Establishing and Fortifying US National Security Supply Chains

TRANSCRIPT

Discussion

- Representative Michael Turner, US Representative, Ohio’s 10th District, and Ranking Member, House Permanent Select Committee on Intelligence
- Representative Brian Fitzpatrick, US Representative, Pennsylvania’s 1st District, and Member, House Permanent Select Committee on Intelligence
- Edlyn Levine, PhD, Senior Fellow, Co-Founder and Chief Science Officer, America’s Frontier Fund
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A video of the event is available: https://www.hudson.org/events/2142-virtual-event-saudi-arabia-s-china-option-82022

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Rep. Michael Turner:

Thanks so much. Well, thank you, Dan. I want to thank the Hudson Institute for having us here today. The Hudson Institute is an incredible resource, especially for Congress. As you bring experts together to be able to have a dialogue on important issues affecting policy, Congress's ear is probably the most important recipient of that message because we can translate that dialogue into actionable to-do list and make a difference. So, you are not only an incredible resource to us, but you're also a source of inspiration because sometimes Congress's eye might wonder, and you help us focus on the issues that are important for us to address. Thank you for hosting this, another part of our series of Beyond the SCIF.

The members of the Intelligence Committee have identified that one of the biggest things that we need to do is return the mission of the Intelligence Committee back to national security. In doing so, we know that if we just focused on national security and became a bunch of people in the basement of the Capitol who learned cool things, we wouldn't really be doing the job that people have assigned us to. Our job is to make certain that intelligence is married to policy makers and decision makers. To do that correctly, and to identify those areas that are important to better bring forward to an actionable item in Congress, we need to make certain that we listen to the experts, that we turn to the think tank world, the academic world, and to look at the issues that they're discussing and how it can translate into the things that cross our desks.

So, in that, we appreciate your hosting, Beyond the SCIF as an opportunity for us to learn as an opportunity for us to listen, and an opportunity to take the expertise that you pull together back to our work on Capitol Hill.

This issue of our supply chain is incredibly important as we've seen, coming out of COVID, the issue of vulnerability of our supply chain directly translates into a vulnerability for national security. Identifying those areas in which supply chain breaks, can affect our national security is of utmost importance. But in addition, there are also threats. There are those who are adversaries who would like to impact our supply chains and thereby destabilize either our national security or economic security, which of course translates back to national security.

I greatly appreciate Brian Fitzpatrick leading this today. As Dan as you were saying, Brian comes to this and to the Intelligence Committee with a great deal of background and the issues of national security having served both as a federal prosecutor and the FBI and of course Iraq. In addition, his educational background of being both a lawyer and a CPA gives him great breadth to be able to do the analyzing that we need to do with the topics that come before us.

But in addition to that, he brings a tender that's very, very important. Being the co-chair of the Problem Solvers Caucus, Brian calls us all to a greater good where we can look to how we can build bridges and make certain that we lessen the partisanship in Congress but pull together on a bipartisan basis to find those issues that are important to address. Of course, there's nothing more bipartisan than the issues of national security.

So with that, I want to thank Hudson again and also thank Brian for conducting this, Beyond the SCIF and appreciate both your contribution and your expertise. Thank you, Brian.
Brian Fitzpatrick:

All right, we'll get going here. I think this is on here. John, thanks for hosting us again. And Ranking Member Turner, has been one of the leaders in leading us in the Intelligence Committee, how many months now, Mike? Four?

Rep. Michael Turner:

Nine.

Brian Fitzpatrick:

Nine? Five? Nine?

Rep. Michael Turner:

Nine.

Brian Fitzpatrick:

Nine months? Goes quick. And he's making a lot of really, really important changes to the committee, and this is one of them. You may all be familiar that Members of Congress, although there are a lot of very bright talented people there, they can be spread to the winds very quickly. They are very distracted with a whole host of issues dealing with constituents in the district, dealing with a whole host of legislative items on the Hill. To be able to have the resource of organizations like Hudson and so many of your colleagues is very helpful to us because you guys, you're all eating, sleeping, and breathing this every day. You can give us the deep dive in a policy that quite frankly, the members nor their staff really have the time to go into the level of detail. And when we're talking about the issue of supply chain, it's viewed in the broader context.

The United States of America just celebrated our 246th birthday. That is not very long. That's just a few generations, and yet we are the world's oldest democracy. No democracy on this planet has survived more than a few generations, and so we forget that. It's built into our genetic DNA. Unfortunately, we take a lot of that for granted. We can't fathom waking up in a world where the US Dollar is not the world's currency standard, where the United States is not the world's military and economic superpower, but that can go away very quickly. We know we have adversaries that are looking to take that mantle from us. There are evil dictators that want to crush freedom loving democracies look no further than Ukraine right here in 2022.

And before we start this discussion on supply chain, I just want to put into context, Xi Jinping has made several comments in the past that I think are instructive and a good way to open this
up. He said a couple things that I always like to share with people, especially when we're talking about supply chain. In looking at America, he says, "You're never going to take America down from the outside. They're the world's oldest democracy, the world's strongest democracy." He said, "The only way you take them down is from within. By infiltrating their supply chains and affecting the cultural conversations in America." He went so far as to identify what he calls the spears of American influence. He's identified traditional media, he's identified big tech, social media, he's identified academia, he's identified entertainment, Hollywood, and he is identified professional sports to name a few.

And he said that, "If we can infiltrate the supply chains and take over the heart of what it is about America and American culture, we can then ultimately erode from within." And the second thing he said is that he does not believe that democracy can survive in the 21st century. And he said this just two months ago to President Biden overtly. He said, "Congratulations, you made it 246 years, but it's not the way of the future." He says, "Myself, I have no political pressure. I have the superhighway in front of me. I've got the guardrails up. We're investing all the money we need and all the technologies of the future and semi-conductors, artificial intelligence, quantum computing, machine learning."

