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HOW TO STRENGTHEN AMERICA'S SUPPLY CHAINS:

A CONVERSATION WITH NATIONAL ECONOMIC ADVISOR LAEL BRAINARD

THURSDAY, DECEMBER 19, 2024

UNCORRECTED TRANSCRIPT

OPENING REMARKS:

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WEST: Good morning. I'm Darrell West, senior fellow in Governance Studies at the Brookings Institution. And I'm pleased to welcome you to our forum today on how to strengthen America's supply chains. There have been many challenges in recent years to our country's supply chains. We've seen pandemics, transportation logjams, high energy costs, a lack of domestic sourcing capabilities in some areas, and, of course, geopolitical complications. There is a high level of global mistrust, and that puts a premium on safety and security in the supply chain. And companies are boosting their domestic capabilities through on shoring or in some cases, near shoring with friendly countries. This week, the White House Council on Supply Chain Resilience released a comprehensive report that looks at where we are and where we need to go forward. It is hundreds of pages long and covers issues in the energy area advanced batteries, critical minerals, semiconductors and pharmaceuticals, among other areas. To help us understand this report and the issues involved with supply chains. We are delighted to have Lael Brainard with us. She is the director of the White House National Economic Council. Prior to that, she served as Vice Chair of the Federal Reserve and Undersecretary of the Department of the Treasury. But most importantly and where I met her, she was the Vice President of the Brookings Global Economy and Development program. And she was very helpful in easing my transition to Brookings many years ago when I arrived. And it has been great to see all the wonderful things that she has done since our time together. Today, she's going to talk about the White House report, and then she and I will have a fireside chat on ways that we can strengthen our supply chains. Those of you who would like to submit questions, you can email them to us at events@brookings.edu. That's events@brookings.edu. So please join me in welcoming Lael Brainard back to the Brookings Institution.

BRAINARD: Well, thank you very much. And I'm delighted to join you for this discussion on strengthening American supply chains. On the day that we're releasing the first ever quadrennial supply chain review. And I want to particularly thank Darrell West for holding this discussion. It wasn't very long ago that most Americans really just didn't give much thought at all to supply chains. That changed abruptly during the pandemic. People were seeing constant pictures of a hundred ships queuing up at the port of Los Angeles and Long Beach and thousands of containers that were piling up on our docks. And that all grew even more difficult after Russia invaded Ukraine, which disrupted global energy and food markets following several decades of relative calm. The Global supply pressures index spiked to unprecedented levels as disruptions led to shortages of goods and price increases. Goods inflation surged after falling the previous year and tracked supply chain disruptions closely with a short lag. Not since the oil price shocks of the 1970s had the US economy experienced aggregate supply shocks of this magnitude. Businesses and government were both woefully unprepared to deal with those kinds of supply shocks. Market pressures had pushed

