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Markus Brunnermeier: So welcome back, everybody, for another webinar organized by Princeton for everyone worldwide. We're very happy to have Bruce Greenwald with us. Bruce will talk about long-term resilience. Hi, Bruce. Good to have you.

Bruce Greenwald: It's good to be here.

Markus Brunnermeier: Thanks, Bruce. So today, we will learn about long-term resilience, not only short-term resilience. And before I give the mic to Bruce, I will talk a few words about resilience. Of course, there are different approaches. There's the risk approach, typically measured as variance or value-at-risk or various risk measures. It's more a static approach. There's also a robustness approach, where essentially it should work in most circumstances, almost all circumstances. It's more a rigidity approach. So you can have a very rigid approach. You don't have to adjust. While resilience is more about adjusting and bouncing back. And the measure is more mean reversion. or half-life, or impulse response curve. And then there are two types of resilience boosts we'll talk about. One is you bounce back to the original steady state, or you adjust and make a structural change. So it's a transition, then, transition phases. So we'll learn more about that today as well. So what are the big transition phases? So one is, of course, we move from an agricultural economy to a manufacturing economy, and then now we are shifting to a service economy. But we have other big transitions going forward. So for the green transition, you have to reduce investment in dirty technology and increase the investment in green technology. We have some deglobalization going on, some efficiency loss because of some trade barriers popping up. We have huge demographic changes. And what are the complications arising from that? How can we bounce to a new circumstance, given different demographics? We have different preferences. People want to work much more from home and so forth. There's a different choice for leisure and labor trade-off and so forth. And we have to figure out how productive this working from home is or not. And typically, when you face a shock, the shock can also lead to what I call uber-resilience. So you might be stuck in some local optimum. So if the welfare is going down, is going up, and as you go down here, you might be stuck like this ball is stuck. And then there's a shock which removes this little mountain, and you can actually go down to a better optimum, which is with a higher welfare. And sometimes a shock can actually shake the system up, and you can actually then jump to the new circumstances. I think Bruce will talk about how, for example, the Second World War was such a shock to shock the economy off during the Great Depression. The other question is, do you really want to have a gradual change so that a continuous transition is possible? So there is a sequence of smaller shocks or you want to have one big jump. And the big difference is if you have a sequence of smaller shocks, there's a reaction possible after each smaller shock. So think of a Brownian motion or Wiener process where the jump – essentially it's one jump and there is no reaction possible. And it depends very much whether you can react. So in a continuous process, you can actually react to it after each little shock. And the question is, is this reaction stabilizing or destabilizing? If it's destabilizing, it's actually better to have one big jump because the reaction itself leads to feedback loops and makes the situation worse and

actually you might hit the tipping point. So here's an example: there's a path, and in the long run, you can go to a higher path.

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But in the meantime, you have to go through a valley. And if the reaction leads to a phenomenon where you go to this slight green thing that you don't hit the tipping point, then actually the fact that you move gradually and you... can react to that and stabilize the situation, but then actually it's better that you have a continuous gradual transition. On the other hand, if the reaction makes things worse because I react in negative ways and it leads to amplification and feedback loops, then I might hit the tipping point much more quickly and then there's no way to come back. So whether you want the jump or gradualism depends very much on the reaction, behavioral reaction, whether the behavioral reaction is stabilizing things or makes things worse. The other thing which matters a lot is when you think about the resilience of a whole system, there's what I call a resilience paradox. Sometimes it's better to have the whole system be more resilient if subsystems are less resilient. So you can sacrifice parts of the system to have a better transformation in order to stabilize the whole system. So the resilience of the whole system is higher if subsystems are less resilient. A classic example are zombie firms. So if you keep each firm resilient, so no firm can go bankrupt, it makes the whole economy less resilient. But if it's easier for banks, perhaps through restructuring and other things, then actually, of course, individual firms will be less resilient, but the whole system is then more resilient. Another thing which affects resilience a lot is the structure of the system, how is the network structure. You can see here, just picture three of various networks. You can see this decentralized structure is not very resilient. If you hit the center point, then the whole network is going down. Here is some intermediate one, which is half resilient. And here's a distributed network, which is much more resilient. If you hit one of these nodes, the rest will just take over and everything stays resilient. So with this, I would like to come to the poll questions. And thanks again to all of you for answering these poll questions, so to be part of this whole endeavor. And so here are the questions: so, the emphasis in economics on stationary models, is this a problem? Because we simply assume resilience. So we assume we go back to the steady state. So it's simply assumed, and that's why, because we assume it, we can't really study it. That's what about 10% thought. It ignores the transition or transformation or shift to some new steady state. That's what the majority thought, 62%. I think Bruce would be happy with that. Or it is a good simplification. That's what 28% thought. So that was the first question. The second question was, what's the best measure of resilience? Is it a mean reversion coefficient? That's what about 30% thought, half-life, 20%, and 50% thought the cumulative impulse response function is a good way of measuring resilience.

Bruce Greenwald: It's a sympathetic audience.

Markus Brunnermeier: Very good. And then we have the third question: more about bouncing back to the old structure, or is it more about facilitating transformation of the economy? And that was, again, very sympathetic; 8% thought bouncing back to the old structure. 92% thought facilitating transformation of the economy to a new steady state. And finally, there's one

question about the Great Depression in the 1930s. Was it triggered by the stock market crash in 1929? That's what 26% thought. Or was it the failure not to relax monetary policy sufficiently?

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That's what 54% thought. Or was it a delayed structure from agricultural to industrial economy? So everything was delayed, and the structural change was actually delayed. And that was 20% thought. So again, 26, 54, 20%. For the last question, I think Bruce will probably change your mind on this one. So Bruce, the floor is yours. We're looking forward to your presentation.

Bruce Greenwald: Okay, so let me try and get the shared screen up. Okay, can everybody see those slides? Okay, so the first thing is that I do wanna talk, with all due deference to Markus, my sense of the resilience discussion so far is that it's really about responses to shocks, that an economy or a social system is in a certain state, a shock appears, an epidemic like COVID, financial crisis, a natural disaster like the Asia tsunami, or an accident like the Fukushima nuclear plant, resilient economies don't go down as far in response to the shock, and they recover more quickly. Non-resilient economies have greater reactions, negative reactions to the shocks, and they recover much more slowly. I think that that's one variety of resilience. And I think if you read Markus's excellent book that he covers that pretty thoroughly. But if you look around the world at disasters, it seems to me they look really quite different. They really, in most cases, either involve transformations where governments intervene to change things. And I think they always think they're gonna change things for the better, like in Venezuela, like in the centralized economies in Eastern Europe, and actually all over the world after the Second World War, and they don't. And the question is, when you get on a bad path like that, you'd think a resilient economy would adjust and get off that path and get back to a much more promising structure of the economy. A non-resilient economy or society will not be able to make the adjustment. You'll keep going down and you will stay down. And I think that that is something that I'm gonna show you has consequences an order of magnitude more important than the type one resilience that I think a lot of the discussion is focused on. I think it means long-term senses, another thing that happens is that there will be underlying changes in the structure of an economy. The examples that I would use here are the depression which I'm gonna talk about. But I also think if you think about Japan since 1990, things have gone on that they just have not adapted to for 30 years now. And the issue of adaptation is very much like the issue of wrong direction. So an underlying change and usually if it's a structural change, it's a long-term change that occurs and resilient economies adapt successfully to it, non-resilient economies don't. So in terms of...

