

Modern China Lecture Series Featuring Isabella Weber – How China Escaped Shock Therapy: The Market Reform Debate, October 5, 2021

– Okay, I think we'll get started. Hello, and good afternoon. Welcome to the Fairbank Center's Modern China Lecture Series. My name is Arunabh Ghosh, I teach modern Chinese history here on the history department at Harvard. I'm also the convener of this lecture series. Today is the second of five exciting events that we have planned this semester. So before I introduce our speaker for today, I want to take a minute and give you a quick heads up about who else we have lined up in the weeks to come. So two weeks from now on October 19, Fang Xiaoping from Nanyang Technological University will speak to us about the history of cholera in post 1949, China. On November 7, I beg your pardon, November 2, Eugenia Lean from Columbia University will speak about her ongoing work on and histories of global capitalism. And then our final talk of the semester on November 30, we'll feature John Judge from York University who will speak on print vernacular languages and reading practices in the Long Republic. So please look out for the formal announcements of these talks, which will include information on how to register, the lobby on Zoom, and I guess, not Fang Xiaoping but the November 2 and November 30 talks will be on Tuesday at 4:00 pm. Fang Xiaoping will be late in the day because he'll be joining us from Singapore. Anyway, today I'm delighted to welcome Professor Isabella Weber. Isabella is a political economist working on China global trade and the history of economic thought. She is currently an assistant professor of economics at UMass Amherst, where she is also the research leader for China in the Asian political economy program at the Political Economy Research Institute. Her first book, How China Escaped Shock Therapy, The Market Reform Debate, which of course we shall hear a lot more about very shortly, has already made a great splash both in academic and in popular media circles. It is most recently the winner of the John Robinson Prize for 2021 and has been recommended by major venues such as Financial Times and Foreign Policy. In addition to her book, she has published extensively in a wide range of journals. And among the forthcoming pieces, the one that caught my eye, is a piece in The Journal of the History of Ideas, which is entitled, Markets and Socialism in China, von Mises in China's Market Reform Debate, which of course should be of particular interest or related to the topic today and of interest to our audience, I imagine. Prior to moving to Amherst, Isabella was a lecturer at Goldsmiths, University of London, during which time she was also the principal investigator of the ESRC funded rebuilding micro economics project called, What Drives Specialization, a Century of Global Export Patterns. Isabella has two PhD degrees, one in economics, from The New School for Social Research in New York, and a second one in development studies, from the University of Cambridge. And she did her undergraduate training at the University of Berlin and has spent a fair amount of time at Peking University and a research fellow or a visiting fellow at Tsinghua University as well. So a very warm welcome to you, Isabella. Before I hand things over to you, just

a quick few words about format. So Isabel will speak for about 35, maybe 40 minutes, and then we'll follow that with Q&A for roughly the same amount of time. The plan is to finish around 5:15 or shortly thereafter. If you have questions, please feel free to use the Q&A function and type them up. And I'll try and curate them once the Q&A session begins, and we will try to get to as many questions as possible. Before you type your question, we would appreciate it if you could identify yourself. That being said, I should note that we are recording we are live casting right now on YouTube as well. So if you prefer to stay anonymous, that is, of course, perfectly fine as well. Okay, so that's the nuts and bolts. Once again, Isabella, welcome and over to you.

- Thanks so much Arunabh for your generous introduction. And thanks so much for the invitation to present one of the lectures in the Modern China Lecture Series. This is a true honor and privilege. Thank you. And thank you, everybody for joining me and joining us tonight. This talk is really about my book, How China Escaped Shock Therapy, The Market Reform Debate. The book has received much more attention than I could ever have hoped or dreamed of when I started this work as a master's student in economics. In fact, I think this is for the vast reasons. I think this is for the vast political reasons that is the context of the so called New Cold War, that brings us back to the question of how did the previous Cold War end and how did we get here. My book is about the 1980s. And it is about the 1980s, thinking of this moment as a crossroads in the global political economy. I think of the 1980s as the beginning of China's economic convergence with the West. But this economic convergence and China's fate in the global economy did not go along with a wholesale institutional assimilation. And this wholesale institutional assimilation did not occur, even though China deeply marketized. The 1980s also marks the beginning of the divergence between Russia's fall and China's rise, which I think can be linked to a difference in approach to market reforms, even though of course, it cannot be reduced to a policy choice, and is the result of a very complex historical conjunction. If we look at the 1980s, from the arguably crude, but yet somewhat revealing anger of shares of GDP of different regions and countries in the world, in global GDP from 1820 to 2008, then we can see on the part of Russia a rise and fall, and on the part of China, a fall, and then again, a rise and on the part of the West, a rise, and then something that looks pretty much like stagnation. And the turning point for these diverging trends, really is the 1980s, and this is what I'm calling, the crossroads of the 1980s. It's quite clear what the economics is that underpins the kind of marketization that Russia has pursued. It's been called shock therapy as one labor of that kind of economics, which I'm using in my book, referring to others that have used this before me. Shock therapy is a policy package that is composed of four key elements. The first element is price liberalization. That is the idea that all prices have to be let go of in order to allow prices to adjust to the correct relative levels. And this is meant to be aided

by macroeconomic austerity that is tight control over fiscal spending and monetary policy, in order to prevent this price liberalization from giving rise to inflation. These first two elements have been called Big Bang, and are thought of as really the shocking element in shock therapy. This was meant to be complemented with trade liberalization, in order for marketization to not stop at the domestic borders, and privatization in order to enable the economic agents to effectively respond to the price signals. But even the most committed shock therapists admitted that trade liberalization and privatization, are fairly slow, complicated processes, so that the idea of overnight marketization really has the Big Bang at its core. If you just take a brief look at the outcome of this kind of policy in Russia, and we take two key macroeconomic indicators, that is CPI, consumer price inflation and real GDP, we can see that inflation exploded, and in fact, this is here on a logarithmic scale, since if we wanted to map inflation on a non logarithmic scale, this will be shooting through the roof pretty much no matter what kind of building you're sitting in right now. In contrast to the explosive inflation, GDP completely collapsed, which gave rise to the so called valley of tears as the shock therapists themselves had predicted would occur, but that valley of tears was arguably deeper and more prolonged than anyone had anticipated. In contrast, looking the same two kinds of indicators for the Chinese case, we can see the exact opposite image. There is inflation, with one exception in the late '90s, consistently being below GDP growth, where GDP growth has frequently be called as having been unprecedented in scale and pace in modern times. So this begs the question, what is the economics that underpins China's reform trajectory that delivered such a drastically different kind of outcome compared to that of Russia? My aim is not to also explain Russia, bringing Russia in to this story is simply to illustrate the stakes that were, sorry, the states that were involved in China's market reform debate. So the question that I'm addressing in the book is, what are the intellectual foundations of China's reform approach? Recent scholarship has challenged the idea of 1978 as a radical rupture, and has, I think correctly emphasized the continuity and the importance of bottom up initiatives. This line of argument has long been articulated in relation to agricultural reforms. Now, it has also been argued that instead of a radical break, there is a continuity in the use of international trade, as demonstrated in the recent book by Chase and Kelly, in relation to special economic zones as convincingly illustrated based on the case by Zhou Taomo, who presented in this lecture series, and recently, the use of markets in controlling liquidity as traced by Lowenstein, and the use of markets in the periphery of the system more broadly, as theorized and convincingly argued by Zhong Yin Yang and Huang Yin Tieng, just to name a few contributions. In my book, I argue broadly, consistently with these contributions that China's reform followed a pattern of marketization from the margins and of growing into the market, which is of course a play, on Barry Naughton's famous, Growing Out of the Plan. At the same time, my account of China's market reform debate challenges a