businesses to adopt just in time lean inventory practices and far-flung supply chains to minimize costs. We now know, with the benefit of hindsight, that made their business models extremely fragile. When the pandemic suffered. When the pandemic shuttered foreign semiconductor factories unfinished auto assemblies began piling up in dealer parking lots. All around the US, the prices of cars and washing machines spiked and waitlists started to grow. Rails and ports, roads and bridges and airports had fallen behind as successive administrations had failed to secure the necessary infrastructure funding from Congress and did not take action, as some foreign governments provided non-market incentives for investments in key industries. In short, it became apparent we needed a new playbook to make our supply chains more resilient in the face of supply shocks and new partnerships to make it effective. Within his first month in office, the President signed the executive order on supply chains, laying out a strategy to strengthen our supply chains. It rests on recovery, risk management, investment and diversification. And I'll touch on each one of those briefly. The first order of business was to restart the flow of goods. The administration immediately stood up a supply chain disruption task force to work with state and local officials, businesses, labor groups and our farmers to identify and resolve bottlenecks. An acute shortage of truck drivers was creating a major bottleneck for the 72% of shipments that travel around the country by truck. So the Department of Labor and the Department of Transportation implemented a trucking action plan which increased trucking employment by the most in two decades and doubled the issuance of commercial driver's licenses, with cargo piling up at our West Coast ports. The president appointed a port envoy who worked with businesses and labor on an action plan to clear the docks and get shipments moving again. And as a result, I think as everyone will remember, the shelves were restocked just in time for the Christmas shopping season. But the goal was not just to restore supply chains to their pre-pandemic levels, but also to spot and resolve emerging problems sooner. We went about building durable capabilities in key agencies to enable data sharing and information analytics with the private sector in states and localities. The goal? The Department of Commerce created a new supply chain center with a diagnostic risk assessment tool known as Scale utilizes a comprehensive set of over 40 indicators of risk, such as supplier concentration, reliance on a single point of entry and inventory to sales ratios to evaluate supply chain conditions across more than 400 sectors of our economy. With this new data, we can spot looming challenges early and take action before they turn into a crisis. When crisis does strike, the hundreds of independent operators that rely on or support America's vast logistics networks must make decisions based on limited information that is available to them. So they told us it was vital to institute data sharing and coordination to enable them to manage risks more effectively by seeing the whole picture. The Department of Transportation created the Freight Logistics Optimization Works, the Flow program, which is now a public private partnership that has built a shared data

resource picture of live supply chain networks. Today, there are more than 85 flow participants using these data to inform their logistics, decision making, helping to avoid bottlenecks and shorten lead times for them to serve their business and consumer customers. The collapse of the Francis Scott Key Bridge in Baltimore last spring was a crucial early test of that institutional capacity. Just hours after the ship crashed into the bridge at 130 in the morning, the federal government had convened the Supply Chains Disruption Task Force. We were immediately in communication with state and local officials, and we initiated calls with shipping companies, labor unions, ocean carriers and other East Coast ports. We coordinated with rail and trucking companies to help reroute the flow of critical goods in real time that had otherwise been relying on the bridge. This all hands on. Jack approach kept goods flowing throughout the region. Workers at their jobs. And the local economy operating at full capacity until the Port of Baltimore was able to fully reopen in less than three months. And we still hear today from some of the manufacturers and retailers that really was so greatly relieved to see those actions. It was also critical to invest in the supply side of the economy. And that's the third leg here. The president secured landmark legislation to revive the federal government's role in supporting infrastructure and private sector investment in the critical value chains that underpin both our economic security and our national security. Thanks to the Bipartisan Infrastructure Law, the federal government has so far invested nearly $700 billion in American infrastructure, over 66,000 different projects. Just to give you a sense of it. We're investing 8.7 billion in 18 of the nation's most economically significant bridges and billions more to strengthen our ports. These investments are going to pay dividends for decades. The Landmark Inflation Reduction Act and the Chips and Science Act have catalyzed nearly $1 trillion in announced private sector investments in critical industries. To give you a few examples. When the president took office, 90% of leading edge semiconductors that are critical for things like air models and quantum computing were all manufactured in Taiwan. Because of the Chips and Science Act, the US is now projected to host 30% of global leading edge semiconductor manufacturing here up from zero. And we're already seeing the global leader of this industry achieving production yields in the US at the same level as in Taiwan. Similarly, four years ago, US producers were only able to supply 5% of global lithium demand because of the clean energy provisions of the IRA. The US is now on track to supply more than 20% of global lithium demand outside of China by the end of the decade, enabling us to power grid storage batteries and electric vehicles. The final piece is diversification. We're working with like minded partners to diversify our supply chains and manage risks. China has used a wide range of non-market practices to gain significant global share in key supply chains. In fact, the growing overcapacity that that has produced has caused a proliferation of unfairly low priced experts that make it difficult for market based competitors to meet investment hurdles. To level the playing field. We have coupled our incentives for investments with tough