Markus Brunnermeier: Can I ask you something about the type one and type two? So one type one, you mean there's two distinctions. One is whether it comes back quickly or late, that's in type one. The other one, whether it comes back at all or not. But the bigger distinction is whether the new – when you come back, if it's resilient, will come back to a different steady state.

Bruce Greenwald: Yes, of course, a better steady state. And it will be, and I think this really summarizes it. So the type one, normally the shock is external. When you think about these

long-term changes, a lot of them are internally generated. Although there are also these external changes through technology and other things in the economy.

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I think the type one resilience, it's a sudden onset. You suddenly are in the COVID pandemic. I think that in type two, and I think I can show you with Venezuela, it's a very gradual onset, it doesn't go bad all at once. So you have a lot of time to adapt. I think in type one, as we found out with the vaccines, at least the consequences are time limited. I think when you look at type two, getting on the wrong path or failing to adapt to underlying changes, you have very long-term consequences. I think in the type one case, you have tailored responses. And I think in the type two case, one of the difficulties of adaptation is you have to have systematic responses to structural change. If you think about what we're talking about, I think in terms of long-term resilience, there are two categories. One is the imposed internal change, post-war economic centralization in Eastern Europe and China and other places, in Venezuela, Zimbabwe, Greece, North Korea, and Cuba, embraced systems that didn't work out well and did not work out well for a very long time. I think the other thing that happens is that underlying economies shift. I'm going to try and make a case that that happened in the Great Depression with essentially the collapse of agriculture as an important economic sector. I think you see it in, and I'll show you the data in Europe and Japan, and there I think it's adaptation to the collapse of manufacturing. And there are other partial changes like this in the UK and the United States that are not quite so pervasive. So I think we're looking at two subcategories that I'm going to discuss at least quickly in the first case and in greater detail in the second, which is imposed direction of change that turns out to be disastrous and not easy to correct, and then failures of adaptation. And again, resilience would be responding in both. Okay, this is, I think, the measure of what these long-term problems can do. So what I'm looking at is, I hope, paired, fairly honestly paired economies. In the right-hand column, there are economies that undertook a centralized planned experience. On the left-hand side are similar economies that didn't. So before World War II, Finland was the poorest of the Baltic countries. Lithuania, Latvia, and Estonia were richer. By 1992 to 1994, per capita GDP in Finland is more than twice what it is in the other areas, and life expectancy is basically five years, six years longer. It's a massive difference. If you look at Middle Europe, the Czech Republic, which is Bohemia, was richer than Austria before the war. By 1992-94, the GDP per capita was significantly less than half what it was in Austria and the Czech Republic, and life expectancy is three and a half years lower. If you look at two big Catholic agricultural economies that had bad war experiences, the Civil War in Spain, World War II in Poland, by 1992-94, Spain had a GDP per capita more than, well more than twice Poland, and the difference in life expectancy in that case is about five years. If you compare China to Taiwan, Taiwan – and by the way, Spain is also poorer before the war than Poland – Taiwan, which is a Japanese colony, is one of the poorer parts of China. If you look by 1992-94, despite the relatively successful changes or dramatically successful changes in China from 1980 on, Chinese GDP per capita is less than a fourth of what it is in Taiwan. And the difference in life expectancy is over seven years. If you look at Thailand, which is poorer certainly than Vietnam, although similar to Laos and Cambodia, before the Second World War, that after the experience of centralized socialism, Thai GDP is more than seven times per capita

what it is in Vietnam, Laos and Cambodia. And there is a 13 year difference in life expectancy. North Korea and South Korea is another example of this experience.

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By the way, the centralized economy numbers came from the Penn assessments, University of Pennsylvania assessments. North Korea has a GDP per capita less than a 10th of South Korea. Now, the life expectancy numbers are the self-reported numbers that the UN puts together. So I don't think you want to believe the 70.1 versus 70.8 life expectancies in the North versus South Korea comparison. But even if you take that as gospel, you have differences of three to one in GDP per capita and six years of life expectancy. That is a massive difference. Go ahead.

Markus Brunnermeier: An assumption here that centralized economies cannot adapt and adjust and be as resilient as non-centralized. But I could also make the case, in theory at least, that if you're centralized, you overcome all the coordination problems in a decentralized economy and then you can adapt more easily. So what's your argument?

Bruce Greenwald: Oh, no. I think that that is the justification, of course, for what they did. And centralized economies are not static economies. There are persistent reform efforts in these and none of them work. Getting on that wrong path was very hard to get off of in terms of the consequences. And it took really a sort of collapse of the regimes in question to do it. And the consequences are, as I say, disastrous. And I just, you know, it's not that they don't try. It's that there's something in the nature of the structure that they embrace that means that they don't try successfully. So you would say they're still agile and adjust, but adjust the wrong way to take the wrong turns. I would say it's that. But I also think that the problem with centralization is there are too many decision makers, so they're not as agile. And remember, this is about wrong paths. This is about bad decision making. And I think centralization makes it hard to change because, of course, you don't have diversity of opinion in centralized environments either. But I'm going to talk about that, I hope, at the end when we talk about how to avoid this sort of circumstance. What I'd like to do though is compare these costs, which are, you know, 7%, 8% differences in life expectancy and massive differences in standard of living to what you see in a traditional type one situation, which is COVID. So these are US data. There are about 1.2 million COVID deaths. They tend to be old sick people, but let's just assume it's 15 years of life that is lost in each case. So you're talking about 18 million years of life lost. There's a population of roughly 320 million. So it's about 1/17 of a year, which is actually 0.0562 years of life that's lost. That's compared to seven years in the long-term resilience issue. It's just an order of magnitude difference. If you have a life expectancy of 75 years, loss of life expectancy is under a 10th of a percent. It's just not the same thing. So I think it's ironic that there's a lot of attention paid to type one resilience and a lot of discussion of it. And this type two resilience and the problems that it generates just don't get discussed. And in a sense that you would think because of the slower onset, that the type two resilience would be more correctable. And this is the Venezuelan data. So it's between 1990 and 2000 that you get Bolivarian, with the Chavez government. Venezuela throughout that period before there is much change does slightly worse than Colombia, but it does reasonably well in absolute terms. From 2000 to 2006 aided by the boom in oil prices. they

still do slightly worse than Columbia, but things don't get bad right away. It's sort of towards the end of that period that they get bad.

