Podcast with Congressman Bill Foster

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Jo Ann Barefoot:	00:00	We have a very special show today, because my guest is Congressman Bill Foster of the 11th District of Illinois. Welcome!
Bill Foster:	00:08	I'm happy to be here.
Jo Ann Barefoot:	00:09	I'm so glad you can join me. We have a lot to talk about, but I was especially excited to be able to sit down with you, because the Chairman of the House Financial Services Committee, Maxine Waters, has set up two task forces, technology and finance, and you are chairing the one on AI. I think that is maybe the most interesting issue that is emerging in the financial space. So we're really excited to get your perspectives.
Jo Ann Barefoot:	00:39	Before we jump into that, though, I'd love for you to tell us just a little bit about your background, which I know is very unusual for a member of Congress.
Bill Foster:	00:46	I went in the nontraditional route from theatrical stage lighting to high energy particle physics to the US Congress. I sometimes introduce myself as saying I represent 100% of the strategic reserve of physicists in the United States Congress, but I also actually am probably 100% of the AI programmers, and 100% of the block chain programmers, and 100% of the integrated circuit builders, actually.
Jo Ann Barefoot:	01:13	That is so fascinating. It's one of the things that, I think, we're starting to work on developing a deep expertise on the Hill in these new technologies, but it's still early days, I realize.
Jo Ann Barefoot:	01:31	Tell us a little bit about the task force. Why was it created? What has it been doing?
Bill Foster:	01:37	Well, everyone in financial services is very much on high alert because of the pending merger of tech and financial services. You see these giant ... When you talk to big bank CEOs, essentially everyone has a five or ten year plan to essentially turn themselves into tech firms. Then, on the other side, we're going to need tech firms from Google to Amazon to you name it, are busy trying to get into financial services, as well. It's like there are these two behemoths staring at each other over a chasm, and people are trying to figure out how it will end up.
Jo Ann Barefoot:	02:16	Yeah. That's for sure. I think it's interesting to think about the fact that finance is possibly the most regulated sector of all, and tech has been lightly regulated, in comparison. But that is about

to change. It feels like lots of new policy emerging there. So at the nexus of the two, we're really going to have interesting issues.

Bill Foster: 02:39 Yeah. There are many common issues. I think the idea of identity fraud, for example, causes huge grief, both for normal tech firms, social media and so on, and obviously for financial services.

Jo Ann Barefoot: 02:54 Tell us what the task force has done so far, what you've been looking at.

Bill Foster: 02:59 One of the things, actually, is what I just mentioned. We had a very interesting hearing on identity and digital identity. That's obviously coming under attack from AI enabled phishing and this sort of thing, where Ais would be used to generate, for example, a call from someone, and you hear what sounds like your boss' voice telling you that he's just sent you an email, and can you have a look at the attachment and give him a call back. That sort of thing, everyone clicks on the attachment.

Jo Ann Barefoot: 03:33 Yeah.

Bill Foster: 03:34 Or even, just a direct order from something that sounds like your boss. Or in a video chat, where it can even look like your boss, telling you to do something that's not what your boss had ever intended. This is not going to get easier. I think that in the face of that, government has to become a partner with people in providing more secure ways of digitally authenticating themselves.

Bill Foster: 04:01 Another thing that we're working on in the task force is one of the big concerns that everyone has in basically the free world is the huge advantage that AI has, AI developers have, if they have access to large data sets. This is a competitive advantage to countries like China, where they basically don't have privacy rules. And so, in the US, and the EU, that takes privacy seriously, there is a discussion happening about how we provide large data sets, often, to starter companies so that they can have effective Ais and can train their Ais and neural networks on large data sets, while at the same time, protecting consumers against both inadvertent data breaches and oversharing of their data.