trade enforcement measures that are carefully targeted against unfair practices in a few key sectors like EVs and legacy chips. Importantly, we are partnering with allies and aligning our approaches to diversify those global supply chains. We've come a long way in the past few years. The number of container ships off our shores waiting to unload has fallen from 150 to about a dozen. The days of sales covered by retail inventories has risen by nearly a third since 2021 and is now roughly comparable to pre-pandemic levels. Shipping rates to the West Coast that had spiked to over $20,000 per container at the depths of the crisis are now back down around $4,400. But we are likely to encounter additional supply shocks in the years ahead. Just last year, we saw 28 climate disasters that each cost at least $1 billion. That's a record. Russia's war in Ukraine and conflict in the Middle East continue to disrupt the flow of energy commodities. Cyber actors are regularly targeting supply chain actors as a way to take down major companies, including hospitals. And we've seen a variety of disruptions to our shipping lanes, including the Houthi attacks on cargo ships in the Red Sea and reduced water levels in the Panama Canal. New dependencies are emerging and some supply chain choke points could pose real national security risks, such as the ability of a foreign adversary to cut off supplies of a key mineral used in defense applications. It will be important to utilize the full scope of our national security tools when necessary. The Department of Commerce's ICTS rulemaking on data security for connected cars is vital, for instance, to ensure that foreign adversaries can't exploit consumer products that Americans use every day. We can't repeat the mistakes of the past when we didn't take vital action to safeguard the manufacturing of a critical input or technology like leading edge semiconductors. America's global preeminence and strategic industries of tomorrow require active attention and engagement today. We need to work in partnership with the private sector when they identify critical bottlenecks. For instance, it's important to support the development of the requisite compute power for the most advanced A.I. models through clean energy to retain preeminence here in the US. So let me just close by reminding us that supply chain resilience has always been important to our national security as well as to our economy. President Biden invoked a proverb attributed to Benjamin Franklin, which you'll be familiar with, for want of a nail. The shoe was lost for want of a shoe, the horse was lost and on and on, until finally the whole kingdom was lost, all for want of a horseshoe nail. The founders of our nation recognized that the breakdown of minor inputs or processes can cascade into monumental national costs. That might a lesson was forgotten along the way until the pandemic served as a stark wake up call. Building resilience in our supply chains is not a partizan effort. It's a national priority born out of hard fought experience. It's also a shared responsibility. Government enabled and private sector led American workers are also vital to these efforts. Today, not only have we recovered, we've come out stronger and we've laid the foundation for America's supply chains to be more

resilient in the years ahead. Now, it's important to build on this new playbook in partnership with business and government and in alignment with our friends and partners around the world. Thank you.

WEST: So Lael, thank you for sharing that report with us. That was a terrific overview. It is a weighty document. I recommend it to all of you. I assume it's on the White House homepage now. So So you can read it at your leisure. And what you do in the report is highlight some of the brittle elements that we've seen in our supply chains. But in our chat, I'd like to be forward looking and discuss what remains to be done. And one of the things I like about the report is it provides a really nice overview of issues that cut across many different areas. But then it also dives into specific sectors. And in your speech, you mentioned the very important area of critical minerals, very important in electronics in general, defense connected cars and in other areas. So I just want to ask, like, what is the specific supply chain challenge here and how can we improve the situation?

BRAINARD: Yeah. So critical minerals is one of those areas where we already were aware of certain vulnerabilities, dependencies in the defense area. But what the real rapid pace of the move to clean energy has highlighted is just how vital those critical many of these critical minerals are. That's why we call them critical minerals to the clean energy transition. A lot of those critical minerals are imported, I would say over 75% right now for the United States. And a large amount of that is actually imported either directly from China, where it is processed or from Chinese companies in other countries. And I think there has been enough recent instances where China has restricted access from foreign countries to some of those critical mineral exports that we recognize we need to diversify supply chain. So some of that has been looking at where the critical minerals are most available. With friends and partners. And here in North America, to the extent that we have reserves here in North America, we've been trying to help clear the way with permitting. And there are incentives in actually in bipartisan infrastructure law, as well as the Inflation Reduction Act. And that's why we're now seeing in the area of lithium, as I mentioned, going from less than 5% to now a projection of 20% of global demand being supplied from here in the United States by the end of the decade. Other areas we will necessarily need to rely on countries around the world. And there we are really looking to have coalitions of like minded countries that want to do this. Critical mineral mining and processing with high standards.

