

Transcript of Conversation with Sophia Johnson (Program for Economic Research, Columbia University), Chantal Naidoo (Associate Faculty, University of Sussex; Program Director, European Climate Foundation), and Megan Thomas (Senior Economist, Featured Merchant Algorithm, Amazon)

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Sophia Johnson:

Good afternoon and welcome to the Department of Economics’ Program for Economic Research’s live webinar series at Columbia University. I'm Sophia Johnson with the Program for Economic Research, one of the world's leading programs for identifying opportunities for enhancing economic research. Thank you for being with us today.

This event will be livestream by the Economic Department's YouTube channel. The conversation will also be recorded and closed captions will be provided in the days following. By attending, all conference participants agree to abide by the event's Code of Conduct, which is posted on the University's website at econ.columbia.edu/per. As always, the Program for Economic Research and Department of Economics at Columbia University takes no institutional position on matters of policy.

A little housekeeping before we begin: each presenter will speak for 10 to 12 minutes. Presenters have agreed to take your live questions at the end of both presentations, at which point, you may unmute and ask your question or simply type your question in the chat box. Lauren Close is the Program Manager here at PER. She's joining us and she will be attending and adding updates on social media, and monitoring and posting comments in the chat box during our conversation today. We invite you to follow us on Facebook, Twitter, and LinkedIn. For this event, we're using #perliveseries.

Now, Economics in Tech and the Energy Transition. By all accounts, we're now in the early stage of the fourth industrial revolution. This technological revolution will fundamentally alter the way we live, work and relate to one another. In its scale, scope, and complexity, this transformation will be unlike anything humankind has experienced before. Now though we do not get know just how it will unfold, one thing is clear: the response must be integrated and comprehensive and involve all stakeholders of the global polity from the public and the private sector to academia and civil society. We start this hour exploring how technology is driving change and creating an economic model that we will never see - hat we've never seen before. And we certainly end this conversation with a glimpse at how we can de-couple growth from the resource constraints we have. So first: Economics and Tech.

Dr. Megan Thomas completed her Ph.D. in development economics from the University of Texas at Austin. She joined Amazon as a Junior Economist on the marketing team. Since then, she has expanded her experience to applying economics to business problems in the Alexa product space and in finance. And more recently, in optimization. She is now a Senior Economist on a team that optimizes to show customers, the best offer for a product. She joins us from Seattle, Washington. Megan, welcome to the Department of Economics at Columbia University.

Megan Thomas:

Thank you.

Sophia:

I read somewhere that Ph.D. economists are very much shaping the strategic direction of tech firms. Are high tech economists helping firms crack new markets?

Megan:

Oh, absolutely. So definitely once there's a new product, even at existing tech companies, if there's a new product to be launched, an economist is very relevant and understanding what is the market scope of that [product]. What are the strategic reactions from different players in the market and understanding the profitability? But as new tech companies pop up to address, maybe previously non-existent areas, economists play a pretty strategic role in determining the direction for those as well.

Sophia:

Thank you for that. So, can you talk to us a little bit about economics in tech?

Megan:

Absolutely, so let me share my screen. To show... excellent, so I'll just spend a few minutes, probably around 10 minutes just kind of walking through what has happened in tech in terms of employing more economists and where that's going to go. And what kind of questions are really economist tackling in tech to give a flavor of the type of work that is there.

So, to just introduce myself, and some of this has already been covered, so I basically started off as a Junior Economist, then I joined Amazon, right after graduate school. Amazon, like other tech companies does employ economists coming right out of graduate school but, you know, the path to tech is really open at is really open at any point in your career, whether you're in academia or industry. And what I liked about being in tech is that I was able to really look at different aspects of the company. So, the portfolio of problems that you handle can be very diverse. So I've been in marketing in a product space, in Alexa in finance, and just very recently, in optimization. And I'll talk a little bit more about why these areas are really beneficial. For an economist in your career, as well as why they need economists. So, I'm sure it's pretty, you know, known now that the trend of hiring economists has grown tremendously. From an Amazon perspective, we started hiring six, seven years ago and are at 200+ economists currently, in this single company. And there are economists in every part of the company answering very different types of questions. And there are so many more questions that people are looking for economists' insight, too. So that trend is no longer - is nowhere near capping in the near future. So the question really is: why do people want economists to help them think through their business problems and why does it benefit an economist to go into such a space? How does that help their career? So I'm hoping that some of my experience can speak to that.