Jo Ann Barefoot:	04:55	When you think about the emerging use cases for AI and, really, for technology more broadly, what upside opportunities do you see that are most exciting, in general, but also specifically for financial?
Bill Foster:	05:12	I think financial services, being able to provide credit for otherwise not credit worthy customers by analyzing all the big data that is known about a customer. You can often make a distinction that would not be visible to the standard metrics that are used for credit rating agencies, and so on.
Bill Foster:	05:34	But when we allow that to happen, we have to be very cognizant of the dangers of algorithm bias. It's a very tough thing that causes you to think very deeply about what you regard as fair. For example, it's a statistical fact that members of some races are much less likely to have wealthy relatives than other races, for reasons that have to do with historical accident or historic discrimination. Given that that's true, you can then have two identically situated families, one of one race, one of another, and one, even though they have the same salaries, the same wealth, everything, one will statistically be a more credit worthy entity to loan to than the other, simply because if you're having trouble making a mortgage payment, one of the standard ways to make the payment is to go hit up your cousin for a loan. So you have to be very careful, because if you order your AI or your neural network that's making the decision that they should not use race in these decision making, they will very rapidly develop a proxy for race.
Bill Foster:	06:52	This is tough. And if you then order all of the existing banks to play by a certain set of rules, the next thing that happens is some bright young fintech comes into my office and says, hey, we have a new algorithm that ignores these rules, but it can help everybody get better scores. But some racial groups may be helped, or gender groups, or what have you. They may be helped more than others. And then you have to think hard. Is this fair or not? Everyone's better off, but some are helped more than others.
Bill Foster:	07:27	I'm reminded of the question we often ask psychology or economics classes to undergraduates where they say, okay, here's the deal. Everyone in the class gets $100, but you get only $10. Do you accept that deal, or not? And the rational human being should say, "Of course. I've got $10 I didn't

ordinarily have." But, in reality, everyone says, "Heck, no." It just tells you what a complicated bag of snakes fairness is. You run headlong into it when you talk about algorithmic bias.

Jo Ann Barefoot: 08:04 What do you think we're going to do about that?

Bill Foster: 08:11 I think we're going to ... I'm going to sound a little bit wonky here, but there's a procedure called Gram-Schmidt orthogonalization, that those of you who've had linear algebra probably remember.

Jo Ann Barefoot: 08:23 I'll try to link to that in the show notes. We'll look it up.

Bill Foster: 08:25 Okay. What you do is that you say, okay, set up your algorithms, and then find, by accident, that there is some gender bias. Subtract out that gender bias by measuring what it is, and subtracting it out, and going through that for each of the protected classes that we have. Mechanisms like that are going to be essential.

Bill Foster: 08:51 And then you will have to make sure it applies uniformly across the playing field. This is where it gets tough, because you have a relatively simple rules that are applied to things like the credit rating agencies and so on, and then if you allow social media media firms to use the whole range of data that they have, they will come up with, inadvertently, just because they're using big data sets, they can come up with, very inadvertently, come up with biases that might horrify us once we realize what they are.

Bill Foster: 09:28 For example, if your big data set indicates that you head off to Las Vegas every weekend, then maybe that wouldn't make you such a great credit risk. But on the other hand, if you're heading off to Salt Lake City to visit your grandmother, maybe that's different. But should it be different or not, if you're equally tardy on paying your bills or not. So we have to have a number of very deep discussions on this.

Jo Ann Barefoot: 09:56 Part of what you're touching on is so-called explainable AI.

Bill Foster: 10:01 Yeah.

Jo Ann Barefoot: 10:02 And ... yeah. Go ahead.

Bill Foster: 10:03 Yeah. This is something that ... You know, we were actually wrestling with this back in the 1990s, when I was working in

high energy physics. I guess it was about two government shutdowns ago, I went and ... When I just couldn't stand it anymore when some senator who will remain nameless was holding the floor of the Senate. I said, okay, I've got to do something to clear my mind. And so I went and downloaded TensorFlow, which is Google's open source AI engine. Worked through the tutorials on it, and what I was struck by was the algorithms that were being used there were not different than ones that we used back in the 1990s to classify particle physics interactions.

Bill Foster: 10:41 So the difficulty that we ran into there was that it was very difficult to publish anything based on, for example, neural network classifiers. Because if you say, "I have discovered a new subatomic particle because my neural network says so," how do you evaluate whether that paper's correct or not? The same way, if someone says, "I'm sorry. Your mortgage has been turned down because our neural network says so," that's not an acceptable answer. So a lot of these problems are just coming back, but they're coming back in the context of the incredible success that artificial intelligence has had, and despite the fact that the algorithms are fundamentally the same, [inaudible 00:11:25] back propagation and all was around back in the 1990s. But what you see is with the incredible computing power, and the size of the data sets that can be dragged across training these neural networks millions of times, you see qualitatively better performance on the neural networks. That's what I think has certainly taken my breath away, and a lot of the technical observers who have looked at the progress.

