

THE BROOKINGS INSTITUTION
WEBINAR

TAIWAN'S ROLE IN GLOBAL SUPPLY CHAINS

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Welcome:

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Keynote Address:

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Minister without portfolio, Executive Yuan, Taiwan

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Chen-Fu and Cecilia Yen Koo Chair in Taiwan Studies
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Discussion:

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P R O C E E D I N G S

MS. MALONEY: Good morning to those of you in the Washington area, and good afternoon, and good evening to those who may be tuning in from other parts of the globe. I'm Suzanne Maloney, vice president and director of Foreign Policy at The Brookings Institution, and I want to thank you very much for joining us for today's webinar on "Taiwan's role in global supply chains."

Global crises, such as the COVID-19 pandemic and Russia's invasion of Ukraine, have impacted global supply chains and underscored the importance of supply chain resilience for economies throughout the world who had to navigate extended supply chain disruptions in recent years. In response, the U.S. Government has prioritized supply chain issues as a key element of our economic and national security. And just last week, President Biden highlighted supply chain issues in his first State of the Union Address. Given Taiwan's role in global value chains, supply chain security is increasingly becoming a central feature of U.S.-Taiwan policy coordination.

That is why I'm so pleased we're joined by the participants in this webinar who are keen experts in this field to discuss U.S.-Taiwan cooperation, and provide insight on strengthening supply chain security. Our webinar this morning will begin with opening remarks from our esteemed guest, Taiwan Minister without Portfolio John Deng. Minister Deng will deliver keynote remarks, and then be joined in discussion with the Chen-Fu and Cecilia Yen Koo chair in Taiwan Studies at Brookings, Ryan Hass.

Following the keynote address and conversation with Minister Deng, Ryan Hass will moderate an expert panel discussion featuring Mireya Solis, who is the director of the Center for East Asia Policy Studies, and holder of the Philip Knight Chair in Japan Studies, and a senior fellow here at Brookings; Jason Hsu, a senior research fellow at the Ash Center for Democratic Governance and Innovation at the Harvard Kennedy School; and

Peter Cleveland, who is the vice president of Global Policy for Taiwan Semiconductor Manufacturing Company. The panel will conclude with audience questions and answers.

A quick reminder to say that we're live and on the record here today. If viewers would like to submit questions, please do so via email to events@brookings.edu or via Twitter at #Taiwan.

Before I hand the program over to Minister Deng, let me say -- take just a few moments to say a few more words about him. Minister Deng has had a distinguished career serving the people of Taiwan. He was minister of Economic Affairs from 2014 to 2016, where he prioritized bolstering Taiwan's global economic competitiveness. From 2016 until today, he has served as minister without portfolio where he has played an absolutely critical role in strengthening U.S.-Taiwan economic coordination. Minister Deng, thank you so much for being here with us today, and the floor is now yours.

MR. DENG: Thank you very much, Suzanne. And good morning, Ryan, Mireya, Mr. Hsu, our friend from Taiwan, and Peter, Mr. Cleveland, nice to see you. Thank you very much for Brookings to invite me to attend this very important seminar. And I will make a few comments, then I believe I will have some discussion, but Ryan will host our discussion later. So, Suzanne is very kind to make very generous remarks about myself, so thank you very much for that.

I would like to make some points here before my discussion with Ryan starts. Despite this pandemic, Taiwan's economy performed quite well for the last two years. In 2020, Taiwan's growth -- economic growth rate is 3.3. In 2021, our growth is 6.4 percent. The forecast of 2022 for Taiwan's economic growth is 4.4. So, this is a very, I'll say, quite outstanding performance among the -- this region. So, I'm not a member -- I would like to mention here, I myself was quite surprised that our export in 2021, compared to 2020, we increased US\$100 billion. Our import also increased roughly the same, 100 billion.

I remember when I was young -- as a young government official, I remember it took us years for our export to reach 100 billion -- first 100 billion. Now, in one year.

The main reason for this economic growth and the increase of both import and export mainly derived from our investment. The investment in 2020 was about US\$163 billion. In 2021, it's roughly 200 billion. So, it's about 350 billion in two years for our investment. So, these are mainly investment-driven growth. And on those investment, 58 billion are returning investment from China back to Taiwan. So, I will elaborate a little bit what kind of factors this returning investment from China back to Taiwan contribute to our economy.

And another number I would like to point -- there's no more number. This is the number I will -- the last number I will give you. Our outward investment from Taiwan to our neighboring country in 2020 and 2021 is about US\$10 billion. So, large inflow also a very significant portion goes to our neighbor countries, including Vietnam, Indonesia, Philippines, Malaysia, Thailand.

As to today's topic on the supply chain, I will -- Peter, of course, knows everything about TSMC, so I will let Peter address TSMC's achievement later. But I'll just mention here that our semiconductor production outputs occupy about 60 percent of the world market. And another thing is the printed circuit board. This is one of the basic components for everything we are using on a daily basis that Taiwan pretty much occupy half of the world production. We call it printing circuit board. And networking equipment also occupies a very large portion of the world production. And my colleague gave me those companies, Qualcomm, Wistron, Foxconn, MiTAC. Those are the companies. They mainly move their production back from China to Taiwan.

