, not pricing in knowledge of the business appropriately, then that seems to open up the opportunity for all of this information intensive FinTech approaches to improve the capability of financial markets to describe what the risks are.

**Catherine Mann:** Facing a business and give them credit that is more priced appropriately for their prospects, for engaging in investment, improving productivity.

**Bart:** Yes. That's really interesting. Thank you. So that wraps up our first round of reflections.

**Bart:** There's clearly a lot we've learned from improving on how we measure productivity in a complex economy to understanding the roots of long-term underinvestment in human and physical capital.

We still need to discuss two other topics: rethinking business innovation models and recognising the importance of place-based strategies for regions and cities.

**Bart:** That's what we will explore next. But before we dive into that, let's take a moment to hear what else is happening at the Productivity Institute.

**Bart:** Welcome back to Productivity Puzzles. In this episode, we're taking a broad brush look at the productivity puzzle and what we have learned in terms of insights from the research in recent years.

**Bart:** So let's talk next specifically about technology and innovation and for that we have with us.

**Bart:** Chander Velu. Chander is a professor of innovation and economics at the University of Cambridge, which is another key partner institution of TPI. And some of

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your research, Chander has focused on the role of technology in driving business innovation. Welcome on the show, Chander. Thank you very much, Bart. Thank you for having me.

**Bart:** Great. Now, you recently published a book under the same title, Business Innovation, and that draws in part on work that you've done with The Productivity Institute for the last five years. And one of the central messages that you are having there is that firms really need to fundamentally. rethink the way that they innovate.

**Bart:** Not just what I innovate, but actually how they innovate. So on the basis of that work, what have you learned about innovation process and how innovation is evolving and how that is reshaping how companies drive investment and productivity?

**Chander:** The basic premise is that in order to get a productivity uptake, we need to fundamentally transform the way we do business, which is what I call business model renovation.

**Chander:** And this has been shown from, various general purpose technologies in the past. More recently, I think the advent of digital technologies becoming more prevalent. One of the big changes is that these digital technologies enable more precise customization and personalization of products. And in doing so, what has happened is this increasing fluctuation in terms of the volume and the mix of products that are being delivered to customers due to the more.

**Chander:** Precise personalization of those products. Hence, there's a fundamental need for businesses to shift their business model from a make and sell type proposition to a sense and respond business model. And that is quite a big change across different industries. And we've seen that evolution over a several decades now.

**Chander:** Looking at the business model in terms of servitization, for example, or even platformization, i.e., firms are adopting platform type business models or manufacturing firms, for example, outsourcing quite a large component of their manufacturing processes into this supply chain.

**Chander:** And these are different forms in which industries and firms have adopted to try to be much more a sense and respond type model to be able to customize and personalize their products. So on the one hand, that type of a shift in business model enables increased productivity and performance.

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**Chander:** But on the other hand, it creates a different type of problem. And that is the fragmentation of the ownership of the business model itself. So as we move to more outsourcing of platform type business models, the ecosystem is much wider and therefore, both within the firm as well as across firms, the ownership tends to be much more fragmented in terms of the processes and activities. And therefore.

**Chander:** Digital technologies tend to be adopted on a piecemeal basis rather than trying to think about the transformation of the business model itself. So therefore, there's a chasm in terms of the ownership of the business model, and that creates a problem going looking forward in terms of productivity improvements, because if one were to improve

**Chander:** Parts of the process or parts of the activity system rather than trying to transform the overall business model, then there could be a drag on productivity. And we begin to see some of that and therefore we need to think about leadership and governance of ownership of the business model to actually re-enable productivity improvements.

**Bart:** Is that ownership of the business model, is that sort of constrained to individual firms or does it also have to do with the broader ecosystem in which firms operate supply chains or eco platforms and things?

**Chander:** Yes, yes. I think it applies both within the firm as well as across the supply chain and the ecosystem.

**Chander:** So, for example, within the firm, what happens is as the firm becomes bigger, the ownership tends to be at a functional level. And each function within a business tend to adopt digital technologies to try to improve their own process. So, for example, the manufacturing process, the head of manufacturing might improve the manufacturing process.

**Chander:** The head of marketing might improve their marketing process, and that creates a level of less than coherent business model within the firm itself. Now, if we then take it across the supply chain, so if we look at a particular industry, things like aerospace or automotive, because of the outsourcing of the manufacturing process, there are now many firms across the tiers, i.e. tier one, tier two, tier three, tier four, and sometimes right down to tier four or five where.