So the first part of the question is: what do economists bring to the table. And these three points that I have taken from Athey and Luca's paper, and I recommend whoever is interested in this to go and read the paper because they do a really good job of laying out the different problem spaces. The reason why economists do well in tech is because we have the skill of not just knowing the methods, but also how to understand the data, how to work with the data and intuitive way and apply the right methods. So we can build a good - we can really understand the empirical relationships and the data in a smart way. And beyond just being able to understand how to draw insights from the data, we also are really good at understanding the mechanisms through which different players act for any decisions. So the strategic implications of any decision when there are multiple players present - that intuitive thinking of how how players respond to incentives is what's taught in economics and comes very handy in thinking through a problem.

And lastly, the ability to understand industry structure in equilibrium - so really relevant to the question that I was just asked. Going into new areas. Do economists play a very strategic role there? They do, because they are - part of their training is to understand the equilibrium effects of decisions that are made. So even for my current role, where we are choosing which sellers to feature on a product, you know, the analysis doesn't stop at what is the effect on customers, it's also what is the effect on sellers.

So, ok, so I want to talk a little bit about what does that mean from a work perspective? Like, what do you do once you bring in all the skills. How does that actually get applied in the business? So a lot of your - a lot of the work that goes into it is a lot of thinking and strategic thinking from an economist's perspective. Because you will meet business people and they will have an ambiguous problem. But it's really our strategic thinking training that helps us work through that ambiguity and frame the question that should be answered, and that is very valuable to the business people, to have that come to the table. And of course, we are trained to really understand the data, work with the data, with the appropriate modeling approaches, based on what is the question that we want to answer. And so, those skills knowing what is the right data to pull, what is the right technique, whether it be purely econ techniques or econ techniques augmented with ML techniques.

This is very useful for progressing with a problem. And then what I really like about being in tech is that you're not just working with business partners, and you're not just working with other scientists, you also working with engineers. So the type of people that you collaborate with is very diverse. Because what really happens is that once you build something that is of use to the business you, you kind of make it a living thing of its own, and that is enabled through engineers taking your analysis and building a product out of it. And what that enables you to do is whatever you build actually has a real world impact for the business. And this is not only cool because you see things happening as a result of your work, but it's really good feedback loop, because you see what happened as a result of your analysis and now you know where to go next with it, based on what what consequences happened. So I know that there are kind of fields in economics that people specialize in. So, I kind of want to give a flavor of the type of problems that economists deal with in tech to basically show that a lot of fields can find their space in tech. So a big portion of Demand Estimation when you're launching new products or you're entering new markets. Forecasting is a big bucket for supply planning and optimization. For example, we just started a delivery service here, so a lot of forecasting economists are building out what our labor needs at different times, improving profit and loss statements in finance, so you know, there are many details that go into it being able to forecast those details. A huge bucket is Causal Inference, so I am a causal inference person. The business always wants to know if I do X what is going to happen to my business, how are my customers going to react in the short term, in the long term.

If my customers do an action, how does that affect their future relationship with my company? And so there, and it's not just internal, it's also if something happens in the outside world, what is going to happen to my business in the future? And so Causal Inference is a very, very widely-used technique in tech. And so that basically opens up all sorts of techniques that we are trained in, from structural modeling to forecasting, a lot of experimentation and pretty complex experimentation. It is not simple AB tests, it's like when you really think about the complexity and strategic players in any given business environment, you really have to think through your experimentation design. Quasi-experimental analysis, which is a huge bucket from surrogates, to synthetic controls, to other methods. Optimization, I put that separately, because I want to highlight that it's not just about finding the effect- it's also like, how does that effect feed into what the business should do next. So it's really building that loop, and because in tech, you will work with rich data, a lot of the times we do realize the need to bring in machine learning techniques, along with our causal inference methods so, for example, double machine learning is a very popular technique that has been used. So it's kind of, you know, there's a lot of things that can be applied in tech, it's a home for most skill sets that are out there.

And so I just maybe want to talk a little bit about my own experience, just to kind of give an idea of what were the questions that I had to tackle and why an economist is a relevant person to be tackling those questions. So when it comes to marketing, you want to understand what is the effectiveness of our different advertising channels on our business kpis. But that then goes into answering the question how do you effectively allocate spend across different advertising channels? What is the efficient way of doing that, what is the right channel for which audience? What is the optimal messaging and targeting for our marketing campaigns? So the question can be as high level as: what is the effect of X and y? But then, once you start actually talking about business strategy, it can get very, very detailed and much richer. So you have usually a combination of experiments - causal experimental forecasting methods that can actually all play a role in building one final takeaway our product.

