

Tim Phillips [00:00:00]:

Today on VoxTalks Economics, three of the next generation of economists are telling us about their research. Welcome to another VoxTalk. It's recorded live at the Center for Economic Policy Research's Paris Symposium 2023. My name is Tim Phillips. If you did a PhD in economics, you might remember the times where you stood in front of a poster to explain your research. So, once more, we have found three of this Symposium's presenters and we've invited them to talk about their interesting and varied work. Well, first of all, we've got Yasmine Van der Straten of the University of Amsterdam. Hello, Yasmine.

Yasmine Van der Straten [00:00:54]:

Hi, Tim.

Tim Phillips [00:00:54]:

We have Arnaud Dyevre of London School of Economics. Arnaud. Hello.

Arnaud Dyevre [00:00:58]:

Hi, Tim.

Tim Phillips [00:00:59]:

And Margot Belguise of the University of Warwick. Hello, Margot.

Margot Belguise [00:01:03]:

Hi, Tim.

Tim Phillips [00:01:04]:

Welcome to VoxTalks Economics. All of you. Arnaud, your research, it's about the impact of government funded R & D in the US. Some people won't even be aware that there is government funded R & D. Can you give me some examples of it?

Arnaud Dyevre [00:01:25]:

It's extremely pervasive, in particular in the US. And so there are some spectacular examples of government funded R & D that have found their way into civilian use. So, for instance, you could think about nuclear technology in the 1950s. So the insights that emerged from the Manhattan project, they were then put into civilian use. There is also the emergence of lithium ion batteries in the 1970s when the Department of Energy in the US decided to try to find a solution to address the consequences of the oil shock. And in my paper, I look at patents that are funded in part or totally by the government. And one of the most striking examples of a patent that is funded by the government is a patent funded by the National Institute of Health that finds ways to modify pox viruses to then be injected into cancer patients, so that a neurological response is created in their body. So wherever you look, if you dig deep enough, you find traces of government's funding in innovation.

Tim Phillips [00:02:23]:

Private firms have incentives to do their own research. So why would governments fund research and development?

Arnaud Dyevre [00:02:30]:

So government would need to fund research and development because, as I show in my paper, government funded R & D tends to be very different from privately funded R & D. It tends to be different in three key ways. It tends to be more basic, it tends to be more impactful, and it also tends to generate more spillovers. A technology spillover is a positive externality whereby a firm that did not conduct the original R & D benefits from a productivity increase. And when you look at the data, you find that when firms innovate, they do not do the same type of innovation as what the government is funding. And so then to your question about why should the government fund public R & D, the short answer is that it's an investment into future growth. And growth can be interesting for many different ways, not the least of which is that it determines living standards over the long run. And so if a government find itself having to make some savings in its budget, while it might save on R & D right now, it's going to get less growth in the future. So it might not be an interesting trade off for government at time T.

Tim Phillips [00:03:29]:

And what specifically did you set out to find in this paper?

Arnaud Dyevre [00:03:33]:

So what I look at is the impact of public R & D spillovers on private firms productivity.

Tim Phillips [00:03:39]:

Okay.

Arnaud Dyevre [00:03:40]:

And I use two instrumental variables, strategy. And I find that the impact of publicly funded R & D on firm productivity is positive, large, and it operates over a long time horizon. And not only that, I also find that publicly funded R & D tends to be two to three times as impactful as private R & D when it comes to spillovers to other firms.

Tim Phillips [00:03:59]:

And is this because the public R & D patents are qualitatively different from the ones that the private sector produces?

Arnaud Dyevre [00:04:06]:

Exactly. They are qualitatively different. And it seems to be related to the incentives that researchers are facing when they get public money versus when they get private money. And this is not from my paper. This is from the literature that I'm drawing on. Some researchers have shown that when researchers get funding from their own firm, they tend to work on projects that directly benefit their own firm. But when they get funding from the public sector, they tend to have more freedom to explore potentially more impactful projects. And so that translates into

differences. I can observe in the patent data. We talked about a difference in how basic, how fundamental these innovations are. I found that publicly funded R & D relies much more on science. I found that it is more impactful in the sense that it can open new technological area and finally generate more spillovers. It is cited by more technological classes once the patent is granted.