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From 2006 to 2013, they start lying about the data, which also makes it very difficult to correct the course they're on. The official numbers are that the growth rate was still positive at 2.8%, but now it's significantly below the Colombian growth rate. And then it falls off of a cliff. And the point is that this is something that takes place over a number of years. By the end of this period, the loss in relative GDP per capita, and again, the problem with the life expectancy numbers is the North Korea problem, that you don't really have good numbers there. But these numbers, by the way, come, I think, from UC Riverside or Davis, and there's a Dutch university that also produces Venezuelan GDP numbers, the loss is a half and a third. So the GDP per capita is between a half and a third of what it was before. It's again, a massive change, but it takes place slowly. The striking thing here is that there's no corrective action and there's still unlikely to be corrective action. Do you wanna say something, Markus?

Markus Brunnermeier: Yes, I have one question from the audience. So when you compare the centralized with the decentralized countries, where would you put Singapore? Would you treat it as decentralized or centralized?

Bruce Greenwald: I'm gonna talk about hybrid models, but it's clearly there's more diversity of opinion. There's more engagement with an international realm of opinion. There's less, there's more private enterprise. There are more – in terms of your picture, there are more decentralized centers of activity. So I would put it as a mixed model. And I think when I come to talk about countries like that, that there are local cultures where that works really well, and you shouldn't fool with them. There are also local cultures where it works badly, but the highly centralized model works badly in every place, it seems to me, in terms of resilience. It's because we're talking about a lot of countries in Asia and Europe and Latin America where it hasn't worked. So that's the story, I think, with imposed change and political intervention. It's something you obviously wanna think a lot about before you do it. But I hope it makes clear that these long-term resilient issues are an order of magnitude more important than the short-term view of resilience. And because the changes take place over time, they ought, in theory, in a resilient intellectual or institutional environment, they need to be more subject to correction. I think what you have to think about is why that doesn't happen. But what I really wanna talk about is failures of adaptation, where there are underlying changes in the economy, they take place slowly over long periods of time. And the evidence seems to be that the systems just don't adapt well to those underlying changes. And I wanna start with the Great Depression because I think that there are things about the Great Depression that nobody has yet really explained and haven't even really addressed. So I think the first question you wanna ask is, where did it come from? And for those people who think it was a stock market crash, it did not come from the stock market crash. Over the course of 1929, the stock market was up 2%. There was a boom, there was a drop, but there was no significant impairment of wealth during that period. The second thing is that it is a... global issue. And the American stock market crash, and it's, of course, much less, there's much less wealth embodied in the stock market in 1929 than today, that it's

not a global problem, the American stock market crash. And I also think, by the way, American monetary policy is not a global problem.

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And the Depression does seem to be a global problem. And I think it also mitigates against that kind of an explanation. So what I want to do is talk about what seems to me to be the global problem. And I think it's rooted in creative destruction. So you have the creative destruction that is really nobody's fault. Productivity growth in agriculture for a long time is above demand growth. I mean, if you have sector neutral technological change, you obviously have a low income elasticity of demand for agricultural products, so their demand falls below what is going on in the rest of the economy. And if you have sectoral productivity growth that's unusually high, which you certainly had in the United States, thanks to the Agricultural Extension Service, you have a very low price elasticity of demand and you have very adverse price changes. Now, the natural thing that you would expect to happen is that the creative destruction is accompanied by some creative creation, that the resources shift. But it seems to me there are significant, especially given the structure of agriculture, impediments to redeploying resources, financing the redeployment of resources, capital, and labor out of the agricultural sector into urban manufacturing economy. I mean, because of imperfect information, it's gonna be very hard to borrow to support the necessary migration. The capital itself is very often embedded in land, buildings and other very specialized equipment. And again, since local investment tends – since individual family investment tends to be local, when the industry goes down, the value of those assets also goes down. So if you can't borrow because of imperfect information reasons, migration and the financing of the shift of resources is gonna be balance sheet dependent. From 1900 to 1920, farms do extremely well. I mean, it's a period of extraordinary prosperity. So in '21 to '23, when you have big problems with agricultural prices, you see a lot about migration. But over the course of the '20s, which is a very bad decade for the farm economy, those balance sheets are impaired. So when prices fall in the middle of '29, the summer and fall of 1929, now it looks like those. farmers are not able to move. The farm labor is not able to move. And that's actually what you see, and I'll talk about the data in a second, which is that migration in that case in the late 1920s goes to zero. Once that happens, so you have a mobility constraint, you get a downward spiral. Because the people can't move, productivity continues to grow. You have all the long-term trends continuing. And since the labor force is still there, they're exacerbated. So '29 is bad. They're now producing more. And you see this agricultural output increases, and there's a lot of land that's come online, agricultural land that's come online in the early '20s, and then between 1900 and 1920. And now output goes up, demand of course doesn't go up anymore, and '30 is worse. Now they're really impaired because all their assets are in worse shape. '31 is really bad, '32 is bad. They're still not moving, mobility. If you look at net mobility out of the agricultural sector in the United States, it's zero. And really until you get down to the point in which it doesn't look like they're covering variable costs – and the government actually in the United States intervened energetically to keep agricultural output down– that you lose, if you measure farm income over that long period, about 80% of farm income. And by the way, this is a global problem. And something else happens that is parallel to what's happening today, which is that, and this is a fact in the depression, that countries try and export the problem of agricultural depression. And the way they do it, of course, is to devalue their currencies. So

Australia and Argentina. devalue very early and they get a significant boost early in the depression.

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The problem with international solutions is that when you add up overall countries, the surpluses and deficits have to be zero, product by product. So it's not going to get everybody out. Now, when countries devalue, you should see a benefit and you do. And there's substantial evidence that that helps, but it doesn't solve the long-term problem. The war... Sorry, go ahead.

Markus Brunnermeier: So the one question is by Christy Baxter, how does the story about agricultural migration relate to the great migration to the north? And the second question I have, if you look at who migrated, are they more wealthy or less wealthy farmers? Because if your story is correct, it has to be that the less wealthy farmers in particular were constrained not to move.