And he said, "You guys, you're fighting every couple of years. Your pendulum keeps shifting back and forth in government, you can't even get a CHIPS Act passed." Which we hadn't passed at that point. And he just said, "Technology's moving too fast and you're too slow. It's too slow of a governmental system." And we have to be able to prove him wrong. And I think that the most important place to start, in my view, is learning from the lessons that were most recently amassed with the COVID-19 pandemic. And it's an issue that Russia is learning with respect to energy right now with their dependence on Russia, I'm sorry, Europe's dependence on Russia.

We have many of those same reliances and dependencies on the Communist Chinese party and the Chinese supply chain when it comes to pharmaceuticals, when it comes to PPE, we certainly saw that front and center with a pandemic. With semiconductors, we're seeing that now. Back in 1990, the United States of America produced roughly one out of three advanced semiconductors. We now produce about 12% globally, Europe's about 8%, the continent of Asia is roughly 70%. And of that 70%, a lion's share of that is on one island, Taiwan. Produced largely by one company TSMC. And that's really why this was one of the topics we wanted to bring to you all today.

So I'll start, and I guess we're just going to pass the mic down, but I just want to give you all an opportunity to comment generally before we dig down deep about what industries ... First of all, what are your thoughts on supply chain issues right now? What is our dependencies on foreign nations? What are our vulnerabilities and what industries specifically are you most concerned about?

Gilbert Kaplan:

Thank you and thank you to the Hudson Institute for inviting us here to speak. I'd just make one general comment. It's interesting that we are here talking about manufacturing. For so long, there hasn't been a lot of discussion in a systematic way about the United States manufacturing sector industry. And I think one reason we're talking about it now, and one reason we've had so
many problems is that the responsibilities for manufacturing in the executive branch are, really, there's nobody in charge of manufacturing. It's all dispersed. There's certainly people at DOD who are concerned about kinetic capability and submarines and things. They're people at Commerce who are concerned about unfair trade. There's USTR that's doing market opening, but we really need a central focus for manufacturing in the executive branch so that we don't learn all this during this crisis period after the pandemic or a crisis period with China and then forget it all.

So I've proposed several times we need an undersecretary of commerce for manufacturing who would not take full responsibility for every program, but would compile a great deal of expertise under his or her jurisdiction and make sure we don't have to start all over again with discussions like this in 10 years.

With that brief introduction, I'll just say the industries I think are the most important. First semiconductors, we have to make sure that CHIPS Act is successful and that we have a robust supply of state of the art and older and current generation chips. We have to expand the CHIPS Act vertically and horizontally; we should be covering printed circuit boards. We don't make those in the United States. We should be covering packaging for semiconductors and substrates. Right now, if we build the great fabs, we're talking about Ohio or maybe Pennsylvania or wherever else, those chips will immediately get in a FedEx plane and go to Taiwan, Philippines or Indonesia to be packaged. We can't package them here. And by packaging, I'm not talking about corrugated cardboard, I'm talking about usually plastic. Very, very sophisticated packaging for the semiconductor dye, which now is generally close to one half the value of each one of these chips.

Other industries, 5G software and hardware, steel and aluminum, batteries and inputs to batteries and rare earth minerals, castings and forgings. Not the most exciting thing in the world, but we have to be able to do castings and forgings in this country much more than we do, and artificial intelligence and quantum computing. So, if we do that, we'll be in good shape.

Edlyn Levine:
I'm going to try to use the mic on my jacket. We'll see if that works.

Brian Fitzpatrick:
You guys have mics? I didn't know that.

Edlyn Levine:
Yeah, we were given mics, I don't know why you were not given one. Maybe you get the special mic. So yes. So again, preferring why do we need to invest in manufacturing and then three critical industries that I would say we should be focused on. But my perspective coming from the world of technology development to being an inventor myself to now investing in companies that
are trying to scale deep technologies in this country, what I can say, which is so important about manufacturing, is that it's essential for value capture. A lot of policy in the United States has focused on value creation. We spend a lot of money on research and development, we spend a lot of money on scientific and engineering developments, but we fail to spend the investment in policy development on actually ensuring that those breakthroughs that American scientists and technologists make, actually convert into meaningful GDP growth, job growth, economic growth for the American people.

And part of that configures into the manufacturing policies. We have to have an ability to take inventions that we produce here and scale them here to manufacture them here. And oftentimes that comes with a learning while doing and coupling to technologies that are already existing, the fact that you have very well entrenched economies of scale with advanced manufacturing, knowledge spillovers and talented workforces. So this is why manufacturing is so essential here.

If you think about three critical industries, again, many industries are critical, but three that I would say we should focus on with 100% certainty to ensure that we have autonomy in the United States and the ability to produce in those areas. And some of them are going to mirror what Gil had already said, but the first would be energy. So looking across the energy industry, first of all, resource production, be it rare earth elements for magnets that are used in wind turbines to hydrocarbons which are still necessary for energy economy to actual energy production in nuclear power plants to any type of power plants, to solar panels, to wind turbines themselves, then to energy distribution, and finally to energy storage. So holistically, looking across those four elements of energy. We have to have energy assurance because without energy assurance, you're not going to be able to manufacture anything, you're not going to be able to turn on the lights in your home, you're not going to be able to keep your food refrigerated. Society would collapse without access to energy.

The second is information and communications technologies, which again, were aspects that we had already spoken about. So semiconductor technologies, but also holistically how you take those semiconductor technologies and build meaningful devices, printed circuit boards, systems integrations, building high performance computers to 5G base stations. All of that is going to be very important for us to be able to do and to scale in order to stay at the lead of next generation technologies.

And then the third is actually the capital equipment that's necessary to make products. So this is anything from welding and lays and industrial lasers to nanofabrication, lithography and etching machines to metrology machines to centrifuges, to everything that's used in advanced production of technologies that are at the cutting edge. And that has downstream effects into all other types of industries such as biotechnology, such as aerospace, such as maritime, such as other healthcare verticals that you could think about. And so if we are able to stay in the lead of the actual equipment to produce other products, then we'll also be able to have that assurance that should the time be needed that we would need to integrate manufacturing capabilities that maybe we don't have scale to, that we have access to the resources that are necessary to do that.
Tom Duesterberg:

Okay, it's going to be hard to be original after these two experts gave their views. But I want to change the focus just a little bit to a slightly different consideration with supply chains, which is perhaps we can divide things up into what are absolutely essential, which the two previous speakers have talked about and things that the business community itself, the manufacturing sector ought to be thinking about. And I reflect a little bit on some of the supply chain interruptions that have happened in the last decade or two that have shut down entire industries or severely handicapped us that one wouldn't always think of.

