Episode 170. National security, semiconductors, and the US move to cut off China

Episode webpage

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Transcript

(lightly edited)

Chad Bown: On October 7th, the Biden administration targeted the Chinese semiconductor industry with a barrage of new policies.

This was huge. Huge for US policy, huge for China, huge for the global semiconductor supply chain.

And it came on the heels of a speech by Biden's National Security Advisor, Jake Sullivan.

In Washington, there had been an ongoing debate about the meaning of US national security when it came to China. But as of the US rule announced on October 7th, the debate is now over. Sort of.

Kevin Wolf: The October 7th rule has ended that debate. The Jake Sullivan speech has ended that debate.

National security has now been identified as anything that is in support of the production or development in China of advanced node semiconductors, any kind of semiconductor production equipment, advanced computing capabilities, and supercomputers. There! That's your answer.

And everything else thereafter is hundreds of pages of implementation of those rules...

Chad Bown: In this episode, we'll explore that new US definition of national security, as well as the hundreds of pages of implementation of those rules. That's because those rules are resulting in something even more profound taking place in the semiconductor supply chain.

Kevin Wolf: There's an enormous amount of chaos in the system right now. This global ecosystem of the people that make the things that go into the things that make the chips, that make the tools that are dealing with the companies…

Chad Bown: After more than a year of chip shortages, just what we need: more chaos in the semiconductor ecosystem.

This week, we're going to work out what the United States just did to the Chinese chip industry, what it did to American, Korean, Taiwanese, and other companies in the semiconductor ecosystem, why and how it did it, and what that all might mean for what comes next.

And we'll be joined by a very special guest.

Kevin Wolf: My name is Kevin Wolf. I was the Assistant Secretary of Commerce for Export Administration during both terms of the Obama administration. I'm now a partner at the law firm of Akin Gump.

Chad Bown: Kevin Wolf has spent his career working at the intersection of national security, technology, and trade. Under the Obama administration, he was in charge of administering the sorts of US export controls we're going to talk about today.

You are listening to an episode of *Trade Talks*, a podcast about the economics of trade and policy. I'm your host, Chad Bown, the Reginald Jones Senior Fellow at the Peterson Institute for International Economics in Washington.

PART I. THE HISTORY OF US EXPORT CONTROLS ON CHINA BEFORE THE BIDEN ADMINSTRATION

Chad Bown: To really understand what is happening with US policy today, we need to start from the tail end of the Obama administration. At the time, Kevin was an official working at the Bureau of Industry and Security, or BIS, in the Department of Commerce. That is the part of US government that administers US export control policy and investigates companies and people that violate US rules.

In 2015, BIS was worried about the behavior of a giant telecommunications company called ZTE.

Chad Bown: Back then, what were the US government's concerns with ZTE?

Kevin Wolf: ZTE is a large Chinese telecommunications company. Beginning in 2015, I and enforcement officials from the Obama administration led an effort to investigate its use of front companies to buy US origin items, to send to Iran and North Korea, in violation of US export controls and sanctions.

In the spring of 2016, we added ZTE to something called the Entity List, which prohibits the export from the US of anything and from outside the US of sensitive foreign made items.

Chad Bown: In the world of export controls, this thing called the Entity List is super important.

A foreign company like ZTE that gets put on the Entity List, in this case for violating US sanctions imposed on Iran and North Korea for nuclear weapons, loses access to all sorts of American-made goods and services that it might need to keep doing business.

Export controls and getting put on the Entity List means a foreign company gets cut off from valuable US exports.

Kevin Wolf: Although we did the listing and the work, the penalty was imposed at the beginning of the Trump administration. There was a determination later that ZTE had not followed through on its conditions, and so it was added back to a similar kind of control list.

However, in an unusual move, in May of 2018, President Trump tweeted that “President Xi of China and I are working to give massive Chinese phone companies ZTE a way back into business fast. Too many jobs lost in China. Commerce Department has been instructed to get it done.”

Chad Bown: This was weird. President Trump's tweet and policy overruling his own national security enforcement officials at BIS put US export controls into the spotlight. Export controls had gone from technical work on national security and enforcement of US laws to a potential pawn or bargaining chip in the president's suddenly escalating trade war with China.

Something was changing.

US NEW EXPORT CONTROLS ON HUAWEI

Chad Bown: The second major export control action during the Trump administration was also weird, but in some very different ways.

This case involved Huawei. Huawei was another massive Chinese telecommunications company.

Kevin Wolf: The issues with Huawei were similar and different. They were similar in the sense that there was an investigation with respect to its diversion of items into sanctioned countries.

But there was a broader, more foundational issue involving Huawei with respect to its worldwide dominance in 5G telecommunications applications, which creates national security concerns for the US and its allies.

Their dominance in the 5G ecosystem, which is of significant threat for cyber surveillance and cyber intrusion and theft and hacking. And if there was a company that could follow instructions from the Chinese government that could pull information at 5G speeds from anywhere on the planet – that is a completely different national security threat. They were doing other things as well, but that was the foundational concern.

Chad Bown: Huawei was a global supplier of not only mobile phones, but more importantly for US national security, 5G telecommunications equipment. 5G equipment was critical infrastructure. Things like base stations and cell towers create the 5G network over which sensitive data from governments, the US military, businesses, and ordinary people, was supposed to flow. 5G networks need to be fast, reliable, and safe from cybercrimes, spying and industrial espionage.