The advantage why -- the advantages that we have to cultivate this strong foundation on the supply chain we contribute -- we attribute to several factors. One is the

cluster -- complete cluster -- a complete, equal chain ecosystem for our ICT industries. So, this -- from the upstream to midstream to downstream, this is a complete ecosystem of that industry.

And the second factor, of course, is the talents that we can cultivate. You probably also know that Taiwan relaxed very, very large extent to attract the inflow of the foreign talents to Taiwan. Our education system was able to attract many students from Southeast Asia. And some of them, of course, they choose to work in Taiwan after their graduation. And we also developed some programs for the work and study program for those students. So, these all add up. We also have this fighting for the talents, but basically we have a rather large number of talents in Taiwan. And of course, this -- seeing the demand of the future, we invest a very large budget on the education now. So, you probably will read some reports that many outstanding universities now have semiconductor programs for the need of the future. And also, our ICT industry is very flexible. They have great execution ability to meet clients' need. I think those are the advantages we have.

The fourth [third] point that I would like to mention here is Taiwan is a safe and reliable partner. Taiwan never coerce any other countries with economic means. And we actively maintain the supply chain security. Our business community, our industries, they believe they have to grow with their clients. They have to grow with their customers. And the government and as well as the whole society recognize we need -- because of our economy, foundation must be there on the strong world economic order, not based on market economy. Therefore, we must play a role as a safe, reliable partner. We need this kind of world economic order.

The third [fourth] point on this topic is our system is transparent. We are a very open and very democratic, stable society, and we protect intellectual property rights. So, that's why we can be a very safe, reliable supply chain partner for our treaty partners.

Fifth point that I would like to mention here is Taiwan is very willing to support U.S.-Indo-Pacific economic framework. We would like to participate in this framework. And we believe our participation will further strengthen this framework. We understand that the U.S. Government probably soon will announce the detail of this framework, and we believe those topics mentioned now by various source, [which] include trade, supply chain resilience, clean energy, taxation, anti-corruption. Those are the topics of this -- probably will be covered in this framework. And we think from every topic we can contribute to U.S. course. We invest large amount on clean energy. We invest very large on the -- this trade -- fair trade. So, on this, I would like to urge U.S. Government. And I hope that all the audience participating in this seminar today can help us convey this message to U.S. Government, Taiwan would like to be a full member of this framework.

Last point, the supply chain cooperation between United States and Taiwan is vital to the economic security of both sides. We understand that we cannot produce everything. We understand that many of our technologies, many of our materials, components are coming from United States. We also understand we import many foods from United States, wheat, soybeans, corn. So, we lead a very reliable supply chain partners with the United States. And of course, we believe U.S. needs Taiwan. From the supply chain report released by U.S. Government on the -- on -- recently, you can see that those reports are excellent reports. They point out many -- they provide many, many information. There the reports itself indicate that Taiwan occupies important role on certain sectors. And of course, we face China that always exercise this coercion on some materials, rare earth, for instance. So, these are the challenges we are faced. Earlier when this pandemic occurred, we all have the trouble to get mask. So, okay, we know where the problem is.

So, to conclude my remark, I want to thank the Brookings again one more

time. And I believe that the cooperation between U.S. and Taiwan on the supply chain is very, very important to each other. And I think the government of Taiwan here is willing to work with U.S. on this issue. So, I will stop here, and then give Ryan -- to ask -- to host the following discussion.

MR. HASS: Well, Minister Deng, thank you so much for such clear and important thoughts. You're held in extremely high regard in Washington, so it's an honor for us to host you here on the virtual stage at Brookings. Your comments were very clear on the value proposition that Taiwan provides, the important contribution that Taiwan is available to make to the Indo-Pacific economic framework, as well as the mutual benefit that United States and Taiwan enjoy from deeply integrated value chains.

One issue that's on a lot of people's minds in Washington right now, and I just love to hear your thoughts on it, is Ukraine. We're all watching the tragedy unfolding in Ukraine. How do you see what's happening there impacting Taiwan's economic interest?

MR. DENG: We think that, of course, we -- government's position on this Ukraine is clear. We oppose any invasion to other countries. And, of course, this cause the world economy challenges. I mean, we see oil price. We see many materials prices going up. We hope that this -- we certainly are on the side of the Ukraine. We try to do our best, to do our most to help those people who suffer because of this invasion. And on the supply chain, so far, I think that most significant impact to Taiwan is this -- the increase of the -- increase on certain materials. So, we see this scale moving up. This is quite -- but our trade with Russia is not that -- our import from them, except very few items, is not really large. So, we hope -- but anyway, we think this invasion shall stop. That we hope that the people can go back to their normal life as soon as possible.

MR. HASS: When I had the chance to work alongside you in government previously, supply chain issues were pretty specialized topic. Now, they're sort of a central

feature of the U.S.-Taiwan economic relationship. So, can you help our viewers understand, why is this such a central piece of the U.S.-Taiwan relationship now? And what is it that the United States and Taiwan are hoping to advance through the prioritization on supply chains?

MR. DENG: I'll attribute several factors. One is they're facing the threat from China. China has been using subsidies, a fair-trade practice, and measures against WTO rules to make this -- to make its economic power rise practically in recent years. And China's political and then military ambition also led the world to understand that they pose a threat to the world order. That's one factor.