One of them was about 10 years ago, I think it was because of some active nature of floods or something. The only supplier of an obscure material called carbon black was put out business somewhere in Southeast Asia and carbon black is essential to making tires. So, it shut down the auto industry because of this one obscure product, which is only made in one place. So then during the COVID pandemic, we couldn't or didn't have the current capability of making masks and gowns and ventilators and things like that. We can certainly make those. But the point I would make is that we ought to encourage industry itself to think a little bit more broadly than it did in the previous 30 or 40 years, which was to go find the cheapest price for anything that goes into a product, especially as the cost differentials between places like China, India, Southeast Asia and the US become a little bit less, it makes more sense to think about these potential choke points that may not be key to national security, but can close vast swaths of our industry.

So, the other element of this is what we absolutely need for national security. My list is about the same semiconductors, advanced communications equipment. I would put advanced propulsion materials and avionics for aviation in that category. I think it's good to be energy independent and fortunately we are, but we have to take care that we maintain that independence going forward.

Nadia Schadlow:

Thanks. Well now I really have a tough job. So, I'll shift the discussion a little bit because I agree with all of my colleagues on the specific areas that we've mentioned. I could always add more, I'm not sure biotechnology, biosynthetics were discussed as much. There are sub areas, one in particular, Hudson looked at related to energetics, which are the chemical compounds that are really important for a vast array of our ammunitions and our other weapon systems. But instead, actually, I'll step back a little bit and say why are we having this conversation? What is the supply chain problem about writ large? Because in some ways the description of what we've talked about, especially when it comes to critical minerals and semiconductors, we've been having this conversation as a country for at least 15 years, if not more.

If you go back the Congressional Semiconductor Caucus, the earliest one was I think 2007 Edlyn would know, critical mineral studies were done early on at the Department of Interior early on. And you'd be surprised if you looked at the dates of those studies. So we've been discussing this and identifying this as a problem set for well over a decade. So I think really now the conversation, and I think part of this panel is shifting to implementation, right? What do we need to do to actually implement the changes that we know are necessary? Well, one is a
sense of situational awareness. What is the problem set? I'd argue that we have that at a strategic level at the next level of understanding the linkages of sole suppliers, of the specifics we need to do better and we need information to do better. And that's where the intelligence committee comes in and other government resources and the private sector.

Another is a forward looking component. How do we stay ahead so that we don't or we're not playing catch up in other areas? Third, as Edlyn mentioned, is a manufacturing strategy, which probably differs by sector and which I'd also argue we do not have consensus on. We're probably not going to have consensus on it. There's going to be a continuing argument about what the right mix is for manufacturing in key areas. So I think as we look ahead, all of that, in addition, when we say supply chain broadly, I think we're talking about different categories of policies. We're talking about what we need to do to stay ahead or not lose our competitive advantage in key areas. We're discussing how to stop or slow our competitors like China, and we're discussing about the leap ahead, innovative aspects that we need. And I think supply chain means a lot of those things depending on how it's used.

Brian Fitzpatrick:

So that leads me directly into my next question to you Miss Schadlow. Dr. Schadlow, I think it was March of '21, you had an article on the Wall Street Journal, you zoomed in on batteries. Do I have that right?

Nadia Schadlow:

Yeah, with my co-author Arthur Herman.

Brian Fitzpatrick:

Correct. So just a question on that. Obviously, these batteries are critical not just for commercial items but also satellites and military equipment. We were looking into this, seven out of the top 12 companies that produce lithium-ion batteries are based in China and not a single one of the 12 are based here in the United States. In the article you propose bringing the battery supply chain back to the United States. Just zooming in on batteries specifically, what are the consequences do you believe of relying on any Chinese supply chain with regard to lithium-ion batteries going forward? And which industries is it going to impact the most?

Nadia Schadlow:

Well, if your assumption is that a large part of the American economy and frankly European economies are going to move toward the use of more renewables for energy storage, more electrical vehicles, and really that's where I think it's a fair assumption to make in terms of where policy is. All of that depends on batteries. It depends upon the storage of energy as Edlyn alluded to. So it's very, very important to consider who controls that supply chain. And it's China
really, as we all know now. But what I think is interesting about the battery supply chain is that it's really a perfect playbook. It's an elegant example of how China achieved dominance in this sector from inputs, critical minerals, all the way through the processing of batteries, the packaging of batteries, the recycling of batteries. It's really an elegant, perfect playbook for what happened in one key sector. And it's something that we're seeing in other sectors, but it's front and center really important to look at it for that reason.

Batteries are also important depending on, there's a debate in military circles, but certainly they have many uses and can provide us with operational flexibility so we can operate in different parts of the world where we might not have access to oil, gas, to traditional fuels. So they're important for many, many reasons. But I think also illustrative of what happens when you lose sight of the importance of having diversification in a supply chain.

Brian Fitzpatrick:
And transitioning to rare earths, 2020 was the last year we measured this, 80% of the US rare earth minerals were imported from China. Obviously, they're critical for a whole host of things, including unmanned aircraft, Tomahawk cruise missiles, jamming devices, laser targeting systems and radar. And there have been rare earth mineral deposits found, I believe in 19 or 20 US states. So for the panel, I'll let whichever one of you who wants to jump in, how do you account for the heavy US reliance when we have domestic supply here of rares that 80% is coming in from China?

Nadia Schadlow:
I would say probably one or two words, regulation and fundamental ambivalence by a large part of the American public. So a large part of the American public does not want to make the tradeoffs, is not willing to make the tradeoffs to allow the independence that we potentially have in a key range of minerals. It's astonishing to look at early surveys, which I've done in some of my work to go back and look at US geological surveys, which show how many deposits we have in the United States. And even today, in Texas, we have a ton of gallium, which is really, really important, but we're not mining it or using it. So fundamentally it's a choice right now in terms of rare earths. And again, we've had the studies for well over a decade on this problem set.

