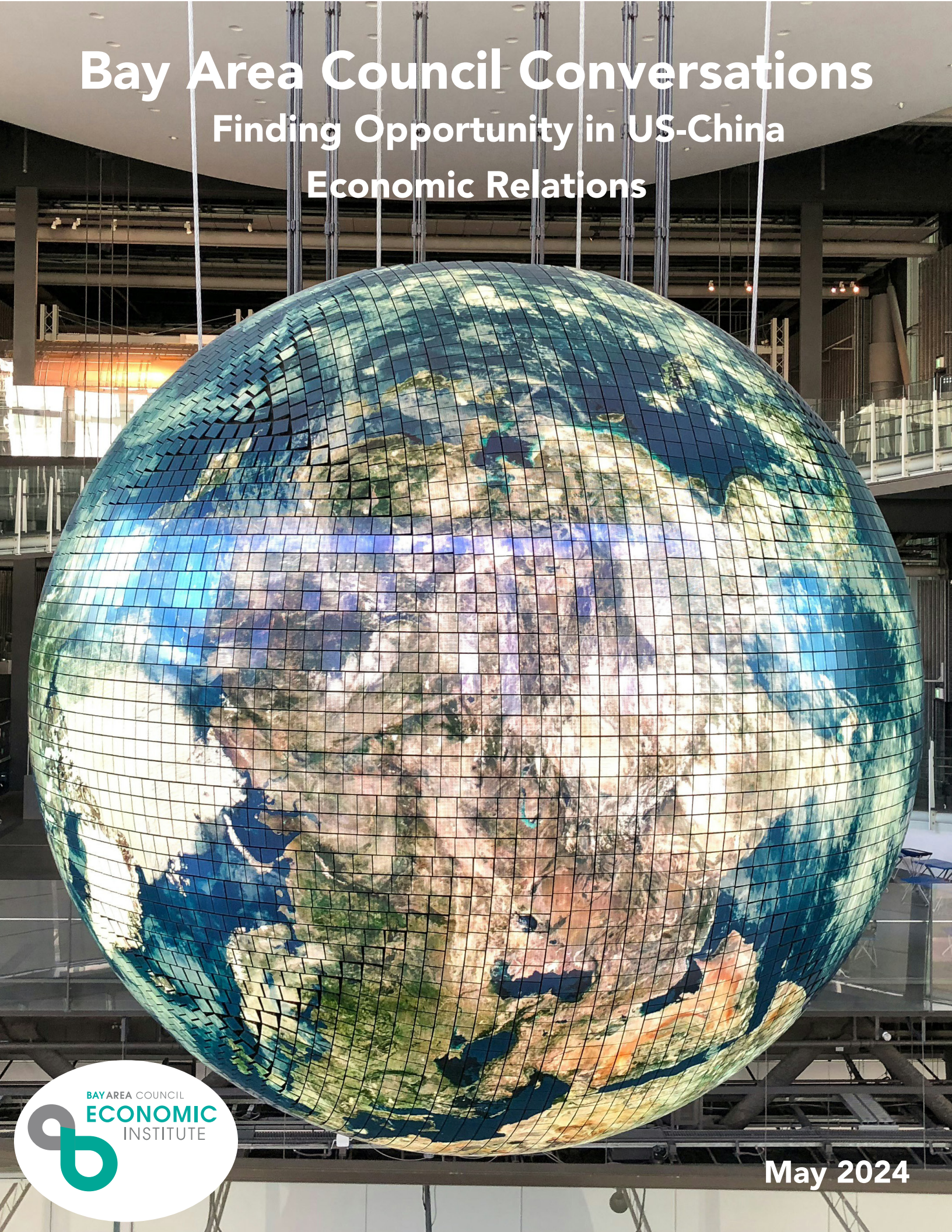
Bay Area Council Conversations

Finding Opportunity in US-China Economic Relations



BAY AREA COUNCIL ECONOMIC INSTITUTE

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This conversation took place at a December 2023 symposium jointly sponsored by the Bay Area Council Economic Institute, the Stanford Center for China's Economy and Institutions (SCCEI) and the Shenzhen-based China Development Institute (CDI) on where, despite the obstacles, opportunities can still be found to build business and economic ties between the U.S. and China.

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Matthew Boswell
Associate Director, Stanford Center for China's Economy and Institutions

Setting the Stage: Changing Economic Relations between the U.S. and China

Sean Randolph: Thanks to the China Development Institute (from Shenzhen) and the Stanford Center on China's Economy and Institutions for partnering (SCCEI) on this dialogue on where, despite the challenges on both sides, there are still opportunities to develop productive business and economic relationships between the U.S. and China.

Matt Boswell: These days it's very hard to hear a dispassionate view among people in the US about US China policy. SCCEI is an effort to give empirical underpinnings to some of these conversations. We're Stanford's home for data driven multidisciplinary social science on China and want to let the data talk. We also elevate the profile of quantitative scholarship on China that might otherwise collect dust in academic journals. I'm very much looking forward to everyone's remarks.

Sean Randolph: Our engagement here at the Council with China began in the mid-2000s, when the Economic Institute produced a very thick report on the connections between the Bay Area and China. It was thick because there was so much to talk about, and so much opportunity. Since then we've had an office in Shanghai and staff in other cities for nearly 15 years, helping California and Bay Area companies enter the China market. So we've had a stake in the relationship for many years and remain committed to it.