Jo Ann Barefoot: 11:53 Is it true that there tends to be an inverse relationship between explainability and predictiveness in these kinds of- [crosstalk 00:12:03]

Bill Foster: 12:03 I have to think about whether that's fundamental or not.

Jo Ann Barefoot: 12:07 Okay.

Bill Foster: 12:07 I think that there's certainly a problem that neural networks tend to latch onto very peculiar aspects of their training sample that are not generally true. This is why things like so called adversarial examples are just such a weakness right now. I personally doubt that that is a [inaudible 00:12:31] problem. It's more like a birthing pain of AI and that you're going to have to make sure that your algorithms are forced to latch onto

characteristics which are generally the case in some more explainable way than I just did. You know, the real characteristics that a human would associate with something.

Jo Ann Barefoot: 12:54 Do you think that we're moving toward policy that would, at the front end, do some defining of what is and isn't appropriate in terms of at least the data that can be used? And then, at the back end also, test the outcomes for bias?

Bill Foster: 13:14 Yeah. I think that we're going to end up having to focus more on the back end. It's really the results you care about. Because there are just so many things that sound like they should be completely unbiased that end up being ... There was a recent academic publication where someone had used a handful of digital signatures like what kind of browser are you using, whether you have a Mac or a PC, what [crosstalk 00:13:41] time of night you're logged in, and to get something that was comparably predictive of your credit worthiness as a credit score. The problem, of course, is that it was just horribly biased in ways. It turns out, some races buy Macs more than PCs or vice versa. It's a mess, and I think we have to just take a results-oriented point of view.

Jo Ann Barefoot: 14:07 Take that one more step. How could you imagine that playing out? Would it be in the hands of the financial regulators to set standards, or, rather, Congress to set standards and then there would be a new generation of compliance standards- [crosstalk 00:14:32]

Bill Foster: 14:31 The way I envision it is that Congress would set the general principles that we want from the results of these. Then the implementation of that would be with, ideally, an open source set of software that says, here is how we are going to judge your algorithms against. The goal of the competition in fintech would be to come up with algorithms that are as profitable as possible that don't violate the standards enforced by this piece of code. The difficulty there is, of course, once you see the code, trying to avoid people gaming it. But done right, I think that can do a much better job.

Bill Foster: 15:17 You also have to bear in mind that the competition here is not perfection. The loan officer in a small bank or even a large bank can and has, in the historical past, been a very bigoted and biased source of credit allocation. I represent, actually, the second, third, and fourth largest city in Illinois. So I spent a while

looking at the redline maps of two of the cities that I represent, Joliet and Aurora, and it made my blood boil because I saw the fingerprints of this redlining in the fate of different areas of these cities, 70 years out, 80, 90 years out. Areas that were originally laid out by their developers to be equal, one got declared to be unfavored during redlining, and one got to be favored. Looking at the effects, and thinking about the effects not only on the owners of those buildings, but on their grandchildren, because of the way wealth is passed on from generation to generation in our country. Anyway.

Bill Foster: 16:33 That's, I guess, the part of me that comes from my father, who was a civil rights lawyer who wrote a lot of the enforcement language behind the Civil Rights Act of 1964. This is something that ... My dad, he was actually a scientist who left his career in science to become a civil rights lawyer.

Jo Ann Barefoot: 16:52 Really?

Bill Foster: 16:55 Yeah. Dad got a chemistry degree from Stanford and during World War II designed fire control computers for the Navy, and most of the way through the war started getting these reports of how many people were killed each week by his team's equipment. Even though it was World War II, and he understood the justice of World War II, he became very unhappy with the idea of his skills being used to hurt people.

Bill Foster: 17:20 He had grown up in the South, and saw a lot of things he didn't like about how blacks were treated. So he came back from the war and thought about it for a while and walked away from his career in science, became a civil rights lawyer.

Jo Ann Barefoot: 17:36 What was his name?

Bill Foster: 17:37 Same as mine. Actually, I go by Bill Foster, as did my dad, but our legal name is actually George William Foster. The difficulty, of course, if you try to run in the Democratic primary, is George W. Anything, it doesn't end well. But I'm actually George William Foster the sixth or seventh, depending on how you score it. But the last several generations have gone by Bill.

Jo Ann Barefoot: 18:04 Very, very interesting. And your point is so well taken that redlining was about human bias, not machine bias.

Bill Foster: 18:12 Correct. But the damage is long lasting and real.