WEST: Okay. Advanced batteries obviously very important in electric vehicles and connected cars in general. It's a sector that's really taking off. I know the administration has invested a lot in that. Just what is the major challenge there and what can we do going forward to address that challenge?

BRAINARD: So advanced batteries is another of those areas that are essential to getting the move to clean energy. Right. And so as we looked and projected forward demand, it became clear that we need a lot more capability here in the United States, a lot more manufacturing. And what we've seen, some of that is for electric vehicles. As you noted, a lot of it is also for long term grid storage, critical needs there. And what we've been able to see as a result of the commitments made in the Inflation Reduction Act, also some funding in the bipartisan infrastructure law is we've seen a lot of foreign investment coming into the US, a lot of joint ventures, particularly for batteries, for electric vehicles, a foreign investment for grid storage batteries. And American companies investing here with a very, I think, very generous incentives that are provided in tax credits along with some grants and loans. The other thing that was important, though, is this is one of those areas where China has a lot of capacity over capacity. Some might assess. And as a result, prices on international markets make it difficult to meet market hurdles in market economies like the US. And so we've had to couple that with some protection through very targeted tariffs on EV batteries. And ultimately, once American production has scaled up enough on long term storage batteries.

WEST: So it sounds like one success area is semiconductors. And you mentioned that it wasn't that long ago that 90% of the computer chips were made in Taiwan. Obviously, a very vulnerable and volatile part of the world. Now, 30% of computer chips are actually made in the United States. And again, this is an area the administration emphasize and has invested heavily. But what do you see as the issue there? What is the goal in terms of what the US role needs to be? How big are domestic sourcing capability needs to be and what the risks are in this area, which obviously these computer chips are just vital for everything A.I. and other advanced technologies.

BRAINARD: Yeah. These leading edge chips in particular, but other types of semiconductors as well, including legacy chips, are vitally important. When chips and science was passed, I think we already believed, based on market analysis, that some of the key sort of future oriented sectors like quantum computing were going to be very much needing to use these leading edge chips gaming. What has happened since that time is they've only become more important as generative AI has become a major future demand source for these chips. And so control of some manufacturing has become not only an

economic kind of priority, but a national security imperative in order to maintain US preeminence. And some of those applications are directly relevant to our national security. So what we have with the Chips and Science Act, which has turned out to be just the right tool, is the ability to reverse what we had seen for decades, which is it was just difficult for US and other companies to meet market hurdles given how much subsidization of these massive fabs was taking place, particularly in China and Asia more broadly around the world. So essentially what we have done with the grants, some of the tax incentives, is seen a tremendous amount of foreign investment and domestic US investment, so that now it is projected that we will be producing here in fabrication facilities in the US, 30% of the global demand for leading edge semiconductors. We already had, you know, a very leading design ecosystem here in the United States. And, of course, we've got an incredible downstream demand with all of the technology companies and the sort of preeminence we have on A.I. But what we really had lost was the capacity to manufacture in that process knowhow. And of course, we had also lost the the supply chain packaging and the materials. And so the way the incentives work, we are we are investing all along the supply chain, including for R&D and packaging. And we have leveraged private investments that are 10 to 11 times the government incentives.

WEST: So an area that up until a few years ago, probably most Americans didn't realize was a supply chain risk was pharmaceuticals. And, of course, the pandemic revealed to all of us. Turns out many of our drugs actually are made in India or China or other places abroad. And the pandemic just showed that tremendous vulnerability we had not just on medicine, but medical equipment and other things in that area. So I know that we've made good progress in this area, but what is yet to be done in that area?