narrative that suggests that reform was simply a deepening of existing trends by finally letting bottom up actors do what they have been doing for a long time. This latter narration taken to its extreme, can lead to the conclusion that reform was simply about removing the constraints imposed by Maoism. Instead of suggesting that China's gradualism and experimentalism was somehow pre determined in China's nature, culture or history, I uncover that there was a fierce struggle over the right approach to market reforms. This was a struggle within the reform camp. China was by no means spared by the wave of neoliberal economics that swept the globe in the 1970s and 1980s. This way found its most extreme expression in the quintessentially neoliberal policy of shock therapy. As Joan Gevirt has shown in his book, China was quick to reintegrate into the global networks of economists in the 1980s. In my book, How China Escaped Shock Therapy, I show that with this re integration, key elements of neoclassical economic policy thinking, including the idea of a Big Bang in price reform, was introduced and seriously considered in China. In China, this blueprint based policy approach was, however, ultimately avoided before it was even tried in the Soviet Union and other formerly state socialist countries. Yet mainstream neoclassical economics was by no means the only economics that emerged in China's first decade of reform. Institutionalist Interactive Economic Research played an important role in evaluating, systematizing and also defending the reform approach that was emerging bottom up. Rather than being narrowly focused on China, this also involves evaluating foreign experiences. This economic research and economic policy thinking was built on a very different understanding of state market relations compared to that which underpins shock therapy. Broadly speaking, shock therapy and the kind of economics that underpins shock therapy, thinks of marketization as liberalization. That is to say the old system has to be destroyed in order to make space for the market. This follows the idea of one unitary model of a market economy which is based on the West's experience whereby marketization is often thought of as Westernization. In contrast, in China's experimentalist economic reform thinking, the market was thought of as a tool in the hands of the state. Markets had to be actively created by the state with state entities as market players. Marketization should thereby not be unitary, but adapted to local conditions to the prevailing situations and would follow a logic of controlling the essential parts of the system while letting go of the unessential. I traced this way of thinking state market relations in the first chapter of my book to the ancient text the Zhuangzi, that was a recurrent reference in Chinese statecraft, including in the 19th century self strengthening movements of Sun Yat-Sen and many other contributions. Considering the market as a tool in the pursuit of greater political goals, was also central to the logic of the Communist economic warfare in the 1940s, as I show in the third chapter of my book. In fact, I became aware of this by going through the documents of the World Bank, in particular, one minute, notes of minutes on a specific meeting in 1982, where Adrian Wood after days of conversations with Chinese counterparts scribbles into

his notebook, "Why do the Chinese answer to every question that they have to go back to the liberation period policies?" So on the mind of the economic reform policymakers and key economic policy thinkers in the 1980s, there was an explicit link to the 1940s logic of economic warfare. In fact, the famous slogan, groping for stones to cross the river, which might be the most famous slogan, trying to capture the logic of China's reforms, is already mentioned by Chen Yun, one of the key architects of the early economic reforms on April 7, 1950 when he's saying, "Rising prices are not good, falling prices too, are not good for production. It is better to be groping for stones to cross the river more steadily." This is of course, in the context of the attempt to overcome hyper inflation, where hyperinflation was thought of as one of the economic reasons that helped the downfall of the nationalists. But rather than telling a story of Chinese traditional wisdom versus Western economics, I showed that a very similar way of thinking of the state market relation emerged in the United States and Europe in the context of World War II and its aftermath, as I illustrate in chapter two of my book. In fact, some key proponents of graduate marketization in the US and the UK after the war, like for example, John Kenneth Galbraith and were also important references in China's 1980s market reform debate. So this is a story of two ways of doing economics and thinking state market relations that cuts across the confrontation of China versus the West. But this prior to the way in which I'm thinking about the basic confrontation of two camps of reformed thinking in the 1980s, let us zoom in to the 1970s and ask ourselves, how did reform begin? This book is based on oral history interview project, I've interviewed more than 50 people who were key participants in the market reform debates. They violently disagreed on all sorts of questions of how China should go about marketization. However, I think, completely agreed on the notion that in the late 1970s, economic reform was a choice of no choice and was really a material necessity. Of course, all the people who I'm interviewed were from the so called market reform camp. So they would come to this with a certain mindset. But I think that this is basically consistent with some recent scholarship on the role of Hua Guofeng that pointed out that the 10 year plan both was a great failure, in the sense of trying to once more achieve industrialization through a big push approach, but at the same time, was an extremely important catalyst in opening up China through delegations that took the word which illustrated the "backwardness" of China's material conditions. Of course, the revolution was about much more than material progress. However, it was also about material progress as the People's Daily on October 2, 1949, put it, commenting on the ambition of the revolution. It was also about "gradually changing this backward, agricultural country into a civilized and progressive industrial one." In 1978, China was confronted with a massive wave of people fleeing China to Capitalist, "Capitalist imperialist" Hong Kong, which was another pivoting moment towards the need of reform. as Chen Yun put it at the CCP World Conference in 1978, "It has been almost 30 years since the founding of the People's Republic of China, but they're still beggars. How can