Tim Phillips [00:04:55]:

And at the end of this story, does it have a different effect on firm productivity then?

Arnaud Dyevre [00:04:59]:

It does have a different effect on firm productivity. I find that if you increase public R & D spillovers by 1%, you increase the productivity of firms who benefit from these spillovers by point 17%. And remember, this impact, I also show in the second part of the paper is two to three times more impactful than the impact of private iron, these spillovers. And when you aggregate things up, you find that that can account for one third of the deceleration in TFP, in productivity in the US from the 1960s to present days. So quite a large impact.

Tim Phillips [00:05:30]:

Yeah, because that's what I was going to ask about, because it's one thing to increase the productivity, the firms within the economy. But do you find that this actually has an aggregate effect on growth? It's good for the economy as a whole?

Arnaud Dyevre [00:05:43]:

I do find that it has an aggregate effect on growth. And I do the same analysis at the firm level and at the sector level, just to see if the effect ties out in general equilibrium. And then, once I have estimated these elasticities, I build up an equilibrium model of growth with heterogeneous firm, which is the vector that I'm using to make this statement. About one third of the deceleration being explained by the decline in public R & D. Yes.

Yasmine Van der Straten [00:06:06]:

Yes, so, Arnaud, I have a question, because over the period which you study, there's a number of secular trends that economists have documented, such as the rise of intangibles, the falling investments, and the rise in concentration. So to which extent can your results actually explain why we've seen some of these trends occurring?

Arnaud Dyevre [00:06:23]:

Yeah, 100%. So this explanation is definitely not the only one about the decline in productivity and the rise in inequality between firms. There are as many explanations out there as there are macroeconomists. So I see my work as bringing complementary evidence about perhaps a little appreciated fact so far that could be driving the rise in firm concentration, because there is an impact on inequality when public R & D decreases and the decline in total factor productivity. What I think is interesting about this explanation is that it operates over a long timeline. So the decline in publicly funded R & D happens from the 1960s, the heydays of NASA and the space

race, to the present days to 2020. The rise of intangibles, for instance, that you mentioned is a much more recent phenomenon. So perhaps that might not be the explanation we might go to if we want to explain such a secular trend in the decline in TFP. But I totally agree with your question. This explanation does not explain everything. It explain just a part of the decline in TFP growth.

Margot Belguise [00:07:25]:

So you find that basically publicly funded R & D realize more on science than privately funded R & D. And I was wondering whether you have any idea if this responds to political turnover. And in particular, I'm thinking that, okay, Donald Trump, to put it simply, does not really believe in science. So I was wondering whether when you have this kind of political turnover, if publicly funded R & D reliance on science is so maybe shaded by US bureaucrats or whether you can have an effect, basically, of these politicians.

Arnaud Dyevre [00:07:53]:

Yeah, so that's definitely a very important insight. And this is what I'm using for identification in my paper. I'm using exogenous shocks in geopolitical factors. For instance, when Sputnik is launched into space, there's an increase in NASA's budget, and that generates more patent. And you're right in saying that political turnover also generates these shocks. They might not generate them in the way you would expect. And in particular, I find that republican presidents tend to be associated with very large increase in funding of R & D, and that is partly due to the fact that they increase funding for the Department of Defense and also for the National Science Foundation. Ronald Reagan increased R & D funding for the NSF by quite a bit, and Donald Trump as well. You know, during the COVID pandemic, there has been a massive increase in the R & D budget of the National Institute of Health. And it is 100% true that turnover definitely drives these changes in funding, but perhaps not in the way we might expect.