BRAINARD: Yeah. So what we saw very starkly during the pandemic, because it was a public health crisis, was just how fragile our supply chains were for PPE, also for medicines. But, you know, as anybody that goes to their pharmacy to pick up medicines knows, we frequently still have medicines in shortage in the United States. And that does point to real fragility of our supply chains. Of course, we want to have, you know, good relationships with supplier countries like India, but we also need to make sure that those supply chains are resilient. And so if you look, for instance, at some of the APIs in pharmaceuticals, like the 90 plus percent are sourced from China either directly or indirectly via manufacturing in other countries. So we've made some progress there using Defense Production Act authority. We have very targeted tariffs. To help create better market conditions for production and investment. In a very targeted way here in the US for certain parts of that supply chain. But the reality is this is one of those areas that I think we are calling out as needing a lot more focused work and probably more public support in the future.

WEST: So another supply chain risk is war and the Russian invasion of Ukraine demonstrated the tremendous need we have there, as well as possibly other places around the world for bullets, bombs, drones and other elements of modern warfare. What specific things do we need to do to strengthen our defense industrial supply chain?

BRAINARD: Yeah. So this is an area where I think you're right that the ongoing aggression by Russia in Ukraine has really shown vulnerabilities in supply chains that are not just in the US, but really among other NATO members as well. And so I think we're taking a good hard look at where those production capabilities are and where we're seeing some thin and fragile production capabilities that need to be shored up. I think, you know, the the the future could, of course, hold more geostrategic risk. And we see that because of the you know, we've we've seen a widening conflicts in the Middle East as well. Not only does it mean that we have to look at our defense industrial base, but we also need to be much more attentive to the vulnerabilities of global shipping lanes. As we've seen, there have been repeated spikes in energy futures markets associated with some of those conflicts. And so as we're also looking at energy, reflecting on the experience, for instance, of Europe in the wake of the early days of Russia's invasion of Ukraine and how dependent they were on Russia for natural gas, I think we have looked at our energy supply chains much more broadly, and that's part of the reason our clean energy investments are so important, but also part of the reason that our to mastic energy production more broadly has to continue to be a priority.

WEST: So in your opening remarks, you mentioned quantum computing and of course there are a number of new and emerging technologies that are becoming very important and obviously will grow in importance over time. A.I. is taking off the data centers that are associated with them. You mentioned the energy requirements that are associated here. So it seems like in this whole area of emerging technologies, there are a bunch of supply chain risks. So how can the United States ensure that we remain competitive in these areas?

BRAINARD: Yeah. So it it is similar to the playbook that we, you know, have laid out more generally. You have to start with understanding the vulnerabilities and tracking them. And the data just wasn't there. And the US government just didn't have a systematic approach. I think what the quadrennial supply chain review shows is that we are now taking a systematic approach across a whole variety of key sectors, but also seeing that set of sectors that are in focus has to keep has to keep evolving as the private sector comes to

us and and raises new issues with us. That is exactly what has happened in the area of generative A.I.. I think we, you know, spent a lot of time putting in place a a important set of guardrails around the safety and security of the development of generative A.I.. But it wasn't many months later that we started to hear a lot about how quickly the compute power for the most advanced training models was growing and hearing from people in this arena that they were looking to move to other countries because they were getting, you know, cheap AI, big sources of what was mostly not clean energy elsewhere. So to us, that was one of those pieces of information that seemed very important. This administration is committed to maintaining US preeminence in the most advanced forms of AI because of the national security and economic implications. And so we have in. Gaged in an effort with that ecosystem to try to understand those power needs and to look at ways the executive branch can help support that in a way that leads to new sources of clean energy. Powering the necessary compute power on the accelerated timeline that the industry has identified.