Bruce Greenwald: Oh, I think that happens. I mean, they do move. If you talk about farm owners versus farm laborers, farm owners are the biggest thing. The classic picture of the Okies is farm labor. And they move to agriculture. They don't finance a movement to industry. The great migration does not happen in the Depression, it happens in the war. And I think that's really what solves this problem. So the war, the demand clearly gets, the standard Keynesian demand argument clearly applies in the short run. But the striking thing is that if you were a Keynesian in the 1940s, you were running around Washington, and this is Alvin Hansen and actually Paul Samuelson, saying in '44, '45, the Depression is coming back. Because again, nobody really understood where it had come from in the first place. And surprise, surprise, it doesn't. And I think that's because the war was also extraordinarily successful. Industrial policy inadvertently moved everybody off the farm into the war factories, into the armies, and then from the armies into the cities. And the countries that don't participate in the war, Uruguay, Argentina, large parts of China, large parts of the Philippines, never really recovered from the Depression. So I think that this is a consistent story of what seems to have happened. Just to summarize the details, what you see in the data is in the '21 and '23, agricultural price decline, which are very sharp. You have high out migration from the farms. From '29 to '32, the net out migration from the farm sector is zero. So to the extent laborers are moving like the Okies, they're moving farm to farm. They don't have the resources to go into the cities and be retrained. The cyclical dynamics of the depression also have a characteristic unlike the normal business cycle. A normal business cycle is six to nine months, and this includes the great financial crisis, a six to nine month sharp decline, and then a long, gradual recovery. In the depression, the second half of '29 is bad, '30 is worse, '31 is worse, '32 is bad, and the first half of '33 is bad. It's a four year down cycle, and that suggests a very different mechanism is at work. Agricultural incomes between 1929 and '33 in nominal terms fall by 80%, and about a third of the population is employed either directly in agriculture or in services in farm communities, so it's not surprising that that brings down demand in the industrial economy too. In terms of devaluations, there are short term gains, and you do see when people devalue and go off the gold standard that things get better, but there are long term constraints. And the recovery distribution around the world is surprising. So Argentina, Uruguay, China, and the Philippines are really have problems. Japan and Germany,



which are devastated, which have been at the heart of the war and have had highly developed war economies, do much better in the wake of the war.

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So I think that if you look at the data, it suggests that especially the global nature of the depression, that something like this has to be going on.

Markus Brunnermeier: So to what extent is this different from the Manso/Olsen perspective that Germany and Japan suffered a huge destruction of institutions and everything was leveled again. And that's helped essentially Germany and Japan to rebuild from scratch, rather than being stuck in the old institutions.

Bruce Greenwald: It was not, okay, the striking thing is they're not new institutions. In Japan, it's the Zaibatsu who are the great corporations of the recovery and they're the great corporations before the war. In Germany, the corporations that do the recovery are the corporations that fought the war. What changes completely, and it doesn't change immediately, but it does change rapidly after the end of the war, is the depopulation of the agricultural sectors. It's not the industrial—

Markus Brunnermeier: The right policy would have been stimulate movement.

Bruce Greenwald: Yes, of course, of course. But farmers were valued. You wanted to save your decent yeoman farmer population. And you see the same thing today, by the way, with manufacturing jobs. Everybody's trying to save manufacturing jobs. It's not gonna happen, and it's not what you need to do. You need to move people into services. Now, when you think about these kinds of transitions, the transition problem, I think, from agriculture to industry, given the geographic relocation, the necessary retraining and sort of a cultural adjustment to urban versus — or suburban versus rural living was difficult and costly. On the other hand, when you have a transition, there are also issues of the difference between the origin structure and the new structure and the destination structure. So in those terms, you went from very small production units in agriculture to very large units. I'll give you an example. There was a Western Electric plant in Kearney, New Jersey that in the wake of the war had 53,000 workers. And with that scale of operation, you can put a lot of managers and a lot of engineers to work, and generating productivity and this is sort of Dixit/Stiglitz is a lot easier in that environment. So all over the world where this transition took place, you see high productivity in the wake of the war. In terms of density, you go from low to high density, so spillovers are likely to be higher in an agricultural than an industrial economy. So again, that supports productivity. In farms, you have the Kulak problem. You have individual production and there are rich farmers and there are poor farmers. You do a lot more collective production in factories. So to the extent that you can identify individual productivities and that drives incomes, you're going to have a much wider distribution given George Stigler's data on lawyers and doctors in an individual production environment than in a collective production environment. So you're going to get a lot more wage and income equality. And you have global markets in agriculture products. You have national markets initially for manufacturing, but ultimately those markets go global. So monopoly positions tend not to be

reinforced by this change. So you don't get a redistribution of income between profits and labor. If you look at today's, anyway, that's the depression story.

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Markus Brunnermeier: I could argue, let me just play Devil's Advocate. The industry is much more collective production. It's much more centralized, while agriculture was decentralized. How does it fit in a centralized versus decentralized story?

Bruce Greenwald: Oh, okay. If you look at the centralized economies, everything is centralized. If you look at these institutions, even a 53,000 person factory is a small fraction of the overall economy. I think you have to have a notion that there's continuity in centralization. Big institutions, and this is by the way, something, I think it's not widely known, but you know, sooner or later. or if you spend time with Bob Solow, you learn everything. Workers in big firms are much more productive than workers in small firms. But what we know from the experience of the centrally planned economies, when you shift authority to a central organization, it doesn't work out well. I think that's the difference. And so what you get post-transition here is a golden age. I think that what's going on today is a similar trend. Oh, by the way, in terms of interpretation, I think that there are real problems of understanding what went on. I mean, the thing is that a Keynesian model always has a real problem, which is that it's not a model of business cycles. The cyclical mechanism that Keynesian model is animal spirits. And if you're relying on animal spirits as an economist, you're probably in real trouble. There's no question that the war spending had an impact. But again, if you're a good Keynesian, there should have been a depression reappearing after the war. And it didn't happen anywhere in the world that it participated in, even though the infrastructure in many of these countries was devastated. So I think that in addition to the Keynesian view of what happened to get us out of the depression, I think you've got to understand the structural adjustment that took place because of the war. It's not simply a Keynesian story. Also, there's a lot of talk about how the Marshall Plan was made up.