Another factor is the COVID-19 pandemic highlights the vulnerability of global supply chain. Of course, production was disrupted. Food shortage happened. And also because of the disruption of supply chain, it's caused unnecessary stockpiling, which leads to more serious supply chain problems. The breakdown of this supply chain also leads to serious port congestions, also container shortage.

We see all these happen one after the other. So, we face some challenges, and the U.S. need to trust the supply chain. Taiwan is a reliable and stable partner politically and economically. So, we have needs to each other. I think our goal is that Taiwan and U.S. should establish a comprehensive, multi-level, and focused bilateral relations, so that both sides can minimize the possible risk of the future crisis. We should deepen our engagement on the supply chain. So, I'm glad that -- as Ryan mentioned that this becomes a very important topic between our two governments.

MR. HASS: Minister Deng, I have so many more questions I would love to ask you, but I promised your team that I will let you return to the important work that you have on your plate. So, we will leave our discussion here for now, but I hope that we can continue it in the future. Thank you so much for sharing your insights.

MR. DENG: Thank you, Ryan. Nice to see you all. I wish you all the best.

MR. HASS: Thank you.

MR. CLEVELAND: Thank you.

MR. HSU: Thank you.

MR. HASS: It's now my honor to welcome to the virtual stage three distinguished experts who will help us deepen our understanding of the critical role that Taiwan plays in global supply chains, and also try to stimulate our thinking about what more could be done to strengthen U.S.-Taiwan coordination on supply chain resilience. Each of these experts brings a different vantage to this discussion. One is a leading expert on regional economic and supply chain issues. Another is a leading thinker on Taiwan's role in global value chains. And another is working at the frontlines of the world's leading semiconductor foundry, Taiwan Semiconductor Manufacturing Company, also known as TSMC.

So, let me just briefly introduce the three of these renowned experts, and then we'll dive right into the discussion. Mireya Solis is the director of the Center for East Asia Policy Studies at Brookings. She is an expert on Japanese foreign economic policy, U.S.-Japan relations, international trade policy, as well as in the Asia-Pacific economic integration. She also is the author most recently of *Dilemmas of a Trading Nation: Japan and the United States in the Evolving Asia-Pacific Order*. Consistent with Brookings' longstanding tradition, she will exercise scholar independence. She will provide her own insights and perspectives on all the questions I will pose to her and will not represent any institutional views.

Jason Chu is a senior fellow at the Harvard Kennedy School. His research focuses on semiconductor supply chain resilience and geopolitics. From 2016 to 2020, Jason was a legislator in Taiwan's Legislative Yuan overseeing technology, policy, development, entrepreneurship, and innovation. He introduced a host of important

legislation, including FinTech Regulatory Sandbox Act, the Autonomous Vehicles Management Act, the Artificial Intelligence Development Act, and the Digital Economy Principle Act. So, he's really been at the cutting edge of thinking through policy and regulatory issues related to everything that we're going to discuss.

And Peter Cleveland is the vice president of Global Government Affairs at TSMC, where he directs policy, legislative, legal, regulatory, and standard matters. Previously, he was vice president and deputy general counsel at Intel Corporation. He also has had important roles on Capitol Hill. He focuses now on driving tech industry consensus on policy towards China, immigration reform, intellectual property protection, international trade, and export controls. I also should note that TSMC provides institutional support to the Brookings Institution.

So, for our discussion today, our plan is first to ask our panelists to help us situate the current moment that we find ourselves in and why supply chain issues have become so central to the nature of the U.S.-Taiwan relationship. And then from there, I'll try to take us from a macro to a micro perspective to understand how supply chains are functioning and where the United States and Taiwan might be able to do more together to strengthen supply chain security.

And as Suzanne mentioned at the outset, we will try to reserve some time at the end for audience questions and answers. So, if you have any questions you'd like to pose to these experts, please send us an email at events@brookings.edu or via Twitter at [#Taiwan](https://twitter.com/Taiwan).

So, with that as introduction, let's dive right in. I'd like to pose the first questions to Mireya and Jason. We'll start with Mireya. And it builds upon something that Minister Deng was talking about. As the crisis in Ukraine unfolds, what should we be watching for in terms of impacts on value chains?

MS. SOLIS: Thank you, Ryan. It's a pleasure to be with all of you. And let me then just jump right into this question. I think first I would note that we have one more exogenous shock to global supply chains that have been going -- you know, a tough time have been experiencing stress for a number of years. As you mentioned, Minister Deng mentioned some of these stressors. They have to do with the more stiff competition between China and the United States played out in the tech field. And we've seen the increased reliance on export controls and tech sanctions. Then, of course, the pandemic disruption. And now, the conflict in Europe because of Putin's war of aggression against Ukraine.

And I think that we're going to see different impacts. One, of course, the increased cost of oil is going to increase the price of transportation. But the one aspect that I would like to highlight, Ryan, is what we are witnessing in terms of in responding to Russia's aggression, the unprecedented degree of coordination on the export controls that target high tech. And there are a couple of elements here that really novel and that we should be trying to dissect and digest for what they mean going forward. It's not just that the sanctions are very broad, and they cover a number of areas such as chips, telecom, lasers, and sensors.