The US government and national security officials had been suspicious of Huawei dating back to at least the 2000s. But the problem was only three companies globally were supplying most of this 5G equipment. Nokia and Ericsson, two European companies were Huawei's only real competitors.

With no American companies to protect or promote, the US government was concerned that the critical telecommunications infrastructure of the future was going to end up entirely in the hands of this Chinese company. A company that it worried had ties to the Chinese military, in which under Chinese law might be compelled to turn over sensitive data going through its 5G network to the Chinese government.

In May of 2019, the US government decided to act.

Kevin Wolf: In May of 2019, the Trump administration's BIS added Huawei to the Entity List, which, just like with ZTE, prohibited all exports from the United States of any kind of any US origin items and sensitive foreign made items made with US technology to Huawei and most of its affiliates.

Chad Bown: This is where semiconductors first come into the story.

Semiconductors are those ubiquitous tiny chips found in everything – cars, washing machines, computers, data servers, video games, robots, and mobile phones – they all require these chips.

5G telecommunications equipment, those base stations and cell towers that Huawei was making that the US government was so worried about, required semiconductors as critical inputs as well.

By putting Huawei on the Entity List, the Trump administration was trying to control this worrisome Chinese company's access to semiconductors.

The problem was the policy didn't work.

Kevin Wolf: Over the course of 2019 and into early 2020 the administration realized that their objective of shutting down the ability of Huawei to make 5G items for distribution worldwide was ineffective. US companies and foreign companies, so long as they made their commercial products outside the United States, they weren't subject to any US export controls. They could be sent from outside the US to Huawei and it was creating an unlevel playing field.

If you shipped it from the US it was illegal, if you shipped it from outside the US, with rare exceptions, it was perfectly legal.

Chad Bown: This policy was almost a disaster.

Understanding why requires coming to grips with two important parts of the story.

The first was the reality of the global semiconductor supply chain. With the Trump administration's action, only semiconductors exported from the United States were subject to these new controls.

The problem was that only a tiny share of semiconductor production globally took place on US soil. Even chips designed by famous US companies were often physically being made by semiconductor plants – what are called foundries – in places like Taiwan or South Korea.

US export controls couldn't touch those chips. The new US policy wasn't stopping the massive shipments to Huawei of all the semiconductors being made abroad.

For the second part of the story, we need to explain a little about how the international legal system for export controls works, and how it wouldn't work in a case like this.

Since the end of the Cold War, countries have signed a number of international agreements on export controls to nudge them all to do similar things, especially when it comes to stopping the proliferation of weapons of mass destruction, or WMDs.

One set is designed to stop nuclear, biological, or chemical weapons. Another really important export control agreement is the Wassenaar Arrangement. That one covers what are called dual use goods. Countries agree to put these dual use goods on control lists to limit exports.

An example of a dual use good might be a special kind of input that can be used by civilians – and so it has a normal commercial application – maybe an input going into a toaster or cell phone or a base station. But it also could potentially be used by militaries to make WMDs.

The problem was that semiconductors for 5G telecom equipment were only commercial items. They were not sensitive and subject to these internationally agreed controls. That meant that under the classical way of doing export controls, no other country had put them on their list.

Put those two parts of the story together – (i) the economic reality of the global semiconductor supply chain, and (ii) that semiconductors were mostly not a sensitive item that other countries had agreed to control – and you can see the problem with the Trump administration policy on Huawei. Or now two problems.

First, their national security objective was failing. Huawei could still get access to chips from foreign countries, so the US government had not cut them off after all.

But second, the administration had created a new problem. The only companies suffering from the US only export controls were the ones manufacturing chips on US soil.

By being cut off, those American companies were going to lose sales and profits in the incredibly competitive and fast-paced global semiconductor industry. Having decided to produce in the United States had suddenly put those companies at a big disadvantage globally.

This was the “un-level playing field” that Kevin mentioned. And the field was being made un-level by the US government's own policy.

Trying to fix the problem it had created, the Trump administration turned to something called the “foreign direct product rule.”

Kevin Wolf: In August of 2020 the Trump administration expanded greatly upon this direct product rule and applied it to any foreign made item made with any kind of semiconductor, electronic, computer, or telecommunications technology of any sensitivity, that was US origin or – here's the kicker – if the foreign-made item such as the semiconductor was made in a facility that used US equipment.

Since every foundry on the planet uses US tools and equipment then, by definition, every foreign-made semiconductor on the planet – if they were destined to Huawei – became subject to US export controls and licensing requirements in August of 2020.

Chad Bown: This was so important. This meant that American plants would no longer be the only ones cut off from supplying chips to Huawei.

Foundries like those of TSMC in Taiwan or Samsung in South Korea – really, any manufacturing facility on the planet – faced US export controls that would not allow them to make semiconductors for that Chinese company.

The foreign direct product rule, that was a legal hook, and it relied on a quirk in the semiconductor supply chain. Every manufacturing facility on the planet had one thing in common. They all used tools that were being made by companies on American soil. That is what was now being controlled.

THE IMPORTANCE OF AMERICAN TOOL-MAKING COMPANIES

Chad Bown: A huge part of this entire story involves three important American companies – Applied Materials, Lam Research, and KLA.

You've probably never heard of them, but these are the companies making the equipment that everyone needed. With these companies, the US government had found its choke point in the semiconductor supply chain.

The US export control strategy was to give foreign semiconductor manufacturers like the TSMCs and Samsungs of the world a choice:

They could stop selling chips to Huawei and continue to use their US-made equipment, or they could keep selling to Huawei, but they would be cut off from access to these top-of-the-line American tools.