Markus Brunnermeier: Can I just ask a question? At the time when Alvin Hansen discussed that, was there also a debate, what you are mentioning, that the movement of the farmers to the cities and all this, that this was a structural change or this was not –

Bruce Greenwald: No, there was no – The interesting thing about the U.S. policy in the Great Depression is, it's designed to keep the farmers on the farms. It's designed to get them to produce less on the farms. I think when these things happen, and there are large classes of people who have to have their lives uprooted, governments are extremely reluctant to do it. I think you see it today in the dedication to saving manufacturing jobs, which has had significant adverse consequences globally. I just – it's just another quick story. I'll do this really quickly. There's a lot of emphasis on the Marshall Plan and what it did in Europe. It's almost certainly wrong. If you look at these numbers, the biggest recipient of aid in the Marshall Plan, by the way, was the United Kingdom. Per capita, the least favored recipient was Germany. Yet, if you look at the recovery, Germany does much better than the United Kingdom. Italy does surprisingly well given the relatively little support that it got. When you look at Japan, we not

only didn't have a Marshall Plan, but we made the Japanese government pay for the US occupation troops.

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About a third of the Japanese government budget went to paying for US occupation troops, and yet Germany and Japan are the countries that do extremely well with relatively stable institutional structures. And in the cities that have been leveled in Japan, those are the occupation – that's where people go back to, somewhat surprising. So I think it's-

Markus Brunnermeier: But did it come a little bit later than Germany, or took a little longer?

Bruce Greenwald: It did, but it was completely leveled. Okay. So I think that the alternative explanations don't seem to do as well as the structural explanations, and certainly don't explain the extraordinary prosperity that you see in the wake- to the war to these countries that participated in the war. If we talk about the service, the industry or manufacturing to services transformation, it really is different. Now, in terms of moving people, there's not the same geographic relocation that has to take place. There is retraining. There are big cultural adjustments because manufacturing jobs have typically been male jobs to a degree that service jobs have not been. And there are clearly cultural adjustments associated with that. But at least in terms of the transition, it has been relatively stable over time. You see a steady reduction all over the world in manufacturing employment. You don't see this situation like you see in the late '20s through the early '30s of the relocation stopping. The origin to destination issues are much worse. So you go from large centralized units to small decentralized units, from high density production to low density production. And that makes generating productivity growth much more difficult. And you'll see that the consequences of that are absolutely clear in the post-transition economy. In services, you tend to have individual performance as opposed to collective performance. And that naturally leads to wage inequality. But worse, industry markets are global, goods markets are global markets. Services are locally produced and consumed. That means they're small markets. Small markets are susceptible to domination by individual companies, especially if you have a degree of customer captivity and local economies of scale. So to the extent that services are continuous consumption as opposed to buying goods episodically, there is much more customer captivity in services, so on both grounds, you see a lot more monopoly power in services. And I'm gonna show you the data for the U.S., you have high excess profits. So there's not only redistribution of income among wage earners, there's significant redistribution between profits and labor. And there's very little discussion or very little sense of what institutional adjustments would look like in the face of this kind of structural change.

Markus Brunnermeier: Would you argue that having platforms like Amazon and other big platforms make it a little bit easier? Of course, the monopoly power goes then from the local service producer to the platform. And hence, is the key policy or ...?

Bruce Greenwald: Well, but here's the thing, Markus. You can order on the platform, but you still have to distribute the goods. And there are local monopolies in goods distribution. So no, and

actually the ordering function is not a big service function. There are not a lot of people who do that.

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And to the extent that there were in financial services, you actually see over time that bank tellers, secretarial, and other similar jobs have disappeared in large numbers. So that change takes place, but you still have the local monopoly power. But there is another important aspect of technology that actually makes things worse. If you look at IT, for example, and you look at the companies that were dominant, say, through 1990, they're big companies that do everything. It's IBM, it's controlled data. I mean, they're all full service companies. They do everything from chips to making the machines to writing the software. If you look at the structure of the market today, it's decentralized. It's been localized in product space. Microsoft does the operating systems and related adjacent software. Oracle does the database systems and related software. Intel does only the CPU chips, but Facebook and LinkedIn do the networks and their specialized networks increasingly. Adobe does the fonts, Google does only search, and it gets put together. Those are small markets and they're susceptible to monopoly domination, and they are dominated by monopolies. On both counts, technology and this trend of services, you've got increasing concentration and increasing profitability. Does that answer your question?

Markus Brunnermeier: You're not arguing for vertical integration. It's good that they are not vertically integrated. Right.

Bruce Greenwald: No, it's good for them, but it's not good for competition because they dominate. If you want to measure barriers, then there's a simple thing you can do. So first you have to look at what's the minimum sustainable scale an entrant has to have. In a big global market like automobiles, that may be 2%. In a small local market like Coca-Cola distribution, that's 20 to 25%. So you've got to get to that scale to compete or to enter against Coca-Cola. The second element is how easy is it to acquire a share? How much share stability, how much customer captivity either through technology and pricing or just direct behavioral support do you have? In Coca-Cola's case, 2% of market share changes hands every year. That means to get to 25%, it's a hundred year barrier. If you look at automobiles, about 1% changes hands every year in the global automobile market. To get to 2%, the barrier is negligible. So I think on both grounds, what you're seeing is higher... barriers to entry, more monopoly power, and significantly higher profitability.

Markus Brunnermeier: Let me just lean a little bit against that. So of course, in the olden days, it was very hard to match a service provider with a customer because I didn't find him. Now the digitalization helps much more, think of Airbnb. Think of if I find a piano teacher online. It's much easier, but somehow the monopoly power moves them to these platforms. And it's not at the local individual level anymore because the matching is somehow much more superior.

Bruce Greenwald: Well, think about doctors and hospitals and local groups. Like the big sectors in services are medical care, housing, and education. And those are increasingly big institutions,

especially in urban housing. And it's got to be matched locally. The matching part of this economy is not where the heart of services are. OK?