But to me, what's really striking is the degree of international coordination. So, it's not just the United States doing this. Many other countries have now imposed their own export controls. And this means that the sanctions themselves have now greater legitimacy. These means that the enforcement task is now undertaken by many other countries, not just the United States. And therefore, this means that there's going to be greater punch to these sanctions.

So, according to the White House, in looking at all these coordinated sanctions, they're about to cover close to half of all Russian imports of high tech. So, this is

a major blow to Russia. And what are then the repercussions? Well, obviously, Russia is going to try to find alternatives. And there's a lot of discussion about the going partnership between Russia and China.

But I don't think that China can really solve Russia's problem for two main reasons. One is that China's not yet capable to produce semiconductors at the cutting edge, the frontier, the most advanced ones. But also that I think that China is going to proceed carefully, and it's not going to sacrifice its own economic interests. And just yesterday, we heard from Commerce Secretary Raimondo that they're going to be watching how Chinese tech companies comply or not with these international sanctions, and that if they don't, they could then become the target of additional sanctions. So, again, this would be a huge economic cost to these firms. In terms of another repercussion I would mention, I think that this will then encourage China also to double down on its economic self-sufficiency efforts. This is not a departure, but really a continuation with greater impetus to do this.

And -- but I think that what's new here, if I were going to add a new element, is that I think that it's important to think about the demonstration effect from these internationally-coordinated sanctions. We have now here a remarkable example that if there is a transgression of another country's territory, there's the use of force to try to change the status quo that it's possible to have a collective response and impose punitive sanctions.

It's important, of course, to know that there are differences between what happens in Europe and the situation in the Indo-Pacific, and we should not just assume that one experience translates easily or completely into the other theater. But I do want to highlight that two weeks ago, we did not expect to see this kind of collective action, and therefore, it would be very important to think through what lessons is China drawing from what it's watching when it has been seen cannot be unseen. And I would just say that one element of recurrence is to complicate the calculus of the potential aggressor and what the

consequences would be. And again, that I think is happening. Of course, China has a much larger economy. It's much more integrated. It would be different where China to use force to change the status quo, but we have seen something that was not in the playbook two weeks ago, and I think that we should not lose sight of that. Thanks.

MR. HASS: Yeah. Thank you, Mireya. Those are very important points.
Jason?

MR. HSU: Yeah. Thank you, Ryan. And thank you, everyone. It's great to be here.

I think Mireya has covered most of the thoughts. But I just wanted to add a few more things from Taiwan's perspective. I think what we've seen in the war that's going on in Ukraine, I think it's impacting supply chain. You will have longer implications depending on how long the war will last and the duration and the scale of its impact. Right now, we've seen a lot of companies also comply with the sanctions that are imposed by the U.S. Government. And also, I think TSMC also announced that they'll also comply with sanction. And let's not forget that Taiwan and Mainland China still maintain a quite close trade relationship. And how much of that trade and also production used China as a middle ground and connecting Russia's export with China become the so-called proxy trade partner exporting Russia's materials or any sort of ingredients that are needed to use for the manufacturing of technology products, I think that's something that we must pay a strong attention. And also, one thing that I am studying very carefully is that whether or not Russia would retaliate of these sanctions imposed on them to the companies -- foreign companies that are operating within Russia. And as you may know, there are Taiwanese technology companies over the world. We have computer companies in Russia as well. I wonder if that would be affected as most recently Putin had issued a list of so-called unfriendly states. Taiwan is included in that state -- in that list.

So, there are a lot of hidden worries that I think given the -- as Mireya has described, the coordinated actions from the democratic governments around the world to impose sanctions. So, what would be that contingency plan of an -- at the event of Russia's retaliation of the global supply chain? I think that's something that must be really looked into, and whether or not Putin and Xi Jinping are having some sort of discussions in the background as to what are some of the plan Bs if these sanctions continue to escalate. And will China get even closer to Russia in becoming the so-called -- the close partners of Russia to help them with the export and everything, since the bigger picture is the U.S. and China tension, whether China will use this as the leverage against U.S.? And I think that remained to be seen. Yeah.

MR. HASS: Thank you, Jason. Peter, if it's all right, I'd love to get your thoughts on this issue as well. TSMC is the world's largest semiconductor contract company. What do you see as the main implications of this volatility for TSMC and for the semiconductor industry more broadly?

MR. CLEVELAND: Well, first, Ryan, thank you so much for inviting TSMC to the panel. Brookings is world class in its thought leadership, and it's a great, great honor for us to be able to join here.

Just a word or two about TSMC. We're a pure-play dedicated foundry, as you described, Ryan. And so, without getting into the weeds, we make the chips. We make those digital engines. We don't design them. We have 500 customers around the world that design the chips, the Googles, the Qualcomm's, the AMDs, the Nvidia's. Then we make that digital engine inside laptops, phones, cars, and so on. So, that's what we do. That's the segment that we're in.

A few weeks ago, the administration announced sanctions, export controls on Russia given the flagrant violation of the territorial integrity of Ukraine. And so, we have

customers in Russia, and then we have indirect customers that are shipping into Russia, and we're enforcing those sanctions. It's complex, but we have a robust compliance system to do so to make sure that our first-class silicon does not enter into the Russian marketplace. There are some details that permit some exports to go, and that's the nuance of how the White House is implementing this. But rule of law matters, and we are operating in accordance with those export controls.