Chad Bown: Did this approach work?

Kevin Wolf: Yes. With respect to the objective of shutting off US and non-US made items necessary to make cell phones and base stations and all the other things that Huawei makes, it was extremely effective.

Companies all over the planet immediately started complying and applying for licenses.

Chad Bown: There was another important difference with the new US export controls imposed on Huawei.

Kevin Wolf: The Trump administration, for the first time really in the history of Entity List policy, created a licensing policy, announced by the president personally. It took a while to ultimately settle on what the licensing policy would be, but essentially, if it was for a 5G or in support of 5G applications, those licenses would be denied.

But if it was for a 4G application, or something less, the Trump administration adopted a policy of granting licenses authorizing the export of those items.

Chad Bown: This was another way that export controls were changing. It used to be that if a company like Huawei got put on the Entity List, it could not get access to any exports at all. None.

Now, Huawei could get some exports, but only of inputs needed to make 4G – the older telecommunications equipment.

For 5G, the answer was "No!" Companies were not going to be granted a license to ship to Huawei the chips or any other inputs that it needed to make the networks of the future.

Again, that included semiconductors made anywhere in the world because those chips were manufactured at foundries using American tools.

A PROCESS NEEDED FOR EXPORT CONTROL LICENSES

Chad Bown: Administratively, for any potential inputs now going to Huawei, the US government had to set up a process to decide which were OK and which ones were not OK. It would need a new system to process all those requests for licenses. And for a long time, both the companies trying to sell stuff to Huawei, as well as officials at the Commerce Department, seemed pretty confused.

Kevin Wolf: With respect to the Commerce Department, they were now processing applications by non-US companies that were affected by these rules and had to decide what really was the policy. Over the year and a half, or two years of this, there was an extraordinary amount of evolution and change and massive uncertainty as to exactly what the government was trying to achieve. And so there was a lot of uncertainty as to which licenses would or would not be granted over the course of 2020 in particular.

It was a completely new experience for hundreds of companies outside the United States that had never been subject to any export controls from their countries or the Americans. They had to figure out how to apply for a license. Export control attorneys all over the country were very busy teaching companies how to apply for a license and helping them do that.

Chad Bown: Looking beyond those hundreds of companies outside the United States, in China, lots of other Chinese companies suddenly became worried about the Trump administration's new use of export controls for a different reason.

Seeing how Huawei had been cut off from foreign exports made other Chinese buyers of semiconductors wonder if they might be next.

This was potentially really big. The Semiconductor Industry Association estimated that 20% of total US semiconductor sales were going to Chinese companies buying chips.

To protect themselves, these other Chinese buyers started to hoard semiconductors.

Because Chinese companies are such big buyers of these chips, this hoarding contributed to what became the worldwide semiconductor shortage problem.

Kevin Wolf: From my perch, I absolutely saw companies that were not directly implicated by the Huawei listing, concerned that other companies might become subject to the same type of action, absolutely started hoarding semiconductors and spare parts and components in order to immunize themselves against a supply chain disruption, should it happen. Absolutely.

CHINA'S MILITARY-CIVIL FUSION POLICY

Chad Bown: Separate from the US actions on ZTE and Huawei, US policy objectives also changed in response to policy decisions that had been made in China.

Under President Xi Jinping, the Chinese government was increasingly pushing a policy of 'Military-Civil Fusion.' Military-Civil Fusion is where the Chinese government encourages Chinese companies to do things to help modernize the Chinese military.

For potential dual-use goods, including for things like semiconductors, this made the old way of doing export controls harder for officials at security agencies like BIS.

Within China, where do you draw the line between an end user who is 'civil' and wants something like a semiconductor to put into a mobile phone or a video game, versus one who wants to use the chip to advance China's military by making a better missile, drone, or other type of WMD?

Kevin Wolf: The structure, historically, of the export control system was built on the premise that in countries there were civil end users, which were generally OK, and there were military end users or those associated with WMD, which were generally not.

And the whole purpose of the dual use side of the export control system was to try to identify the types of items that if diverted for a military application would be harmful or contrary to national security interest, but not to affect those otherwise dual use or commercial items for purely civil end uses.

And over time, including during our administration, given Chinese state policy of requiring civil firms to comply with demands from the military to support military modernization, it became ever more difficult, and now I would suspect almost impossible, to distinguish between a true civil and a true military end user, given that Chinese state policy.

And that completely upsets the whole point of a dual use export control system and makes the old way of thinking not really viable anymore as a result of that change in Chinese policy.

US EXPORT CONTROLS AGAINST SMIC

Chad Bown: With the whole point of dual use export controls unraveling, in the last days of the Trump administration, the US used this Military-Civil Fusion motive to apply a third important set of new export controls. The December 2020 action targeted SMIC – the Semiconductor Manufacturing International Corporation.

SMIC was China's largest manufacturer of certain types of semiconductors. Like the second action taken against Huawei, these new controls would cut off SMIC from buying US tools to make chips. The US government's stated concern was that SMIC was making semiconductors for the Chinese military.

Kevin Wolf: Semiconductors are right at the heart of that civil-military fusion concept because of how significant they are to the functioning of anything – any military item, any commercial item at some level needs semiconductors of greater or lesser sensitivity, and SMIC being the largest semiconductor manufacturer on the logic side in China obviously was right at the center of that policy concern.

Also, in a completely novel approach, it wasn't just a complete ban on all exports to SMIC, which before Huawei was normally the case. Rather, if it was for use in producing or developing an advanced node semiconductor then the license would not be granted. And if it was for something else, a mature node chip, then it might be granted.

