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Alexi Savov & Itamar Drechsler on Investing in a High Inflation Environment

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Webinar Transcript

Transcript:

Markus Brunnermeier: So welcome back everybody to another webinar organized by Princeton for everyone worldwide. We're very happy to have today with us Itamar Drechsler from Wharton and Alexi Savov from NYU Stern. Hi Itamar, hi Aleksey. Great to have you and today, we will talk about investing in a high inflation environment and how you protect your investment from inflation and new inflation numbers just came out for the U.S. today, so the inflation is now close to 8%, they analyzed inflation and that's data before we knew about the war in Ukraine. And what's changing essentially is also what you see on this figure. Essentially, initially the inflation was all about durable goods. Now, it also moves to the service area, so we have core services. That's taken from firm and Twitter feeds where you see that actually there's an increase now in service inflation so it's not only coming from durable goods but it's also coming more broadly. So the question is what is inflation, inflation is essentially a tax on precautionary savings. And if you combine it with financial repression, so force people or banks to hold some inflationary assets, assets where you can inflate the value away, that's essentially what you do, you lower the real return on save assets and the question is, why do you want to tax precautionary savings in the first place and what's the argument for that? Why should we do that? And one idea will be that you know you want to push people into more risky real investments, they shouldn't just hold government bonds or some non productive assets. And that's the case, actually you know if idiosyncratic risk or uninsurable idiosyncratic risk is going up and it's very high, actually there's an argument to maybe you want to do this to some extent. There's some work with Yuliy Sannikov on the optimal inflation rate in an incubate market setting, there's actually an argument to do that. Of course there are arguments, where you don't want to do this because you essentially tax the poor, because the rich, they can escape the inflation tax or they hold some real assets and they can get around that. And so it's a very aggressive tax, you can also argue that you don't really want to tax precautionary savings, but it's just the collateral damage, because you want to achieve lower real wages, because of some wage rigidities and the only way to get around that is to have some higher inflation— attacks on precautionary savings. Now the question is, how can we get around it, what investment can we do in order to protect ourselves against inflation. So there is, of course, we can invest in stocks, as inflation x , we can argue that it's a real claim but it depends very much on whether the inflation is driven by demand phenomenon or supply phenomenon, so if it's a demand, if there's inflation, because huge demand is pushing prices up then the profits of firms are going up, that's a good hedge so whenever we go in high inflation, that would be high profits for firms and you have a good hedge and the stock-bond correlation is negative. If you, on the other hand, it is a supply inflation

where it is a stagflationary environment, so you go into recession, inflation is coming up and the profits of firms will be low as well, so it is it's a bad hedge, so the stock bond correlation is positive, so it's not really a big benefit. You can also go into real estate. It's also a real claim, but real estate is often financed through mortgages. And so called money illusion, so if the normal interest rate goes up, often the real estate claims also go down, because many people suffer from money illusion then there's actually some phenomenon which makes it a less ideal hedge, but it's still a good hedge in a sense. Or we can go in other currencies and you have some Hayekian competition across currencies. You can go into cryptocurrencies, you can go to other international currencies, of course, if you live in the U.S., whenever there is a flight to safety, the U.S. dollar bill appreciates, and if you hold some other currencies, you would suffer some exchange rate losses. So that's an additional risk you're loading up on.