50:00

Markus Brunnermeier: So let me come back, so in the Great Depression-

Bruce Greenwald: Can I do the data before we do the – let me defer this till the data's done and then you'll give your explanation of the data. Okay, so these are the consequences. You've had slow economic growth in Japan since the 1990s, really in Europe since the late '80s, early '90s. I think when you look honestly at China, they've had significant problems with growth and I'll show you why I think that. And I think there's a significant problem with growth in the developing world, ex-East Asia, that I think is going to be around for a long time. So the slow economic growth I think is undeniable. Increasing wage inequality, certainly this is not just the top 1%, this is sort of the top 20 versus the bottom 40. You're going to see that that data, I'm not going to show you, I assume it's well established. Profits versus wages, I am going to show you. Then you've got what you saw in the depression, which is, and I'll talk about this in detail, countries trying to save manufacturing jobs through exports. And that works for individual countries like Japan, which has had a long sustainable surplus, but for the world as a whole, the surplus and deficits have to be zero. So you're not gonna export your way out of the problem. And then there are these social imbalances that I think are behind a lot of the tensions that are out there today. And also again, these problems are global, they are not local. Now let me do the growth data, cause I think it's striking. So if you look at 1960 to '90, which I looked at because I didn't wanna get the immediate post-war effect. Average growth in per capita income in the US was two and a half percent. There's a slight downward trend in that. In Canada, the downward trend is more pronounced from '60 to '90 by decade, but it's also two and a half. The UK, which is a fairly flat trend, is also two and a half. But continental Europe does better. It's 3.1%, 3.1 in France, 2.8 in Germany, 3.5 in Italy. And these are all the G7 countries. And in Japan, it's 5.4%. If you look at 1990, I mean, sorry, 1990 to 2018, which is when I did this data, Japan is steadily less than 1%. It is a phenomenally painful change. You go from a growth rate at which you were doubling per capita income every 14 years to a growth rate at which you're doubling per capita income every 80 years. If you look at continental Europe, it's again, 1% in France, 1.2% in Germany, down from 3.1 and 2.5. respectively. And in Italy, it's 3.5 to 0.6. Again, you've got an average of 0.9%, which is a huge reduction. At 3%, incomes double every 24 years. At 0.9%, they double every 80 years. The formerly lagging economies in the UK and Canada and the US, although Canada is not so much, I think of the US and the UK as being particularly successful service economies, do better, but they don't do as well as they did before. So there's absolutely no question that productivity impairment occurs, and it's very long term. So I don't think there's any question about that part, at least of the consequences that we would have expected from this kind of structural change, although nobody talks about it in terms of the structural change. In China, I think it's worth looking at, because even though they lie about everything, when you have a situation like that, where a company lies about its results, you typically look for a counterparty who is reliable. And here, it's the trade data. And the IMF and the IFS does a pretty good job of making sure that when China reports a billion dollars of exports, somebody else reports a comparable billion dollars of imports. If you look at the growth in the trade data, which typically

is slightly higher than GDP growth, although probably not in this case, from 2013 to 2018, which is five years, imports grow at 1.6%, exports grow at 2%.

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This is not a 10% growth economy. Now, it's still a poor country, so it's probably 3 to 4%, but this is not dynamic growth, and it's not gonna be dynamic growth in the future. By the way, that number in brackets is the oil price effect in 2015. I'm going to compare China to Germany. And you'll notice that the oil price effect is very similar between the two. So it's not the oil price effect that is making them look so similar. German growth in this period, as you know, is about 1%. So the idea that China is unaffected by this problem, and that therefore it's not a global problem, seems to me to be entirely wrong. And since this time when this chart was done, which it was actually done in 1980, as you can tell, because I only had three quarters of the 1980 data for China, these problems have only gotten worse. So this chart as a forecast of what's going to happen has done remarkably well. This is a global problem in terms of the low productivity in a service structure economy. This one I'm not going to talk about in detail, but it's not about catch-up. Those countries, the U.K. and the U.S. that did badly are doing actually well before and are doing well in the data I showed are also doing well relative to other countries. So this is not about catch-up. Here, all right, Markus, this is your chance. Here's the profit data. If you average over the cycle in '89 to '91, and this is again typical of the earlier years when profits are falling, the profit share of US national income is 9%. By 2012, it's 14%. And it has remained at roughly that number since then. If you think there's all this competition out there, and by the way, investment as a share of output has fallen over that period. It used to be as high as 17, 18, 19%. So this is not more capital being invested. So what's your explanation for these numbers?

Markus Brunnermeier: I don't have a good explanation, but it's very consistent. The other side of this number is just the labor share going down. So some people argue that the trade unions have less power, so the bargaining power of the industry is moving up. So it's more the labor market rather than the product market.

Bruce Greenwald: Look, I suppose that that is consistent, but notice where the unions don't have any power. And that's in services. And in the industries where they do have power, wages have not done particularly well, although profits have not done well in goods markets. So to the extent that that explanation also accounts for this, I think it's the structural change that's at the root of that also, because it's hard to organize in a decentralized market environment. But in the labor union terms, by the way, the problem in a sense with that argument is that. I think, well, no, what I'm gonna say I think is wrong. What I was gonna say is that the U.S. has done relatively better in profits and relatively better in productivity because we tend to have big service companies, but the service companies didn't get organized.

Markus Brunnermeier: Do you think it's a- Production comes from a lot of services we're exporting from IT, is it primarily the IT sector?

Bruce Greenwald: No, no, no, no, no, no, no, no. The IT service exports are tiny. I mean, they really are not a big factor and we're huge exporters in the world, but that's not – services are

locally priced. And don't forget, this sort of thing seems to be going on all over the world. Okay? So again, it could be a labor problem.

58:52

Markus Brunnermeier: In China, there's still a lot of subsidies to bring people from the countryside into the cities by providing free housing. Yeah. That's essentially what your recommendation would be for the Great Depression.

Bruce Greenwald: No, no, yes, they've avoided a Great Depression, great. Now they're loading them into the cities where manufacturing employment has fallen. So they would do much better to leave them in the country and do decentralized services in the country. So I think this is the point I'm gonna talk about at the end, that they have an ideological view of the world. It has something to do with the history that was gone through, but has nothing to do with present day reality. We're tracking these structural changes without paying serious attention to them, which typically does not work well.

Markus Brunnermeier: So, but you will also tell us at the end who, which countries are the worst offenders in terms of not doing the transition to services. Is it like Germany, Japan, China?

Bruce Greenwald: Yes, of course, of course. Japan, preeminently so. I mean, I'm gonna show you what.

Markus Brunnermeier: But what about Korea? Are they going to- Korea, okay.

Bruce Greenwald: Can I defer Korea? Because I think Korea is the hope of the world. And okay, so in terms of transition issues, what you've had is international imbalances for very long periods of time, because you have permanent exporters. So the Japanese have run large and in some sense until recently growing surpluses for years. Germany has run large and growing surpluses for years. In Japan, it's partly because they've always thought that they're a resource poor country and they need a big margin of safety of exports over imports. But what it means is that the institutional structure of Japan is dominated by export oriented manufacturing companies. And the policy is presumably in letting the yen decline, which they've done as they have to, and manipulating the exchange rate, has maintained those surpluses. Germany, they did it by joining the Euro. So the mark used to appreciate and screw the German manufacturers. It stopped happening, and they managed to destroy industry and most of the rest of Europe. In China, it's done usually for macro stimulation. They've been very aggressive about maintaining the currency and not letting it appreciate. In Korea, Indonesia, Thailand, and Malaysia, they used to run big deficits. The deficits undermined the confidence in the currency because somebody's gotta eat the surpluses, and they were doing it. They had confidence in the currency fall. You have this tremendous crisis. They debt financed it. The burden of those debts soared when the currencies fell in half, and they had a terrible experience. Well, as the currencies went and fell in value by a factor of two, they went from deficit to surplus. Well, somebody still gotta eat the surpluses and they're not going back to do it. They've had that experience. Ultimately it became the United States and those countries and the problem is for

the importing countries to sustain full employment, they have to have savings rates that are essentially not sustained.