this be the case? If this problem of having enough to eat is not solved, the peasants might rise in rebellion and be led to the cities by local party leaders demanding food." This reorientation towards material economic progress in the late late 1970s came along with an ideological shift back towards a more Orthodox kind of historical materialism that emphasized the development of the forces of production over revolutionising the relations of production. Already in 1979, Deng Xiaoping pointed out to a foreign journalist that, "Saying that the market is limited to capitalism is wrong. Why can't socialism practice market economics?" However, one of the big questions that emerged that was that even if you assume that China needed more markets, how would one introduce market mechanisms into a command economy or any economy that was at least modeled on the idea of a planned economy? In this context, Deng Xiaoping called for economics to be put in command as a reversal of the catch revolution slogan of politics and command. However, the problem was as Deng Xiaoping points out in January 1980, in a speech, the Present Situation in the Tasks before Us, "A good number of comrades who were shunted aside for many years, and haven't been back in their original posts for very long have lost touch with the situation. Even those who stayed at their post all through, are confronted with new problems they find hard to grasp immediately." So this was a situation where economics was meant to be put in command. However, economics as an academic discipline had been shattered during the Cultural Revolution, and was only in the process of being re established, was only the process of recreating itself, so as such was in some sense, not ready to take command. In fact, as the secretary of, the youngest secretary of Zhao Ziang, in an interview in 2016, was telling me, the reforms of the 1980s progressed because were not relying on a theory. If reforms had needed to follow a theory, there would have been no progress. Zhao Ziyang was not academic. The old generation of communist cadres was not concerned settling theoretical questions. But despite this disregard for big theoretical questions, I'm arguing that economic research nevertheless played an important role. In fact, while economics as an academic discipline was just being re established, the agricultural reforms were already in full swing. We all know the stories of the bottom up initiatives, and what I'm arguing is that one particular initiative of economic research played an important role in helping to systematize these bottom up initiatives into national policy. This was a rural reform group that was founded off of basically young urban intellectuals who'd spent the youth in the countryside during the Cultural Revolution had just returned to the cities in the late 1970s, but continued to be dedicated to the question of agriculture reorganization. In fact, as Zheng Yizi, who was the director of one of the leading figures of the Rural Development Group, and later on, the director of the Economic System Reform Research Institute put it, contracting production to the household is a creation of the peasants. Dual-track pricing has continuously existed in China from an early time on. So there was a recognition that these researchers did not invent the policies that

they were researching, but rather that their role was, to understand how these policies were designed on the ground, understand their logic and ask the question to what extent they could be upscaled and could be transferred to other kinds of situations within China's own political economy. This group, broadly speaking together with other groups that were emerging at that time, was starting to form one side of the great market reform debate of the 1980s. Its members were broadly speaking, composed of young reform intellectuals, and they received backing from the older generation leaders, who often had first hand experience with forms of responsibility systems in earlier periods but who also often belonged to what has been characterized as a conservative camp such as, for example, Deng Li Jun who played an important role in initially helping these young researchers to form a group and get institutional backing and in fact to have pretty direct policy influence. They had an educational background as self trained in Marxist classics Maoism, but also started to study Western social sciences broadly, they started translation initiatives, translating a very wide range of social theories and texts from the social sciences were deeply versed in the political economy of agriculture. Broadly speaking, they took their intellectual inspiration from empirical studies in China, such as initially those on agriculture, but later on also enterprise reform and other key reform questions, as well as study tours in Hungary in Yugoslavia, as well as later on, in the context of West Germany, the UK, and also Latin America. So if the question was, how to introduce market mechanisms into China's command economy, we have to start from an understanding of what that initial economy looked like. And in fact, the most dramatic question pertained to the urban industrial economy. This urban industrial economy obviously, this is a very stylized depiction, but nevertheless was broadly speaking, modeled on the idea of one big national workshop, where higher level command authorities would be commanding outputs and assign inputs whereas the individual production units would be delivering outputs based on the inputs that they received, and in return get a price for the outputs where they had to pay a price for the inputs. Now, this was a system that was structured such that the more upstream the industry was, the more tighter controlled it was, but also, the lower the price. This meant the prices in the system were not signals for individual units to react to and take decisions, but rather these prices had the function of a redistribution within the system, privileging the development of heavy industry. Similarly, the price system was also designed to redistribute from the countryside into the urban industrial economy in order to finance industrialization. So the question then was, how would you move from a system in which prices were really accounting units to a system where prices would signal to individual decision makers or collective decision units, but on lower levels, what to do with their production. The dual-track price reformers who grew out of the kind of tapestry that I've tried to illustrate, were arguing that the dual-track system that emerged more or less endogenously in China's economy was one way to solve the price reform problem. The dual-track system emerged to

some extent as a result of the deepening of the kind of marginal and prevalence of markets that has been traced in recent scholarship, but it also emerged as a result of the agricultural reforms since as the rural communities started to produce not only for the plan, but also for the market, they were receiving cash incomes in return for their production for the market, and were starting to demand consumer goods, but also intermediate and raw material goods in return for the efforts. In particular, the township and village enterprises required input goods that often came from the urban industrial system, so that there was a somewhat spontaneous demand for dynamic towards a dual-track price system that really was linked to the success of the agricultural reforms. So the big question was, whether to harness this dynamic that was emerging, systematize it and channel it, or whether this dynamic would create a system that was undesirable in the pursuit of a new kind of economic system for China in the '80s. In this context, the 1984 Moganshan Youth Conference played an important role. This was a conference that summited young scholars from across China who were discussing China's most urgent and economic reform problems. In 1985, the dual-track price system became official national reform policy, not only for the countryside, but also for the core of the urban industrial economy. Zhao Ziyang explained to local cadres, what this would mean, and he emphasized that this would not only mean letting go of small commodities, reforming the price management system and adjusting important prices in small steps, but that this would also mean participating, that is to say, "After having enlivened prices by letting them go, the state had to participate in the market to regulate the prices, as in the first years after liberation." This is what I've been referring to, when I was saying that there's a different way of conceptualizing the state market relations. In contrast to the dual-track reformers and their economic reasoning an alternative economic reform policy approach was emerging from the re established economics. This was mainly driven by middle aged established intellectuals and young academics, often with a background in the sciences. These were often scholars who had been trained in orthodox socialist economics and the '50s and '60s and later on in the '80s were the first to study modern economics in the US and England. Some of them also had a background in engineering. Broadly speaking, they took their inspiration from the socialist calculation debate that dates back to the interwar period, and evolved some of the most famous economists of the 20th century such as, for example, von Mises who Arunabh had mentioned in the introduction, but also Eastern European emigre economists such as Bruce Schik and Kornai, as well as monetarists like Milton Friedman and Gregory Chow, and finally, the so called Erhard Miracle, which refers to the price liberalization after World War II in West Germany which allegedly created a market economy overnight, simply by letting go of prices. One important event in this context was another Moganshan Conference, the 1982 Moganshan Conference which was jointly organized by the World Bank and the Price Research Center. The only participant from the Eastern European side of the participants whom I could still interview was Mr. Kenda, who is