In Alexa, my questions were, what is the long term effect of a customer starting a new feature for the first time? Or what is the long term effect of a customer having a bad experience on the device? So if there is a bad, maybe ten things we want to fix in Alexa, it's useful to know which one is the worst one in terms of customer experience, so we can actually go ahead and strategically put resources behind these problems. How do customers react to content and information? How do we optimize the content on our devices? What do we think we should do next with a device? And so that can also employ survey kind of research to answer that question. My short experience in finance exposed me to how forecasting can improve understanding a profit and loss statements, so you know whether one component of P&L is going to go in one direction. Then, what does that imply, and what I should do, where I should take my business, what do I think it's going to impact my financial situation in the future? What is the effect of macroeconomics or what's happening in the economy, on my business? How do I understand my growth as a result of what I'm doing vs. as a result of what's happening outside? So that really tells me what I should maybe do more of or what I should do less of.

My current team, we are basically talking about what if a customer comes in searches for a product, what is the best offer to put in front of them in terms of what is the seller, with the best offer for the customer experience? This goes into a whole set of optimization, but also in terms of thinking about a particular brand because you have an effect on customers, but you also have an effect on sellers. So it's a nice complex problem for economic thinking there.

So I talked about why economists are relevant to tech. I'd want to just add, in the end, talk a little bit about what you can gain in terms of career growth. So what, you know, what is beneficial to you as an economist to go and work there, in addition to interesting problem spaces that are there. There is independence in owning a product, so as you grow with seniority you can become independent and you can actually own an area of a product, you can build a science team about it, so there is scope to play the leadership role in that way. There's of course, very rich data, which can be, you know, a challenge, as well as a blessing. You work with people from various different backgrounds, so I mentioned, you can work with people from businesses, from different science backgrounds, to engineers, so there's a lot of learning that happens when you work with people with different skill sets.

You can have influence across different science projects, or depending on the company, like Amazon is very big so you can really be involved in various different types of projects, but that's true of other tech companies as well. But you are never really isolated or siloed in one particular problem space, because that probably has consequences on other parts of the business.

And lastly, if you like to see frequent effects of your work, so you want to have that feedback come in more often, tech gives that opportunity. So when you, kind of, are thinking about academia versus industry and tech as a specific case of industry, you know, depending on the customer and your own preferences, it's not the case that you will really spend a lot of time perfecting a model. In tech is more like you will iterate on it, but you will see the effects of it in the meantime as well.

So I'm going to wrap up with that. Hopefully that kind of gives a flavor of what economists bring to the table in tech I would recommend reading this paper by Susan Athey and Michael Luca which gives a much richer description. Thank you.

Sophia:

Thank you very much, Dr. Thomas. Our second speaker is Dr. Chantal Naidoo. Dr. Naidoo joins us from Johannesburg, South Africa to discuss new and meaningful roles for scholars in the energy transition. Dr. Naidoo is the Program Director of an energy transition program in South Africa, but is funded by the European Climate Foundation. She's worked in national development banks, investment banks, multilateral climate funds in South Africa and abroad, she holds a Ph.D. from the Science Policy Research unit at the University of Sussex. Her research relates to the role of financial systems and sustainability transition processes, national development banks, financing strategies for climate action, and re-thinking finance theories for sustainability. Her publications include policy and academic articles. She is on Twitter and her Twitter handle is @naidoo_chantal.

Now, Dr. Naidoo, an underlying theme in my conversation with global CEOs and senior business executives is that the acceleration of innovation and the velocity of disruptions are really hard to comprehend or anticipate and that these drivers constitute a source of constant surprise, even for the best connected and the most well informed. What are your concerns on transition related finance issues, who will engage and how?