Jo Ann Barefoot:	18:15	Yes, it sure is. And the same neighborhoods got hit again by the recession and haven't rebounded.
Bill Foster:	18:23	Yep. There are many things in our system that amplifies wealth discrepancies. So we have to make sure that our system leans against the amplification that happens.
Jo Ann Barefoot:	18:37	When you think more broadly about technology ... I make speeches all the time about how technology is changing the world. People always come up to me afterwards and say, "I don't want this to happen. It's scary. We're going to lose. Nobody'll have any jobs," and so on. Are you an optimist or a pessimist or what is your [nex 00:18:59] on how tech is going to change our society?
Bill Foster:	19:06	I started thinking about this after the 2010 Tea Party wave. I lost my seat in Congress in the 2010 Tea Party wave, spent two years in the wilderness before returning to Congress. During that time, I represented an area that was a mixture of rural and urban. I spent a lot of that time trying to figure out what just happened, and what was driving our politics, and concluded that it was anxiety over technological job displacement. That is actually the primary motivation not only for the Trump Effect, but also the Bernie Effect. So this is, I think, fundamental.
Bill Foster:	19:48	What is new in the last several years is how rapidly this is going up market. This is not just the farmers and the factory workers and the long haul truck drivers. This is going to be everyone. About a year ago, I visited the trading desk of one of the giant Too-Big-To-Fail Banks, which I will not name. But the trading desk consists of hundreds of people staring at giant screens. I went into the corner office and talked to the guy who runs it and said, "Okay. What fraction of those people out there are going to be unemployed due to AI five years from now and ten years from now?"
Bill Foster:	20:29	He looked at me and closed the door and said, "Well, look. First off, a third of them could be unemployed today because they are already being outperformed by either software that we have in house or software that we could buy. Our baseline plan is that half of them will be gone in five years, and 95% will be gone in ten." All right? These are not factory workers. These are people with Master's degrees in finance. Okay? It's simply the case that the ability to analyze huge masses of text and make

some kind of sense out of it and apply it to financial predictions, things that you used to think of as human skills, are actually about to be done better by machines.

Bill Foster: 21:20 I think that when we realize that we're all in this together, it will be easier to discuss this instead of trying to separate us into, well, this is the poor rural people. Of course they can't compete, but we'll be fine. No. We're all in this together, and I hope that we come to a better political discussion of that.

Bill Foster: 21:42 One of the first lines of defense that Andrew Yang and others come to is the question of universal basic income, and how will our economy work? I guess probably everyone is familiar with the old science fiction story about one person who owns the robot factory, and no one can compete of any job with the robots built by the robots in his factory. We're within spitting distance of that, and whether the person at the top of the pyramid will be Elon Musk or Bezos, or whoever it is, there is that problem.

Bill Foster: 22:24 The problem is that an unregulated free market economy in that kind of technological universe will deliver all of the money to the one person at the top of the pyramid. Then the economy stops. From a circuit design point of view, there is not a continuous circuit for the money to flow. When that happens, there is not an alternative to reaching deep into the pockets of Elon Musk or Sergey Brin or whoever's at the top and redistributing the money at the base of the pyramid. And then let that money circulate in the human-to-human economy. Then that will persist until someone spends a dollar buying a McDonald's at a robotic McDonald's, and then immediately all the money will be distributed, pile up at the top again, and you will have to continuously redistribute it.

Bill Foster: 23:20 The interesting question, from a circuit design point of view, is what fraction of that wealth you will have to continuously redistribute. I suspect it may be smaller than people think. If you think of the whole world as a factory town where the factory is closed and all of the factory jobs disappear, and then think about that town, maybe 80% or more of the economy were not the factory jobs. They were the people, the restaurant workers and the realtors and everyone else who fed off of the money injected by the factory salaries. So it might be that with a number as small as 20% or perhaps smaller of injected money that the human-to-human economy will proceed in a very

healthy state, the same way you could replace the factory wages with a UBI of the same magnitude and have all of the other businesses in a town survive well.

Bill Foster: 24:24 Then there are some interesting observations along those lines. The first observation is that in Alaska, everyone gets something like $3,000 a year. That doesn't seem to have destroyed capitalism in Alaska. In Canada, everyone gets the equivalent of $10,000 a year in the form of universal health care. That doesn't seem to have destroyed capitalism in Canada, as well. Those are two interesting numbers. The real question is at what point does the basic income become so generous that people just sit around on their couches and take drugs and play video games- [crosstalk 00:25:10]

Jo Ann Barefoot: 25:10 Yeah. That's the cultural-

Bill Foster: 25:11 The cultural effect. But my guess is that it won't be disturbed by 10% of GDP being recirculated. So I think this is something where the experimental scientist in me really sees the need for large scale experiments here.