sitting in the first row second to the right. When I met Mr. Kenda in a coffee shop in Paris in 2017, he was wearing the exact same outfit that he's wearing in this picture. I'm telling this story since I think that this is revealing something that was very important for him in this interview. He emphasized that was incredibly bold for him to travel to China in 1982, at a time, where he expected to be arrested upon crossing the border to his native Hungary, since he was considered a dissident. So in other words, China was inviting Eastern European immigrants to advise on the most critical question of economic system reform at the time, people who are considered as dissidents in other socialist countries, which I think illustrates the enormous openness of the debate in the 1980s, at the spirit of trying to consult whatever opinion one can reach out to, whoever has something relevant to say to the debate in order to make up China's future path. So from this camp, emerged critique of the dual-track system that argued that the dual-track system created friction and contradiction, and because it now had, the system now had two tracks and in fact created a situation that was more irrational than the old system. And the higher market price would result inherent rent-seeking and corruption, and therefore China would be well advised to do away with the dual-track system as quickly as possible. So the proposal was to first adjust prices based on calculations to some perceived equilibrium level, then abolish the market track, impose tight fiscal and monetary control, and finally, let go of all prices as quickly as possible and particular let go of the most upstream most essential kind of prices in order to replace market participation by the state with indirect macro control. In contrast, the dual-track price reformers argued that such a Big Bang would cause cost-push inflation without however, adjusting the relative prices and quantities, since the prices of the most extreme goods will be shooting up, they were after all, by design below cost, whereas workers will be demanding higher wages facing higher consumption prices, so that the result will be an upward spiral in wages and prices which cannot be contained by macro control. Even the dual-track price reformers agreed that one should be letting go of the prices of small commodities. So the core of the debate was really whether or not the state should keep direct control over the core of the industrial urban system. 1986 Premier Zhao Ziyang took the initiative to establish a program office for the implementation of what we've heard today, based on the language that has been developed elsewhere called Big Bang price liberalization. But this plan was stopped after an intervention, by the dual-track reformers who were arguing based on a tour in Hungary and Yugoslavia, that as I just illustrated such a Big Bang would result in cost-push inflation, thereby undermine the need of political and economic stability in order to pursue reforms rather than to create a functioning market economy. In 1988, Deng Xiaoping himself took initiative towards radical price reform. In 1988, social tensions had been rising, economic tensions had been rising and had become clear that economic reform did not stand to benefit everybody equally where some of the leaders who initially were on the side of reform thought

that reform was going too far. In this context, Deng Xiaoping tried to rescue the project of market reforms and to crush ahead. In his own words, "Long-term pain is worse than short term pain." So one should be carrying out price reform, and would have to face risks and difficulties heads on, since China should not be afraid of risk and be courageous. In August 1988, the Politburo then passed in principle a plan for price and wage reform, which when announced on State TV, was enough to trigger bank runs, panic buying and an upshoot in inflation that was so severe that this plan was ultimately reverted, which, however, was an important background to the reversal in reform in late 1988, and finally to the political meltdown and crack down in 1989. This context, Milton Friedman once more visited China but at this moment, the end of opportunity for economic advice had closed, this moment, the political dynamic had become so severe that this was beyond economic arguments. So why was China's policy choice not the Big Bang, but the dual-track? I think that leaders were not prepared to risk the survival of the Communist state, and endanger their vision for long term development. The Big Bang seemed to promise a scientific solution to economic system reform, yet was ultimately found not to create a viable market economy, while at the same time undermining the core of the plan. The dual-track system gradually emerged as a policy alternative through experimental reliance on techniques of market creation by the state, distinguishing between essential and inessential goods and relying on a systematic assessment of the concrete economic conditions and dynamics. What are some of the implications of China's escape from shock therapy in the 1980s? The two reform approaches have continued to compete in China's debate over so called unfinished reform and market economy status, as a result of China's distinctive path of reform, and through decades of experimentation, I think that China has created a new kind of economic system that requires us to come up with new ways of thinking about a market economy. China has reindustrialized, and this has enabled China to develop its own full-fledged economy, which ultimately resulted in China gradually moving towards competitiveness in sectors that are closer to the technological frontier, which is part of the background to the enormous economic tensions that we are observing today. Thank you very much for your attention.

- Great, thank you so much, Isabella. That was really fantastic. I can imagine a lot of questions and just to our audience members, please the floor is open now. So please type up your questions. And I will try and make sure that we get to them as we go along. But as they come in, maybe I could ask something of you. One of the things that was really striking in listening to your talking and earlier reading, your work is sort of, the way in which you sort of try and unpack what is a very contentious debate. And one of the things that's striking is sort of the think about this not so much in terms of the specifics of the debate, but structurally, as a process of some kind of consensus formation amongst groups of elites, groups of experts, not elite, sorry. I'm here, so I'm thinking I mean, I've tried to look at it in

my own work in the 1950s, in certain contexts, but I think, most relevant in some ways is Susan Wainhouse's work on the ways in which the one-child policy emerged as the way forward, and more or less the same, well, a little earlier, the starting point is the same, I guess it's the '70s, the policies were already in place by the early 1980s. So I was wondering if you have any reflections on sort of, is this mode of debate and disputation that you uncover that seems to have interesting parallels in terms of different groups of experts with different sort of ideological commitments, but also disciplinary expertise, who sort of fight it out, try and get political, I guess, use their access to political power to move things forward. Is there a particular moment where you see something emerging that then is present in today? And on the flip side of that is I'm thinking also a lot of the work that political scientists have done in, you know, talking about what they call adaptive governance, I guess, right? There's a large body of work, I'm thinking most directly of the edited volume by Elizabeth Perry and Sabastian Heileman, on Mao's invisible hand, but the idea really of, this sort of very similar idea from the margins, let ideas emerge, and then, you know, sort of you work with what seems to be the most interesting. So do you see this as part of if you think about it, sort of decontextualizing it, but looking at it as the process of consensus formation? Is there something broader to be made, an argument to be made here? I wonder what your thoughts are.