Tim Phillips [00:08:47]:

Arnaud, that's fascinating. Thank you very much. Yasmine, your paper's about the effects of climate change. Usually when we're talking about climate change on VoxTalks, we're talking about mitigation. But you're interested in the impact on society of adaptation behavior. Why?

Yasmine Van der Straten [00:09:11]:

So when we think about how to respond to climate change, there are two possible approaches, and one of them is indeed mitigation, which is about reducing emissions to limit the rise in temperatures. Now, mitigation is extremely important, but unfortunately, current efforts are falling short to make sure that we keep the targets of the Paris Agreement in sight. Now, we are already seeing that extreme weather events are intensifying across the globe. And this means that the second approach, which is adaptation, is becoming more important, because adaptation is about taking measures that reduce the losses that we suffer whenever a climatic impact occurs. And this is going to only increase in importance as we go forward.

Tim Phillips [00:09:50]:

Now, you studied extreme weather events like floods and how they affect houses and firms. Is that partly because you're Dutch?

Yasmine Van der Straten [00:09:57]:

So, I'm indeed from the Netherlands. And the Netherlands is indeed a country which has a long history in flood management. And the risk of flooding is particularly salient given that a large part of the country lies below sea level. What is actually the case is that floods are one of the most common natural disasters in Europe as well as in the US. And they're also one of the most costly types of natural disasters, and they will only increase in frequency as climates change.

Tim Phillips [00:10:24]:

So in your model what happens to houses.

Yasmine Van der Straten [00:10:27]:

So houses are at risk of becoming destroyed as a result of an extreme weather event, which could be a flood, but could also be something else. And as houses become destroyed, the stock of houses is going to decline gradually over time. So how you could view this is, for example, that as sea levels rise, there are certain regions where you cannot live anymore. And that means that people will have less space to share together. As climate change evolves over time, adaptation then slows down the speed at which this occurs.

Tim Phillips [00:10:57]:

Now you've also got firms in your model, and you've got the people that work in the firms and live in the houses. How do they play into this?

Yasmine Van der Straten [00:11:03]:

So the firm is also exposed to extreme weather events, and extreme weather events damage the physical capital that the firm operates with. And what is important is that low skilled workers are complementary to physical capital in the production process of the firm. Now, what's going to be the case is that as a result of the capital loss that is induced by this destruction of physical capital, the output of the firm will become lower. And that means that also wages are going to become lower. But this affects wages of the low skilled workers to a larger extent, due to their complementarity to the physical capital.

Tim Phillips [00:11:38]:

So the effect on the housing market is?

Yasmine Van der Straten [00:11:40]:

There's actually two effects on the housing market. So on the one hand, given that a house is exposed to climate risk in the future, that's going to put downwards pressure on the price today. And this effect is what we know as the sea level rise discount, which is heavily discussed in the empirical literature. But there's also another effect that comes into play because of this decline in the stock of houses, which is that as the stock of houses declines, houses become more

valuable, or they give you a larger utility. And this is actually going to put upwards pressure on the price.

Tim Phillips [00:12:13]:

Where you end up with this is by being able to say some things about the changes in inequality due to the effects of climate change. So what's that?

Yasmine Van der Straten [00:12:22]:

There are multiple effects on inequality. And the destruction of physical capital increases incoming equality, because it puts more downwards pressure on the wages of low skilled workers. But the destruction of physical capital also increases the cost of borrowing, which leads to a further rise in wealth inequality, because those who have a mortgage have to pay larger cost on interest, or have to pay larger interest expenses, whereas those with positive savings accumulate wealth at a faster rate. Now, an important amplification effect comes into play as a result of imperfect adaptation by constrained households. Households who are constrained have an incentive to spend resources not on adaptation, which will benefit them tomorrow, but rather on housing capital, because they're below the optimal level of housing consumption. Now, this means that they underinvest in adaptation, and as a result, they will remain more exposed to the consequences of extreme weather events. So when they occur, they lose a larger fraction of their housing wealth, which gives an amplification effect on wealth inequality.