Chad Bown: The new part of the December 2020 policy targeting SMIC was the way it distinguished between types of semiconductors. This was big.

It was sort of like how the export controls on Huawei differentiated between 4G and 5G – between the old and new technology.

Here, American companies could still sell equipment to SMIC to produce mature nodes, sometimes called legacy chips. The older technology stuff was still OK.

What was not OK was American companies selling tools that SMIC needed to make advanced node semiconductors – the smaller, faster, fancier chips.

With Military-Civil Fusion, this Chinese company producing advanced node semiconductors would be a US national security threat.

Looking ahead, the export controls imposed on SMIC would turn out to be an early version of the Biden administration's approach announced on October 7.

EXPORT CONTROLS AND WORKING WITH ALLIES

Chad Bown: Looking back at these last two US export control actions, the one on Huawei and the one on SMIC, in both cases, the US did them unilaterally. Even close US allies did not impose similar controls.

I asked Kevin about the importance and the implications of the US going it alone on export control policy.

Kevin Wolf: There's a fundamental concept within export controls and it's baked into the law as well, in the Export Control Reform Act, that unilateral controls tend to be less effective because if they are US-only controls, then the same items can be purchased from non-US companies.

There are a lot of very clever people outside of the United States that make things too, and if your goal is to cut off a thing from moving to a country or an end user of concern, then the way to make it more effective (or effective at all) is to have allies impose similar controls.

And the other big difference is that, when you have US-only controls, by definition you are giving those markets to their non-US competitors who are not subject to any similar controls on exports of similar items from their country. In these high tech spaces, the R&D is critical to success because you need massive amounts of exports in order to fund the massive amounts of R&D to do the innovation to create the next generation of your clever product. If you don't have the money to invest to do that, and your competitor outside the US does, eventually they will out-innovate and outcompete you.

Although unilateral controls are absolutely very effective in the short run, given dominance of the US in key sectors, and in fact sometimes should be done regardless of effectiveness, particularly if it's for a human rights related concern or if there's a law enforcement issue – so I'm not saying that unilateral controls are always bad as a policy matter – but in the main, if your goal is to stop something from getting to a country or a company, you need allies to do it as well.

Chad Bown: The US export controls, targeting Huawei especially, were also pretty extra-territorial – meaning they were impacting companies not located on US soil.

Chad Bown: How do foreign governments – even in allied countries – generally feel about these extra-territorial US actions impacting their companies?

Kevin Wolf: On the countries, they generally bristle at the extra-territorial jurisdiction of US law over their companies. They wouldn't say it, but it is something that frustrates and upsets otherwise very polite, good allies.

Other allies love it because they may have the same policy concerns, and they don't have the legal authority or the political will in their countries to impose the type of controls that the US has. They think, personally, "Great, the US is doing what I would love to be able to do in my system. Go, get 'em!"

I absolutely heard both of those answers over time.

Chad Bown: How did the foreign companies feel about those same sorts of controls? What was their response?

Kevin Wolf: In the semiconductor world, every company on the planet was affected because of the extra-territorial reach of US export controls. They bristled, of course, at the imposition of billions of dollars of limitations imposed on foreign-made items that were not sensitive, that were not controlled by their country, from outside the US, going for what they understood was a completely commercial application. They bristled at it.

Chad Bown: To be exempted from the US export controls, companies trying to sell stuff to Huawei or SMIC now needed a license from BIS. The license process was so new and so non-transparent, and with the US policy objectives still shifting, foreign companies now complained.

Some accused the US of just setting up this system to be protectionist. They alleged that the US government was favoring American companies and not giving licenses to foreign competitors, even ones in allies.

Kevin Wolf: I heard those stories a lot. Everybody in the business thinks that their competitor is being favored. Foreign companies think that American companies are being favored, and American companies think that foreign companies are being favored. And from a licensing decision – working with lots of US and some non-US companies, I never really saw that.

But because the process is completely confidential, the company can't discuss it and the Commerce Department can't discuss it, paranoia and suspicions often run wild.

PART II. US EXPORT CONTROLS ON CHINA UNDER THE BIDEN ADMINISTRATION

Chad Bown: The Biden administration came into office in January 2021. On US export controls, a lot had changed over a short period of time.

There had been ZTE, the trade war, Huawei and 5G equipment. Controls were impacting the semiconductor supply chain and those American tool makers. China's Military-Civil Fusion policy had led to US export controls targeting SMIC.

There was just a lot for any new team to absorb.

Chad Bown: With respect to China, how did US export control policy change over the first 18 months or so of the new US administration?

Kevin Wolf: It didn't really, it really just adopted where the Trump administration ended at the last literal days of the administration and maintained those policies for the first year, year and a half, or so.

And during this time, there were several things going on. They were, as an administration, developing a coherent narrative across all areas and other issues related to China. And second, it took a long time to get political officials in place in order to be able to administer the system.

The first year or so was just maintaining where things ended at the end of the Trump administration.

Chad Bown: For close watchers of national security issues, there was never a sense that the new Biden team would simply reverse the Trump administration's export controls, including those that stopped American equipment from going to SMIC to potentially make those fancy, advanced node semiconductors.

Kevin Wolf: It was clear from the beginning of the administration, and even before the administration, that the people at the National Security Council had fundamental national security concerns with respect to advanced node semiconductors in China and their per se relevance to the modernization of China's military and weapons of mass destruction fleet.