**Chander:** The tier four or five firm doesn't really know precisely where a particular component product may sit in the overall, finished product, so to speak. And now we've got a larger problem in terms of how does the original equipment manufacturer

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coordinate the supply chain in order to enable the entire supply chain to change as a result of new technologies.

**Chander:** And hence the fragmentation is even more prevalent both within the firm as well as across the supply chain.

**Bart:** So, Chander, I think I probably have the same question to you as I've had earlier on to Mary, about how we can ever get a good sense of what is going to come down the road in terms of new technology. You know.

**Bart:** Technology's probably even harder to predict on skills about where you're going to go. So, so we've always sort of running behind the facts and the question therefore is what is now important at the frontier for us to begin to focus on when it comes to our research agenda in the next couple of years,

for example?

**Chander:** I think this is a really important point because quite often I think as business managers and economists, and policy makers, we somehow tend to be behind the curve in terms of the forefront of the technology. So therefore the two things, one is we need to be able to better forecast what are the technologies coming our way in terms of business applications and be able to engage with that technology early before it becomes a mature technology.

**Chander:** So just to give a couple of examples to illustrate the points that I'm trying to make, if you look at generative AI, which is creating a lot of news in the marketplace, as well as interest among firms. This is a technology that has probably been developing over several decades among computer scientists, among engineers, among mathematicians.

**Chander:** But more recently, it has become perhaps very relevant for firms, and firms are now trying to adopt this technology and trying to think through the implications of their business models and the core processes and so on so forth. And there are a lot of issues around, you know, what does it mean? How do I use it? how do I transform the value proposition and so on and so forth.

**Chander:** Now if we look at another technology that is coming at very fast quantum technology or quantum computing. Quantum technologies has been there for some time because it's based on quantum mechanics, which has evolved over the last a hundred years or so, the last century.



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**Chander:** However, over the last couple of decades, the technology, itself is becoming relevant for businesses because as AI and other problems in terms of materials or drug development becomes more prevalent, the complexity of the problem has increased tremendously and therefore, high performance digital computers are unable to compute fast enough.

**Chander:** And we probably need a new technology, you know, things like quantum computing and so on and so forth. And it's important that we as business managers, economists, policy makers, engage with the engineers and the computer scientists and the physicists early on. Although quantum computing is not ready for deployment yet, it is likely to become ready and it'll probably work in conjunction with high performance digital computers.

**Chander:** And we need to be able to understand and shape the direction in which this technology is going to evolve and has an impact on business and society early by working with, uh, the engineers, the computer scientists, the mathematicians, and so on and so forth, as opposed to waiting for the technology to become mature and then trying to react to it, which is I think, the key premise in terms of trying to get productivity uptake and improvement.

**Bart:** Yeah, that's a really important message that is collaboration between economists and innovators and business and researchers has to become sooner rather than later. So that's a good point. Thanks Chander.

So

**Bart:** let's move on to the place-based perspective of productivity. And for that, last but not least, I'll speak with Kate Penny. Kate is a research fellow at the Productivity Institute.

**Bart:** Also the lead of the Northwest Productivity Forum of the TPI. Kate's work is very much focused on the regional dimensions of productivity. And I was just saying last but not least, because that's not only because she's the last in the row of five panelists I've been able to talk to, but also because place-based productivity is really where it, in the end, all happens.

**Bart:** You know, productivity is not just a national statistic, it's something that you can observe on the ground. Something that you can see in firms, that you can see in places, and you can see that places and communities that are more productive just look different, and have a different feel than other places.

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**Bart:** So that's why this is interesting, Kate, to discuss it with you. Welcome on the, on the show here.

**Kate:** Hello. Thank you for having me.

**Bart:** What is it that we have learned in all the work that we've done at TPI around productivity at the local and the regional level in the last few years? And how does that support a more sort of inclusive concept of productivity and improve the regional balance of the benefits of productivity for growth and development?

**Kate:** Well, we've known for over a decade that place-based policies, those policies that recognize the regional distinctions rather than a one size fits all approach matter in addressing regional inequalities. And particularly over the past five years, we have seen growing recognition of the nature and scale of regional inequality and the impact that this has on national productivity.

**Kate:** So some of the things that we know really are important there, one is governance. It's a key factor in improving productivity and overly centralized systems have a negative impact on how regions develop. And the UK is a clear example of this. In addition, we've seen improvements to productivity data at the national, international and regional level, and the TPI data lab, the productivity lab has

**Kate:** Some really good examples of not only data at a regional, national, international level, but also doing some really important work in inputting that data into context and making it accessible to a broad range of users. Another important point on the data is that we now better understand that

**Kate:** This is across a range of productivity drivers, such as skills, such as innovation. And with the recognition that measures need to be broader and that productivity needs to account for the social, the political, and not just the economic factors. So it's, it's an important relationship between those three things.