So, a word or two maybe on the implications of all this volatility. At TSMC, we certainly are thinking along the lines of demand, maybe a little bit more uncertain from customers. But you know, we have a long train in terms of the silicon that we manufacture, and so that's an area of TBD in terms of our customers reacting to this, and then maybe inflationary pressure on consumers -- end user consumers may debilitate purchasing power a bit. But I thought the remarks that Minister Deng made about a stable, secure, consistent, reliable supply of chips from Taiwan through the supply chain continues. There's no threat. We produce billions and billions of chips annually with the biggest player, and so we're comfortable in terms of the resiliency and the security of that supply chain presently and going forward.

The final point I'm going to make, Ryan, is we're not geostrategic experts, geopolitical experts. We defer to people like you. We watch, and we listen. We're -- we watch, listen, and value what experts think. There are many of them on these broader questions. You're a good example of that, Richard Bush, Shelley Rigger, Oriana Mastro. We're a semiconductor company. We're not a geostrategic firm. And so, we keep our head down, and we're careful, and we're cautious in assessing the landscape.

MR. HASS: Well, thank you for those comments. And I'm flattered by your references to me alongside some of the other impressive colleagues.

If it's possible, I'd like to sort of pick up where Peter left off, and let's talk a

little bit about the geostrategic and regional issues at play here. And Mireya, I'd love to bring you in for your thoughts. Asia's regional economy is evolving as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, CPTPP, and the Regional Economic Comprehensive Partnership, RCEP, come into force. There's a digital trade agreement that is moving forward, so there's a lot of pieces that are moving around here. How is that reorienting regional value chains? And what implications might it have for Taiwan's role in it?

MS. SOLIS: Thank you, Ryan. Yes, and those are really important developments. The economic architecture is coming together. The CPTPP and RCEP are very large trade agreements. There are differences amongst them, not only in terms of membership. There are some countries that are participating in both, but the differences have to do with the degree of liberalization, how much will they cut tariffs, but also on the depth of the rulebook. But in one very important way, Ryan, they do share a mission, and that is to promote trade and investment flows. These are about integration. They see the benefit of -- again, predictability is key here. They see the benefit of bringing together these economies closer. And they do this by trying to enhance the operation of the supply chains, because Asia has used this mode of production to really raise its income levels to become a wealthier region. So, we're going to see the consequence of this. We're going to see larger flows of intra-Asian integration. And it's important to know that China is a member of RCEP, and RCEP has very lenient rules of origin that will facilitate the operation of supply chain, and therefore it's not a story of decoupling by any means.

Now, another important consideration here, Ryan, is that neither the United States nor Taiwan are members of these two important trade agreements. And therefore, I think that they face the risk of missing the train, being left behind, and they will not be able to benefit from the tariff preferences. They will not be able to influence the rules as they will,

because these are leading agreements. Once you're in, you have a say. You can say on who comes next into the grouping, and you can say how we go about adjusting the rule. So, it's a loss to not be there.

I don't sense any desire or political will from the Biden administration to join the CPTPP. They're moving instead with the Indo-Pacific economic framework. But in contrast, I do sense a very strong desire from Taiwan to join the CPTPP. And I would also note that President Tsai has undertaken some really courageous steps including some of the obstacles to make this happen. For example, the recent elimination of the ban on imports from Fukushima. That was an irritant that has now been taken care of. Now, China is also seeking entry into the CPTPP and has shown openly its displeasure about Taiwan's application. And this means that the current members of the CPTPP have a very difficult situation in the -- as they entertain debates both from China and Taiwan. And how to handle this obviously is critical.

My own view is that when you're faced with such a choice, you go back to foundations, and you make sure that the mission of the CPTPP, what it stands for, is not lost in the process of admitting new members. And these would, therefore, could be subsumed on their -- the way I would frame this is that, you know, it should be that aspiring economies have a demonstrated ability and will to live by the standards -- the high standards of the CPTPP.

And in closing my comment, Ryan, and we can go into the Indo-Pacific economic framework, what we know at this point, I think that should be the message that the Biden administration uses in deciding who joins or not that -- and, you know, I think that we heard some strong desire from Minister Deng about Taiwan's membership. And I think that inclusivity is important, and certainly their willingness to abide by high standards.

MR. HASS: Thank you, Mireya. We will try to come back to that if we have

time, because it's an important point.

But I want to turn to Jason now to help us provide a Taiwan level perspective on a few really critical questions. The first is this concept of a silicon shield. This idea that because Taiwan is such a critical producer of semiconductors that it has produced a silicon shield that protects it. How do you think about the role that Taiwan, central role, in global supply chain gives it in terms of leverage on the world stage? And how should Taiwan use that leverage? For what purpose?