I think what's interesting and worth mentioning before I turn to my panelist is that, over the past year and a half or two years, there have been a lot of studies by different government agencies, Department of Energy, the White House's Commission Studies on this problem. But if you actually read them and look at the language, very few if any of them actually talk about increased mining, right? It's about alternatives and it's about recovery, which means recycling. So alternatives and recovery. And that's not enough to get us to where we want to be in terms of independence in rare earths or critical minerals for that matter.
Edlyn Levine

Yeah, I would add to what Nadia was saying as well. There were policy failings on the part of the United States, but there was also the fact that we were frankly outcompeted in this by China through decades long policy concentration and focus that they have to capture this industry. And Tom probably knows much more about the trade and regulation and then basically market distorting effects and policies that China has been able to use. They're entering to the market. So if you look to have access for rare earth deposits, you have to have natural resource. China does have a significant fraction, so does the United States. So to Nadia's point, we have opted not to produce that resource. But you also need to look at the entirety of the rare earth element supply chain, which means not just mining, but also separating, refining, alloying and then ultimately producing the product that you want.

If I'm going to use a samarium cobalt magnet in an experiment or in a product that I'm building, where do I get that? How do I actually produce that? If I'm getting the samarium from a mine somewhere in the United States, I still need to send it over to China for alloying and finally for the magnet production. And so, you think about that dependency. And so the dependency there, if you look again in China's policies, and my panels can probably speak to this more than I can, but they started, their entry point was with the early stage, the supply side of raw materials, which is the upstream mining and separation of rare earths. But then Chinese policy, for example, the Chinese government in the '90s started to tax Chinese raw material exports because they wanted to encourage the domestic Chinese industry to actually start developing the downstream aspects of the supply chain.

So build up Chinese expertise in the alloying and in the refining and in the production of those end products that use the rare earth elements. And because of that export tax, which I think violates WTO laws, and I think the United States and Japan and the EU actually did have a successful WTO appeal against China. But at that point it was too slow, it was too late, and then China now dominates in those upstream elements of the rare earth supply chain.

And then finally you look at their investment, they invest heavily again, what I was talking about with value creation. They invest heavily also in research in rare earth element metallurgy and in material science, which we frankly don't have sufficient investment in from that value creation point of view. So globally, again, patents are noisy economic metric for productivity, but they outcompete. The total number of patents in rare earth elements around the world is smaller than that of China alone. That's the entire world. So when you talk about supply chain issues and dependency from a global perspective, this is a big one.

Gilbert Kaplan:

I just add quickly two points. The whole idea of supply chain is new. We used to want to have things in the United States, we want cars, we want steel. But people didn't talk so much about where are we getting the things. This is really a new way of looking at the world. The other big picture thing is, US companies go into lines of business to make money. And in China they certainly don't do that. And making money by mining and then processing rare earths is extremely difficult. Given the environmental regulation in the United States, it's a very messy
process. So it's not just whether you want to do it, but then you have to compete against the Chinese who have been doing it for 20 years with enormous amounts of government support.

So in order to change this around, we really have to start looking at those things which are so critical that the government has to provide either assistance or tariffs or something to make it profitable for US companies to do it and choose those areas, and rare earths may well be one that we really have to have a government policy, very aggressive, to catch up with what's happened in other parts of the world.

Tom Duesterberg:
I don't have much to add to all of this but permitting reform for mines is critical and also for processing facilities. But also, we need to have some, I think as Gil said, some government support for developing indigenous technology. It's so bad that when some investors wanted to reopen the biggest US mine down in California, they had to take on a Chinese partner to get the processing technology. So, we need to reflect on that and probably do a little bit better in preventing that eventuality.

Nadia Schadlow:
I'd just add that what we're seeing, the politics of permitting, it's happening in a different context on the Hill right now with Senator Manson, and doesn't, in my view, bode well for some of what we're talking about, right? We're politicizing a really important issue.

Brian Fitzpatrick:
Migrating over to healthcare, COVID-19 unasked and laid much bare I'd say, none more so than in the healthcare field with medical products, I never even knew what API was. Now we all know what API is, active pharmaceutical ingredients and just how dependent the United States of America is for life saving and life sustaining medications and equipment. And China took advantage of this in my estimation, nationalized control of the production and distribution of medical supplies in China and redirected all production for domestic use only to respond to COVID. Had a clear impact on US healthcare, and it also raised questions about what other supply chains China may manipulate as part of their national defense strategy, especially if there is a greater conflict or an escalation with Taiwan. Should China conduct a military operation against Taiwan? Should we expect China to use the supply chain as a weapon? And what government and industry? What should we all be doing to prepare for that?
Gilbert Kaplan:

I'll give you my answer and certainly will the others too. Well, first of all, this is very rudimentary, we need to make a list of everything we get exclusively or substantially from China. And there are lists like this, but they're not generally available to everybody in the government and they're not paid attention to. We have to determine the criticality of these products. If it's high-end semiconductors, which is not the case with China, it obviously would be critical. No one's ever heard of APIs until recently, and now we know that's critical. There are many other things that we are dependent on China for. There was a very big trade case when I was in the Reagan administration on footwear and the footwear industry argued, "An army cannot go to war without shoes."

And obviously, that's true, but we can't start controlling every single product, even if we bring a lot of it from China, we'll make everything and it'll just be impossible. So we have to make a list of what's really critical. We have to figure out how quickly we can develop other sources, and to some extent we have to develop them now. And China will definitely cut off anything they can if we are in a wartime footing with them. There's no question they've already done it in some trade disputes with respect to some of their trading partners or competitors. There's no question that if there're critical things they have and something boils up in Taiwan or elsewhere, they will cut us off.

Edlyn Levine:

In my look at this, I would put it in association with two characteristic time skills for the policies that are involved. There's one which is acute, which is saying this is imminent and could happen in the next six months, something like that. So what can we do? You're obviously not going to be ensuring massive high tech supply chains in a six month to a year period. So you have to actually start looking at what really are you going to be running into in a wartime crisis where are our dependencies? Where can we build up and should we be building up more strategic stockpiles to make sure that we have resilience?