It was always clear – for those who follow things that people write, even before they joined the administration – that something significant was going to happen on the advanced node semiconductor and semiconductor production equipment as a policy matter. But exactly what it would be was largely unknown.

BIDEN AND EXPORT CONTROLS FOR SEMICONDUCTORS? SOMETHING IS COMING

Chad Bown: With the Biden administration and export controls for semiconductors, something important was coming, but exactly what and when was unclear.

Then in the summer of 2022, two big things happened.

Kevin Wolf: The first was the news that SMIC had developed, to whatever degree, a chip at a very advanced node at the seven nanometer level. And there was clearly an indication from the administration that they needed to move and move quickly to achieve their objectives, to stop that from advancing.

And then there was, from all indications, a great deal of concern at the Chinese reaction to House Speaker Nancy Pelosi's visit to Taiwan. And that enhanced the national security concern with respect to doing something, and something significant, through export controls and many other vehicles.

Chad Bown: SMIC, that same company that the Trump administration had put on the Entity List – to stop it from getting tools to make more advanced node chips – it had managed to make progress anyway.

That, combined with China's massive military response to how Speaker Nancy Pelosi's visit to Taiwan, the Democratic island that Xi Jinping has said he wants to unify with the communist mainland – those events set the stage for what happened next.

On September 16th, National Security Advisor, Jake Sullivan, gave an important speech, which spelled out the Biden administration's national security objectives for export controls.

National Security Advisor Jake Sullivan: *On export controls, we have to revisit the longstanding premise of maintaining "relative" advantages over competitors in certain key technologies. We previously maintained a "sliding scale" approach that said we need to stay only a couple of generations ahead.*

That is not the strategic environment we are in today.

Given the foundational nature of certain technologies, such as advanced logic and memory chips, we have to maintain as large of a lead as possible.

Kevin Wolf: That was really the first coherent articulation of what national security meant when you're outside the scope of items that have some identifiable relationship to the development or production of weapons, military items, or classic export control considerations.

He also said quite explicitly in his speech that the era of "sliding scale" changes with the evolution of technology is over. Whereas for things that had historically been controlled, an unwritten rule was that, in the policy consideration, so long as we're staying a couple of generations ahead with respect to this otherwise commercial item, then that was acceptable.

He said that's over. And now the objective is to maintain as large of a lead as possible.

Chad Bown: Let's dig into that a little. Can you give me an example that might explain what Jake Sullivan meant by this "sliding scale" and "maintaining as large a lead in technology as possible?"

You're holding up your iPhone there. OK. Go ahead.

Kevin Wolf: I've used the example of cell phones to the end of sliding scale era being over. So when I started in export controls 30 years ago, the GPS system in here, that allows you to navigate, was highly classified and strictly export controlled because it's what was used to direct missiles to targets.

The encryption capability in here was controlled, as some of the most strict munitions list items, because of its encryption capabilities. And the processor in here would have met the definition of a supercomputer back in the day.

The sliding scale, for commercial items that aren't bespoke or inherent to military applications has been to gradually release the controls on them once they become widely available commercial items.

The significance of the Jake Sullivan speech is that he said that we must maintain as large of lead as possible, and that this era of moving the goal posts every couple of years to account for evolutions of technology is over.

THE US EXPORT CONTROLS ANNOUNCED ON OCTOBER 7

Chad Bown: Maintaining as large a technological lead as possible is one of the Biden administration's important new policy objectives set out by that speech on September 16th.

But the administration did not put those new objectives into place, or make any policy changes, until its sudden announcement on Friday, October 7th.

CNBC: *Watching chip stocks getting hit hard in overseas trading today following Friday's announcement by the Biden administration of new export rules on chips. The rules restrict the sales of semiconductors made with US technology…*

Chad Bown: What was in those new US export control rules on China that the Biden Administration announced on October 7th?

Kevin Wolf: The October 7th rules are focused on limiting, in China, the development or production of four things: advanced node semiconductors, semiconductor production equipment of any type, advanced computing capabilities, and super computers.

And the US government is implementing this objective through novel uses of lists of controlled items, through controls on activities by US persons, and extraterritorial reach with respect to foreign made items going to specific Chinese companies.

Chad Bown: Let's start with the first of those – advanced node semiconductors.

This is production of fancy, small, fast chips. The regulation is pretty specific about what types of chips were being targeted – advanced logic, advanced DRAM (dynamic random access memory), and advanced flash memory chips.

The policy is restricting US exports of the top-of-the-line tools made by American companies from going to facilities in China making semiconductors.

Let's try to sort through which companies in China are affected and how.

There are a number of foreign headquartered multinationals making chips in China – Taiwan's TSMC, South Korea's Samsung and SK Hynix, even the American company, Intel, still has a plant that is in the middle of being sold off to SK Hynix.

Did the new US export control rules apply to even those four companies' semiconductor plants in China?

Kevin Wolf: Yes. So the rule as written did not distinguish between if it's a company headquartered out of China or a Chinese-headquartered company.

But what the administration said in the rule was it was going to treat differently the companies that were headquartered out of China than the companies that were headquartered in China.

The rule was fairly explicit that, if you're a Chinese headquartered company, the licensing policy for any exports or covered activities to a facility that does one of these types of advanced node work would be denied. No exceptions. You can't get the US item or the benefit of the US service for it.

If, however, you are a foundry that is headquartered outside of China there would be a case-by-case review policy.

Chad Bown: There would be a case by case review policy for the four, foreign headquartered multinationals that we mentioned that had plants in China.