Jo Ann Barefoot: 25:27 How should those be run, and who should run them?

Bill Foster: 25:31 The current model is that a handful of visionary billionaires are making small scale projects. I'm not sure that that ... They will not have the scale or the long term nature of this. I think my biggest concern is the long term effect that may have on the culture of a country. But I think universal benefits in the form of universal health care, for example, I think will have a very small effect. People are competitive, and they will always want to compete. Even if everyone has robots giving them everything they need for their material survival, they will still want to own the real estate right off Central Park, and have a good view of the Golden Gate Bridge. There will be always, if nothing else, real estate will be something that people will compete for forever. So what I just said, I guess- [crosstalk 00:26:29]

Jo Ann Barefoot: 26:29 I guess I was just living in the VR world, and they could see- [crosstalk 00:26:32]

Bill Foster: 26:32 That's right. For them, the [inaudible 00:26:35] imagine that they have a five bridge view, as they say in the [bare end 00:26:39].

Jo Ann Barefoot:	26:40	Are you worried that law and regulation may choke off some desirable technology innovation? Are you worried that we'll overregulate or hit the regulation wrong?
Bill Foster:	26:58	The biggest worry that I have there is that the US will be at a competitive disadvantage because we care about privacy. China has a huge competitive advantage because they, basically, don't care about privacy. So companies operating in China can have access to huge data sets that would completely disturb most Americans. I think Congress and our regulators are appropriately responding to the concerns of Americans about privacy. That will have a big downside on the rate in which AI can be applied to different programs.
Bill Foster:	27:40	I think another thing that is really at the heart of this has to do with a secure digital ID. For many people, they know that these big data sets exist, but the real threat to their privacy is to have someone impersonate them online. Everyone is just sick and tired of having to change all their credit cards every time someone steals their numbers, for example. They also want a system that works efficiently, and with low friction as they say.
Bill Foster:	28:12	For example, when you go into a new clinic or hospital you haven't been to and you have to fill out all of these forms, and you have to remember when it was that you last had your tetanus shot. This doesn't happen in other countries that have a secure and reliable form of digital ID, a way for a citizen who wants to authenticate themselves as a specific citizen in a way that can be privacy protected.
Bill Foster:	28:44	There are a lot of interesting technologies out there, these so-called selective reveal technologies, where if you want to buy an alcoholic drink at a store, what you really have to show is that I am a resident of this state, I'm over 18, and that I have an account somewhere with enough money to pay for the beer. That's all the information that has to be transferred. Those technologies I find very exciting.
Bill Foster:	29:15	But there is, I think, an essential government role in provisioning that unique identifier for a person, and to provide the method of authenticating that they actually are a US citizen, that they do live in a specific state, or the sort of information that you may want to selectively reveal because ... Industry has gotten very far along at providing the hardware and the

		software standards for this, so I think when we decide, as a country, that we want to have the government provide a secure digital ID, then I think the technology is there and can be rapidly deployed.
Bill Foster:	29:56	You can see most of the big tech firms are adopting what's called FIDO technology or even FIDO2 now is the standard, which are simply little keys that have the digital codes that are provisioned to you that demonstrate that you are an employee of that company. So the technology's there, but there is still an essential government role in taking people and biometrically [de-duping 00:30:30] them so that you can't have one person getting 12 different driver's licenses and digital IDs. At that point, there are many ways that industry could come into a piggyback on top of this unique identifier that the government, I think, ultimately has a duty to provide to citizens who want to have one.
Jo Ann Barefoot:	30:54	[Halvenkin 00:30:54], the shout outs to some other guests who've talked about these issues, including the zero ... Some people call it the zero knowledge proof- [crosstalk 00:31:05]
Bill Foster:	31:04	Yeah. We had a very interesting witness in our AI hearing, talking about homomorphic encryption-
Jo Ann Barefoot:	31:11	Yeah, we've talked about- [crosstalk 00:31:11]
Bill Foster:	31:11	... which is a way to scan big databases, potentially even trying neural networks on them, without having access to the database.
Jo Ann Barefoot:	31:19	Yeah. Exactly.
Bill Foster:	31:20	That may be a way around this problem that I've alluded to that we have this disadvantage compared to other countries.
Jo Ann Barefoot:	31:27	I was thinking the same thing as you were saying it. Maybe we can share data safely if we can find technology that people trust- [crosstalk 00:31:33]
Bill Foster:	31:32	Find ways to do that. But then you still need a trusted party to serve as the gatekeeper. All of these systems have what is called a privacy budget where you can't sit there and ask questions again and again, because eventually you figure out individual

information. But they may be workable. There may be a workable compromise.