- Yeah, thank you. This is a great question. I think there is something broader at the same time, there's something very unique. So I think it would be leaping ahead to draw general conclusions about today's consensus formation in China from the 1980s, since the 1980s, I think is really a very specific kind of moment of openness, where it is clear that a new kind of system is needed, it is entirely unclear what the system will look like. And I think this parallel appearance of this very clear opening, we need something new. And this great openness at the same time of what this something new would be, creates a kind of discursive atmosphere that is really unique to the 1980s. And this is something that many of my interview partners have also been pointing out to me, we have to remember that some of these young scholars, like for example, Huang Xiao Xiang, he was not even a member of the Communist Party, when he was meeting with the Prime Minister, discussing with him one of the most crucial economic system reform questions of the time. I think this is pretty much unthinkable today, in the sense that by now, China is of course, a very established hierarchical kind of system. It's not like it wasn't hierarchical in the 1980s. But as a result of the Cultural Revolution, all the turmoil and all the upset, turning everything upside down. This hierarchy was just being re established. I think there was a second element that relates to the Cultural Revolution that was unique to the 1980s. And that is the communication between the older generation leaders and the younger, younger, it's weird to call them intellectuals, because I mean, when they went to the countryside they weren't intellectuals, yet, right, there were urban youth going to the countryside. So these

two generations that kind of formed this very unique alliance, that is, in some sense, only possible because they have all gone through this experience of having been sent to the countryside, all the trauma that came with it, all the struggles that came with it, so that some, for example, Hu Yaobang would have had discussion groups with these young people coming in at his house talking about critical questions and so on. So this, in that sense, there's like some sort of an ironic, unintended consequence of the Cultural Revolution by indeed having overturned all the hierarchies, actually having prepared the communication space that enabled the creation of a system that couldn't be more opposed to the Cultural Revolution, and its essence, right? Since you mentioned the one-child policy, this was actually also something that came up in my interviews and some of the arguments around that were apparently in parallel to the question of whether one should have one big target model for the economic system and then work backwards from this target model, or whether one should be to use the overused metaphor, groping for stones across the river. And there, the idea of having a one-child policy was also based on certain optimal control type of models that were projecting population development, were some of the people were also arguing for a dual-track price system and against a target model type of approach in marketization suggested that having a one-child policy for the urban population, and a loser policy for the countryside, would create by design an enormous inequality, I mean, even greater inequality than already existed between the urban and the rural populations, since all the urban households would be pouring all the resources that they had into one-child, where these already smaller resources in the countryside would be divided by more than one. So there was a related debate that in terms of the underpinning epistemological approach and methodology has certain parallels.

- Great, thank you. So we have a lot of questions that have come in, and I'm going to try and do my best to group them thematically together, to the extent possible. So there are two longest questions that both I think address sort of the decade, the immediate decade following the '80s, but also then into China's accession to WTO. So I'll just read them out both one by one, and you can read them too, Isabella on the longer side, but for our audience, I'll read them out. So the first one is from Rafael Silveira, who says, greetings everyone, I'm Rafael Silveira, a researcher in the field of human geography at the Federal University of Santa Catarina in Brazil. Thank you for your presentation. In your book, they say two moments, 1986 and 1988, are detailed in which China was close to applying shock therapy, which for reasons didn't go ahead as you just explained. However, in the 1990s, a series of policies that traditionally make up the neoliberal package were applied, such as privatization and dismantling of certain public services with a high social cost for the Chinese people. Although the shock therapy by itself did not really occur. So what they're expressing is not a doubt about your book, but about the eventual continuity of events from '89 onwards, and the

continuity of the marketing process. Do you have a next book in mind, basically, that will address these questions, but for now, some thoughts on this? And then the second question that's somewhat related is from Ansung Lee, who's a student here in political theory at Harvard, who says thank you very much, Isabella, for this compelling and stimulating narrative, I wish to ask about the aftermath of this avoidance of shock therapy, it is true that the dual-track has won the argument in the '80s. However, with the accession to the WTO, there has also been what many consider to be excessive privatization and financialization. Do you think the dual-track paradigm is still viable? Certainly state market relationship in China is still distinct. But is it still dual-track? Or is it neoliberal economics with state interventions? And how would one properly distinguish the two? So maybe you can try and take these two questions, and then I'll try and keep curating.

- Great, thank you. These are excellent questions that allow me to comment on things that I didn't get to in the presentation or the book. So this is great. Yes, of course, in the 1990s, the neoliberal paradigm became much stronger in China. And I think it's also important to recognize, which is something that I didn't get to, in this presentation that many of the people who in the '80s, were arguing against a Big Bang, were in 1989, standing loyal with Zhao Ziyang, and were afterwards basically in exile, or, at least, if they stayed in China were either, some of them were in prison, and some of them kind of and went into private business. Most of them did not maintain positions of strong influence. And some of them even before all of that happened, in fact, towards the late '80s, even though they had started out as defenders of the dual-track, ended up becoming themselves convinced that China had to move towards more radical policies. So in that sense, in the 1980s, ultimately the dual-track worn out, but it also in terms of the sociology kind of lost out, so that by the 1990s, the people who are at the forefront of economic policymaking are no longer the same set of people that were in charge in the 1980s. This is to say that the struggle continues and in fact becomes fiercer since the power balance changes. Nevertheless, we have to remember that by the 1990s, China has, of course, seen what happened in the Soviet Union, what happened in other formerly socialist countries, so that the headwind for those were arguing for very rapid kind of liberalizations was to some extent, being hampered. But that being said, there were of course, very wide ranging prioritization in the 1990s. But even these very fierce privatizations ultimately follow the logic of grasping the big and letting go of the small, which is exactly that same logic of keeping control of the most essential parts and letting go of the less essential parts, which has nothing to do with not creating social harm, but which has all to do with the state, keeping control over the economy and steering the economy in its own, towards its own goals. So in that sense, yes, there was privatization, and there were very severe social consequences of this privatization. But the ways in which this