The focus of the conversation today is practical. There are a lot of difficult issues in U.S.-China relations and we want to acknowledge those, but also look beyond them. To set the stage, I'm going to get the hard stuff out of the way first, because we can't ignore the obstacles to cooperation that have arisen in recent years and have tended to push us apart. If we go back to the early 2000s, China was at the heart of the global offshore production model where many companies moved production to China as a platform for global markets. Costs were low, efficiency was high, and it worked very well for what it aimed to do. As China's economy grew, a lot of that investment also focused on China's domestic markets. Then in the mid-2000s China started to export capital around the world. In the US there were three major destinations: New York, Los Angeles and the Bay Area. That investment was classic FDI (for example in real estate) but was also in technology. That peaked in 2017, after which investment in both directions started to go down.

It initially went down on the Chinese side because of capital controls, where a lot of Chinese capital was being yanked back by the government because too much was leaving the country and Chinese companies were arguably over-extended. So we started to see investment in real estate and other assets disappear. After that we also started to see a fallback of Chinese investment in technology, which made a decisive turn around 2020. By then we saw both inbound investment and investment going to China dropping. Acquisitions in China fell, greenfield investment flattened, and venture investment in both directions started to drop. There were political restrictions on both sides but also pandemic restrictions.

In this shift US policy evolved from one that focused on trade imbalances early in the Trump administration to one with a greater focus on technology and security. This reflected a declining level of trust in both directions but particularly on the part of the United States. The Trump tariffs are still in place and there is a growing list of technologies that require approval for export to China, particularly technology that may have dual civilian and military uses. Trade is still strong, but Mexico has replaced China as our number one trading partner.

One big limitation is on investment through acquisitions here. CFIUS, a government panel that reviews inbound foreign investment for security issues, has been given more authority. It used to just review big acquisitions but now it can review even minority investments in smaller companies if they produce sensitive technology. Most of the companies that are reviewed come from China. Not all transactions are turned down and there are workarounds, but it creates a barrier that discourages investment. U.S. semiconductor exports are under tight controls, and under the latest rules U.S. investors going to China are required to report what they're doing. We'll see where that goes. The number of students moving in both directions has also fallen, with barely 700 U.S. students studying in China today.

All of this has narrowed the scope for trade and investment cooperation, and we want to acknowledge this setting. But that's not what we're talking about today. Today, we want to be realistic but positive and ask where it's still possible to develop productive economic and business ties between the United States and China, and especially between San Francisco Bay Area and China. We're not going to go into depth on every topic but want to tag specific pathways where we and our partners see opportunity.

Dr. Gang Fang: First allow me a bit of introduction on the China Development Institute (CDI), which

was established by the central government and local government in Shenzhen 35 years ago at the beginning of China's reform and opening up as Shenzhen's economic zone was first being developed. We do economic and social development consulting for government ministries and departments, not only in Shenzhen but with local governments in many provinces and cities. In 2016, we were named as one of the 25 leading think tanks in China. We also have a mandate to work with the central government on issues around economic development, regional development, and international cooperation including the Belt and Road initiative. Shenzhen is part of the Greater China Bay Area and we study that as well.

As an economist, I'll say only a few words about situation of Chinese economy. There's debate about the current downturn: is it cyclical or the beginning of long-term decline? I would argue that it's cyclical. We've had a long time with high growth, and when you have a slowdown all the problems come up. That's normal and may require a couple of years to clean up. In the long run we are still a developing country, so the potential is still there. It's not like Japan in the early 90s. The urbanization ratio is only 65%, and 70% of the population is low income. Even middle-class income is only $20,000 per capita.

The potential long-term growth of China is going to be slower. One of the major reasons is geopolitical tension and the issues around decoupling that are cutting China off from technology. Now we have to innovate more ourselves, and this has slowed growth in many companies. Ten years ago, when China was preparing its 13th Five Year Plan we calculated China's potential growth. At that time growth was about 7.7%. Now it's something like 5% or 5.5%. I'm cautiously optimistic. Of course, anything's possible, but I believe that if we get the policies right China still has the potential for reasonable growth.

There is still a lot of potential for business and economic cooperation between China and the United States. For businesses, I would like to mention two things. One is that there is a consensus among China's policymakers and business leadership that in the face of this decoupling China needs more opening. That has made China's leadership and the government pay more attention to the needs and demands from business leaders. The second thing, and one of the reasons why the exports to the U.S. will continue to grow, is that consumer goods industries are affected much by this decoupling, and China's consumption will continue to grow, in services as well as consumer goods. So there's still potential.

One area to focus on is climate change, where declarations have been made between the two countries. Chinese renewable energy companies will have to invest in United States to avoid barriers, but maybe that's good. China and the U.S. can also cooperate on climate at the global level. Then there's AI safety. A big conference on that was recently held in the UK and this could also be a topic.

I also want to mention subnational cooperation. The recent trip to China by California's governor is a good example. Another is Bay Areas. The China Greater Bay Area, in Southern China, is a cluster of cities that are working to complement each other and promote urbanization – a development that's significant for consumption as well as technology and innovation. There are also clusters in the Shanghai region and around Beijing, and we also see a lot of potential for cooperation there.

Trade and Investment

Ker Gibbs (Moderator): Andy, we're hearing a lot in the press about debt and the property sector. What's going on?

Andy Rothman: You're reading in the newspapers that China's economy is in crisis and collapsing but I don't see it that way. If you compare the state of the Chinese economy today to where it was pre-COVID in 2019, industrial value-added is 22% higher than it was and electricity consumption is 23% higher. Retail sales are 14%, higher than they were in October 2019. That's not fantastic but it's not terrible. Trouble in the property market, which is one of the weakest economic sectors, I think reflects regulatory problems and a lack of confidence rather than an economic collapse.

The way to illustrate this is to look at the 25 biggest cities in China. New home sales in the first three quarters of this year (2023) were down about 28% on a square meter basis. That's terrible. But existing home sales during that same period were actually up 13%.