The existence of such a policy was announced on Friday, October 7th, but some of these controls were going into effect right away, and the foreign companies needed licenses to keep those plants pumping out chips. And those licenses – presumably determined after the case-by-case reviews – were *not* announced with that new rule on October 7th.

Nowadays, you are a private sector lawyer with clients to deal with. So what happened?

Kevin Wolf: Yeah, that's actually probably the four longest days of my professional life. It sounds very simple now, but those licenses for the four multinationals and the companies that export to them were not announced on the same day as the controls Friday, October 7th, before a holiday weekend in the government.

A lot of companies that were affected had to scramble because some of the rules became effective immediately on Friday and others of the controls were becoming effective on US persons the following Thursday.

Again, for the Chinese-owned companies, nothing has been granted as far as I can tell, and it's just a per se denial policy.

But for the four multinationals, there's been a reprieve of a year to decide what the right policy should be for non-Chinese owned companies manufacturing advanced node semiconductors in China.

Chad Bown: The companies and BIS scrambled, but Commerce got licenses out to the four multinationals before the controls went into effect, so none of them had to even temporarily shut down their plants.

But how should we interpret the fact that these licenses are for one year only, as opposed to, say, 18 months or two years or something else?

Is that just pro forma and they'll just get another one year license one year from now?

Or no, that's a signal that these companies need to start winding down those facilities in China right now and be ready to get out in a year?

Kevin Wolf: There is no pro forma, this is all completely new. Remember, the policy goals, the objectives, the approach – Everything about this is non-traditional, non-classical. So it's all being made up on the spot.

I don't know if anybody has decided what's next. And a lot of that will be a function of diplomacy, of working with the allies bilaterally and trilaterally. What happens in the multilateral regimes, the Wassenaar Arrangement – in terms of whether some of these controls can be made multilaterally – what the policy judgment of the US government is about what the right node is with respect to China, and these broader concerns about China's indigenous capability.

I think the only thing you can take from the one-year authorizations that have been reported is that there's a one-year authorization. And it is going to be an interesting year to see what happens.

DIGGING INTO THE WEEDS OF THE OCTOBER 7TH RULE

Chad Bown: How did the export controls that the Biden team announced on October 7th compare to the Trump administration's export controls applied to SMIC?

Kevin Wolf: The SMIC policy was the grandfather of the October 7th policy for the mature versus advanced concept. But the Biden team used every other tool that either had already existed, or ones that hadn't existed, in order to have sort of a comprehensive policy of cutting it off, not just for one company, but for the entire country.

If it's advanced nodes, we're cutting it off completely. (Minus the one year for the multinationals as we sorted out.)

But for mature nodes, one reason why it's so complicated of a rule is they went out of their way not to effect (once people understand the rule, it's going to be a lot of chaos for a couple of months as people figure out what's actually prohibited and permitted) but the policy objective of the rule is not to affect the inputs for the production and development distribution of mature node logic or memory, the older generation chips.

Chad Bown: So even Chinese companies are allowed to continue to produce the mature, older node legacy semiconductors. But how is BIS doing this, especially for the companies that might produce both advanced and mature node chips?

What's the rule?

Kevin Wolf: The prohibitions are based at a facility level, not a company level.

And this is another novel aspect of the rule that is creating lots of confusion. And not that the rule is unclear, but it takes a while to sort out what the lines are given the novelty.

It's not based upon whether a company makes advanced node chips. If another facility, even if owned by the same company, is only doing mature node production, then that facility is not affected by this part of the rule.

Chad Bown: One way to look at this then is that the US government could have gone farther and said, "We're not going to allow any US equipment or any US persons to service any Chinese owned facilities, even the ones manufacturing the mature nodes."

Why do you think the Biden administration decided against doing that?

Is this out of recognition that we're still suffering chip shortages, even for mature node chips? And China is a massive producer and if the US were to stop their ability from making even those chips right now, that might hurt the auto sector and other downstream industries that buy those semiconductors? And we don't want to make supply chain disruptions worse than they already are?

Kevin Wolf: The rules implemented are remarkably consistent with the policy vision of what national security means that Jake Sullivan articulated in his speech. So the answer to your question is the reflection of a determination that mature node chips in China are not, per se, a national security threat, and the export control rules don't apply to them.

I don't know what internal discussions were had about those other impacts on the supply chain. But to take it at face value, the reason the rules were not applied to mature node chips is because the national security assessment was focused on the advanced node capabilities.

IMPACTS OF THE NEW RULES ON THE GLOBAL SEMICONDUCTOR SUPPLY CHAIN

Chad Bown: I want to move on to some of the other parts of the global semiconductor supply chain caught up in all this. Obviously, Chinese semiconductor companies trying to make advanced note chips are going to suffer if they can't get access to American equipment and tools from companies that we mentioned before, like Applied Materials, Lam Research, and KLA.

The main competitors of those three companies include Tokyo Electron in Japan and ASML in the Netherlands.

How are all of those companies likely impacted by these new rules?

Kevin Wolf: There's obviously a significant negative financial impact on those companies, and I'm referring to the US companies.

For the two primary non-US competitors – one in Japan, one in the Netherlands – I don't know if this has any effect on them. In fact, in media reports they said it would only have a tiny effect because they implied that they've been able to develop their tools without US equipment, without US technology, and can wall off any US persons that are involved in providing support.

The impact is very different depending upon whether it's a US tool company or a non-US tool company.