Chantal Naidoo:

Thank you, Sophia, and firstly, thanks for the invitation to be part of this conversation. That's a really big question you asked me, because I have through both my work experience and the

academic journey that I've gone on, I went in thinking that I had this little bit of concern and I finished the Ph.D. journey realizing I actually had a much wider spectrum of concerns. So it was the case of the more you, the more you deep dive into it, the more you realize how little, you know, how wide the spectrum of the issue is and how deep one's concerns are. Some of my concerns and relate to the fact that a lot of the the way that CEOs, policymakers, even financiers, CEOs of tech companies and others, that they are projectizing the issue. So it's about an individual project and how that project contributes. Is it a clean project in terms of clean energy - wind or solar? You know, or is it coal related? What's less visible is the questioning of is the portfolio of everything that company is doing and everything the bank is doing contributing to systemic changes in the whole energy system?

So the issue of systemic contributions is still less understood and not adequately articulated and I think that comes from a lack of language, both from the policymaker as they normally to set the direction, per se, but some of that is ambiguous. And and private sector also they want when it comes to doing things that are game changing, they always, I find them very immobilized. It's like, "no government needs to tell us first, what is this direction, what's the policy issue, then we will act."

I don't always agree with that, because I think private sector has a circle of influence that they can use and they don't necessarily exhaust their circle of influence. So they have - those are some of my concerns. One of the big ones is that - and that's why I went back to study - I felt very strongly that the issues that come from the financiers of what's driving the energy transition and the response to climate change, as opposed to the systemic need or what needs to actually happen on the ground, the vulnerability of people, the poverty, the inequality issues. I you put that in the forefront, and say finance followers to achieve alleviating or driving a particular systemic outcome, you get to a different place than if you say, well, the banks need specific levels of risk and return, which they do. But if that's the driver, then everything else follows you start compromising the effect of what it is that needs to get done within the system. And then we just find ourselves back to where we are now, which is an unequal world. So green and climate change and sustainably issues, if we do it in the same way we won't get very far. So yeah, those are some of the issues that are troubling, Sophia.

Sophia:

Well, thank you very much for opening with that we'll just - we'll give you another 10 to 12 minutes or so - 15 minutes to present your findings on the energy transition, thank you.

Chantal:

Thank you, great. So let me share my screen, I always feel nervous at this stage because you always hope that it's all the world is going to go well. I'm assuming, you can see my screen - I'm just going to put it in presentation mode. Is that visible to everyone?

Sophia:

I can, I can see it.

Chantal:

Ok perfect, then I'll get going.

So I thought, in my pre-discussions with Lauren and Sophia, I thought I'll share with you a little bit of my personal journey about how I got to doing this kind of work and then get a little bit into the work and why it matters. For, for I guess for myself, but also from an academic point of view and just a practical point of view as well.

So a little of my finance experiences, today, I started out I studied a bachelor of commerce degree at the University of Cape Town. With all good intentions of being an accountant, and soon realized that it's not my passion. I actually love tax, more than anything else, which probably makes me a better geeky person at that point in time. And then I went through some some lots of different experiences within the finance community, and it was focusing on tax first. And then through investment banking experiences, some of the things that Sophia mentioned in my in my bio, I even tried to hand it being an entrepreneur, because I was frustrated with the banking world and I just saw nowhere that it actually contributed to uplifting others. I then went into development banking and what I'll probably say more green banking from a development finance from to view, thinking I'd find the answer and purpose of finance the and I didn't. I realized that doing work in the public finance sector so much harder than actually doing it in the private finance sector because you are juggling political outcomes. I eventually left the public finance space and moved into more independent consulting work, specific to climate finance. So, policy related work with national treasuries and departments of environment in South Africa and three countries in Latin America. And that lead to a portfolio of about 25 countries of the African region. And there was something that happened along this journey that in as much as I was trying, as I write there, my passion was to try and get Ministries of Finance to see that they have a role in the space. It wasn't clear to them that they had a role and I didn't have the policy language to communicate to them what their role might be. So that took me back to my Ph.D. journey at Sussex where I went literally in search of language and vocabulary to articulate some of the concepts of things that are we seeing in practice but I just couldn't find the words for it. And having finished my Ph.D. now and the work being around energy transitions and finance, it has it's been around working in managing of a philanthropic pool of funds working into Africa in part to the region with advocates driving for both from a technical technology point of view, wind or solar technologies, but also working with financial advocates and the kind of elements of work that they are doing on on financing and energy transition. So that's a little bit about my backstory, and so I'm not really employed at one particular firm in the way that Megan is. I am using my work a little bit more across different types of organizations. Both what is called inside track in terms of policy work and then sort of outside track, which is more advocacy and campaigning type work on on these issues. So the issue space is largely around supporting an energy transition for the African region which is away from fossil fuels and towards more clean energy sources. And to do this in a way that's both just and equitable and inclusive, which is - so it's an issue about technology but it's also the quality of that transition to be done. in particular way. And, of course, you would be able to go through literature and see that in the issues of justice and equity and inclusivity in the context of development matters a lot. South Africa is one of the most unequal countries in the world, so how we do, how we think change here really matters. You'd have to consider the fact you're building off a very unjust base. So if you're trying to promote new technologies, we'd have to do it in a way that it opens up economic opportunities, social opportunities for everybody in the economy, not only the select few.