**Bart:** It's particularly interesting that you emphasise both the quantitative part and the qualitative part of this region-based work, right? Earlier on we spoke with Josh Martin about the measurement side very much at the national level, but are statistics at the local level good enough, but also more importantly, are they useful for policy makers to sort of get a more targeted investment strategy or productivity strategy if they have good data at hand?

**Kate:** I think we get consistently told from the places we're working with, the people that are developing the plans, that the local data is very helpful and it is helping to

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inform decisions and how they make those decisions. But there are a couple of points on that. One is it has to make sense and it has to be in real time, so

**Kate:** That's why things like the productivity lab are really helpful because it's consistent. It puts the context into an accessible format. It tells a consistent picture. It is at the local level, they can make comparisons not only just to their neighbor, but across the country in a national picture, or the places that might have similar sorts of conditions to them, and not just necessarily their immediate geographical partner.

**Kate:** That may be less helpful. So I think there are some really good progressions in that area. But we also get told the importance of understanding data from the qualitative perspective, as you say, Bart. So actually getting feedback from the people who are in receipt of services, who are sat round the table making decisions.

**Kate:** And the importance of making sure that those aren't just the traditional measures, but actually picking up on important factors. They're not new, but we have a great recognition, I think now, about the importance of the social impact, of the role of institutions, as I already mentioned. So I think there's still a bit of work to be done around how we can get better at measuring and defining some of those ideas.

**Kate:** There's a conceptual piece there as well as a measuring piece, but it is improving.

**Bart:** You've been working with local councils and city councils, and they've got a lot of day-to-day issues on their hand. So how can we support them to think more strategically around these kind of issues on investment and productivity. What is the best way as a research community, uh, to help local councils to actually do things better?

**Kate:** And I think this is particularly timely, isn't it? Because we are in a context now where we have got increased devolution, particularly in England. So there are lots of important considerations and questions that this, this raises a couple of things. That also matter. There is this point around how to understand second tier cities in their hinterlands and how they can increase their productivity to attract further investment.

**Kate:** So understanding the importance of places having a cohesive narrative, that's a really important point there. And that's something that comes up a lot in our research is how do places work together with key partners to think about actually what is it that we are doing that we are showing progress in and that we want to show more progress in, in order to attract further investment.

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**Kate:** But also, as you say, Bart, to deal with those everyday issues around making places a quality place to live, to work, to learn. That's the sort of thing places are thinking about. But there does need to be that strategic long-term vision in order to get there. So I think part of that is helping to places see how the difference different drivers of productivity and dissect.

**Kate:** So things like the human capital, the physical capital, financial capital. How do these important different drivers work together or indeed work against each other. And if they are working against each other, what can be done about that? What are the trade offs? So these are important things to help the strategic regional planning. But I think there's also a very important piece around understanding what productivity is within different contexts.

**Kate:** And it's not just a language thing. Although that's part of it, but actually how is productivity being conceptualized and discussed within these different perspectives across different regional stakeholders. And in turn, what does that mean for the decisions that are made?

**Bart:** Yeah, and I think what's really.

**Bart:** Important here, probably more than any of the other research elements that we're talking about, is the importance of action-based research, by which we mean to actually do this in a participatory basis with the local counselors and other stakeholders at the local level. That's great.

**Bart:** Thanks very much, Kate.

**Bart:** Well, I hope you enjoyed this round of discussions. A big thank you to our five speakers for helping set a stage for some of the key themes we'll be revisiting throughout this season of Productivity Puzzles. Looking ahead, one of our next episodes in the coming months will feature a conversation with Jeffrey Anderson from Georgetown University who delivered the keynote at the September conference.

**Bart:** He'll be sharing his insights on place-based development, so stay tuned for that. But first, in our next episode, we'll turn our attention to the upcoming UK budget. I'll be joined by a panel to explore how the chance of plans might reflect a long-term commitment to productivity growth, and maybe we'll even hear a few suggestions from our guests.



## Season 4 Ep. 1 Productivity Puzzles podcast transcript

### The Productivity Puzzle: Lessons Learned and What's Next?

**Bart:** That episode will drop by the middle of November. You can sign up for the entire productivity puzzle series for your favorite platform to make sure that you also don't miss any 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 [productivity.ac.uk](https://productivity.ac.uk) or follow us on Bluesky and LinkedIn Productivity.

**Bart:** Puzzles was brought to you by The Productivity Institute, and this was me Bart van Ark at the Productivity Institute. Thanks for listening and stay productive.

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