And importantly as well, balancing what's happening now globally with Ukraine and supporting Ukraine with the wartime effort. There's also concern that I have that we might not have the types of resources from a weapons, munitions, et cetera perspective to support Taiwan if they were threatened. And so, I think that that's another acute area that we need to look at immediately and start really looking at how we ramp and bootstrap the types of supply and access to those critical defense mechanisms that we might need to be dependent on.

The next then is the next characteristic time scale, which is, there is a future where there is no outright conflagration, right, between China and Taiwan or anyone else, and they just continue their march. There's systematic gutting of US industries and manufacturing capabilities. That's the long-term strategy. That's where we need to have to step out of near-termism and actually think about decade or long strategies and policies that need to be systematically implemented to make the United States favorable as an environment for manufacturing. So that we do build up those industries of the future. We reassure what's necessary because we create the correct economic environment, regulatory environment, and we also ensure that we have that
leadership position for industries of the future. That's a long term, long characteristic time scale. So I think we need to think about policies in association with those two time skills.

**Tom Duesterberg:**

If I can add a little bit, I agree with Gil. China has proven that it will use whatever leverage it has against us in an acute, not only a war situation, but when they want to apply pressure. They did that with rare earth’s, whatever it was, 10 years ago. On the question of the medical mystery, I have a slightly different take. I'm not sure that APIs are the most important problem facing us. There's some dispute about really how much we get directly from China. I think the more important consideration is trying to stay ahead in terms of the basic technology that are going to impact healthcare in the future. And the United States has traditionally been a leader in the development of new treatments and pharmaceuticals for that matter. We're way ahead of China. Just looking at the production of COVID vaccines, China has resisted using Western developed technology. And so they're way behind us. Their vaccine basically doesn't work. But China also thinks very holistically in terms of possible future developments including biological warfare.

And I think it's extremely important for us to maintain support for both basic research and development of new treatments in the United States so that we're not only economically independent and have a vibrant industry, but we're prepared for the worst sorts of eventualities that may come out of Chinese labs.

**Nadia Schadlow:**

I would just add that we could look at what's happening in Russia and Ukraine and Europe today and the war to see how important the economic instrument or tech instrument is in warfare as a part of economic warfare. The withholding of technology has been a really important part of this war. So I think it's certain that everyone looking is going to take that as an important lesson.

**Brian Fitzpatrick:**

So, Dr. Levine, when you were listing out the critical industries, you started with energy and then you went to information and comms. So let's dive now, migrate over to 5G. China, obviously being very aggressive in the sphere. Where do you see the United States vis-à-vis China with regard to 5G and the race to develop that technology and expand it and deploy it to other nations?

**Edlyn Levine:**

Yeah. Unfortunately, the prognosis is again not good. This is the stormy clouds and rainy weather session here. But 5G is unfortunately similar to other industries in the sense that we
fallen behind. And the thing which is remarkable when you look about at telecommunications is, here's another area, another technology that was developed in the United States and we dominated for over a century. And then in the course of a decade, again, still if you go back to 1999 and two of the largest capital equipment suppliers for telecommunications were North American. One was Nortel and the other was Lucent. And in the course of a decade, they both have essentially zeroed out. Right now we have Huawei, we also still have Ericsson and Nokia over in Europe as potential suppliers. But when it comes to capital equipment, we're not doing well.

And in deployment we're also falling way behind. You think about capabilities, Chinese 5G deployments, when you look at their internet speeds, their capabilities being orders of magnitude faster than ours. They've built over a million base stations in China, 5G base stations that is and deployed them, whereas we're batting at about a hundred thousand in the United States. So you just think about those economies of scale as well, and we're also way behind. There's again a heavy thumb of the state of China, right, of the PRC actually on waiting and building up their national champions. Huawei itself was reported by the Wall Street Journal to have received about $75 billion worth of subsidies. How would any company in the United States that could compete with that? We're not going to be giving $75 billion worth of subsidies to a single company.

And so the question becomes, what can be done? Where are the avenues where we can lead? What does the United States need to do? Because the security implications are massive. There's economic security implications where we will lose out on the futures of downstream industries that will depend on 5G. And then ultimately 6G capability roll out the same way that 4G led to whole new economies with the social mobile internet and huge growth and huge technology sector development. But we also have national security implications. 5G has a potential to change the way warfare and military networks work the way that concept of operations and deployments happen, the way that organizational units actually function on the battlefield.

And if China has a capability and we don't, that's an asymmetric advantage for their military. And if our military needs to depend on Chinese technology, then they have that poison fruit of having to compromise the security of military networks by using Chinese devices. And we know that Chinese companies by law have to collaborate with their intelligence and military.

So we do have all those problems. What can the US do about it? I think that there are several things to think about. Gil had mentioned the CHIPS Act before. A lot of people separate somewhat between semiconductors and 5G, which is amazing to me because try to build a 5G base station or a handset without a semiconductor, you can't. And so we lean in and connect those two and we say, "Okay, US still has leadership in semiconductors." This is actually an industry which in certain metrics we are still by far the leaders in the world. So connect the two and say, "Well, we're going to hit it out of the park in terms of all of the components that are necessary to build 5G, 6G telecommunications, right? Analog, mix signal devices, radio front ends, group three-five semiconductors. Those are areas that we should really be focused on. So coupling the CHIPS Bill to the 5G strategy is going to be very important.

The other area where we have significant strength is actually in software, right? A lot of people forget also that 5G has a whole software layer and software component. And so you really need to think about the telecommunications stack, which goes hardware all the way to software. And
we have tremendous strength in software. And so the challenge here becomes how do we partner with our tech industry, which there are problems with the tech industry, they have grown very big, they're very powerful. There's all sorts of questions about how do we reign in that type of capability?

But rather than potentially repeating the type of, I would say somewhat mistakes regarding antitrust, right? Which then led to the breakup of US technology companies that had the scale to actually compete with Chinese giants. Let's figure out how do we create better collaboration between the government and our big tech sector to actually lead in the software layer. And then ultimately, that trickles back down into the hardware because the two are very coupled together.