WEST: So now we're going to move to the audience question part of this. We have some questions that have already come in from our online audience and those of you who are watching, feel free to email questions to us at events@brookings.edu That's events@brookings.edu So one question is, given the recent developments in trade tensions with the People's Republic of China and just the general volatility in many other parts of the world, what can the United States do to mitigate ongoing and future supply chain disruptions arising from geopolitics?

BRAINARD: Yeah, well, we thought that this was an area where we had a lot of common interests with allies and partners around the world. Certainly it's something that, for instance, we've worked on in the context of our our collaboration in the Indo-Pacific, for instance, with some of the work that APF did on supply chain resilience. We've worked a lot with our G7 partners and with our North American and European partners on aligning approaches. And so increasingly, I think we are developing supply chains that are diversified, that do include partners and allies, but that are much more attentive to risks. And where other countries, I think, have joined us partly in providing some incentives for production and investment, but also partly in being targeted about tariffs where there's excessive dependance, for instance, on one country like China.

WEST: So we have another question from someone who's watching the event online. And it's an interesting question linking supply chain resilience and inflation. And the specific question is there's been a lot of interest in on shoring and near shoring, meaning bringing capacity back to the United States or to friendly nations

close to the United States. So the question is, does either on shoring or near shoring present the risk of reigniting inflation?

BRAINARD: So I think the way that supply chains are adjusted and diversified matters a great deal. The kinds of additional production capacity associated with the Inflation Reduction Act in the Chips and Science Act expands the supply side for these vital goods that turned out to have fragile supply chains and whose shortages led to spikes in prices and then ripple throughout the supply chain, resulting ultimately in consumer prices going up and consumer goods inflation going up. So it depends a lot on how that's done. The Biden administration has put a central focus on expanding the supply side, investing in our capacity, and then using a very small number of targeted tariffs to make sure that those investments really are able to pay off in our market environment rather than looking at sweeping across the board tariffs, which we think would be much more disruptive. And unless they are paired with expanded supply, side capacity and incentives could actually lead to a large increase in prices that could cost families, you know, some have estimated $4,000 a year.

WEST: So I want to give people in the room a chance to answer or excuse me to ask questions. There's a gentleman right here. There's a microphone coming up right behind you. And if you can give us your name and organization.

AUDIENCE QUESTION: Sure. Good morning. Thank you for analysis. I don't know if I call you advisor. I guess you're. My name's Nii Simmons. I'm ex World Bank official, now a non resident fellow at Center for Global Development. I hear quite a bit about rare earth minerals. A lot of my work is in mostly Africa, a little bit of Southeast Asia. As you are aware, this concept around China plus one strategy mitigate your supply chain risk from China to India, Vietnam, Malaysia. Unfortunately, Africa is not part of that conversation. You know, with. Out the African continent. There won't be a. There won't be green transition. There won't be semi-conductors there. There is a group of us, thousands of us with Africans who have backgrounds in semiconductors. I just recently found this out and we're organizing ourselves. Kind of like what the Indians have done and Chinese. And we're ready to have a conversation with this administration and upcoming. And we want the African countries want to want to be taken seriously. You know, and I want to know your take on how can you as g going forward, partner of the African continent, focus on validation, innovation and R&D. Thank you.

BRAINARD: Yeah. So I think there is a lot the Biden administration is doing and a lot the US government can do. And I think it's very much in our national interest to see that kind of production at scale. Africa, African, different African countries becoming additional contributors to global supply chains of some of these critical goods. As you know, the President was recently in Angola and announced a very large capital commitment by American companies in the Lobito corridor, which is going to be a really important logistics network that'll help achieve that kind of scale that's necessary for some of these investments. And we have a number of additional cooperative ventures in areas like the semiconductor workforce and other areas. So I think there's a tremendous amount of potential there. And, you know, I certainly hope that that will be a focus of the incoming administration as well.

WEST: So as a person right here, there's a microphone coming up from behind you.