What this tells me is that there's plenty of demand for housing and plenty of people who can afford to buy a house, but they don't have confidence that developers will actually build and hand over a flat on time after people have put 30% cash down and have started paying their mortgage. This is a problem that the Chinese government and can solve and I'm puzzled they haven't yet. For example, why don't they take a page from our history. When during the Depression we lost confidence in our banking system the US government created the FDIC so people would put money in the bank, and if it fails would be protected through an insurance program. I'd like to see the Chinese government do the same thing for down payments for new homes.

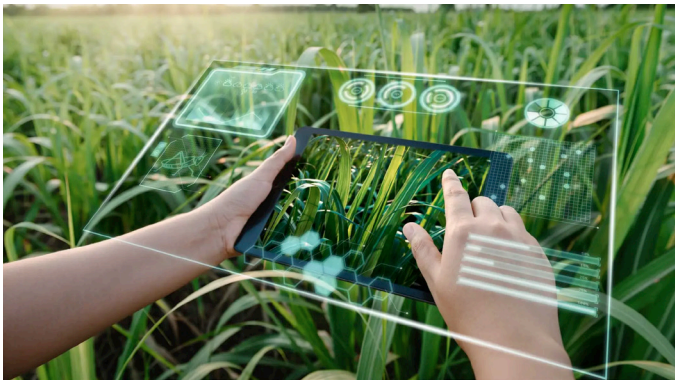
Climate

Ker Gibbs: Climate change is frequently cited as an area where the US and China can work together. Max Wei is a scientist in the Energy Analysis and Environmental Impact Division at the Lawrence Berkeley National Laboratory. Can you talk to us, Max, about opportunity to cooperate more closely on climate change?

Max Wei: This is a huge area. At the Lab we're very proud of our heritage in developing energy efficiency standards. We do a wide range of R&D on energy technologies, and there are three main divisions: the Building Technologies and Urban Systems Division, the Energy Analysis and Environmental Impacts Division, and the Energy Systems and Distributed Resources Division, which does a lot of work on storage. We are a lead technical resource for the recently awarded federal hydrogen hub in California called ARCHES, and also work globally in fields such as zero energy buildings.

I want to mention two topics. The first relates to climate adaptation, which means adapting to the impacts of climate change. The other is resilience, which is the ability to withstand extreme heat, storms, flooding, and in California wildfires. Cooling is particularly important because in most years extreme heat is the leading cause of excess mortality due to climate change. To address this, super cool coatings can do a good job reflecting sun from surfaces. More climate friendly air conditioning represents an almost 100 gigaton carbon emission savings opportunity by 2060. It's huge because the world is going to be using more cooling devices to ensure the health and safety of those most in need, during increasingly severe, frequent and longer heat waves. It's a challenge here and in China.

Ker just asked me about the definition and scope of "climate equity". This is about trying to equalize the distribution of benefits and burdens from climate change. Low income and disadvantaged communities bear a disproportionate burden of climate-induced pollution and don't see all the benefits of solar power, electric vehicles and other technologies. So how do we equalize that? One way is through affordable housing and the potential for prefab or industrialized construction - trying to do as much construction as possible off-site at a factory. This can reduce the costs of construction by 20-40%. Building construction contributes 30-37% of energy-related carbon emissions and there's room to improve both materials and designs. This in an area where China is further along.



Agtech

Ker Gibbs: My Chinese friends often have a hard time being convinced that California is an agricultural state when they come to San Francisco and don't see any farms. They go to Los Angeles, and it's all about Hollywood. But California is also an agricultural state. Can you talk to us, Gordon, about agricultural technologies – can technologies from OECD suppliers can be utilized at scale in China?

Gordon Feller: China still has more than 200 million people working in agriculture. It's a much smaller percentage than it was in 1979 when it was 40% of the population - now it's 20% and the number is declining, in part due to the age wave that's hitting Chinese agriculture. If you go to an average village you'll see a lot of older people. The Chinese are also embracing

ag tech in a big way because they see this as a way to address the population crisis, as well as the lack of clean water, of land for farming, and the rising consequences of the use of pesticides and herbicides, which is showing up in the food supply.

The Chinese government has always promised that farmers would have primacy and that agriculture would receive leadership attention. Meeting those promises now will depend on technology. I can give you a quick survey of the areas where China is trying to lead. One of them is on platforms for buying and selling, where the traders and brokers are being pushed out as intermediaries. Organic products are increasingly being bought by middle and upper class Chinese using these digital exchanges, because there's demand and Chinese fear about food safety.

Then there's precision agriculture: knowing the plant, the leaves on the plant, the salinity of the soil or the humidity of the soil under that plant, with each plant having an identity of its own. Precision agriculture has that promise and it's widely used throughout the world. Here in the United States we pioneered it and it's widely used to do things like increase crop yields and reduce the cost of inputs like water, pesticide and herbicide. It does this by using sensors and cloud analytics to understand anomalous conditions. The goal is to use exactly the amount of water you need, reduce the chemical input towards zero, and reduce the labor input because there are fewer people ready to bend or get on their knees and attend to that particular plant. Precision agriculture is being used in conjunction with AI-powered crop disease tools that tell me what's the plant's problem and how it can be dealt with.

There's no official US-China conversation about ag tech. There are lots of non-government, university-based research organizations in China, however. Maybe the most important layer is corporate, where ideas are being exchanged. There haven't been big acquisitions or investments and everything in this field is on a very modest scale right now. Chinese agtech leaders are quite okay with that right now. Their idea is: small gains, big ideas. This isn't high visibility or sexy - it's low level and very under the radar. One area where the Chinese are ahead of everybody is the low-cost use of drones in farming.