4:14

But in general in order to protect them make your currency more attractive, there's another form of financial repression is to say, you make it through regulation, make it less attractive to hold other private or other foreign money so indeed in before the 70s, in the U.S. you're not even allowed to hold gold, because it was outlawed to hold some gold. And it might be, you know for tax reasons, very attractive to hold some crypto assets or some other assets. Or even make it more attractive to hold the public money in the form of CBDCs, so central bank digital currency. It is one way to make the dollar essentially more attractive and keep people drawn into it. Of course, then we also have TIPS, so inflation index bonds, you might think these are the ideal inflation hedges. They actually benefit if inflation goes up, you also get higher nominal payoffs, so you actually have some inflation hedge there. But there's also a duration risk, so if you have longer duration bonds and if the interest rate goes up, then you have a duration risk and actually the real value of the bond is going down. So that's a tradeoff you have to make, on the one hand you are protected against inflation, but if then the Fed is hiking interest rate and it follows the Taylor principle, which means you have to hike it more than one for one, then actually there will be a duration risk, and you have to balance the two. So it's not ideal so these are not the ideal hedges, because you have this duration risk you have to balance it with. And the question is, what is the optimal maturity of the TIPS, you would like to hold in order to hedge inflation risk. And, finally, a few words on inflation and wars, I just want to quote Warren Buffett saying "never hold money during a war," so major wars essentially he was referring to, but of course we we also now a war environment where you know, the environment, which we hoped we will face might be more adverse and might be towards stagflation and might change some correlations and we will talk about that so very happy to have Itamar and Alexi with us, they have raised some three questions you could answer. So which asset class will perform best if inflation unexpectedly rises: is stocks, real estate, or crypto assets? And the answers were 26% thought stocks will be best, 64% thought real estate is the best inflation hedge, and 10% thought crypto, so it is very small. Second question is going forward will be a "Fed Put" on the stock market provided by the Fed so whenever this stock market tanks, the Fed will step in. The answer is yes: 25%, pretty high. No: 35%, and 40% uncertain whether there will be or not. And finally, what is the probability that the U.S. economy will be experiencing a stagflation in the next two years? And it's below 25%, between 25 and 50%, between 50 and 75%, or above 75% and the answers were. 35, 40, 17, and 8% so the majority thought between 25 and 50%. 40% thought it would be between one quarter and a half, and the second highest was below 25% so it's not above 50% but the numbers are not too low. So with these answers I pass it on to you. I don't know who will take over first, Alexi or Itamar, so we have two speakers today, and then we're looking forward to your presentations on how one should actually invest in a high inflationary environment. Thanks to both of you.

Alexi Savov: Thanks Markus I'll jump in first and we'll switch off, thank you very much, we're very happy to be here, we're longtime listeners, first time callers, as they say. And today we're going to talk about a lot of the things that you are just kind of previewing and develop some of that further by discussing investing in a high inflation environment. So let's start with just a little bit of theory first. What should we expect? The question is how different assets are expected to perform in an inflationary environment. We just want to start with the benchmark: what does theory tell us, kind of theory 101.

8:46

Alexi Savov: And it is going to depend on the asset, of course, because different assets have different cash flow profiles, so of course we have nominal bonds like nominal treasury bonds. Nominal treasury bonds have payouts that are fixed in nominal terms, and so, since investors care about the real cash flows that they'll receive, when inflation goes up those nominal cash flows decline in value and that causes bond prices to fall, so nominal bonds decline when inflation rises. Now it's a different answer when we look at stocks in the stock market. Stocks are a claim on firms cash flows and firm profits and when inflation rises, almost by definition, the prices that firms charge rise with it. And that means that firms profits are also expected to increase roughly one for one with inflation, and as a result of that, the value of those profits, since they're stable in relative terms, should not be affected by inflation, assuming that all that's happening is inflation changing. And so, because of this, we expect stock prices to be neutral with respect to inflation. Now the same holds for other real assets like real estate, which you mentioned, or commodities like stocks. These payout cash flows in real terms and so their value should not be affected, should be neutral with respect to inflation. So just to be a little bit more concrete here, as we usually think in asset pricing, stock prices, and our asset prices are the present value of future cash flows. And since investors care about the real cash flows that they're going to get, C_t , from an asset, they discount any future nominal cash flows that they get by the accumulated inflation. Let's call that little i to the power t , here it is i^{t-t} . And so, in the case of stocks, what we expect is that those nominal cash flows, C_1, C_2, C_3 in real terms, we expect in nominal terms to see them growing with inflation. So as those cash flows grow in nominal terms investors are also discounting them more and more, such that the you know inflation shows that both the numerator and denominator, the price is unaffected. And the price remains neutral with respect to the inflation rate. So it shows very clearly that for inflation to affect stock prices something else has to be happening, it has to affect either the real cash flows, C_1, C_2, C_3 , or the real discount rate r . If those are staying unchanged, inflation shocks should not have an effect. Of course that's different from nominal bonds, where the real cash flow is definitely declined because their cash flows are fixed in nominal terms not in real. But in the case of stocks, we would expect this neutral effect. So with that in mind, that's what theory tells us, let's look at the historical evidence. This is a long time picture, going back to 1950, between 1950 and 2000, showing you how stocks did during different periods and, of course, in the middle of that period, shaded in grey, is the era known as the great inflation from about 1965 to 1982. And as you can see from the black line in the background, inflation was very high during that period, rising from a modest 2% or so to as high as 14% toward the end of the period, so this is what we call the great inflation. And what you see in the picture: the red line, that's the performance of the stock market normalized to \$100 as of 1966 right at the start of this period. And the graph shows you what would have happened to that \$100 cumulatively in real terms during the rest of the period. And what you see is that stocks did very badly during this period, the real return on stocks over the full great inflation is negative or kind of close to zero. And it includes some very negative, very big drawdowns, you can see by 1974 there's almost a 50% drawdown, meaning that your hundred dollars down to just \$50.