privatization was structured, was still around the logic of maintaining control of the commanding heights of the economy, maintaining control over the backbones of the economy. In fact, in many ways, the creation of national champions and the pooling together of resources in order to create big, competitive state-owned enterprises, was part of the logic of letting go of the small in order to reorient resources towards these key enterprises. So this is the idea of, we do not need to state control all streams of production, we need to control those streams of production that had the highest leverage in working towards the project of industrialization and competitiveness of the Chinese economy. Now, as regards China's state market relations today, this, of course, relates to the question of how we think about the 1990s and the 2000s, and also how we think about market economies more broadly. If we think that a market economy is one where the state has withdrawn from the market, then clearly, China is not a market economy. But this then also raises the question if we have any market economy in the world. If we think of a market economy as one that is actively created by the state, then China might be a market economy. If we unpack the state market relations in China today, I think we can still see a pattern of Chinese state actors participating in markets for key essential goods. And by participating in these markets, stabilizing prices, and steering these markets towards certain kinds of activities. To give you an example, if you think back to earlier this year, I think in May, it was, when the prices started to go up very rapidly, which was part of the fear around cost-push inflation, that we are still facing and in some sense, are facing a more severely now than we did in May 2021. What the Chinese state did in response to this was not to say we will impose monetary restraint, we will limit the quantity of money in circulation, or we will flat out and cut down fiscal spending. Instead, what they did was to call on state-owned enterprises to stop hoarding certain and released stocks of these very same from state reserves in order to increase supply of these very commodities while at the same time trying to limit as much as possible the demand for these commodities by urging state-owned enterprises to limit their demand. So in that sense, I think this is an example of state market participation towards the stabilization of prices, which is functioning not through a mechanism of command in order but through a mechanism of mobilizing certain state actors that are market players to behave in a certain way on the market. We have seen something similar happening in relationship to the pork price, which was another price around which there was a lot of anxiety where then the state-owned enterprises started mobilizing imports of massive amounts of porks. And stocks of frozen porks were being released, and so on. And in some sense, one could even think of the ongoing situation around Evergrande as an example of the state trying to reverse an immense speculative bubble that has build up, by statute in an example around one of the biggest players.

- Great, thank you. I'm gonna shift tack and try and go again, sort of

two questions, actually, one question, one comment, but this is about the Soviet Union. So I'll ask the question first, and then there's someone who offered some thoughts on the Soviet experience, and maybe you can respond to the comments, but also respond to the question. So the question comes from David Young, who's basically asking my question, but they're saying in the opposite direction. But they ask, if you do the same analysis on the Soviet Union, what are the key, institutional, political, or other such elements that were missing in the Soviet Union that did not lead to similar policy debates, or a debate that occurred, but then the consensus that they arrived at was actually quite different? So as you mold that question, I just wanna read a comment from Thomas Remington, who speaks to the Soviet experience. They say, thanks for a very interesting talk. I have studied the Russian reforms and compared them with China's and have three comments. First, price liberalization in Russia was far from complete, basic consumer goods such as food as well as energy remained controlled. Second, policymakers frequently were surprised by enterprise behavior, which did not respond to policy signals as would firms in market economies. And then finally, you don't give much considerable, you don't give much consideration to the powerful pressure from industrial sector, ministerial and enterprise interests. These affected both policy and policy implementation in both countries. So both the question and these comments, whatever you feel you'd like to respond to, or add to.

- Yeah, great, thank you. Let me start by responding to the three comments. Yes, of course, price liberalization was not complete, which I think underpins just the danger of what is involved in complete price liberalization. I mean, even, there's actually another paper that I've forthcoming in a book edited by Quinn Slobodian and Dieter Plever, even in the West German case, the idea that this was complete price liberalization is basically a myth. This was also partial price liberalization. But the key question in the Chinese context was around the liberalization of the most upstream most essential kind of consumer goods which could potentially have had such a ripple effects throughout the economy. Enterprises did not behave in the way in which one would expect them to behave. This was one of the points that the critiques of Big Bang, were pointing out when they were saying that as long as enterprises do not have a budget constraint, so sometimes they use Kornai's soft budget constraint argument, and in fact, this was related to a conversation with Kornai, as long as these socialist enterprises did not face budget constraints, and as long as their primary production relations were with the next socialist enterprise, they would not be behaving like competitive market enterprises, but they would be behaving like units that have been created in a hierarchical system that is used to responding to higher up commands. And in fact, if they were to get an increase in input prices, they would just be handing down these increased input prices to the respective next production unit, since this is what they were used to doing, and since they did not face any severe budget constraint, the

next enterprise would also be willing to pay these higher prices, which is the underpinning argument of cost-push inflation. Now on the powerful interest, I think the interesting thing is that in China, the dual-track system and I know that the dual-track system was also considered in the Russian case, and I would love to understand better, why this was not the case in the Russian case, but my sense is that in the Chinese case, the dual-track price system created a situation that on the one hand, of course, gave way to moral hazards and rent seeking, on the other hand, made the officials in charge at the state-owned enterprises enormously invested in this reform systems since they were hugely benefiting from the dual-track price system. So yes, it created corruption, and this was a huge problem and to some extent, continued to be a huge problem for a long time, and it's related to problems that continue to this very day, at the same time, by creating all these opportunities for rent seeking, it created enormously powerful vested interests in the continuation of this specific kind of marketization approach. To the question of whether the same analysis could be conducted in the Russian context. I mean, let me say, again, I'm not Russia scholar, I just think it's important to keep in mind what happened in Russia to illustrate what was at stake in China. Nevertheless, I think that there are some important differences that also pertain to what I've said in response to Arunabh's question. So I do think that it did make a big difference that in China, the first generation revolutionary leaders who by then might not have been revolutionary anymore, but who nevertheless, had spent their whole lives dedicated to the project of building up a communist, new kind of society, were still in charge, And we're still enormously powerful. So in that sense, the specific moment in history in which this happens, I think, does play a big role. I think it also plays a big role, and this actually links to a question that I did not answer that Arunabh raised, which is how my argument is connected to that of Elizabeth Perry and Sebastian Heilmann. And that is, they emphasize the enormous importance of Maoist revolutionary struggles. And the fact that the Communist Party was really formed through decades of warfare, in basic principles of economic policymaking. In my book, and in some sense, tracing that same logic in relationship to price policies, where price policies are one way of getting a hold of state market relations. So in that sense, there is guerrilla warfare type of logic of using markets as tools towards the pursuit of big goals, was really something that was totally intuitive for some of the first generation Chinese leaders and economic thinkers who had developed their thought and political practice through these experiences of warfare. So that I think was also quite different from the kind of generation of leaders who was in charge in the 1980s in Russia would have been brought up within an established nomenklatura of a hierarchical bureaucratic system. So in that sense, I think there were very important differences in the sociology and policy mindset of the leadership and economic policy thinkers, in these two countries, which is not to say that the dual-track system was not considered in Russia, it was and the Russians still study the Chinese experience, but this links then

again, to this bottom up origins of reform literature, which has shown that this was really deeply rooted in the Chinese case, not just as an idea that suddenly sprang up, it's quite it really was rooted in the practice of bottom up initiatives all across the country's from Hua An special economic zone to Anhui house of responsibility system, and so on, and so on.