I'm very pessimistic about the bilateral government-to-government relationship, but quite optimistic about the potential in this area, particularly in light of how climate change is impacting crop yields and farm productivity. We can collaborate on this even when the two governments are in a war of words.

We have very robust associations of agtech producers and processors here in California who are interested in transnational arrangement. California of all the agriculture producing states is the most focused on the global market, and executives who are interested in bringing technology, innovation or investment to the ag sector in California need only send one message to the association of almond growers, of raisin growers, of tomato growers, whatever it is, and say "we have an idea for how we could collaborate." That doesn't require embassies or ministries to talk to each other.

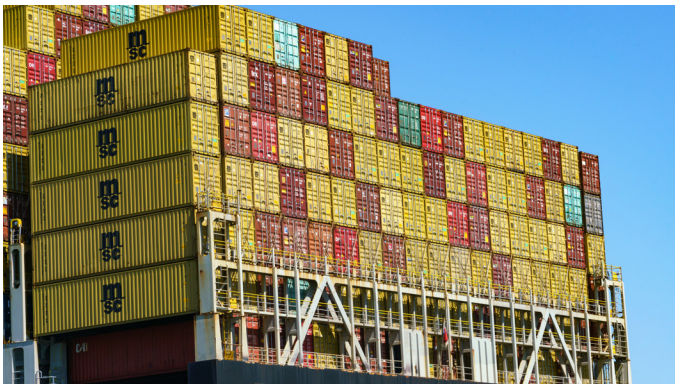
Health

Ker Gibbs: Let's pivot lastly to healthcare, where we're seeing Chinese demand for higher quality services. David Lindemann has over 40 years of experience in academic medical centers, digital health, innovation, and healthcare delivery. The Center for Information Technology Research in the Interest of Society (CITRIS) creates information technology solutions for social, environmental and health care problems. Can you tell us David what you see as the most promising opportunities for collaboration with respect to healthcare innovation and technology-enabled healthcare solutions.

David Lindeman: I'd be remiss if I didn't start with a shout out for the Bay Area Council, which brought us the opportunity to work in the Guangdong area several years ago, which is where a lot of our work is that I'll speak to. Health is a global issue, and the U.S. and China are facing similar challenges: stroke, cancer, heart disease. Both countries also have aging populations.

We work on digital health technologies, including everything from VR, AR, robotics, wearables, etc. Gordon mentioned AI, which is another of our focus areas. CITRIS is a multi-campus interdisciplinary program based at Berkeley that also includes UC Davis, UC Merced, and UC Santa Cruz, and we work with all five UC medical centers. That gives us a 15 million person database that we can use to look at these issues. In China there's even more data and opportunity to work on issues that can improve diagnoses, health care

delivery models, and ultimately quality of life. There's a great deal of overlap and a huge opportunity for our countries to work together. When we get to the next panel I'll share a model for how we're already doing this.



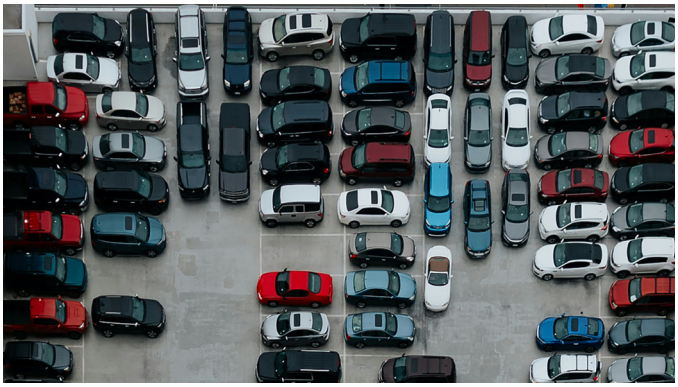
Consumer Goods

Ker Gibbs: Frank Lavin is a former U.S. Undersecretary of Commerce for International Trade and author of a recent book on ecommerce in China. Could you talk to us Frank about how American companies are viewing China these days. The size of the market has always been the appeal, but we have political risk now that could overshadow that potential.

Frank Lavin: You put your finger on it. Let me share two datasets that I think will help people understand. The China market is extremely rewarding because of its size and because it has a hungry, aspirational consumer middle class that wants the best the world has to offer. That's part of it.

The other part is the brand or the product itself. There has to be something aspirational or agile or innovative in what is being sold. The question is, why should the Chinese consumer take you seriously? Why should they fall in love with your product? Some brands have a very good answer to that question and some don't. So what I would say first is that the challenge of the China market is not just about China. It has to do with the company itself and its product. I would tell any US company that you don't want a China strategy. What you want is an international strategy. What is your strategy for going to new markets? What is the purpose? What are you willing to spend? What are you willing to invest? What is your time horizon? Whether it's Brazil, or Turkey or France or China, what is supposed to happen when you go into this new market? Once you have this internal conversation it becomes simple and is just business rationalism: to what extent does China fit your own parameters and criteria?

For most American companies, there's a positive answer of some sort. The people who get it wrong in China are the people don't ask that initial question. They simply say "China is a large market and I'm the number one manufacturer of whatever I'm going to bring it to China." If that's your logic, I'd say that's not much. We call that showing up, but showing up is not a strategy. Many American companies just show up in China, thinking "everybody in America loves me so you need to love me." This isn't logical. So my first suggestion when I speak to American companies is "let's think through the ultimate international goal. Secondly, let's think through to what extent China helps you reach that goal." There are definitely challenges and political headwinds and it's not always sunny weather. So another question a company needs to ask is, does your company have the ability to move ahead, even when it's not sunny weather, or is your business model such you can only be successful when the weather is good? I would ask how do you make your company an all-weather company, and how can your company mature to a point where it has all weather capabilities and its financial exposure is reduced? Those I think are the fundamental questions.