Chad Bown: On the issue of unilateral export controls, from the beginning of their administration, the Biden team has emphasized the need for the United States to work with allies. This October 7th policy decision was so big – we've barely scratched the surface, but we've already managed to describe how the new US export controls are impacting companies headquartered in South Korea and Taiwan, as well as those that are making tools like Tokyo Electron in Japan and ASML in the Netherlands.

At an event at CNAS on October 27th – after the export controls were imposed – Biden administration official Alan Estevez, the Under Secretary of Commerce for Industry and Security at BIS, spoke about how the Biden administration was working with allies to turn these unilateral export controls into multilateral controls that the allies would impose too.

Under Secretary Alan Estevez: *I know there's going to be some questions about where the multilateral is in what we just did. And I will say that's a work in progress. We moved out at this point because we felt we needed to for the national security reasons. We're talking to our allies. No one was surprised when we did this. And they all know that we're expecting them to cover likewise. And we're working on those details with specific allies around that.*

For the US tools that we put on the list – eleven or so tools – those are US-only made, there is no foreign competition for those tools. That's not to say that ASML or Tokyo Electron couldn't develop those tools over time. I expect to have a multilateral deal done before that time. So we expect to have a deal done in the near term.

Again, this was not a surprise to our allies. What we keep hearing is, you know, ensure that you also US have skin in the game, we've shown we have skin in the game. We've taken action. We viewed it as a down payment from what we're going to do. And the discussions we're having are good.

Chad Bown: OK, Kevin.

We've gone through the new October 7th rules for advanced node semiconductors. That same announcement put similar types of controls on exports of American inputs, potentially going to Chinese semiconductor manufacturing equipment and tool makers. This is designed to stop Chinese companies from making tools for foundries that might otherwise be supplied by Applied Materials, Lam research, and KLA.

IMPLICATIONS FOR ARTIFICIAL INTELLIGENCE

Chad Bown: Next, I want to turn to the controls on two more things you mentioned as being covered by the October 7th announcement, advanced computing capabilities and supercomputers.

Let's start by describing what is in these new rules for artificial intelligence and the challenges with developing export control policy for AI.

Kevin Wolf: The problem is how do you define AI? You've got large data sets, you've got algorithms, you've got massive amounts of memory that are needed, and you've got advanced compute processing capability and then clever people to make it all work together, in order to predict events or actions or make decisions, and that obviously is quite important for modern commercial applications, but also equally important for the effective operation of a modern

military. And given the civil-military fusion policies that we described earlier, it is of particular and unique and profound significance with respect to Chinese capabilities in that regard.

But export controls can really only regulate the movement of things, the movement of technology, in the form of information that is for the production or development of something, software, or services.

Those four elements of AI that I just mentioned are, in large part, too squishy to have an export control hook.

Chad Bown: One challenge for the AI ecosystem is that export controls can mostly only stop the movement of things. As Kevin said, AI is squishy.

Earlier this summer, American semiconductor companies like Nvidia and AMD reported that Commerce had asked them to stop selling to China their advanced GPU chips (or graphics processing unit chips) that might be used for AI.

As part of the AI ecosystem, those chips for advanced computing were also tied into the October 7th announcement.

Kevin Wolf: The one part that is controllable in that ecosystem, in terms of an input is the advanced compute side, which was an instruction to companies that make advanced graphics processing units that they were not allowed to ship to China their chips that met a certain technical threshold.

And what the rule did on October 7th, it just transferred those specific instructions to those specific companies to export controls on the same kinds of GPUs to anybody or any computers or electronic assemblies containing those types of GPUs.

It doesn't actually refer to AI, as such, as the basis for (export) control, but it's clear that a policy decision was made that that is the controllable part of one of the key parts of the ecosystem for doing advanced AI work.

US POLICY COHERENCE WITH RESPECT TO CHINA

Chad Bown: Stepping back, and looking at the entirety of the October 7th announcement, how do you see these export controls as fitting in with the rest of the Biden administration's policies, including the CHIPS Act that passed Congress and went into effect this summer, which provided $52 billion of US government funding for the semiconductor ecosystem?

Kevin Wolf: These new export patrols are a reflection of a remarkably consistent, across the administration policy view, about what national security means. As described in the Jake Sullivan speech, it has two halves. He didn't use these words, but it's the "run faster" and the "keep away" strategy.

The "run faster" is the industrial policy, the US support for STEM education and domestic development and production and onshoring, which is reflected in the $52 billion, for the CHIPS Act.

And then the "keep away" strategy is the export control side. But it's also baked into the CHIPS Act, in that there are guardrails that say as a condition of your (a company) accepting this money, you're getting tax credits, you can't go and improve the development or production of your facilities or other work in China that would help with indigenous, advanced node production or development capability.

So the export control rules on October 7th, I would argue, are completely consistent even down to the technology node issues with the guardrail assumption.

Chad Bown: This October 7th announcement covered a lot of ground. But what's next for the Biden Administration's policy in this area? What else are you watching out for?

Kevin Wolf: There is the bookend to these export controls, in terms of what's next, which is outbound investment controls. And in this remarkable degree of policy consistency point that I just made that we're seeing from the Biden administration, it would make sense that, if you can't export technology or items to support indigenous development of advanced node compute or supercomputers in China, then you shouldn't be allowed to invest using foreign technology in the indigenous development of advanced node compute and super computer capability.

There's been one congressional hearing, but lots of public discussion about whether there would either be legislation or an executive order, to impose controls on investments in the indigenous development at a minimum of the very things that are now subject to export controls as of October 7th.