1:02:24

So that you've got a big problem of international imbalances and it's not going away and you've got to think about doing something about that. Just to go back, there's issues of cultural displacement and there are big issues of financing services. So we've still got some transition issues. Medical financing in particular, I think is something people are slowly dealing with. In terms of policy difficulties, I don't think that the global financial crisis, which I think is related to these international imbalances, was anticipated. I think the low interest rates are a way to sustain demand in the face of these international imbalances and trying to save those manufacturing jobs. You've had slow non-recoveries. You saw the growth data and systematically over-optimistic forecasts. You've had incorrect inflation expectations that were systematically too high. And then more recently, once it started, since people didn't take into account the monopoly power that was there, they were persistently underestimating. Then there are no problem solutions that seem to apply. I mean, you know, the latest funny one is the monetary policy, which was supposed to restrain economies. We know from the micro data that interest rates have never had a significant or detectable impact on consumption and savings decisions. And now everybody's writing about how resilient the economy is in the face of rising interest rates. Well, welcome to the last 60 years of reality on interest rate effects. Labor market unemployment is down, but real wages are falling and labor force participation is quite low. And you've got these chronic temporary government deficits presumably related to compensating in the deficit countries for the sustained international imbalances. So there are continuing problems that haven't been addressed.

Markus Brunnermeier: What do you mean by temporary? What do you mean by chronic and temporary? That's an oxymoron in a sense.

Bruce Greenwald: Well, okay. I mean there are problems of transition, which by definition are temporary and there are problems of origin and destination, which are permanent. And I'm telling you, we're still living through the problems of transition.

Markus Brunnermeier: But you're arguing the government should go into debt and finance some transition.

Bruce Greenwald: Yes, of course. of course. And they should finance things like the Agricultural Extension Service that concentrated not just on technology creation, which doesn't seem to be a problem, but on technology diffusion, which when you've got decentralized production units is a big problem. And I think that's not something that technology policy ever just addresses since it seems to be focused on technology creation. All right, I want to talk about also the sort of reading that goes on of what it is that's gone wrong and how unrelated it is to what really has gone on. So if you think about Japan, and Japan is sort of the poster child for not managing that transition well, people talk about zombie firms and banks, they talk about demographics, they talk about excessive savings. Those are all issues really of low demand in some sense, for



investment in the zombie firms, for consumption in the demographic case and consumption in the excess savings case.

1:06:09

Well, if it were a demand problem, the slow growth in say Japan versus the United States should be attributable to slow growth in hours worked. There's no reason why productivity growth should be impaired by those things. If you look at this transition, the problem is gonna be in productivity growth. If you look at Japan, what you see is that in hours worked pre and post 1990, Japan was roughly 1 to 1.5% behind the U.S. and post it's about exactly the same. It is not an issue of hours worked in Japan. It is an issue of productivity growth that was 3% higher than the US and is now half a percent below the U.S. This is a problem of failure to adapt to changing productivity conditions. This is not a problem of demand or demographics. And it's striking to me that nobody bothered to do this decomposition.

Markus Brunnermeier: So can I ask a question about, so if I go back to the Great Depression again, you argued that the productivity growth in the '20s in the agricultural sector was too high. And that was why.

Bruce Greenwald: It wouldn't be too high if they got rid of the people.

Markus Brunnermeier: Yeah, but what you say now, the productivity growth in the industrial sector is not too high, the analogy is not.

Bruce Greenwald: Oh no, the industrial sector, it is high, in the industrial sector. This is overall productivity growth. This is not the aggregate private. No, no, I can show you the industrial sector in Japan. And there the problem is the traditional one. So if you look at the hours worked. By the way, one of these charts is mislabeled. This one is actually employment, not hours worked. And the one on the right is hours worked. If you look at hours worked, it has, in fact, in Japan since 1990, in manufacturing, grown much more slowly. They are getting rid of workers, and it's a big problem. But they're not getting rid of workers fast enough. And that's impaired the measured productivity growth. But that's where all their engineers and managers are. They're just not being successfully redeployed. And that's what you see in the aggregate data on productivity growth in Japan. Or the per capita.

Markus Brunnermeier: It's a matter of relative wages that typically in the service sector, wages are lower than in the industrial sector?

Bruce Greenwald: Well, I mean, you've got to move people. And if wages are lower, it's hard to move people. But if the jobs are disappearing, the wage is zero for those disappeared jobs. So I don't know how you want to do the wage comparison.

Markus Brunnermeier: But what explains that the relative wage is not adjusting?

Bruce Greenwald: Oh, I think that there are rigidities in these structures. And I think that that means you're slower than you should be in getting rid of industrial workers. Although you do see a steady decline even in Japan, it's just not fast enough.

1:09:25

And that's why they're trying to save themselves through exports. Now, there are, and this speaks to something else that came up, which is this issue of, are there good degrees of centralization? And I think, yes, there are. There are countries like Singapore, like Korea, Thailand, and Indonesia, and Malaysia, although I didn't put them on this chart, that have functioned extremely well with, I think, what got pejoratively characterized as crony capitals. Well, if that's crony capitalism for 30 years between 1967 and '97 prior to the financial crisis, it worked really well. That's extraordinary performance. And then for people to decide because of the crisis in '97, '98, that it was a real problem and they ought to get rid of it, Thailand and Indonesia actually dismantled a lot of those institutional connections. The Koreans were much cleverer about circumventing the IMF and not deferring to that view of how they should change their institutional structure. And they did much better. So I think one thing I would caution about this overall story is that there are big local variations and local culture matters.

Markus Brunnermeier: You're saying essentially crony capitalism helped the adjustment?

Bruce Greenwald: Yes. Yes.

Markus Brunnermeier: Can you explain a mechanism of how, was it the Chaebols or something?

Bruce Greenwald: I'm not an expert in Korean culture, but the data are undeniable. They didn't change and they did much better than the people who did. Malaysia, by the way, also did well and they resisted changing their system. Now, people steal billions of dollars. So there is a downside to crony capitalism, but on balance, it seems to work really well in the countries where it works. Latin America, not so well. So I think one of the important points that I would stress here is that in adapting to type two underlying transitions, you cannot ignore local cultural differences. It's not gonna be one size fits all. Okay?

Markus Brunnermeier: But if I take this seriously, I cannot do cross-country comparisons and that questions the early analysis you put forward.