Automotive

Ker Gibbs: Great point. We've seen this change over time. Immediately post-WTO showing up was enough. China was growing fast and needed everything, in large quantities. Fast forward to today.

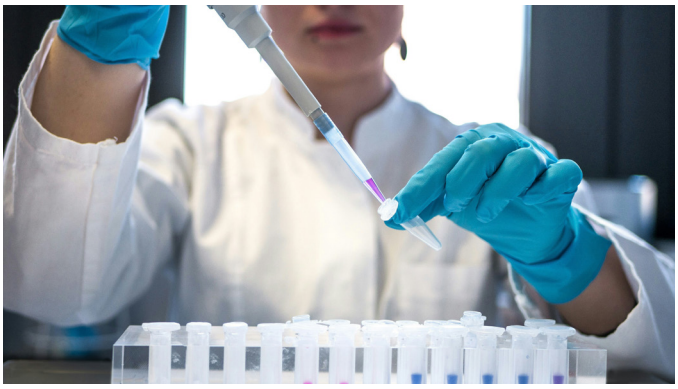
Let's turn now to the automotive sector. Bill Russo is an expert in this in this area. He's the co-founder of AutoMobility, a strategy and investment advisory firm in the field of mobility and has nearly four decades of experience as an automotive executive, including the GM for Chrysler in China, where he's been living in China since 2004. This is going to segue perfectly from the comments that Frank made about competitiveness. Can you share with us Bill what's going on with the transition from internal combustion engine vehicles to EVs or New Energy Vehicles, and whether with China moving so fast in the direction of EVs this is a threat to us or more an opportunity?

Bill Russo: Let me first share some data points so people can understand what's happening in China. Things there changed dramatically in the span of just a few years and not in favor of multinational companies, which have lost 19% of their market share in the automotive sector since 2020. China's automotive industry grew from annual sales of 1 million units in 2000 to 28.9 million in 2017. That's almost 30x growth, and all of the world's automotive industry growth in this century. Some growth has recently been lost but that's not the end of the story.

What brought me to China, the growth, is what brought the global automotive industry. What kept me there, because I left Chrysler in 2008, was the optimism. I had lived in Detroit for 17 years prior to moving to China and Detroit hadn't changed much. It's improving incrementally but can't compare. I moved to Detroit in 1987, and in Detroit today I can navigate around a city that looks pretty familiar. But change in China has been dramatic. In 2022, China sold 6.9 million new energy vehicles. Through the first 10 months of 2023 it's already 7.3 million units. U.S. EV sales were a little less than a million last year, and two thirds of that was Tesla. Its market share in China is about 7.8%, while its market share in the U.S. is 60%. So your EV revolution in this country is pretty much one company. In China there's a lot of companies. The implication is that Western brands who never prioritized this are losing market share.

China's automotive market grew to its peak of sales in 2017, then went in reverse. Something interesting happened there. Despite having an expanding middle class, owning and operating a vehicle in urban China became a pain point. That caused the overall car market to contract, with 1.9% negative growth since then. But look then what happened to New Energy Vehicles: sales went up from .8 to now 7.3 million. Until 2020 most cars that were sold had internal combustion engines. If you were sitting in 2017 planning your business as a foreign company you weren't anticipating 7.3 million units of New Energy Vehicle sales. You were thinking that 28.9 million in total automotive unit sales would go to 30-35 million. Instead it's gone to less than 20 million. The negative growth of 7.5% in internal combustion engine vehicle sales has caught the foreign global auto industry completely by surprise.

But it shouldn't have been a surprise. China did it through a combination of investment and infrastructure, and through a progressive set of policies. Public institutions and private industry encouraged the transition to new energy. Something else is also happening that everyone needs to take note of. China this year will export more cars than any other country, surpassing Japan. They're generating half a million cars for export every month, and by the end of 2023 will export more than 5 million vehicles to markets around the world.



University and Scientific Research

Sean Randolph: We're going to shift gears now to talk about universities and scientific research. This is particularly significant for us in the San Francisco Bay area, where our universities host many Chinese students and are deeply engaged in research collaborations with Chinese partners. Many of the students in our graduate departments of engineering and computer science, as well as social science, have come from China since the 1990s, and in many cases have made important contributions, not just to scientific research, but to our economy, as many stayed and become technologists or investors. This is a very important channel between the US and China that we hope to maintain.

Matthew Boswell (Moderator): Reflecting on Sean's remarks, before the pandemic international research collaborations were growing, particularly in publications between US and Chinese co-authors. That growth was much faster than for co-authored publications between the US and Europe or the US and Japan. Some take-aways are:

- U.S. scientists who collaborate internationally tend to be more productive than those who collaborate only domestically.
- Those who collaborated with scientists in China were the most productive of all, particularly if you look at metrics like citation rates.
- In fact, authors with an institutional address in China are not only the most frequent co-authors with U.S. researchers but their papers are also the most highly cited. This is in large part because of the quality of research that is going on in China, which makes it a very attractive place for U.S. researchers to collaborate.

- In China about one in four papers is published with co-authors based abroad, and authors from the U.S. are by far the most frequent co-authors.
- During the pandemic, scientists from the U.S. and China collaborated even more frequently on pandemic related research than they had on papers in general over the previous five years. This underscores the value of international and in particular of U.S.-China scholarly collaboration in addressing global crises.

Today, however, publications with both US and Chinese authors are down for the first time since counting began decades ago - by roughly 13% from their high in 2019. The publication timeline in academia is slow, so this decline is certain to grow. The number of China's internationally co-authored papers are down, almost entirely due to the decline in publications with US co-authors. There's no similar decline in China's co-publication with authors from the EU. The dysfunction is unique to the US and China, and it's political.