- Great. Let's shift tack a little bit. There's a bunch of questions on the contemporary moment. So I think we come to that in a moment, but before that as maybe a question that we can use to transition. This is from Wu Chang Li, who says, how do you evaluate, sort of question on method, I guess, how do you evaluate the influence of foreign experts on Chinese policymakers? What types of primary sources are helpful?

- Thank you, this is a great question. I didn't dwell on my methodology a lot here. So basically, the way that I've gone about it is that I have, of course, read the kind of memoir literature what is around before going into the field. But then I went into the field and basically did interviews based on the principle of snowballing where I had some key entry points if you want so, through connections with people who were on different points on the spectrum of economic reform debate, and then through that, I got to talk to more and more people who were involved in this struggle of the '80s. And I then kind of use these interviews as guidance to what kind of primary materials ever be considering. So if say like one economist came up again and again in these interviews, then I would go back and try to understand what the role of these this economist was, trying to uncover, also, archival sources such as in the Glasgow archives on Charing Cross and so on. So I have really taken oral history as my entry point into the source material, which is one way of doing it. I'm not saying this is the perfect way. But this is the way how I did it. On the more general question of how we should be evaluating the influence of foreign economists, I think there's one anecdote from a conversation with one of the World Bank officials that I like to use to illustrate that question. And that is, the first World Bank report that was published in 1983, after several years of deliberation, in fact, was printed, and circulated by the Chinese leadership across the ranks of people who were important to economic system reform. But it was printed with a cover that was distinctively different from the studies that would be circulated from, say, the Chinese Academy of Social Sciences, or any of the system internal type of research institutions. So as the respective World Bank economists was pointing out, there was a sense of too highly professional, bureaucratic organizations interacting, each of them bringing in their expertise, he even used the language of saying, this was a marriage made in heaven between the World Bank and the Chinese Communist Party. But it was a relationship that was highly professional, but always at arm's length, in the sense that there was a very clear distinction of this is what you are doing, and this is what we are doing, and we are seeking your advice. We want to learn

what you are thinking about our situation, we take that very seriously, we study that, we assess that. But at the end of the day, it's a responsibility of the actors within the Chinese state to decide what to ultimately do. So in that sense, this is neither, oh, this foreign stuff is just window dressing, nor is it, oh, this economist came and had a brilliant idea, and then that changed China's course, which I think are two opposite narratives that sometimes float around. But it's a serious study and engagement with ideas that are being presented if they are deemed worthwhile studying.

- Yeah, thank you. I wanna maybe transition a little bit into questions that push into the contemporary moment. But let's take this one first, and then there are two that we can ask together. So this one's from Huan Xiao Zhang, who's a student here in the law school at Harvard. Thank you for the wonderful talk. I have two questions. Can you elaborate on the unfinished reform in the last slide in your presentation? What do you think is the major contemporary relevance of the debate? And then how to explain the prevalent narrative in China that downplays the contribution of the dual-track system, and its proponents after the 1990s? Sort of a legacy question?

- Yeah. Yes. So, okay, this is a question of how political one wants to get. I mean, to make it extremely timely. If we think about the speech that was just given by a fairly high ranking government official in this country yesterday, there is a reference to China not having engaged in meaningful reforms since the trade negotiations started. Now, the question of what are meaningful reforms is, of course, a question of, what is your standard that you're measuring up against in terms of what the market economy should be looking like? If you take the WTO standard policies as your measure up against which you are measuring China's policymaking, then, yes, maybe there's have not been meaningful reforms. If you try to unpack the logic of China's own reform trajectory, then there have been quite dramatic changes in recent years, for example, in the rearm of giving access to foreign investors in the insurance sector, which is pretty big, lifting certain restrictions in the automobile sector, which is also pretty big, because it's a very important and huge sector, right? So, in that sense, I think this whole question of unfinished reforms, which is often articulated in relationship to one specific kind of measure is hugely political because it raises the question of, what constitutes a market economy, what constitutes fair market practices? What constitutes the kind of state market relationship that is compatible with whatever international order we are living under. Then the question of the dominant narrative. So, this is a great question. I think that my narrative, in some sense sits squarely with the dominant narrative in that, I am foregrounding, this idea of having come to the cliff, but not having jumped down, right? This also means that things almost went wrong. And even Deng Xiaoping was often treated as, like the saint of economic reform policymaking might have pushed China to the edge of the cliff at one point, right. So in that sense, this is

not the kind of narrative that is particularly conducive to a narrative of the victorious economic reforms from the beginning to the end, right? At the same time, those who were arguing for radical price reforms in the 1980s, many of them also don't have a particularly strong interest in foregrounding that idea, whereas finally those who are arguing against these type of ideas of package reform and rapid liberalization of core upstream prices, published their memoirs and analysis and so on in outlets that are vastly unavailable to a broad public or scholarly community in small presses in Hong Kong, Taiwan, in traditional characters, which are sadly only accessible to a very exclusive small group of scholars in the English speaking world anyways.

- Great. So we are actually at time, but if it's okay with you, we can maybe do at least one more round of questions, maybe for five, seven minutes.

- Sure, sure. So there's a couple of questions that are again on the contemporary mode, and have to do with the pricing of commodities or real estate, which is, I'm guessing, which should not surprise you, given recent developments. So the first question is a very short one, that just is from Lauren Solomon who asks, does lack of shock therapy explain current problems of energy shortage in China? So it's also an invitation to talk about pricing issues, and I think that had been, I think part of the story. The second slightly longer question from Abdul Sufi, who asks, the economic reforms in China argued that central planning had created an irrational economic system. The rational economic system was due to creation of excess demand in some markets and excess supply in others. This is what they argued. However, today we observe excess supply in at least eight industries in China. What is the position of reformers on the failure of market and private property to allocate resources optimally? So I guess this is the shadow of Evergrande is looming over this question in some ways?