So my - this slide covers part of what Sophia had asked me about - my main concerns and just some things that I didn't mention in the kickoff. There's two elements to this. There's a systemic element about just broadly the whole financial system, working together in harmony like an orchestra of some sort. These different elements of that system. But there's also the whole element around financial product innovation. Very specific and institutional level what kind of financial instruments are needed, how do you find a particular project, in what way. And how do you manage the risk and have the language of risk and return that everybody cares about? But broadly putting all of this together, ultimately we've got a Paris Agreement - Paris Climate Agreement, which the US has just jumped back into, so thank you to the US for that. But the point is, even if you have a multilateral agreement, making those multilateral agreements real in a national context is very difficult. And as Sophia alluded to up front, this big story into an institutional mandate and action point can be very much immobilizing, especially if those institutions are locked into a particular agenda. One of my fellow Ph.D. students is actually on the call and she's done some really interesting work on the institutional response, so please look up our work. Blanche Ting, I'll put her details in the chat. So she's written more about the institutional dimension. My work is looking a little bit more at the systemic dimension. So I'll tell you a bit of my theory story. When I started looking for what in the fields of both economics and finance and - where was this association between finance and sustainability? And I found an absolutely substantive literature base different and finance and sustainability, which started in about '88 - 1988.

The Brundtland Commission is about the definition of sustainable development and all of that around that. So the table kind of lists at least 11 different trainings and narratives are how finance and sustainability is associated already. But interestingly enough, none of this has actually seeped into mainstream economics and mainstream finance literature. They are definitely critical approaches, both to finance and critical approaches to economics, like ecological economics, environmental economics, those types of approaches. But in the way economics is mostly engaged with, these qualitative issues - environment and social issues - are seen largely as an externality. And so I basically, literature couldn't help me, I went to Sussex looking for language and I couldn't find any. And that was disheartening for me. So I went down a rabbit hole- I didn't find anything, so I had to change my angle. And before I changed my angle, I wanted to share with you how I did that - how does this matter in the real world, and what are you seeing in the real world? The language around transitions, which I will help define for you in a minute, is being picked up by specific banks. So there's a bank, the Canadians are looking at transition finance taxonomies. A bank in Singapore, a Japanese bank, as well as doing that.

In the EU they've created what they've called A Just Transition fund to support this way from coal to clean. And between South Africa, Poland, and Indonesia, they're actually looking at a power utility level, how can they shift those power utilities, who are mostly coal, towards a cleaner agenda. And how do you help them to build resilience.

So first I started as: well, what does transition mean? And going back to a political economist Antonio Gramsci from the early 1900s, he described it as basically somewhere between the old and the new system is something he called the interregnum, which is a very old English word. It refers to a period of discontinuity, chaos, confusion, disruption, uncertainty, and basically describes it as a time where neither the old, which is dominant and fighting to survive. The new, which is emergent, is struggling to become dominant and between those two processes, there is morbid symptoms that occur, is what he referred to. And this really captured from the way we are in our world today, not just on energy, but probably on many, many levels. But our focus on energy, so my studying

question was how does finance respond to that kind of process and all the new fighting for survival for some transitions? And calling it a transition between the old and new.

And I was inspired by work from Perez and Mary O'Sullivan, who have both written extensively on the economics of innovation. So, then would be [?] work with [?] where they suggested that the characteristics of an innovation process can inform the demand for finance. And so I went deeper into what those characteristics were. And tried to understand what demand does it actually place on the financial system so then to better understand how can that system respond to those demands.