Alongside this decline in publications there's been a sharp decline in Chinese students. The number of Chinese students in the US stands at 290,000 today, down from a high of about 370,000 in 2019. That's a 22% decline. Meanwhile, there are only about 700 American students in China today, down from 15,000 in the early 2010s. So we're in a situation that's uniquely challenging. What I'd like this panel to do is offer some perspective on US-China scholarly collaboration, because despite the direction things have gone it's not all doom and gloom.

David Lindeman: I'd like to pick up where we left off earlier, focusing on opportunities. I've been fortunate to see great opportunities over the last several years, demonstrating that academic, entrepreneurial and public-private partnerships can move forward.

We have a joint US-Chinese initiative with colleagues in Guangdong at the First Affiliated Hospital, one of the top hospitals within Sun Yat Sen University's academic medical center. Identifying common interests and high-priority, impactful areas to study has allowed us to rapidly find agreement and build programs supported by both countries. With original funding from the US Lingnan Foundation, we created a partnership to leverage US clinical, technology, engineering, and data science expertise at Sun Yat-sen University, leading to collaboration across the UC system, Hong Kong, and Singapore in surgical robotics and large data science and health informatics.

The surgical robotics program aims to make First Affiliated Hospital China's leading training center in AI and health information. We're shifting from broad population health to precision, individualized healthcare, working with colleagues trained at Harvard to build collaboration across the Pacific Rim by applying new data science techniques with significant computing power. We've hosted the first Pacific Rim conference in this field, reaching over 18 countries and 125,000 individuals. This success has led to a 3-5 year expansion plan focused on training physician scientists and building new public health collaborations. We've also launched a new journal, are hosting fellows in China, and are sending teams from the US with the aim of building a pipeline of students, postdocs, and faculty. Our goal is to train the best individuals in both countries for a future where technology transforms healthcare.

Zhijie Liu: Inter-university collaboration is significant stabilizing factor in US-China relations, and the exchange of talent has been crucial since the 1979 China-US agreement to cooperate in science and technology.

Since the pandemic, as Matthew mentioned, the number of US students in China has fallen to its lowest level, while Indian students in the US surpassed Chinese students in 2023 for the first time since 2009. Some Chinese students may choose Europe instead. Growing China-US tensions have also introduced uncertainties into scientific research collaboration. Despite the U.S. Justice Department's China Initiative's having ended in 2018, persistent negative effects are discouraging new Chinese PhD students from coming and are creating unwelcoming environments in the U.S. for Chinese scientists, especially in engineering and computer science.

Despite these challenges, China and the US remain each other's top scientific research partners. While concerns around intellectual property and potential military use are valid, the costs of a long-term decoupling of talent and collaboration risks counterbalance them. Global health crises, climate change, and food security challenges affect both countries, and collaboration leverages collective knowledge and expertise. The U.S. has research agreements with 60 countries and China 64, illustrating the global interdependence of scientific research. The bilateral science agreement's recent extension, though short, represents progress in advancing scientific collaboration.

Huan Wang: As an economist my remarks will focus on social science. Our research center's main focus is on improving human capital in China, especially in

underserved rural areas. We use data to assess real-world problems, identify education and health issues, and evaluate promising ways to solve them. Since 2016, our team has conducted about five large-scale randomized trials each year. For each project we involve hundreds of schools and collect data on tens of thousands of students. Our research output includes dozens of academic papers each year and our evidence-based research has informed policy recommendations that the Chinese government has adopted to improve quality of life in rural areas.

For a number of reasons we are not currently conducting research trials in China. In the U.S. the China Initiative, though mainly targeting STEM, also affected social science research. This has impacted research collaboration with top universities in China, many of which are on the US blacklist. U.S. universities face a cumbersome exemptions and approvals process for China-related research that is challenging for researchers. We spend a lot of time drafting contracts, and sending research funding to China faces legal uncertainties and roadblocks.

We also have problems conducting China-related research in the US. In the past, we worked with Chinese partners who sent their postdocs and PhD students to our center for training. They would return to China and apply these methods in their research. Now visa issues prevent them from coming to our center, especially those who attended universities now on the blacklist.

These arbitrary barriers by the US are causing collaboration between the US and China to disappear. The incentive system within the Chinese academic world has changed, transitioning from working with US universities as an asset to a liability for Chinese scholars. This has decreased the interest in and incentive for collaboration with U.S. research groups, leading to a polite refusal of collaborations. This situation is a loss not only for the U.S., in understanding China issues, but also for improving the quality of life and human capital in China, and for advancing human knowledge globally.

Matthew Boswell: The blacklisting issue is something many researchers at our center have encountered. You have universities with thousands or tens of thousands of graduate students, ambitious, young, smart people, but because one department is working on airplane engines you can't conduct any research without obtaining many cumbersome exemptions.

David Lindeman: I couldn't agree more about the challenges. It's important not to gloss over them or to paint too rosy a picture. And I couldn't agree with you both more regarding the challenges for students going in both directions. This has been difficult in terms of conducting research together, especially with the issues around blacklisted universities or those with ties to the Chinese military, which we are all prohibited from working with. Still, there are ways to address these issues. For instance, we undertook a project in Guiyang, crossing over into social science, that focused on older adult and child populations. Working closely with the local government we aimed to improve educational outcomes and social services. Data collection was collaborative, our Chinese colleagues conducted the analyses, and we worked together on reporting the findings.

In conducting clinical and engineering work between California and China we are cautious about intellectual property and data sharing. We devised a model where we don't put all data in the cloud but instead created algorithms, models, and methodologies that can be used independently in each country. We conducted independent analyses but have been able to compare findings. We've also established mechanisms for fellows to work together and have found companies willing to sponsor and support programs and team collaborations, including several in Shenzhen and Guangdong. This spring, we plan to visit four different universities to explore long-term collaborations in various fields.