MR. HSU: Absolutely. I think this is a critical moment of a critical industry in the world as, Ryan, rightfully pointed out that the so-called silicon shield is actually silicon wafer or the entire semiconductor supply chain that was so successfully being the kind of the hallmark of Taiwan's past economic development over the last three decades. And it has been a fruit of a close U.S. and Taiwan collaborations. A lot of engineers returned from the U.S. studying their Ph.D. in the early 1970s, and then built the semiconductor industry and the science park. And over the last three decades, we've seen the technology advancements, and now we are really at a point of convergence of software and hardware. And Taiwan is the most ideal place and the best place to integrate such an important convergence. And really, if you look at the semiconductor ecosystem, it's not just wafer. You have IC design. You have packaging. You have testing. And you have a bunch of other things that are coming out of this wafer production that Taiwan excels at. So, it's very important to think of the semiconductors supply chain as one ecosystem.

And how do we make sure that this ecosystem is secure and resilient and sustainable? If you look at the competition between U.S. and China, it's really -- they are competing for tech supremacy. And China has the ambition of Made in China 2025, and they are accelerating down from semiconductor investments and technology and as well as big data and AI. And it's very important to understand that this integration is happening, and

it's happening so fast that we might not even see it and that it was right in front of us already.

So, back to Taiwan. You know, it's important to understand that what we are seeing right now is a very important component that is being used as the most important component for all industries across the board. So, how do we make sure that this industry is secure and resilient and sustainable? There are three important parts. One is talent pipeline. It's important to understand there will be a huge talent shortage in the years to come in the semiconductor industry, in its application, and its R&D. So, how will U.S. and Taiwan work closely to build a stronger talent ecosystem and to train the talent pipeline to be able to connect the top R&D that is so good in the U.S., and also the precision of manufacturing delivery that Taiwan has excelled at over the last 30 years?

And secondly, how do we ensure that we continue to reinvest into the technology? TSMC is what it is today, because they invest so much in their R&D to make sure they are to stay ahead of the game. And they are -- they continue to develop the cutting-edge chips. So, how do we ensure that?

And thirdly, how do we make sure that the transition is smooth, and also it benefits to the entire ecosystem? Right now, I want to say there's a lot of focus on the wafer, a lot of workers on the microchips, but there's -- that needs to be looked at in a broader sense in terms of ecosystem perspective. It needs to be the wafer and IC design and packaging, everything integrated as the total policy framework.

So, how do we look at that when U.S. is thinking about coming up with the so-called CHIPS Act with the 52 billion in funding and support to bring TSMC and other big fabs to the U.S.? But how do we think about that in an ecosystem point of view? And what sort of policy needs to be in place for that type of thing? I think it's very important. And that's also not to forget that as Peter pointed out that, you know, at the end of the day, you know, they are running a business, and TSMC is a business, and it's important that this

companies need to have business viability in order to survive and in order to thrive in the long term. And I think we must not -- that geopolitics getting away of their innovation or research and development. So, that's very important. Thank you.

MR. HASS: Well, thank you, Jason. Now that's a really critical perspective, and it leads very naturally into the next question that I'd love to pose to Peter.

One of the formulas for TSMC success has been its concentration on the factors of production in a small geographic area in Taiwan to really produce efficiencies and economies of scale. At the same time, the United States is focused on diversifying risk by moving more production into the United States. So, how will TSMC manage this and ensure it doesn't lose its edge and competitiveness as its production becomes more geographically dispersed in United States kind of world?

MR. CLEVELAND: Well, geo-dispersion is an advantage for us. Expanding and diversifying our global footprint allows us to innovate faster with the customers, to serve the customer, to bow to the customer. We're doing it in western Kyushu with Toyota and Denso and others. We're expanding there and Kumamoto. And then we're doing it in Phoenix too. And what does that do? It geographically sets this up in a way to iteratively work with Nvidia, AMD, Qualcomm, and Aparna (phonetic) even more closely. Remember I mentioned they design -- they have the ingenuity of designing what a chip looks like their own patents and what have you combined with our technology process node in a very complex way. But iteratively, if we're here in their backyard, we can collaborate more effectively and serve the customer. What do they want? They want 5, 4, and 3-nanometer chips, the fastest chips in the world in terms of performance, thermal energy efficiency, transistor density, all these things. And if we can do it here in their backyard, there are no degrees of separation between us and them. And so, that's a huge positive for American innovation and the technical collaboration that goes on between us and the customers.

Final point, it's expensive. What we do on the -- we call it the leading bleeding edge is exceedingly expensive. We put 44 billion in CapEx into building new fabs around the world. And those numbers will continue to be large, but it's geared towards helping those customers. And that's why it's so critical for us to have a diversified footprint around the world.

MR. HASS: Right. And Jason mentioned a moment ago the CHIPS Act, which I think -- you know, I think many of us expect will contribute around 50 billion dollars to offset the increased cost of production in the United States for foundries. But beyond costs, what do you see as some of the key impediments for TSMC and other foundries as they consider whether to expand production in United States?

MR. CLEVELAND: That's a good question. We operate at such a massive scale that it's mind-blowing to people. It's important for us to have huge swaths of land, massive amounts of water. To run a single fab on the leading bleeding edge, it takes about 14 million gallons of water for us a day. The power requirements are enormous. STEM talent is critical. The United States is a huge resource right there and rule of law matters. We care deeply about where we are, and the United States presents a perfect opportunity in terms of stability of our business. So, we look at all those factors in terms of the massive scale at which we're operating now and how fast we are growing. And so, Japan is a welcoming environment in terms of stripping away those impediments, and the United States as well. We do this with great efficiency in Taiwan. But because the arrow points straight up for us in terms of expansion of our customer base, and as we get -- as we build faster and faster chips, we do need resources to support that.