And then finally what I'd say, which is very important, which again I think has to come as collaboration between the US government, US industry, and then the governments and industries of our allied nations is engagement in 5G standards development. Standards development is very important in the telecommunications world. That's where basically a global standard is determined for which technologies are used and how they're going to be deployed. China has weaponized this process so that standards favorably select for Chinese technology, Chinese solutions. And ultimately these standards in technology represent our values, right? Will we have open networks? Will we have networks that value privacy? Will we have networks that are actually promoting of democratic societies or they going to be autocratic and actually support a digital autocracy? That's what's at stake with standards? And so we have to lean heavily into that. So I think those three things are very important for us. Yeah.

Brian Fitzpatrick:

We are at our Q & A time. But I do want to get one last question in for you, Dr. Duesterberg about the World Trade Organization. One of the criticisms of NATO is that one country can block any action and hypothetically, if Putin were able to flip one nation, it would essentially neuter Article Five. You've talked about the paralysis of the WTO, mainly because China has blocked any changes. Can the WTO be improved, changed? Should China remain in? Can they be removed if we wanted them out?

Tom Duesterberg:

Well, the problem with the WTO is, unfortunately, runs a little bit deeper than just China. China can and does block any efforts that reform. But there are other nations that are recalcitrant in trying to, for instance, improve the rules that apply to agricultural subsidies or industrial subsidies for that matter. So the organization as exists now, which does has this one country veto, power is essentially powerless. And I think what we need to think about going forward is using what's left of the World Trade Organization to do things like adjudicate tariff disputes. We're not going to be able to improve it so that it covers the mercantilism of China.

So what we need to think about is some parallel form of trade agreements amongst like-minded countries that exclude China because China has not ever and will not ever, at least under the current trajectory, be willing to live up to the promises they made when they joined the World
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Trade Organization. So we need to develop a parallel structure. There have been various ideas floated over time. Reagan had a Reagan free-trade zone. Their idea is in Asia wide trade agreement. I'm a proponent of what's called CPTPP now, the successor to the Trans-Pacific Partnership. I think we ought to join that, but there may be more creative ideas even than that, maybe sectoral agreements. But clearly, China is not going to be a part of this and we ought to try to work around them. We can't kick them out of the WTO. That's technically impossible. So we have to work around it.

Brian Fitzpatrick:
So we have some time built in for questions. And we'll start right here. Yes sir.

Pat Malloy:
Congressman, Thank you very much. My name is Pat Malloy. I was 15 years up on the staff of the US Senate Banking Committee and then I was tenured on the commissioner on the US-China Economic and Security Review Commission, which is a think tank for the Congress on these Chinese issues.

So when we put CFIUS into law in the 88 Trade Bill, we put the exchange rate provisions. And then we saw the way China incentivize our corporations with the forced technology transfer to transfer technology jobs out of this country there. But there's an issue that's not being discussed, I think, very important one. When I was on the staff at the Senate Banking Committee, I saw our movement from stakeholder capitalism where the corporations had, even on the business round table website, they'd say they had a responsibility to their customers, to their communities, to their workers, and to their shareholders. By '91, they had up on their website, their only responsibility is to their shareholders. Other countries saw this and offered them incentives to enrich their shareholders and their own compensation got tied to their ability to do so. That's when the CEO compensation went to 30 times the average worker to 400 times. That's an issue that we have to focus on in this country, the behavior of our own corporations and how to bring them back as part of our national interest, not just making money for a group of shareholders.

Brian Fitzpatrick:
And what is the best way to do that? Because I think you're right. The question is how do we do it?

Pat Malloy:
Well, one way you really have to look at the corporate governance charters, and I know that many people won't like this, but some people say if you have a billion dollar corporation, you
should have a federal charter rather than a Delaware charter that would give workers the right to be on corporate boards that you would put other people on corporate board to have a different interest than just enriching shareholders. Another way would be to give a tax incentive. If corporations make their products in the United States, they get a low tax rate if they want to make them in China and import them to the United States, they have a higher tax rate. But this is an issue that we do, in my view, have to do a lot of thinking about because I think it's a very important one. And I think Gil and Tom both mentioned that the Chinese corporations, they work for the Chinese Communist Party and our corporations can be very influenced by Chinese investment coming into this country. So I think that's a huge issue and I hope we'll think a lot more about it in this country.

Nadia Schadlow:

I think that's a great question. And it was something that we didn't talk enough about, the private sector role, especially when looking for instance, at 2017, 2018, when there were over a dozen deals by US investment firms into the Chinese semiconductor industry, right? This is the period when we're discussing this as a huge problem. The Wall Street Journal had a great article on that about a year ago, and it's worth looking at. Right now, I think as many of you know who's following what's happening on the Hill, there are different approaches to this. Some of them are punitive, right? We're going to forbid you from investing outward capital in key sectors in China.

Pat Malloy:
The Casey-Cornyn Bill?

Nadia Schadlow:

Right.

Pat Malloy:

Yeah.

Nadia Schadlow:

Exactly. There's a new executive order on CFIUS expanding it to say we're going to look at CFIUS now in terms of supply chain issues. So if there's a single note of failure, for instance, we're going to prevent and we will prevent a buyout of a particular company by China. A good example of that is the German case of KUKA, which is a very important flexible manufacturing
firm. China bought it, promised to keep everything as is, nevermind that the problematic fact that China bought this really important company, but now they've actually just fired the CEO, reduced the staff, and did all the things they said they weren't going to do.

**Edlyn Levine:**

But there's also, I think the key ... Other part of this is to have US firms, how do you create incentives so that they themselves are thinking twice, right, before making those investments into China semiconductor industry? Before thinking about the sale of one of their companies that produces a really important product in some of these next generation areas by a Chinese company? So, I think there's the public private part of this, but there's also just understanding the thinking of the private sector in that domain. I don't know if my fellow panelists have other thoughts.

**Pat Malloy:**

Gil has a manufacturing unit out at the Indiana University that is looking at these issues as part of what they're doing at Indiana University of Manufacturing.