The idea with this program is to build long-term relationships where faculty and emerging talent, who will be leaders in the next 10-20 years, will have a global network they can turn to, sponsored by institutions like Lingnan Foundation or Sun Yat-sen University. This allows colleagues, including those doing similar work in the EU, to collaborate and support each other in advancing new technologies and methodologies.

Matthew Boswell: What are some low-hanging fruit type steps that stakeholders, whether universities or governments, can take to facilitate collaborations in the same spirit as what David just described?

Huan Wang: If I could speak to Biden and Xi Jinping, it's clear that the governments set the tone for collaboration. If the governments of China and the U.S. can encourage more collaboration between scholars it would be great, and universities like Stanford could accept more students from China. Turning away talent from China - students who wish to study and often stay in the US after graduation - represents a great loss. Making visas more accessible for Chinese students is also crucial.

On the Chinese side, there have been fewer Chinese scholars attending international conferences in the U.S., with missed opportunities on both sides. I'd

like to see the Chinese government encourage more international travel. Also, many Chinese universities still control scholars' passports, requiring approval for travel. Addressing these government and university level issues is low-hanging fruit.

Zhijie Liu: You mentioned low-hanging fruit. Today's event is an excellent demonstration. A Chinese think tank and a U.S. think tank jointly holding this event, convening experts from various circles—government officials, entrepreneurs, and think tank experts—to discuss topics like healthcare, the automotive market, and more. This is an effective way to reduce misunderstandings and enhance collaboration.

My second thought, coming from Shenzhen in the China Greater Bay Area and being now in the San Francisco Bay Area, is that universities in both regions have established joint research platforms that focus mostly on science and technology. Inspired by today's conversation, however, I think we can also look at research areas like healthcare, food security and climate change. The risks of collaboration in these areas are small but the potential benefits for humanity are enormous.

Question: We've heard that Indian students have now surpassed Chinese students in numbers. Do you see any consequences for the U.S. and China?

Huan Wang: Yes, many of my colleagues are now shifting their research focus from China to India or other developing countries. I think we can learn a lot from China and now we won't.

David Lindeman: I don't believe we should be focusing solely on US-China or US-India relations. Health is a global issue. We need to expand our perspective, working with the EU, engaging with countries like Denmark and the Netherlands, and universities there that come to us to bridge work with China and India. For example, we're building out a new collaboration with Germany. Looking at these issues from a higher level, as opposed to focusing on individual countries, can open many new doors for the greater good. Also, the issue of talent in each country isn't just academic. Companies are very interested in being part of doctoral and postdoc programs as they cultivate individuals they can recruit.

Question: Everything about data is very sensitive now and linked to national security. How have you overcome this issue in your collaborations with Chinese partners?

David Lindeman: We focus on everything from human subject data, privacy and security, to concerns about large dataset breaches. In doing so we prioritize the careful control of data, as all academicians should. Consequently, we keep data sources separate within the different organizations. We then create sandboxes for data cleaning and shared analysis. This enables work on diagnostics, prediction, and precision medicine, but with utmost caution. We constantly remind ourselves of the implications of any problems that could lead to misdirection or government intervention. Until we reach a point where we can merge datasets without those fears, we're better served by keeping them independent.

Sub-National Relations

Sean Randolph (Moderator): We've talked about business, academic and scientific exchanges, which are all subnational. There's another layer involving city-to-city, state-to-state, and people-to-people relationships - the bedrock for how different economies and societies relate. San Francisco, for example, was the first U.S. city to establish sister city ties with China. California has pioneered state relationships. In November, before APEC, Governor Newsom traveled to China before the APEC summit and met with President Xi.

When California governors travel overseas the topic of climate always comes first. The California Air Resources Board leads the state's climate policy. Can you tell us something Dr. Cliff about the discussions during the governor's trip?

Steven Cliff: We have a vibrant relationship with China and a dozen active MOUs at the city, provincial, and national levels. The governor signed five new MOUs during his trip. At the California Air Resources Board our job as the state's clean air agency is to spur innovation, reduce emissions in California, and show what's possible beyond our borders. We've worked closely with China, hosting scholars and government officials at our laboratories to learn about emissions testing, policy development, and regulatory enforcement. We've also collaborated on cap-and-trade programs.

Following the trip China's climate envoy, Mr. Xie, visited California. We discussed regulatory programs to reduce climate emissions and improve air quality for over an hour. This is important because China is the world's largest greenhouse gas emitter, and we them as need partners to solve the climate crisis.

Sean Randolph: Amy Tong is California's Secretary for Government Operations and the person who makes sure everything works in this state government. You've been involved also in China, and I believe the governor sent you back to China after his trip to make sure there would be follow up on everything that he agreed to. Besides climate, Amy, what else was on the governor's agenda?

Amy Tong: As was mentioned, the governor's trip to China was very well received. There were many commitments and I had the privilege to follow up on those immediately after his return. There are three top priorities: climate is the big one but there's also trade and people-to-people exchange, which was added after the discussion with President Xi. Specific to that, on my return to China I was representing California, along with 20 other mayors, at a sister city conference that addressed many California interests. A Shenzhen delegation is already here and in conversation with San Jose about a sister city agreement, and another delegation is visiting Napa tomorrow. This work is ongoing and brings the conversation down from national and geopolitical tensions to focus instead on what's most important - how individuals feel this relationship will impact them.

What's important is ensuring a stable relationship between the world's fifth largest economy, California, and the second largest, China. This is the governor's continued commitment. I also joined him at the APEC conference, reiterating in bilateral conversations that China's relationship will be stable despite geopolitical tensions. It's important for California to sustain its role as a sub-national gateway by supporting these people-to-people exchanges.