Bruce Greenwald: No, well, I think in every country they're dealing with this problem. How well they deal with the problem has to do with the nature of the institutions. The irony here is that in Japan, which is very close to Korea, they have not dealt with it as well as Korea has.

Markus Brunnermeier: But Korea is a very positive, South Korea is a very positive outlier. Yes, it is. Taiwan is also an outlier. Singapore is also an outlier. And my problem with those outliers too, which is why I introduced this as a cautionary note is, they're small countries. And Bavaria is an

outlier in Germany. So if you start thinking about that, then you're gonna be in very local culture, but that may be the lesson that you have to look at. Okay.

1:12:54

Markus Brunnermeier: Is it culture or is it like institutions like Asimov or Robinson's institution now?

Bruce Greenwald: Listen, I wish I knew. I think that the challenge here is to recognize the problem, and then to have people who understand the local culture, to adapt within the context of that culture to this problem. Okay, so it's recognizing the problem that I think is not going on in Japan. And I think even when they do, the adaptations can be very difficult. Okay, the other huge problem that I think is involved in this current transition to services is that for the reasons that you have such high productivity growth, export or manufacturing-led growth has historically been the successful development model. And I think it's because, again, it's concentrated, you have big structural institutions you can put a lot of attention to, you have spillover, so there's ease of technology transfer. It involves relatively advanced technology, and it's independent of the sort of embedded cultures that you aren't moving people out of farms and craft production. And the more you do that, I think, in a sense, the better it is. The problem is that as manufacturing productivity outstrips global manufacturing demand, just the way agricultural productivity growth outstripped agricultural product demand, this is a dying sector. And as productivity of labor increases and labor input shrinks, the value of cheap labor, which is what the developing economies offer, is going away. So what you're starting to see is manufacturing is coming back to the developed world, which is going to undermine the export-led growth model, but the jobs are known. That it's basically fully automated plants with almost nobody in it. And that means that you're going to have to have a substitute developer. And I think that's going to be something that's going to be difficult to think about. On the other hand, there are resources. So one way that you can think of dealing with the global imbalances of everybody wanting to export.

Markus Brunnermeier: What do you mean by substitute development model? So export-led development is not the way to go? We need a different –

Bruce Greenwald: Well, I don't think it's going to be available. I don't think-

Markus Brunnermeier: For India, for example, they should not follow the Chinese approach.

Bruce Greenwald: Well, I think Chinese should not follow the Chinese approach. I mean, I think that's working really badly at the moment and it's not going to get better for you. But what's the other – I think you have to have some sort of support for an alternative development model and they're gonna try and export. But I think the developed countries are probably gonna do better because the advantage of cheap labor is gonna be smaller in the export markets. So I think one way to do it is that if you've got chronic imbalances with chronic export surpluses, go ahead and just print money. And you can start out allocating IMF SDRs on the basis of shares, but then you wanna tax the allocations of the surplus countries and provide that to the deficit countries,

especially the ones in need of development aid. And I think that if they commit to adaptation, and I guess if I were gonna do this, and I didn't want governments in the developing economies to steal it, I guess what I would do, because I think population growth, particularly in Sub-Saharan Africa is probably the biggest environmental challenge out there, is I would provide pension plans for old people in poor developing countries.

1:17:08

And then they will demand services and you may be able to develop locally successful service institutions. But there is something that's gonna have to be done about that. And if you can help to correct the international imbalance.

Markus Brunnermeier: So just to make sure, the U.S. is a big deficit country. The U.S. will benefit from this scheme.

Bruce Greenwald: Yes, it would benefit from this scheme, but it benefits from being a reserve currency anyway. So I think it's probably gonna be a wash from the U.S. if the SDR is substituted for traditional reserves.

Markus Brunnermeier: But the reserve aspects might not go away, or it's still –

Bruce Greenwald: It might still be a problem. But the thing is, if you flood the world with SDRs that are fully tradable among governments, I think the attraction of holding dollars since the SDR can't depreciate has gotta be a lot better. At least in theory, I mean, it hasn't been successful so far, but you live in hope. All right. So the bottom line then is, I think, this. In dealing with these issues of long-term resilience, it really involves recognizing that are taking place and recognizing mistakes that have been made on the government side. I think the absolute essential for this is intellectual and ideological diversity. And I think that's what there is not a lot of in the world today. And there was certainly not a lot of them in the formerly socialist economies. I think you have to do reasoned evaluations. You can't have a bunker mentality. So I think I, you know, if you look at things superficially, it looks like the anti-Covid measures, which were focused on broad populations, not the vulnerable populations, have actually killed substantially more people than they saved. I think if we don't do a thorough accounting for the Covid experience, that's gonna be a very bad sign. And I think things are heading very much in that way. I think because you need flexibility and ideological diversity, you can't have moral restrictions on debates. You get into, these are good guy positions, and those are bad guy positions, which I think you had in the formerly socialist economies, you're gonna be in real trouble. And you can't have certainties. You can't have ideological certainties that dominate discourse. You can't have power sort of defining what truth is, which clearly happened in the centralized economies. And I think also you have to have local responses and local analysis that we've talked about. And I think all of these things are in a relatively powerless state of existence at the moment. But at universities, it seems to me that this is where we should be concentrating. Now, there is a canary in the mine shaft here. Chile has shown a remarkable ability to get off bad paths. And this is returning to that first area that we were talking about. So they have a traditional economy that does really well. Pinochet comes in, not surprisingly, when

the government gets in the way, the performance of the economy deteriorates, liberalization happens, and it happens in a reasonable amount of time.

1:20:56

So they do correct. For Pinochet, they do much better. They start to impose controls. They do a little worse, but they still perform well. Bachelet comes in, does centralized things. She does significantly worse, but in relative terms, again, when she starts out, she does better. Pinera comes in. The absolute number improves, but the relative number, and this is just versus Latin America and Central America, deteriorates slightly. Bachelet comes back, and now you have a more interventionist government. That does not work out well. Pinera is reelected, but you have all these disturbances, and I would think this country is on the cusp. If I were in Chile, I would be working on not reinforcing the existing direction of political contentiousness and political attitudes. But this is a country that at least shows that things are not irreversible. That's all I have to say.

Markus Brunnermeier: Thanks a lot, Bruce. That's also the closing message, a positive note that things can change, and with change, things might improve.

Bruce Greenwald: I think that's right. I think that's why I wanted a positive example to end on.

Markus Brunnermeier: Very good. Thanks a lot, Bruce. We learned a lot, and we see each other. We ran way over time today.

Bruce Greenwald: I'm sorry.

Markus Brunnermeier: We see each other next week with Martin Wolf. Okay. Thanks, everybody, for staying, and for Bruce in particular. Bye-bye. Bye.