AUDIENCE QUESTION: Thanks. Evan Dankworth. Milken Institute. I was wondering if you could speak to the utility of the tariffs, the targeted tariffs that you thought they had, what their measure of success was for those specific industries. If you saw US importers, you know, switching because of the costs, etc., but just what your measure of success was and if you think any of those things might be administration agnostic into the tax administration.

BRAINARD: Yeah. So as you know, the administration, this the Biden administration undertook a very detailed, extensive review of potential sectors that the private sector had flagged as benefiting from targeted tariffs and looked precisely at these kinds of questions as to would what level of tariff would be the right level to provide incentives and adequate market compensation for making investments here in the US. So they're very it's really only a handful of sectors where tariffs were raised. Some of them were raised by a large amount. So, for instance, the electric vehicle sector has 100% tariffs. And that was based on market analysis that large investments were being made in this sector. There was going to be a very large demand here in the US But looking at the experience of Europe, which was being flooded by very low priced EV imports, that we needed to put some kind of wedge in the US market in order to make these electric vehicle and battery investments viable. Similarly, in parts of the solar supply chain, you know, where where, for instance, in solar wafers, more than 90% reliant on China. We had to look very carefully at sort of what's the right level of tariff to make the domestic production that's just starting to come online viable. So I would say it's a little early in some of those sectors because they are forward looking sectors. EVs, for instance, we have hardly any imports. The the traditional practice is to put tariffs on existing imports. This was really a forward looking

attempt to create a viable sector and it'll take a few years to to and I hope they will be assessed. You know as as is done with all three ones regularly and you know, they'll be adjusted accordingly.

WEST: Right here on the aisle, there's a microphone coming up from behind you.

AUDIENCE QUESTION: Hi, I'm Daniel Davis, Agence France-Presse. I'm just a quick question. You talked about specific sort of targeted tariffs, but I'm just wondering how concerned you are about the prospect of supply chain disruptions if the incoming administration does, in fact, put in place sort of wider, more widespread tariffs on goods entering the United States?

BRAINARD: Yeah. So I think there have been some good outside analyzes that look at. What is the effect of across the board high tariffs both across all countries and then, you know, particularly high against China, which, you know, some some have been proposing. The difficulty with across the board, all countries, all products, tariffs is there are bound to be unanticipated supply chain effects. US manufacturers do rely on foreign imports for certain parts of their key inputs. And so you could see a real massive change in their cost structures, which would lead to massive increases in their prices. And that, of course, works its way through to consumers. So the analysis that's been done suggests a potential $4,000 increase for American families. And of course, those costs will be greatest in areas that we we just don't produce. And of course, in certain food areas like coffee and chocolate areas like that, I think you would see an immediate large pass through.

WEST: But we definitely don't want to mess up the chocolate supply chain.

BRAINARD: I might have chosen those for a reason.

WEST: We have time for one more question. Will take this gentleman on the aisle.

AUDIENCE QUESTION: Thank you. My name is Bill Conoy I'm head of the representation of the Farou Islands to the US. And I have a question to you. First of all, thank you very much for a very enlightening talk this morning. But the the access of minerals has to in order to to to ensure the clean energy transition. To what degree would you think that access to minerals in the deep seabed is requisite to achieve that goal?

BRAINARD: Yeah. So it's a good question. I know there are considerations about feasibility, environmental consideration. So I think it's a I know that's an ongoing area of intensive discussion and debate. The administration didn't take up a view on that for that very reason, because it was still in the area of, you know, sort of an active discussion with, you know, sort of pros and cons. But I think it is important to be looking at all potential sources of critical minerals and and, you know, particularly diversified sources and, you know, understanding in kind of great detail potential effects on communities and consumers livelihoods, environmental effects. And so we have the ability to, as a society to make those choices with with, you know, with a right risk balancing.

WEST: Well Lael, we are out of time, but I want to thank you very much for sharing your views. It's good to see that we have made some progress, but we know there are lots of challenges out there, so we certainly cannot declare victory. And thanks to all of you and people in our online viewing audience for tuning in as well. Thank you very much.