Margot Belguise [00:13:25]:

So, Yasmine, I was wondering, do you have any idea how maybe the results would change if in your model you also had the possibility that those households who are low income households, they may have higher need for adaptation because, for instance, their houses could be located in some areas that are more likely to be flooded?

Yasmine Van der Straten [00:13:42]:

Yes. So the current version of the model only has one region, but I'm working on an extension where there is a high risk region and a low risk region. This is still work in progress, but I can tell you a bit what the tradeoffs are. So when it comes to house prices, a demand effect will come into play, because when you have the choice between living in a high risk region and a low risk region, and given that that's the only difference between the regions, there will of course be more demand for the low risk region, but that will put upwards pressure on prices. Now, when this means that the constrained households live in the high risk region, this will, on the one hand, mean that they have to spend less when they purchase a house, because prices are lower. But what's important is that this also affects credit conditions, because the credit constraint is said to take into account the future resale value of the house. And because climate risk is higher in this region, this actually means that credit conditions are worse in this area. So you could here get an even worse outcome where constrained households end sort in a region which is more exposed to climate risk, but where they also adapt to an even lesser extent, because credit conditions are worse.

Arnaud Dyevre [00:14:47]:

And so in your model, you have several margins through which households are being affected by climate change. It goes through the value of the firm and also through the value of their houses. Are you able to decompose this effect so that a policymaker could know which particular channel to target?

Yasmine Van der Straten [00:15:02]:

So the underinvestment would also occur without the effect on wages and the cost of borrowing. And that's driven entirely by the credit constraint. And it also occurs because households that are credit constrained are simply below the optimal level of housing consumption. So that's the main channel that is at play here, and which drives the subsequent rise in wealth inequality over time. Now, what's very important is that this effect becomes stronger over time, as climate risk rises, simply because this leads to a further reduction in the availability of houses, which therefore increases the value or the utility that you get from an additional unit of housing. And therefore constrained households would get an even larger incentive over time to divert resources from adaptation to housing.

Tim Phillips [00:15:49]:

Having been looking recently at some of the figures about sea level rise and what's predicted to happen in the next 50/100 years, I think this is research that's going to be pretty relevant in the future. Thank you very much. Margot, your research is about red herrings. For people who've never heard the expression a red herring before, what is it? It's not a fish.

Margot Belguise [00:16:14]:

No. So, like figuratively, it refers to some information which is disclosed in order to distract from something else, from some other information. And typically it can be something which is very entertaining but not very relevant. So kind of distracting.

Tim Phillips [00:16:27]:

What do you want to find out about red herrings?

Margot Belguise [00:16:29]:

My model is a model of red herrings in politics. So by politicians. And I essentially wanted to understand when can they work, because you could think that maybe voters can be suspicious, essentially. So I wanted to understand when politicians are going to be able to fool voters and, for instance, be rejected with those red herrings, if they could not be rejected without those red herrings.

Tim Phillips [00:16:48]:

So give me an example from real life where politicians are using red herrings.

Margot Belguise [00:16:53]:

I think that both Donald Trump and Boris Johnson are kind of good examples of those politicians who often say things that are very entertaining, not always related to the topic at hand, but sometimes hard to know if this is a red herring or whether this is just that they like joking. And actually this tension is really at the heart of my paper. This question of, is this real red herring or not?

Tim Phillips [00:17:12]:

This strikes me as a pretty difficult thing to model. So in your model, what do you assume about politicians and what do you assume about voters? How do they behave?

Margot Belguise [00:17:22]:

I start with the voters. I'm assuming that they are inattentive. So they may miss some information, they may be distracted, but they are not naive, meaning that essentially they form correct, psychically correct beliefs based on the information they retain. And so they are trying to elect politicians that are good. For politicians, they may be either good or bad, and independently of that, they may also have a preference for telling what I call tales. So irrelevant things, but that are very entertaining. Like people who like joking or they may actually dislike this, for instance, they may be kind of shy. And choice of this second dimension is very important because in my model, this is what is going to make red herrings successful because if good politicians, who don't have anything to hide but simply like telling jokes, tell tales from time to time, then essentially it's going to be very difficult to tell apart good and bad politicians.