- Yeah, great questions. So the honest question on the coal market is, that I have obviously been reading the news, but I have not yet had a chance to dig into the precise constellation in the coal market in recent months, more deeply. On the one hand, one could argue that yes, there is exactly the problem of not having had shock therapies since the prices for coal were set, sorry, the prices for electricity were set too low, therefore, there was not enough, with the coal prices shooting up, there was not enough incentive for the electricity producers to buy enough coal in order to then produce enough electricity in order to avoid these shortages, right? On the other hand, one could also argue that China has created one of the largest smart grids to my limited understanding, and I'm not a student of electricity networks, in the world, which was not least possible because electricity was still in the hands of state-owned enterprises. And it seems that in the current situation, this grid has been brought

to its limits. At the same time, if we look at climate change and the kind of violent fluctuations in commodity prices that are very likely in this setting, not only in fossil fuels, but also in the renewable energy sector, then it might well be that such a smart grid, that was possible because China did not completely privatize its electricity sector might be a big advantage. At the same time, I agree that there clearly was a pricing issue and that clearly that the state set price apparently was too low, and that there weren't enough incentives for the state-owned enterprises to react quickly enough. Now we see again, the mode of the Chinese state mobilizing the market, as they are mobilizing the corporate users to ramp up production, which is exactly part of this state mobilization of market actors type of logic, which, if we compare the Chinese situation, with the EU situation around gas prices, where now in fact, the EU policymakers are talking about creating buffer stocks, which is something that China has been doing, quite consistently for a while by now, then it might be the case that if a similar type of crisis was to continue to loom on in the EU, we might be humbled, in terms of saying our system is just by design superior, because we don't quite know yet how this will play out. So that's me, I'm being very cautious here in the context of radical uncertainty. But I take the point that clearly there was a severe pricing issue. On the question of an irrational economic system and excess demand and excess supplies, one of the key arguments for the need of shock therapy, or at least for the need of a Big Bang, was that there was excess demand more or less by design in a planned economy. And that, therefore, one had to let go, like kind of basically release the pressure that had build up and that this pressure had to be released eventually. So it's better to do that earlier than later, then move to a market system that would avoid the building up of such pressures, and then be like in some sort of, wonderful working economic system. One of the very simple points against is that one of the economists that I was interviewing was making that I found quite intuitive was, well, if you have aggregate demand being above aggregate supply, there are two ways of correcting this. One way is to try to bring down aggregate demand. The other way is to try to bring up aggregate supply, right, which is pretty logic. In a very poor country like China, where we have to remember 1980, China's GDP per capita was the lower than that of Sudan or Haiti, bringing down demand is not simply a matter of austerity in a rich country, but this could be extraordinarily brutal type of policy. So therefore, from the perspective of development, this was this economist arguing. We did not have another choice, but to work towards increasing supply. Now, this process of increasing supply, I mean, part of the severe bottleneck in China's industrialization project, going back to the Maoist period was of course the most upstream industries. So there's logic of increasing supply, was all about increasing supply of the bottlenecks that are bottlenecks for the industrialization of more downstream industries. Now, it's probably fair to argue that there has been an overshooting in certain industries where the supply by now is possibly more than it would have

had needed to be, for the industrialization effort.

- Great. So if you have the energy, maybe we can wrap up with one final question. We won't get to, I have to apologize to the members of the audience, we won't get to all of the remaining questions, I'm sorry. but we're past time. But it might be a nice question to end on in some ways, because it asked you to reflect on the discipline of economics itself in some ways. So this is a question from an anonymous attendee, who asks, the existence of beggars was quoted as the reason for economic reform in 1978. But now there seem to be more beggars and homeless people on streets and many more begging for jobs, housing, education, medical care, and so on. So how do you explain the irony? Does this mean that another reform is needed? Related to this also considering the economic collapse of Russia after shock therapy, should ivory tower economists be more careful and humble when they suggest some major policy changes to other countries.

- Yeah, this is a brilliant observation. And I think this is really, really important and great that whoever brought this up, this connection between beggars then and now. I mean, in some sense, something that I did not dwell on during my presentation, there was this whole idea of the late '70s that China had moved towards to advanced stages of socialism, and therefore had to backtrack and basically make up lessons of capitalism, unleash market forces in order to enhance the material forces of production, let's use Deng Xiaoping's famous slogan, some become rich first, and then eventually have the rest catch up, it's kind of implicit in the idea of have some get rich first and not have some get rich, full stop, right? Now, the big question is, of course, is the level of poverty and beggars and social deprivation that we have seen in China in the last two, three decades, consistent with this idea? Or isn't this already in itself a betrayer, of this initial mission? To the question of what about economics? What does this tell us about the wisdom of economists? I mean, beyond China, I think that, on my mind, and this is not just China, right? I mean, if you look at, for example, the studies of a colleague of mine here at UMass Amherst, Lawrence King, who has been systematically studying the impact of IMF structural adjustment programs on things like child mortality, I mean, it's just shocking. It's just shocking what the social outcomes of these kind of programs have been all around the world. So in that sense, I think the, to put it mildly, disappointing track record of the Washington Consensus should really humble the economics profession, in switching from the Washington Consensus to the post Washington Consensus, which is then again, some sort of package that suggests that there's one unitary model, one set of policies that can solve it all, for all countries around the world, no matter what the history, what the culture, what the local institutions, and so on. And I think that in that sense, actually, this is part of the reason why I started with appreciating the reason scholarship in the Chinese context that traces these bottom up initiatives that have long existed, there is a need for economists

to take such bottom up initiatives in all sorts of historical and local contexts much more seriously, and ask ourselves, what do they tell us about the potential for economic development, rather than thinking that there's one big blueprint, whether this is now being labeled the post Washington or maybe even the Beijing Consensus, that can then just be like, put as a magic bullet on any kind of local circumstances. So yes, thank you for this question. I do think that this should be humbling, the economics profession, not only China, but beyond China. The more general track record of development that, I think in the context of the pandemic has just become once more very, very salient. And in fact, points to quite sad story.

- Well, on that humble, but in some ways, perhaps a gesture towards greater interdisciplinarity in some ways, to, you know, is perhaps a nice note to end on. So I apologize again to be, there are still a few questions we could not get to, and my apologies to those questioners. But, Isabella, thank you so much. And thank you to our audience. There's still 50 people who stuck it through to now. So thank you so much for staying with us. And do join us in a couple of weeks for our next talk. But for now, please join me in thanking Isabella Weber for a fantastic talk and discussion. Thank you.

- Thank you so much for having me, Arunabh. And thank you, everybody for these great questions. If whoever asked about coal wants to discuss further with me, I will be happy to learn from the insights. Thanks again to everybody for really great.