**Brian Fitzpatrick:**

Question at the back there.

**Chris Paludi:**

Hi. I'm Chris. I work at AI on the Defensive Taiwan Project and I'm a Political Studies alumnus only one person. So when we look at nearshoring versus onshoring, and we look at our partners who are in the Pacific like in NAFTA for example, and a biggest reason why China is able to do so much is because they have so much cheap labor and we don't have that in this country. In fact, with inflation, wages are going to rise pretty fast. How likely is it that we're actually going to be able to onshore things versus move industries to India, so Mexico? When we think about onshoring, what do you view as more likely near or on for the industries you're talking about? For example, are we really going to produce things in a state in the United States or are we going to produce them in Mexico and is it good enough to produce them in Mexico? So it's a two-tiered question. Are we going to produce them in America or in a partner state and it's producing them in a partner state actually good enough.
Gilbert Kaplan:

I think that's a very good question. The number one problem US manufacturers have is they don't have enough workers. There's endemically about a million unfilled manufacturing jobs in the United States. And if you talk to CEOs, they're concerned about a lot of things. Their biggest concern is, I can't get people to do the work because they don't want to come in here and work or we don't, they're just not available. We proposed at Indiana, what I call immigration manufacturing visa. There are many people coming in on the southern border and elsewhere who want to come here and work, millions, and we have consistently a million unfilled manufacturing jobs here. We've proposed and written legislation for the Congress to consider a manufacturing immigration visa. And I think it really would help.

Gilbert Kaplan:

In terms of your question, whether we want onshoring or nearshoring, I think my view is, we would like onshoring of all these industries. It may not always be feasible. We would like to have industries in countries where we have free trade agreements, or at least we're aligned with such as Mexico. That's a lot better than having these industries in China where products can be cut off or national security implications of them building up technology that we don't have. So it's best to have onshoring, but if that won't work, nearshoring, and now there's something called allied-shoring. There are a variety of different shorings, but we don't want what's sometime called enemy-shoring. We want to be either in NAFTA with our free trade partners or other allies or in the United States.

Tom Duesterberg:

I can just add a brief comment. On this question of cheap labor, I think that's less and less important. When I was running the Manufacturers Alliance 15 years ago, we did a series of studies to try and quantify the cost differential between producing very specific things like chemicals in China, India, and the United States. And we found even back then that if you properly account for the political risk and the transportation costs of producing outside of the country, and this has been reinforced by COVID, by cutoffs of medical equipment during COVID, by shutdowns of the auto industry, by Chinese cutoff of rare earths, various other matters. So what we, I think need to do amongst other things is to encourage business to take fuller account into the full lifetime costs of producing in China or another so-called low cost country. And the certainty that you get by producing in the United States or close allies, let's put it that way.

Nadia Schadlow:

I think Tom's point about risk is really important. Look at DiDi, look at Tencent, look at Alibaba, look at the risks than investors.
Edlyn Levine:

I want to come down hard though on actually competing for manufacturing talent and labor here, actually really hard. Nearshoring, ally-shoring is great, but I think that we should be open for business. We should make sure that the United States is born on one of the most economically competitive places to manufacture. I think this is particularly true for whatever you want to determine as strategic industries, right? High tech industries, let's pick the semiconductor industry as a point, right? You cannot decouple the manufacturing process from the cutting-edge research and development process. Those two are intimately linked.

Nadia Schadlow:

And if you don't own the manufacturing, then you don't own the technology development. You don't own the cutting edge. And so for the United States, there's certain industries where that's not necessarily true. Certain types of lower end manufacturing might still be critical, but we don't necessarily need to own it. But for certain strategic industries, I a hundred percent come down on, has to be manufactured in the United States and we should build up the policies, cut down the regulatory regimes, build up the trade policies, build up the economic policies to put in favor actually attracting that industry.

Edlyn Levine:

One thing, for example, I did my graduate work in Cambridge, I had a friend, well, actually a very dear friend who went to work at ASML, right? Which for those of you who know, produces UV lithography machines for the semiconductor industry. The Dutch government gave him a 30% tax reduction compared to his fellow high-tech workers in the Netherlands. So as a high-tech immigrant to the Netherlands, he was paying 30% less taxes because they wanted his talent, right? So, if we think about it, you can change the economics associated to how much does the labor cost in this country? Let's change it. Let's change different knobs associated with how we actually make this feasible and let's compete for that manufacturing. Let's do it here a hundred percent.

Brian Fitzpatrick:

Sir.

John Walters:

First of all, I want to thank both congressmen for doing this because I think we have drifted away from talking to the American people about the key issues of our country. And as a result, not only critical changes that need to be made are difficult to fill and form a consensus for, but also we are not prepared for the mega change it seems to me that you're seeing here, which is, from a time where we thought trade and interdependence of countries was going to cause
peace and going to cause greater prosperity to a place where that interdependence is now being weaponized and used against us and we have to sort out how we're going to protect it.

I can't resist asking this panel and those assembled here about the other side of this. We've talked a lot about, we haven't been defending things we rely on and they're now being made vulnerable and they're even being turned as weapons against us. How much should we think about the offense here? How much should we be thinking about how much could be done by looking at the vulnerabilities of our adversaries and beginning to look at holding their vulnerabilities as a way of both deterring them and potentially weakening them should things become more dangerous, or conflict arise here? Do you think that can't be done in this environment or do you think that is a useful path given the circumstances we're in?

Tom Duesterberg:

I'll take a first shot at that and let's think about China because that's the most important competitor and the country that is systematically working to become dominant in many of the manufacturing technologies about other communications technologies as well. China is dependent on us for a lot of their technology. We talked about 5G, but they, even Huawei, which is dominant in 5G, depends on US designed and Taiwanese built chips. So we demonstrated by cutting off access to that, that we can do serious harm to Huawei. Their mobile phone sales dropped by a third last year because they didn't have access to the highest level of semiconductors. But that vulnerability can be exploited.