And the administration, final point, hears that and feels that, and that's been the basis of the CHIPS Act. We announced in May of 2020 coming to the U.S., and a few weeks later, the CHIPS Act was introduced. No coincidence there. We have worked hand

in glove with the Trump administration and now the Biden administration to construct and land in a very effective way in the United States.

MR. HASS: Great. Well, I'd love to pose my final question to you and Jason before we turn back to Mireya, which is sort of looking for projecting out where you see Taiwan or TSMC's role evolving in the United States in the coming years. What do you see is the long-term goal and objective for TSMC in the United States? I'd love to first start with you, Peter. And then Jason has spent a lot of time thinking about these issues more broadly, and we'd love to hear his perspective as well.

MR. CLEVELAND: I think very, very quickly, and I'll let Jason and Mireya take it up. What our executive chairman has talked about, Mark Liu, a brilliant man and a fine boss, is helping the United States run faster. United States is on the mat when it comes to fabrication, when it -- vis a vis advanced silicon. And we're here to help as a friend and as a collaborator. We do that, and we do it very, very well. And so, in partnership with Commerce Secretary Raimondo who has done a tremendous job, she has the intuition to understand what's going on here and the precedent, we're trying to help United States run faster and reestablish their strength in semiconductor manufacturing particularly at the advanced levels.

MR. HASS: Jason, what do you think?

MR. HSU: Yeah. So, I think going forward, there are three major challenges in this field. One is that adapting a successful business model in a time of rapid change. I think if we've seen the how the global geopolitics is changing, this industry in particular has become a very coveted industry and become a very coveted resources. So, how do businesses adapting this change and innovation and creating models that will adapt to the change? I think it's very important, as Peter also pointed out.

Secondly, how do we use semiconductor to strengthen Taiwan's place in

the world? I think I mentioned that, you know, Putin's retaliation and its potential collaboration with China. I think we must be very careful with that. And I think if someone in the National Security Council is thinking about this issue, they should definitely take note of that. And I wonder, after the sanctions, including the SWIFT, the world will become even more multipolar. There will be a China system, a Russian system, U.S., and the rest of the world. And how will the supply chain restructure itself? How will the supply chain reorganize itself in a way that's efficient and effective? And how does Taiwan rely or entrust it with U.S. in the talent development, in the investment, in the R&D on high-level policy collaborations? I think these are all very key issues that require coordinated efforts to deliver.

Thirdly, realigning U.S.-Taiwan interest as a supply chain transformation. I think we've seen a lot of supply chain issues during the pandemic era. That is because very few companies like TSMC infested such a large amount of resources into optimizing the efficiency and the supply chain. But globally, I think we need to look at how do we ensure that supply chain disruptions won't be an issue. Or when that happens, which they will happen many, many more times in the future, how will we address that issues? We've seen the logistics issues, you know, the goods that are stuck in the ports that couldn't get in, and that drives up the product prices and et cetera. So, all of these things, I think, you know, as the countries start to reopen, you know, in the wake of post-COVID pandemic, I think we need to use this time to really, you know, innovate the -- our system. Otherwise, I think when the next time when such a massive scale of global slowdown or global disruption happens, we will see another disaster. Yeah. Thank you.

MR. HASS: Thank you. Mireya, I have a slightly different question that I'd love to gain your insights on. The Biden administration talks a lot about the importance of building supply chain resilience and strengthening U.S.-Taiwan coordination on supply chain issues. But it also talked a lot about the need to rebuild American domestic manufacturing

and build America by America. How do these two goals or imperatives relate to each other? And how do they impact each other?

MS. SOLIS: Thank you, Ryan. That's a great question. And I think it really -- it can be done, but you need to proceed carefully. And I see these as -- quite frankly, as an unresolved tension in the Biden administration's approach, because on the one hand we hear a very strong message about Made in America, and therefore a lot about onshoring incentives. But also, we also hear about resilience built by working with our allies, and therefore the term there has been ally-shoring. I think that there are ways in which we could accomplish both, but we also need to avoid some counterproductive measures, so when we think about how we boost our competitiveness.

And I think it doesn't have to be all about manufacturing. We should be mindful of the fact that we're moving towards a digital economy. And services, for example, are very important to the United States. And the lead on these software development digital elements is critical. So, I'm all in favor for investments in competitiveness in research and development in modernizing our infrastructure on human capital. And you yourself have written a lot about this. But -- and others today have also made reference to this talent, digital skills, STEM capabilities, all of this. I will also add a safety net, because one of the things that really has undermined U.S. international economic leadership is the fact that we don't have good social policies that can sustain a rapid economic change and economic opening. So, those are the policies that I think are very much called for, and we should indeed provide the resources.

Now, what I see happening in the United States and in other countries is the shift towards industrial policy. And now that's a term that's come back, and, you know, we're talking about subsidies. You know, when it goes towards large subsidies to target specific sectors, we have to be mindful that we're not undermining our efforts to bring discipline in

the way in which China provides these subsidies and therefore that we can no longer speak with authority in trying to craft international rules. To curb excessive subsidization, we have to be careful that we don't encourage inefficient production.