Then it's, what do you do about AI more broadly? That is something that's next. What do you do about quantum computing more broadly? Those two were not directly addressed in those rules, but there are things to be done.

Chad Bown: How about for the companies in the semiconductor supply chain? Earlier you used the word chaos. What should we be watching out for there?

Kevin Wolf: Because of the novelty of the rules and their expansiveness, a lot of work is being done to figure out what is or isn't permissible. And in the short-term companies that want to comply with the law pull back.

And because the supply chains between the two are so completely intertwined, there is going be a lot of unintended impact on mature node production and development in China.

And I mentioned the multinationals is something still to be sorted out.

Chad Bown: For those four multinationals with facilities in China with one year licenses, we'll be watching for them too.

IMPLICATIONS FOR CHINA AND ITS RESPONSE

Chad Bown: Now I want to turn to China.

As we're recording this, there's not yet been a formal policy reaction from China. So that's something we'll have to watch out for as well.

But I want to ask you a different question.

I know you're no longer in government, and so you haven't seen all the latest intelligence on Chinese military advancements and capabilities.

But how would you respond to the concern that what the United States is really doing here is slowing down China's economic development.

By trying to develop its own semiconductor industry, China was just trying to become more innovative to help its economic growth. China's policies were natural of any emerging economy worried about the middle income trap. And with these export controls, what the United States is really doing is hurting the Chinese people by slowing their prospects for economic development.

Kevin Wolf: I hear those arguments, but I take the administration's (word) and believe it personally, of the inherent significance to the modernization of weapons of mass destruction fleets through the use of advanced node semiconductors, advanced node computing, and super

computers. And I really do believe that the driving mission, the national security objective, of the people making these decisions is to achieve that objective, given actions of Chinese policy.

The rule referred to an intelligence assessment of Chinese motives and intentions with respect to this capability for their weapons systems and for their militaries.

People, of course, make all sorts of inferences, in terms of what the true motive is. But if you read the preamble of the rule, there's nothing about any of that as part of the motive or the policy or the intent or the impact. And it's all tied directly to an ecosystem, combined with Chinese motives, combined with Chinese civil-military fusion policies, combined with the significance of this capability to make modern weapons, that these rules were implemented.

So that may be the effect. People will say that who have other agendas, but I take the administration's stated policy objectives at face value. And from my experience in government, it all makes perfect sense.

Chad Bown: As my last question, I want us to look for any possibility for optimism.

Is there anything in this October 7th announcement that might be seen as an off ramp? Something that says. "If Chinese firms stop doing X, then they can get access to these exports and technology again?"

Kevin Wolf: The Entity List is just one tool in a broader suite of tools this administration is using.

There is no off ramp. It's the country of China which is the issue. It's the ecosystem of China. It's the state policy of China to blend civil and military applications and to acquire purely civil items of advanced capability for use in modernizing its military, which is the threat.

There's nothing baked into this rule or the policy considerations that would suggest that there is an off ramp, because there's no reality the Chinese government is going to change any of those policies that I just summarized.

Chad Bown: Kevin, thank you very much.

Kevin Wolf: Happy to help.

SUMMARIZING THE OCTOBER 7 POLICY

Chad Bown: So much has happened. Let me try to summarize where we are.

Following the Jake Sullivan policy speech on September 16th, the October 7th announcement of new US export controls was a big deal.

The US government is telling Chinese companies that, because of the Chinese government's Military-Civil Fusion policy, those companies can no longer rely on American equipment or services or people to help them develop their advanced semiconductor industry.

Because their country is a military threat, their indigenous industry is now on its own.

Foreign headquartered companies making chips in China like TSMC, Samsung, and SK Hynix have been given a reprieve. These companies have tens of billions of dollars of plants and equipment sunk in China, and they are making massive amounts of chips that the world still needs right now. The rule allows them to keep making semiconductors in China for another year. Beyond that one year, we'll see.

The US policy is likely to disrupt the semiconductor supply chain, but how much more chaos to expect is still unclear.

American equipment companies are going to lose out by no longer selling their tools to certain Chinese facilities. At the same time, governments and other countries, including the United States through the CHIPS Act – but also in Europe, Japan, and elsewhere – are spending tens of billions of dollars to help fund new semiconductor manufacturing facilities being built outside of China. The need for new equipment at those plants may help ease the sting facing US tool makers losing export sales to China.

In terms of working with allies, these new US export restrictions were done unilaterally. Other important countries have not yet said that they would control exports from their tool-making companies that want to sell to Chinese firms, making advanced node semiconductors.

For the policy to work better and for American companies to suffer less economically, the United States really does need countries like Japan and the Netherlands to come on board. We'll be following developments there as well.

The last point is that there is no end in sight. It seems like there are serious national security reasons behind this policy.

But it is not good news for the Chinese people or China's economic development.

There is no sort of off ramp, and China is also likely to respond.

Lots to worry about here beyond simply international trade.

This is probably one of the most important, but also one of the least fun episodes, I have ever had to put together.

GOODBYE FOR NOW

Chad Bown: And that is all for Trade Talks.

A huge thanks to Kevin Wolf, formerly the Assistant Secretary of Commerce for Export Administration during the Obama administration, and now a partner at the law firm of Aiken Gump.

Thanks to Melina Kolb, our supervising producer. Thanks, as always, to Collin Warren, our audio guy.

Do follow us on Twitter. We are on at @Trade__Talks. That's not one, but two underscores, @Trade__Talks. ■

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