That was my theory journey. And I came up with five characteristics around a specific direction away from unsustainable towards sustainable. There's a specific time dimension which is accelerating not necessarily making this gradual and in an incremental, especially because of the science and the higher incidence of climate events. There was also a specific system effect which is that finances need has to create and to disrupt at the same time away from the old and towards the new. And there was a social context in that it's not just the shareholder of the financial institution or the shareholders, or the CEOs that Sophia was speaking to earlier, it's actually about broader stakeholders and addressing issues of justice and inclusivity. And then, something the financial sector and finances do not like doing, which is experimenting. Nobody wants to lose money - everybody wants to be guaranteed of some kind of backup. What is the risk and can I price it? And what is going to be my returnable for that? And the challenge with transitions - energy transitions - is that there is actually very limited certainty around this, even if all the big brothers lineup. So, "I am a World Bank, government guarantees, blah blah blah," there is still an issue around that. And so I took South Africa's financial system, which I illustrate there, and try to better understand how does it actually relate to the energy transition. This is a picture of all the different stakeholders, and I there was quite a detailed interview and quantitative process behind this. I then took each of those characteristics and mapped, the one there was time, I mapped it across a period of time to better understand what was finance and policy actions doing, around this time.

And what was interesting was that for a long time there was nothing and suddenly there was a golden age, and then there was nothing, and now we have COVID.

And fascinatingly enough, most of the energy policy and responses in South Africa related to crisis management, around this time there was energy blackouts. Sophia, and Lauren and I were planning for what do we do if there's no electricity this evening for those calls, so we had a backup plan for that, so it was - it's a real concern!

And then some other insights from my data - on the direction side, governments sent out an ambiguous signal that's why I was saying what I said earlier, Sophia. If there is, if government is sending out an ambiguous signal, financiers and institutions are going to say: well, there's opportunity to invest in both so we'll just do that.

On the system effects, the same thing, there was meant to be two types of programs to address both large investors and smaller investors but mostly the larger investors were funded, but not the smaller investors and that already created an imbalance in the economic opportunity and direction that it took.

What was the best story from all of my data was the power of social movements. And our social movements are actually driving the changes in banks with government and the actions that they are taking - investor activism. In the room, shell activism and outside of the room, or grassroots organizations that are actually helping to drive that change. And an experimentation, huge

disappointment. South Africa's financial system, everybody says, is the most sophisticated on the continent, but none of that sophistication was actually used to think innovatively around the empowerment shareholders or the, rather than the, the more the social shareholders, as opposed to the project level shareholders.

So a few things stood out which I'll just quickly touch on which was mostly around dialogue. Around the program design and the ongoing learning, which was transactional level, but what was standing out mostly that this whole journey on energy transitions wasn't about the money they were just unspoken expectations, frustrations, and assumptions underneath. And perhaps this is harder for economic students to grapple with because this is a bit more of a - this is one of our very specific social science political economy type of element, but the numbers tell a story. And it's not just about the absolute number. And that's what the Ph.D. journey helped me to better understand - what story are these [?] telling me, what does it mean if one on one sees these things, and how can that help to drive and move the money better?

And also what stood out was that the investment models that are being created around the energy transition, especially on the public finance side, but also private, to some extent, is unimaginative in the [?] context. It lacks equity at the minute and it lacks inclusivity. And I won't go through this detail, because I think the slides are going to be available and I'm at time already, but an important question to ask, which is what I guess economic students might grapple with a lot is the structure of the financial system. It's important to look at that in the context of how you can contribute.

And I'm going to leave it there, but maybe just leave with a quote which really mattered a lot to me in my journey. That this wasn't about finding the right answer, or the right set of answers, it was actually just a process of learning and evolution, because I think in this very uncertain context the answers come to you, but it means engaging with the complexity and not trying to apply reductionist approaches too soon to make that happen. Thank you.

Sophia:

Thank you very much, Dr. Naidoo, thank you very much, Dr. Thomas. We will now open up the floor to the live stream to questions. I have been receiving a couple of questions from social media and from YouTube, so I will begin with the first one: how does the work of an economist differentiate from that of an industry expert?

Megan:

So I'll take that one. So the work of economists, you know, you could become an industry expert as an economist as well. What you bring to the table really is the tool set of how people respond to incentives and so an industry expert might be very, very focused on one particular aspect or one particular industry, but I feel like the economics tool set allows you to be - to handle questions in a more general way, because that thinking can be widely applicable. But that's not to say that an economist cannot be an industry expert, you can definitely go down that route, but I feel like our tool set makes us more relevant across not just being specific to industry but also, like, recognizing the overlap and the interactions across industries.