Sean Randolph: Keeping with the people-to-people theme, Scott Beck is the CEO of SF travel. For many years we have received large numbers of Chinese tourists. It's important to our economy both in San Francisco and in the state. Individual people and their understanding of each other and each other's countries are critical to how we relate to each other. Can you share with us Scott what's going on with Chinese tourism? And are there things that need to be done to get the numbers up to where they were before the pandemic?

Scott Beck: When we talk about people-to-people exchanges I want to use a different word than "tourism" - "visitor". Tourism denotes leisure travel, where for China it's about travel in general including business travel. The biggest headwind right now is air service. In December 2019 there were around 626 flights between the U.S. and China. Right now there are about 63. In San Francisco, we had roughly 49 in December 2019. Now we have 20. San Francisco accounts for 1/3 of all US air service from China, which is good, but today that service is much less than it was. To get back to when the Chinese visitors had a $1.2 billion economic impact in the Bay Area - a really big number compared to our total $24 billion visitor economy - we need to fix that.

Second, visas are important. The average wait time right now is 116 days. As demand spikes again, those wait times will grow. We're focusing on air service and visa issues at the national level because we can't fix them in the Bay Area alone. President Xi's framing of his discussions during APEC as the "San Francisco Vision" gives us a place at the center of this conversation.

Sean Randolph: What's your perspective Doctor Hu on this question of people-to-people connections, and especially the role of the China Greater Bay Area, this huge region that includes Hong Kong, Macau, and 11 cities in Guangdong Province?

Zhenyu Hu: Electrical vehicles could be a bridge. In Shenzhen we are building superfast charging stations, with most of this funded publicly since we see it as a public investment that will also stimulate the battery and EV market. BYD is a Shenzhen company. Governor Newsom wants to buy electric buses from Shenzhen and the IRA could help. The IRA, however, requires locally produced raw materials in batteries and North American manufacturing. Some U.S. experts think Chinese companies can establish U.S. factories with help from IRA funding, but that may not be easy.

Sean Randolph: This is a significant question, since BYD has been producing electric vehicles in California for some time. There seems to be a conflict between some of the IRA's provisions and the administration's desire to get more of these vehicles on the road quickly. There's an opportunity for both sides but those issues need to be worked out.

Let's broaden our focus a little. As a Shenzhen company BYD is located in what's being called the China Greater Bay Area, which in some respects mirrors and connects to the San Francisco Bay Area. Area we're going to talk about logistics. Dr. Gouwen Wang has over 32 years of experience in logistics and management,

including as business manager of a container terminal in Shenzhen, manager of a shipping company, and general manager of a freight forwarding and international logistics company. What can you tell us Dr. Wang about connections between our two Bay Areas? I'll ask the same question to Bruce Pickering, who helps lead a Bay-to-Bay initiative but from this side of the water.

Guowen Wang: Logistics is like a weather forecast as an indicator of the macro economy. Starting from zero, the throughput volume of containers in Shenzhen today is 30 million, making it the third largest port in the world. Of its 30 million container throughput 7% is to and from the United States. Hong Kong and China's mainland are first. Looking at China's Greater Bay Area and the San Francisco Bay Area there are obvious differences. In terms of population and land area the Greater Bay Area of Hong Kong, Macau and Guangdong is much larger. But if you look at GDP per capita, in the San Francisco Bay Area it's over $161,000 US dollars and in the Greater Bay Area in China it's $22,000. So your GDP per capita is eight times larger. Within the Greater Bay Area the GDP per capita in Shenzhen is 160,000 RMB, which I think is the highest in China, but there's still a large gap.

As an example, seven years ago one of my colleagues wanted to leave my institute to explore a new way to do big data. He graduated from Cornell two years later and got a job at eBay. After that he jumped three times in five years, ending up at GoogleX and doubling his salary twice. He now makes half a million dollars. As a young person he's much better off there than working with me.

Each of the two Bay Areas has advantages: in the China's we have a larger population, more manufacturing, a strategic location, and people who are eager to learn. You hold the lead in innovation and technology and are very capital intensive. I see a lot of potential to work together.

Bruce Pickering: The Bay-to-Bay initiative that I'm part of started with an exchange between Dr. Peijun Duan from the Central Party School in Beijing and Harvard and expanded in 2019 to a larger discussion focusing on issues affecting global Bay regions - including but not limited to China's Greater Bay Area and the San Francisco Bay Area. In January 2020 participants from both Bay Areas met in Beijing, along with representatives from Tokyo Bay and Singapore. The last day created a working framework with the Central Party School, Chinese Academy of Sciences, and NDRC. While COVID disrupted those plans, the framework remains in place and we created working groups like the one Sean and Dr. Mark Levine co-chair on adaptation to sea level rise. We've continued to talk here in San Francisco and expect to hear from the Chinese side soon about potentially meeting again in Guangzhou.

Sean Randolph: Thank you everyone. We covered a lot of ground today, and there are some topics we didn't get to, such as gaming. The intention wasn't to do a deep dive but to explore the outlines of where US-China economic cooperation can continue to grow. We touched on many themes and sectors: about the US and China, despite the obstacles, working together on AI safety. Climate opens up many opportunities. U.S. competitiveness in the Chinese consumer market came up. Chinese investment in battery and EV manufacturing was also discussed, though the IRA raises issues. The mutual benefit of joint scientific research was a theme, and interesting strategies were raised for how to address the barriers. The importance of sub-national relations came up again and again.

Thank you again to the Stanford Center for China's Economy and Institutions and the China Development Institute for partnering with us. This is an important conversation.

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