China is, I think, not across the board, but in many, many areas, is dependent on companies like ASML, we can't build semiconductors without Dutch equipment. They can't build semiconductors without US designs, they can't build commercial aviation, they can't build successful airplanes without avionics materials, process technology that they get from Europe and the United States. So if we want to apply pressure, which I for one think we should, there are pressure points against China that we could use and we ought to be thinking more aggressively about doing that.

Nadia Schadlow:

I think, John, your question is really fundamentally about economic state craft. So to Tom's point, we don't have a sophisticated operational level economic state craft strategy in the United States. When we say the term, people often think sanctions, but that's not that at all, right? It's a sense of mapping of our strengths and weaknesses and vulnerabilities and adversaries and competitors, strengths, weaknesses, vulnerabilities, just in the way the military and the defense department does their planning at the operational level to look at asymmetries and opportunities. We don't have that. I personally don't think it's not something the Department of Commerce could do. I think it's something you'd have to really think about the different inputs that you would need into it. We certainly would need more information, different kinds of information to do it effectively. But it's something that at the very least, should be on someone's shelf and we're far from having it there.
Gilbert Kaplan:
Go ahead.

Edlyn Levine:
Yeah. One thing that I want to say is that you do need to be very careful with the application of these types of gated access. I would say to US technologies, if you look at the response of China to the entities list and potentially shutting down ZTE overnight by preventing access to US technology and US IP. That has really poked the dragon awake and now China is dedicated in really building out its end-to-end whole supply chain for semiconductors. And basically, it's not an economically efficient means for them to do it. They're pumping a lot of money in a non-efficient way into their economy to basically duplicate capabilities that exist elsewhere in the world. But they do it because they see it as such a strategic imperative. And Nadia, to your point, if you then evaluate as a function of time, how dependent is China on US technologies? You're going to see that because they realized, hey, our dependency is a strategic weakness and we're going to plow money into this and plow technology development into this, we're going to end up decreasing our dependency on US technology over time. And that happens systematically.

And so what I always say is, you have to be very careful with what I would call weaponizing access to US technology. And in fact, you have to see that US technology companies themselves end up getting hurt and our innovation ecosystem can potentially be hurt by that. So think about, for example, what happened historically when we implemented the export control laws. First export control, I believe in 1979, 1980 to 1990 saw a decrease in the market share for US semiconductor capital equipment manufacturers from 90% of the global market to 50% because we became the vendor of last resort. Because suddenly, you had to get seeming the arbitrary approvals to get access to US technology. And then as US technology market share decreases, our company market share decreases, we have then a diminishing capability to reinvest in research development and technology and product production and actually market entry.

And so the thing that I would say, again, getting into this concept of mapping dependency, we should be invested in creating what I would say dependencies. We want the world to use US technologies, we want the US companies and US capabilities to have the biggest market shares in the world. Unfortunately at this point, or fortunately, right? It's good when you think about global prosperity, China is a major component of the global economy. And so we have to be very careful with how and when we actually go on the offensive, and I would say it should be a weapon of last resort. It shouldn't be used willingly, I see this discussed. We should do this, this, this very careful.

Certain strategic technologies, very pointed strategic technologies, I think there could be a case for, but blanket prevention and access to US technology could hurt US industry in a major way. And we see that also by the way of the startup world, right, where actual startups are actually moving from the United States to anywhere from Canada, to Cayman Islands to China because they're trying to get rid of export controls. So it's not necessarily a good thing.
Gilbert Kaplan:

I'll just say very briefly, I think your question is an excellent one. And following on Edlyn's point about the consequences of doing certain things, the US government is remarkably bad at thinking two or three steps ahead. If we do this, then this might happen, then this might happen. I'm sure that happens more at the Pentagon than in the non-military agencies. But one problem is, the export controls in CFIUS in both those areas, those controls are based on national security, not economic security. So I've been in many discussions about whether we should cut off certain access to technology because it's really going to hurt us in the long run in keeping a strong economy. Because if you can't show nexus to national security, those laws cannot be applied. We ought to maybe think about that and I think change the laws.

But Edlyn is right on the importance of selling to China, the largest semiconductor market in the world by far is China. So if we were going to say we're going to cut off the semiconductor exports or sales from the US to China, that's going to be very bad for our incredible semiconductor companies. So you do have to look at the whole picture here.

Edlyn Levine:

And maybe one more nuance to add balance between those two, it's important when you think about export control, to think about appropriability, which is US companies and actually global companies are operating in a weak appropriability regime when it comes to China. China will steal your technology and run with it. And so having trade secrets doesn't really matter when it comes to operating there. And so when it comes to these types of technologies, if you have a technology which is easy to copy, right, you have low differentiability, if you then export control and don't let US makers of that technology access the Chinese market, they're going to copy it very quickly and ramp, right?

But another technology like UV, that tool is very difficult to copy, very difficult. So there you might say, if you actually were to put X, and we do, right? We actually export control that technology, they don't have a very easy means to copy it that quickly. It's not to say they can't do it eventually, right? It is a technology; it's demonstrated as proven engineering. It's possible eventually to reverse engineer and copy these sorts of things. But it is a low appropriability regime. And so therefore, we have to be very careful with that when we think about ... And I think those are nuances and overlays when you think about applying these types of laws to think about, "Is this technology easy to copy?" If so, if we were to export control it, next day it'll be gone. Literally.

Brian Fitzpatrick:

So we are actually 10 minutes over and I actually need to get to my intelligence committee hearing, which is really important. But John, thank you so much for hosting us. To our panelists, I'm actually going to reserve some time tomorrow my schedule to go back and re-watch this and take notes because you've all shared some really, really interesting points. It really begs the question why we don't have a tighter relationship between the policy experts and the policy
makers. Because I'm just thinking of all these legislative ideas as you're saying this and I just want you to know, we welcome that.

We want you to be very, very engaged with our committee, with my Problem Solvers Caucus, with anybody that can help. Because to end where I started, we live in the greatest country that God has ever created. The country that's done better for more people, more nations than any other has, than any other nation ever will. But we got our competitors that are trying to overtake us and I think we really need to implement a lot of these things into policy if we're going to maintain our amazing country. So thanks for having us. Appreciate it.