Sophia:

Thank you. Another question here: are scale economies, important for energy transition? Or are scale economies important for the tech space to thrive for the suppliers, for customers? And I think we've got an opportunity for both of you to weigh in on that.

Chantal:

Would you like to go first, Megan?

Megan:

You go first.

Chantal:

Using the example in South Africa, it did matter quite a bit. There needed to be a signal from government to make sure - to get the program started. There was some sort of individual initiatives, but it couldn't get to scale, it was only once governments in that signal of a large scale program that it got taken up by local investors. And in that graph that I showed, when it dipped down, governments' procurement policy stopped and there wasn't enough legislation to independently procure directly. So it's a tech question but it's also very strongly political question.

Sophia:

Sure.

Megan:

And so, for tech, I think you know, economists probably play a role in recognizing what scale is even required for any given problem that you're handling. So you come in even at the beginning of the question. And so there's no line clear answer because tech is so diverse. Amazon is a big scale company, but they're also much smaller companies working on much smaller, well defined areas that benefit from economics skills so it's really dependent on what you're working on, but I think that economists bring in bring to the table what scale is really required for whatever you're working on to be successful.

Sophia:

Thank you. We have another question on social media: what would be the best way to articulate the current, the correct policy language to negotiate transitions? For example, digitization of consumer finance.

Who's going to take that? What would be the best way to articulate the correct policy language to negotiate the transition? It sounds like an energy transition question. I'll throw it to Dr. Naidoo.

Chantal:

Yeah, I'm trying to also respond - think through the response. What's the best way to articulate the policy language, right?

I don't know if there's a best way, to be honest, I definitely don't know if there's a best way. But the policy language, what policymakers care about is probably where I would first go. And to be absolutely blunt, right, when it comes to who's going to sign the bill, they care about being elected. The next round of elections. They wanted to they want to look good. Right and, as you go down the scale of others, these other developmental agendas - so what I found is helpful is the work actually are very niche economists on this whole field of work around energy economics, and that is very helpful to start showing the the policymakers, then, if they embedded in a call agenda, for example, what is the longevity sort of a future call investment? Export markets that might be changing, China, Japan, South Korea that have just announced net zero targets for example, it's very valuable to bring forward those kind of dimensions to the policymakers. But what I've also discovered, is it matters more about what is the policy language, a particular policy maker better understands sometimes you have a minister of energy, who doesn't have any energy background. You have a minister of finance with no finance background, so you have to speak to them in their language, first and foremost, and it very much means understanding that political economy behind them. But having economists like Megan that are working in specific niches, right, to be able to both have strong evidence base to translate that to them in the language in a way that they understand.

Sophia:

This be helpful, you know, I have a colleague of mine, also on this very topic, working on some really incredible work at UC Berkeley. It's a collaboration between a colleague at UC Berkeley and [?] University in [?] India. And they're looking at social innovation and the really - the question sounds like to what extent, you know how can we, let's see to articulate the correct policy language, so I insert myself here to say that there's this new body of work coming out about social innovation, how to re-educate civil society in terms of engagement and how to strategically engage at the at the grassroots level. You know, so that that is a thought. I know that one person is working in the marketing space and one person is working in the environmental space and really looking at how - what types of social innovations are possible in terms of engaging people in this discourse, and the topic of consumers, finance, in particular so that's a thought. And really an addition to what Dr. Naidoo has shared.

We have another question here: How is the tech sector reacting to the social push for more carbon friendly businesses? How will this push affect overall global economic growth? Dr Thomas?

Megan:

Yes, so a lot of tech companies are responding to that push by having carbon goals in the future. So I know a lot of tech companies are working towards making themselves carbon neutral and so, you

know, it is a challenge to do that and, at the same time, you know balance out growth, just company growth goals going forward. So what I can say is that there is a lot of you know, work that has been that has been started there. And that also again overlaps a lot with policy. And so there's a lot of interaction between the economists and other partners who are working in most of the sustainability sectors in the tech companies with policy, where all the points that were just made become very relevant because the communication has to happen between, say an economist who's working there with a policymaker in a language that is understood by both sides.