Tim Phillips [00:18:09]:

Okay, I get that. But you've also got journalists involved in this as well, journalists like me. What role do we have?

Margot Belguise [00:18:15]:

Journalists are really important. So here, essentially, they are going to detect and cover stories. So if a politician is bad, they are going to detect a scandal and cover this scandal. And if the politician tells the tale with a probability that I call the media attention to tales, they're also going to detect and cover this tale.

Tim Phillips [00:18:33]:

We would all like a world where the red herring tactic never ever works. Is such a world possible?

Margot Belguise [00:18:41]:

Yes, actually, that's the key results of the paper. So I would distinguish between two cases. So in one case, social norms matter and our decision, because you may have different possible equilibria that coexist. One in which essentially all good politicians who like telling tales, coordinate on not telling tales, which leads voters to be suspicious of tales. And essentially this makes it optimal for those good politicians not to tell tales because there is a high electoral cost of telling tales, provided that this media attention to tales is sufficiently high. A second case,

which is also quite interesting is essentially that the media attention to tales can discipline those good politicians. So when it is sufficiently high under parameter conditions, essentially there will be a unique equilibrium in which those good politicians who like telling tales always remain silent. And therefore it is possible to perfectly tell apart good and bad politicians. So here, we don't have this multiplicity of equilibria. We will have a unique equilibrium when this media attention to tales is sufficiently high.

Tim Phillips [00:19:40]:

Now, we don't live in a perfect world and there are problems. There's polarization in politics. And a lot of journalists really enjoy this whole red herring type conversation. It's entertaining. Does it mean that it works more often for politicians to use these red herrings to distract us?

Margot Belguise [00:20:00]:

For the media, enjoyment of red herrings? So precisely, a tree, it has this paradoxical effect where, like within equilibrium, it does worsen things, but it can create those higher enjoyment of tales, essentially can have these discipline effects that I've just highlighted. So the effect of polarization is quite complex. I showed you this in an extension of the model. So if the electorate is not too biased in favor of the politician who's trying to, for the voters, basically. So then higher polarization is going to make it more difficult for this politician, for red herring senders to be elected because they also need to convince those voters that are very biased against them, so they are harder to convince. But actually, that's not really a good news, because here we have a disconnect between those red herring senders and good politicians who like telling tales under some realistic assumptions on just how the electoral race is constituted. Essentially, those good politicians who like telling tales will not need to convince those voters who are biased against them. So here, basically, it kind of mitigates this discipline effect of media attention to tales. And so we have cases where we, again, have multiple equilibria. So we don't have this unique equilibrium that we had in the baseline model.

Arnaud Dyevre [00:21:07]:

So in your model, from what I understand, you have politicians who have a taste for telling tales and some who do not. Do you think your model could speak to a world in which the media actually shape the preference for politicians to tell tales?

Margot Belguise [00:21:22]:

Yeah. So that's a very interesting question. So one result in my model is that depending on the equilibrium of the game, those politicians who like telling tales may have an actual advantage, or they may also have an actual disadvantage. So here, essentially, like the media enjoyment of tales may shift society from one equilibrium to another. And so you could imagine in a dynamic setting that this would also have some effect on the composition of the pool of politicians.

Yasmine Van der Straten [00:21:46]:

And in your model, the role of the media is to simply cover a tale when it's told. But I was actually wondering what would occur if there's a certain probability with which they call out the

red herring.

Margot Belguise [00:21:56]:

Formerly in the model, it would just translate in a decrease in the inattention of the voters, but actually, again, within equilibrium. This is a good news, but not if you consider those equilibrium shifts, because essentially, like the suspicion of voters, which is really important in disciplined politicians, is increasing in this inattention. So this result of a unique equilibrium with perfect screening, it holds when inattention is sufficiently high. So actually, this could possibly shift society back to this multiplicity of equilibria where social norm is kind of self fulfilling.