And, you know, I also think that there are some policies that we should definitely avoid, because they make us inefficient and because they undermine cooperation with our allies. What are those some of these policies? Well, it worries me how much of a push by American policies are receiving and that there is an effort to even pay at higher cost for some components. The use of the federal procurement for that purpose, if not done carefully, can come to hurt us and make us less efficient, more costly economy.

And also, the tariffs, the way in which they were implemented. As you know, I'm not a fan of how the Trump administration used unilateral tariffs. And I don't think that the Biden administration has been as nimble in eliminating them. Certainly, we have reached some compromises with our allies in the aluminum and steel tariffs. But it's not a return to status quo ante. There's still a tariff rate quota. More importantly, the tariffs vis a vis China have not accomplished any of the goals we desire them to do. They were not the right tool. And therefore, China has not bought more products from us. We have not been able to pursue the structural -- encourage more structural reform in China. And again, that has contributed to higher costs that are passed to our consumers and our producers. So, there's a way to do this. And we have to be careful, tools matter a lot.

MR. HASS: Thank you. We have received a number of questions from our global audience, and I want to put those to you now. I will present you with two, and any of you who would like to weigh in, I welcome you to do so.

The first is a specific question. The second is a broader question. The specific question comes from Wen-Yee Lee, who is a tech reporter at *Business Weekly* magazine. She notes that South Korea has been given an exemption from the foreign direct

product rule for exports to Russia. Should Taiwan be pursuing a similar exemption to be allowed to continue exports to Russia?

The second question is a broader question relating to cross-Strait issues. Can Taiwan firms afford to delink from the mainland market in the knowledge and engineering capacity that the mainland has? This question comes from Dennis McNamara, a professor at Georgetown University. Would either of you like to weigh in on either of those two questions?

MR. CLEVELAND: Yeah. I --

MR. HSU: Yeah. I will --

MR. CLEVELAND: Go ahead, Jason. Go ahead.

MR. HSU: Sorry, Peter. Okay.

MR. CLEVELAND: Go ahead.

MR. HSU: So, I'll take a shot on the mainland issues. It is indeed an alarming situation that mainland is -- mainland China is stepping up their indigenization of their technology, as well as accelerating the investment in semiconductor all cause and in all fronts. If you compare the sheer number of engineers that are mainland China will be producing and compare that with U.S. and Taiwan combined, we address to falling behind. So, what we should do, I think, going forward is to really take this issue of human capital or talent pipeline training even more seriously. Taiwan has recently launched -- announced a semiconductor institute. It's an important initiative to train the semiconductor engineers for the future, but it just couldn't keep up. We still have so much in shortage. And U.S., obviously, also have the same issue as well. So, I think there needs to be a comprehensive program that link the U.S. and Taiwan talent development and ensure that Taiwan can continue to develop the manufacturing capability and the talent and the top U.S. R&D, research, ingenuity, and also innovation can be shared with Taiwan, and then you connect

R&D and manufacturing, and then you build a strong synergy off of that. So, I think that's very important. And I'll stop here.

MR. CLEVELAND: And then on the first question, Ryan, it's a discrete issue. But bottom line, the foreign direct product rule extraterritorially applies the export controls to us, TSMC, and we are abiding by that. There were a number of countries that were listed in the export control rule when the administration issued it that had countries applying the FDPR to their companies resident in those countries. South Korea has negotiated with the U.S. Not an exemption. That's not the right implication. But they will oversee the restrictions as a country over, say Samsung. And similarly, my understanding is Taiwan is speaking to the administration to administer the export control as well. So, there'd be no material difference to the export control that we face and that we are acting in accordance with. It would just be overseen by the resident country where a company is. I hope that wasn't too complicated, but that's what -- that is what is occurring right now. And TSMC would be supportive of that.

MR. HASS: Yeah. Thank you. I appreciate you clarifying that. Mireya, our time is coming to an end, but I want to make sure that you have a chance for a parting shot, if there's any final thoughts that you'd like to put on the table.

MS. SOLIS: Well, no, I think that we covered the waterfront. But I would just -- you know, going back to the question of supply chain resilience and security, I would just say that we're really living through an extraordinary time in terms of the shifts in the risk environment, and they have occurred -- many that we have covered today. But the way I think about resiliency is that, you know, overdependence is clearly problematic, and we should be thinking about how we diversify, how we create redundancies, and how we also proceed with targeted economic security measures, not an over-expensive -- you know, not use of expensively national security to -- because that would, again, come to hurt us in

diminishing our innovation capability. So, again, I would hope that supply chains are going under stress, but they continue to provide a tremendous channel for economic innovation, growth, and international influence.

MR. HASS: Well, I wish that we have more time, but I need to wrap us up now. This has been a tremendously insightful conversation. I thank you all for lending your wisdom to the conversation. I think it's contributed to raising public awareness about the critical role that Taiwan plays in global value chains. It also helps stimulate thinking about what work can be done to strengthen U.S.-Taiwan coordination to generate greater resilience. So, thank you all for a wonderful program and I look forward to staying in touch.

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