How does that affect the growth of the economy, so I know that you know that's - that's a very big question it really depends on, you know, there's no, there are a lot of tradeoffs to be made, essentially, and that is really the thought the problem space to to enter and make those tradeoffs and really define what is the exact outcome that we even looking at. That outcome might not be just a one dimensional outcome and then optimizing decisions to reach that outcome. So there is work that started in tech and that could be something that is exciting for people to enter into.

Sophia:

Very good, thank you.

I have two questions and I'm hoping we have enough time because I'm looking at the clock as well/ We're at 1:54PM eastern time. So one question, this looks like it's a question for for you, Dr. Thomas. What are your goals, or what are the goal, what should be the goals in tech space? I mean, you can't speak specifically on behalf of Amazon, but what, what are the goals around user growth, profitability, fairness, and how is the design of these platforms, you know, these online platforms, affecting them? So in this new economy, what are the goals around user growth, profitability, fairness, and how was the design of tech platforms ultimately affecting these goals?

Megan:

Right, so each tech company is going to have their own goal that they define and it's really up to each tech company to define a goal, that is a fair goal that takes into account profitability, but also the social consequences of their actions, So there is, you know it's hard to say, overall, what is the tech industries' goal, but just from my experience, when I have conversations with - not just limited to Amazon - it's always, you know, there is a product that you think is valuable to customers. How do you build that out, keeping the customer experience in mind, but also what is a sustainable way for you as a company, because you also want to grow as a company to do that. So again, it comes back to the trade offs and balancing those out where they are not necessarily always competing against each other, they have to be part of the equation. And you know the point about online platforms plays a very big role because coming back to something that I mentioned, they're very different players for any given decision that you make, so if you have an online platform, they could be positive, they could be segments that benefit positively from, they could be segments that benefit negatively from it, and so you have to really be comprehensive in your analysis to realize what are guardrails. What are our metrics that we want to focus on. And so it's a very complicated space, and it really even depends on what product you're talking about and we was talking about the online platform, because each product is going to have its own set of complications and purposes.

Sophia:

Thank you. I'm looking at the clock.

So this question is for Dr. Naidoo. I want to go back to this bit that you were talking about multilateral agreements and really thinking about the question is really broadly trying to capture what the role of scholars are going to be in this new space. Obviously you acknowledge that the Biden administration has signed back on to the the Paris Agreement. How do we move forward with these the institutional dimension of the energy transition? What should you know job market candidates be thinking about their role and how to insert themselves in this in this new space? How can we do this creatively across many different disciplines?

Chantal:

I think that there's a greater role for interdisciplinary work and not single decisions. And I think that's one of the biggest shifts right now that we need to connect much for real world contributions. We need to not stay in academic silos we actually need to connect, be open enough to embrace other disciplines and literatures and and viewpoints. So [?] was one of those places where where we studied it was just everything thrown into the pot. The field of sustainability transitions is a little bit like that, because no single discipline is able to help address that. And the best part of what I'm finding is that there's a lot of demand for people being able to work in this policy space. But with those different dimensions that even if you take an economics module, try and do some social other social science modules. To help build up your toolkit so you've got more in your you know, in your toolkit that can help you find language to express that. Even though I've seen a job ad, for example, in the last two days from UNDP. And they looking for a consultant, and this is not a plug for UNDP, it's just an example of what kind of work is out there. And it's the first time I've actually seen it. So they looking for somebody with an undergraduate or somebody with an undergraduate or master's level economics to be able to work with them to design financial instruments that will have a systemic effect not only a project effect. They looking for what kind of financial mechanism does it need what, how do you measure that effect, so a little bit of impact investing perhaps, but much deeper than that. So they are questions that are being asked suddenly right which is going to demand a new skill set. And that means that all of us, whatever discipline we come from, have to stay very open and porous to be able to absorb other influences and not rigidly stick to "well, I was taught this by whomever and that's, the only way I'm going". Because in so many ways, the minute you finish your degree, it becomes irrelevant. It just gives you a license to do the work, but you need to have a very flexible mind to engage with the issues that we're dealing with at the minute.

Sophia:

I think that's a fine way to wrap up this conversation, the idea that we need to think creatively about how we're going to engage in this new economy, tackling issues from climate change to global business and technology I want to thank you both again for joining us in the Department of Economics Dr. Naidoo, Dr. Thomas from Seattle. We really appreciate your contribution, we thank you for your time and we look forward to our continued conversations and continued engagement, thank you!

Chantal:

Thank you as well, thank you.

Megan:

Thank you.