Tim Phillips [00:22:28]:

Thanks very much, Margot. It's interesting for me, as a journalist from the UK, the country which gave the world Boris Johnson, the red herring user par excellence, probably the best that there will ever be, if we can say that that sort of thing is good.

[Voiceover] [00:22:49]:

When we visited the Paris School of Economics last summer, we took the opportunity to talk to three more of the next generation of economists about work that they have done on crime, impatience and tolerance. So, to learn about three more fascinating papers, listen to the episode called The Next Generation of Research. And that was from July 2023.

Tim Phillips [00:23:21]:

Before we finish off, I wanted to ask you one more question, because you've all been studying hard on your PhDs and everyone will tell you this is pretty intense, it's hard to do. So I want to ask you, for anyone that's listening to this and maybe they're just starting out or considering it, is there anything during these last few years of study, looking back, you wish you'd done differently? Arnaud, you start.

Arnaud Dyevre [00:23:43]:

So in terms of work, I think what I would do differently is maybe not work on as many projects of what I've been working on over the last five years. It's very easy to find yourself overwhelmed, and being focused on one particular project really pays off in research.

Tim Phillips [00:23:44]:

Yasmine?

Yasmine Van der Straten [00:23:58]:

What I would have done differently is the approach that I had towards work, because what I think is very important is that you realize that doing research is a creative process. So that means that you have to find your ways of doing research. And because it's a creative process, you sometimes have to take a step back in order to set two steps forward again. And I think that during the start of the PhD, this was something that I sometimes wasn't realizing. I was more focused on pushing forward. And I think it's something that you have to embrace in some way

sometimes, that by actually slowing down, you can make a lot of progress.

Tim Phillips [00:24:33]:

Very interesting. Margot?

Margot Belguise [00:24:34]:

Related to Yasmine's point, when you start the PhD, you have this pressure where you think, okay, I have three or four years to produce three papers. And because of this, I think you can have a tendency to rush a little bit and try to go for the most urgent things, which might not be the most productive things in the long run. So in the long run, it's helpful to read some papers not exactly related to what you're doing, to read beyond the abstract and these kind of things. And when you have kind of this publication clock which is ticking, you tend to prioritize really very short term, urgent things, which instead of seeing the longer term horizon of just doing research and having a clear research agenda and doing the research that you're interested in.

Tim Phillips [00:25:15]:

Three pieces of good advice, and I can see how those would be very relevant. And I could also imagine that there are some people who are listening to this, who are thinking, I was just about to make that mistake. Thank you to all of you for presenting today. Margot.

Margot Belguise [00:25:27]:

Thanks, Tim.

Tim Phillips [00:25:28]:

Yasmine.

Yasmine Van der Straten [00:25:29]:

Thank you, Tim.

Tim Phillips [00:25:29]:

And Arnaud.

Arnaud Dyevre [00:25:30]:

Thanks, Tim.

Tim Phillips [00:25:31]:

And congratulations to all the poster presenters that we've left downstairs. I'd like to be able to interview all of you, but that would be a very, very long podcast, but I'm sure we'll do more of these in the future. If you want to read these papers, and I really suggest you do, they're three very interesting papers. Then Margot's paper is Red Herrings: A Theory of Bad Politicians Hijacking Media Attention. Yasmine's paper is Flooded House or Underwater Mortgage, and Arnaud's paper is called Public R & D and Productivity Growth.

[Voiceover] [00:26:19]:

This has been a VoxTalk recorded at the CEPR Paris Symposium. Follow us wherever you get your podcasts. Leave us a review, too. Tell us what you like and what we could do better. And don't forget, you can listen to clips of past episodes when you follow us on Instagram at, you guessed it, VoxTalks Economics. Next week on VoxTalks Economics, the surprising link between pre modern scholars and economic growth.