Bill Foster:	31:52	Another thing that worries me a lot about AI and its impact on monopoly and the feasibility of startups is that a startup that has to have access to a gigantic data set to make its AI work effectively, if it had true access to that whole data set, could do incredible economic damage if there was a breach or a deliberate mis-sharing of the information. That's not really an insurable risk, because literally one line of code, or one line in your set up file for how you've set up your database or your server can be the difference between being completely secure and a disaster. And trying to come up with a mechanism where a small firm, without a lot of capital, can have access to this enormous data set where it can do hundreds of billions of dollars of damage by having a breach, that's a tough thing, because left to itself, it's going to drive monopolization.
Bill Foster:	33:01	I'm not saying that these giant companies are evil. It's just this is the nature of any purely digital form, that it's a natural monopoly, because the return's to scale. That's now being amplified because of AI, and its need to have a large data set.
Jo Ann Barefoot:	33:19	When you think about this in the context of the financial industry, do you think that AI based systems may level the playing field despite what you just said? Could they drive down, say, compliance costs for community banks and startups?
Bill Foster:	33:43	I think that's the only hope. You can see that in small banks. I'm personally very worried that small community banks are going to go the way of small community newspapers, and our country will be poorer because of that. Very often the personal relationship available at a small community bank is the only way that someone might be able to get credit. On the other hand, that same person based credit allocation has often resulted in very bad results, where people on one side of the tracks in a small city may have very different credit allocation than the other side, the good side of the tracks. The history of this is a mixed bag.
Bill Foster:	34:36	So I think a future in which there's a mixture, where you can go on your cell phone and get a loan based on big data that's known about you, and at the same time rely on individual relationships, if you can get a better price on your loan that way, might be the best way. I'm worried, though, that the

banking by cell phone is just going to effectively cherry pick all of the profitable customers, and make it very hard for small community banks to sustain themselves.

Bill Foster: 35:12 Another worry that I have is we have had for generations in the banking thing something called the Community Reinvestment Act, which is simply a requirement that banks not just suck deposits out of the area they serve and invest them elsewhere, which is part of the real reason for the decline of the central cities and, to a large extent, rural areas. There were stories in the Wall Street Journal recently about banks that are maintaining their branches in small, dying rural towns just as a source of deposits, and doing all of their investments in the larger cities that are doing okay.

Jo Ann Barefoot: 35:52 I missed that story.

Bill Foster: 35:54 It's remarkable, but it makes perfect sense in terms of the viable business models. To prevent that, we've had something called the Community Reinvestment Act, which has been supported by Democrats and Republicans for generations. The problem is, what does it mean if you're out in Silicon Valley or Salt Lake City or wherever, with a banking by cell phone startup? What does community reinvestment mean in that context?

Bill Foster: 36:23 I think part of the answer has to be, again, using big data. When I ask myself, what is it that we really want to incentivize with community reinvestment, and the various subsidies we provide to housing, that what we really want to do is make sure that people in all socioeconomic strata are gently pushed to meet each other, face to face. That you don't have gated communities with wealthy people that are isolated from everyone else in society, and that if some sort of big data analytics could be used to preferentially allocate credit to projects that bring less wealthy people into those gated communities and encourage the right amount of gentrification, so that you end up with a mixed income area at the end of gentrification ... You can imagine the wizards at Zillow and so on coming up with very interesting metrics on this ... that would actually accomplish what we want to accomplish, which is to get this country feeling like we're all in it together.

Jo Ann Barefoot: 37:35 Yeah. The Community Reinvestment Act is being rethought, as we speak, so we'll see what starts to come out. So you are sophisticated in your understanding of all these issues. Most

people are not, including policymakers. I'm a former deputy controller of the currency. It's not anybody's fault that we're not equipped to deal with all this technology, but here we are.

Jo Ann Barefoot: 38:09 What's the pathway to get the talent and the cultures of our legacy regulatory agencies and policymaking community to really be able to grapple with these issues in a smart way? And do it fast, because as you said, we're tons- [crosstalk 00:38:29]

Bill Foster: 38:28 Yeah. Part of the solution has to be that the public has to respect expertise. One of the most corrosive and destructive things of the politics of the last few years, maybe even longer than that, was the suspicion that experts are somehow intrinsically evil or self-interested or not working in the public interest. That has not been my experience in my dealing with government workers. The vast majority of them are there because they listened to John Kennedy, talking about that we should ask not what our government could do for us, but what we can do for our country. We need another generation of that. And the deliberate vilification of experts, and people who are spending their careers trying to make our government work better, that has to go.

Bill Foster: 39:36 Otherwise, it'll be very hard to recruit the next generation of talented individuals to go into this. I got a chance to meet the woman who operated the water testing system that discovered the problem in Flint. She works in a laboratory in downtown Chicago. That woman is a hero to me. And the vilification of EPA by, I include this administration, and by politicians for decades now is, I think, an example of just how far we've gone off the rails.

Bill Foster: 40:23 Everyone should understand that the world is a complicated place. It's going to get more complicated, and it's going to be moving faster. Under those circumstances, we have to have more trust in experts, rather than less. And we have to have transparency. I think the place that it goes off the rails, partly, is when the experts are not presented in a very transparent way to the public, because then there is the suspicion that they are not doing their job fairly.

Bill Foster: 40:55 That's one of the things that we wrestle in the science committee all the time, with these so-called secret science initiatives, a perfect example of the complexity of public policy. One of the many hats I wear here in Congress is I'm the co-chair

of the national laboratories caucus. So I spend a lot of my time taking members of Congress around to visit the 17 DOE national laboratories. They're just blown away with the technical work there.

Bill Foster: 41:29 In fact, there's some economic analyses have calculated that roughly half of the economic growth since World War II has been due to federally funded research. Integrated circuits, there's a whole ... Out in Silicon Valley, they have this whole, we did it alone by working in a garage. No, you didn't. There were massive contracts from the military and from NASA that were responsible for the development of these. We have to take pride, not only in our private sector research, but also in our federally funded research here.

Jo Ann Barefoot: 42:05 I just flew back from Asia and watched the two part documentary, Silicon Valley, on the airplane. It's very well worth seeing, and it makes that point that [crosstalk 00:42:16] the-

Bill Foster: 42:18 Yeah. Hewlett-Packard had lived off of federal military contracts for decades by- [crosstalk 00:42:24]

Jo Ann Barefoot: 42:24 Yes. I could talk with you all day. I know we're running short on time. Is there anything I haven't asked you that you want to talk about?

Bill Foster: 42:36 Let's see. There are various ways that I have been trying to get Congress to raise its technical game. One of these is trying to resurrect the Office of Technology Assessment. This is something that for a couple of decades gave Congress very high quality, real time technical advice. In the end, it fell prey to political forces, and when Newt Gingrich came in, it was on his list of government agencies to kill. Congress has been poorer, and our country has been poorer from this.

Bill Foster: 43:16 I remember one of their last suggestions was that the US should adopt a standard electronic health record system, so that you can inter-operate the electronic health records systems, and that government should take a lead on this. Billions of dollars have been lost, and tens of thousands of Americans have lost their lives because that was ignored.

Bill Foster: 43:40 Of course, the Office of Technology Assessment also was asked to and correctly gave a determination that Ronald Reagan's Star Wars, the anti-missile defense, didn't have a prayer of working.

		The problem is this was interpreted as a political statement, instead of a statement of fact.
Bill Foster:	44:02	It's a very tough situation to be in, but Congress is very well-served by non-partisan organizations, like the Congressional Budget Office, whose job it is when someone proposes legislation to say: Here's how much it's going to cost, and here's how the economy will react to your proposal. It's, by and large, a trusted organization, and trying to rebuild in Congress the Office of Technology Assessment is something that I've been working on for as long as I've been in Congress. I actually took the project over from Russ Holt, who used to be the other physicist in Congress. That's something where, just this summer, we, for the first time, got the budget restored for the Office of Technology Assessment. Who knows if the Senate will follow suit. But that's an example.
Bill Foster:	44:57	The other thing, of course, is just to try to convince technically competent people to spend part of their life in service to their fellow man, either working in elected office, or working in the federal bureaucracy. Because part of this ethos that we have in academia, for sure, and I think to some extent in the private sector is that, well, if you can't get a job anywhere else, work for the government. That is not healthy for our nation. You don't have to spend your whole life working ... You came in and out of government work.
Jo Ann Barefoot:	45:41	Oh, yes.
Bill Foster:	45:43	Which is actually a very healthy thing for our country, when people do that. I urge any of the technically oriented people there that after you've gotten your fifth or your tenth million or whatever your goal is, to think about spending part of your life in service to your fellow man. When you think about that, you will find that science is absolutely no help in helping you answer that question. You have to look at the spirit inside you, and why do you think you were put on earth. And that, perhaps if you think about it, you'll come to the conclusion that I did after very successful careers in business and in science that maybe spending part of your life in public service, and maybe even elected office, is one of the windmills that you want to be tilting at.
Jo Ann Barefoot:	46:34	I'm optimistic about this, actually. I work all the time with technology people, and you can see a growing group who are ...

Tech people like interesting problems, and we have a lot of those in the government [crosstalk 00:46:52] that have never been touched by good technology in a lot of cases.

Bill Foster: 46:54 That's right. Yeah. There's- [crosstalk 00:46:57] Absolutely, absolutely correct. There are lots of just the nuts and bolts of government that could benefit from better technology. We also, for example, if you take the problem that we've come to earlier in this interview about a secure digital ID. The government has so many databases where the database key is not shared between all these different things, again, partly for privacy, but mainly, I think, by a mistaken idea of what privacy should really be. The reality is that all these big databases are there, that the internet of things is not going to make our lives any more private. But you need to have a trusted gatekeeper in that, so that if the world is going to live off digital currency, for example, I believe the gatekeeper for that should be the federal reserve. There should be a very well defined legal system, backed by a court system that we trust, to be the gatekeeper on digital cash transactions are anonymous and when they can be seen.

Bill Foster: 48:10 I think, in the end, that will be a competitive advantage to the free countries in the world, because if you think about things like digital contracts, I think it's not going to be acceptable to most people to have large fractions of their net worth tied up in digital contracts for which there is not a trust third party, a court system, if you will, to back them up when mistaken or fraudulent transactions take place.

Bill Foster: 48:40 That, I think, is the key realization we're going to have to come to to make our system work better in the digital world for all of our citizens. We're going to have to find a mechanism for trust. We're going to have to find a mechanism, for example, to let some classes of speech be things that people can digitally authenticate.

Bill Foster: 49:07 For example, everyone knows how these spam calls that come into your cell phone. I personally, and I think most Americans, have no interest in receiving any electronic communication from anyone who is not willing to digitally authenticate themselves to me, in a way that allows me to ultimately take them to court if they do something illegal. Okay? You can be anonymous 99% of the time, but I want to know that if something illegal happens, I can de-anonymize that.

Bill Foster:	49:41	This is part of a wider conversation that's happening in financial services. It's happening in the discussion of social media and election interference. I think it's really all one discussion. At the core of it is a secure digital identity, and government backed entities that you can trust. That is the advantage of our relatively transparent democracy, if we can keep it, that we can ultimately have court systems and governments that have the trust, so that people know their lives will be private with a little asterisk that a government you trust can look deeply into them because of the tail risks that happen with technology in our society.
Jo Ann Barefoot:	50:34	Last question. Do you have any advice for policymakers grappling with these interesting issues?
Bill Foster:	50:44	To try to read one book a month. If you just look at ... I'm halfway through this book, how do you pronounce it on podcast? Mindf*ck?
Jo Ann Barefoot:	50:54	I read it.
Bill Foster:	50:59	Yes. That, for example, is one of the ones that I'm going to be recommending. It has to do with the Cambridge Analytica, and the disruption of our democracy and our society. The three books by Yuval Noah Harari gives ... I think I can ... One is Sapiens, Homo Deus, and 21 Lessons. These things, I think, really lay out the issues, admittedly from the secular point of view, which is where I come at things. Really, we have to understand why our species is what it is, why it's not necessarily well-matched to the technological future, and the ways that we will have to lean against the more dangerous aspects of our nature to protect us from the machines, and the machines from us.
Jo Ann Barefoot:	51:58	Congressman Bill Foster, thank you so much for being our guest today. This has been an incredible conversation.
Bill Foster:	52:05	Well, thank you.
Jo Ann Barefoot:	52:06	Very grateful.