12:40

Alexi Savov: And so started very badly during the period, and this has led to the view that stocks are negatively impacted by inflation, that inflation is bad for stocks, because they did so badly during the great inflation, As you can see, outside of that period, both before and after stocks did quite well and, of course, as soon as the great inflation era ended, we got into what has been an incredible kind of bull market lasting decades. You can see in this graph here that it looks completely different from the experience of the great inflation, so I will turn it over to Itamar.

Itamar Drechsler: So another way to look at the performance or what's going on in terms of investors' pricing of the stock market is not just to look at what the previous slide did, the total return, but to look at the valuation ratio. That tells you for every dollar of cash flow how much investors are willing to pay, and the common one is the price earnings ratio and for the price earnings ratio a nice measure of it is a Bob Schiller's is a Cape ratio, which takes the price and divided by a smoothed version of earnings because earnings can be very noisy over the short run. So the thing about this is the price earnings ratio and what you see is that the price earnings ratio climbed into the 60s it was that kind of close to the average ratio over a very long time period, but right at the beginning of the great inflation, with the very first signs of inflation started to drop, and you can see several times corresponding to very poor returns, where the Cape ratio dropped very hard, including you see by the end of 1974. But at the end of the time period, just to get a sense for how bad this time period was, the Cape ratio falls from 24 to 6, that means that the stock market, instead of being worth 24 times its earnings, is now only worth six times its earnings. And to give a comparison, this is the lowest value in valuation in the post-war sample and was only lower once in the great depression, which is only slightly lower at 5.5. So stocks had a very low valuation during this time period, now I should note that you might think that because inflation was rising, interest rates were rising, that's true, but that somehow would naturally explain the fall in the valuations— it does not. And the reason is because interest rates really only rose as much as inflation, so the actual real rate of return those priced in was not changing at all, it was in fact actually falling so, if anything, it should have had the opposite effect, that's not explaining this/ Nevertheless, we see that valuations fell tremendously and again after the end of the great inflation, stocks take off and the valuations revert back to normal levels and eventually you get high.

Markus Brunnermeier: So Itamar, can ask a question: did the risk go up a lot because a premium was required because suddenly there was a much more risky environment?

Itamar Drechsler: So we think that the answer is yes, we'll have quite a bit to say about that in terms of slides, I don't want to preempt so we're gonna argue that there's both lower cash flows, so that also relates to something you had said, which is the stagflation is kind of bad because it causes a lower cash flows; we're also going to argue that the risk premium went up a lot, and for the audience, Markus is asking about that here because evaluations are a lot of times the way to look at the risk premium, and since the valuation is going down and suggest that the risk premium is going up, and we're going to argue that that was the case.

16:13

Okay, what about bonds? So as theory, unlike in the case of stocks, so the theory does predict correctly what you know theory one to one at least predicts correctly what happened to the bonds. Bonds were an extremely bad investment during the great inflation— nominal bonds that is— there actually weren't TIPS around at the time, that you can invest in. So with their cash flow being fixed in advance in nominal terms and inflation going up, their value tanked and so you can see the drawdown in nominal bonds is just an onslaught and over 17 years if you rolled

over 10 year treasury bonds, you lost 60% of their value in real terms, so it's an absolutely atrocious investment. They also rebound strongly after the great inflation. About real estate: well as the name indicates, real estate is real and so theory suggests that it should do all right, and in fact it did. So real estate performed the best, by a long shot of these three groups during the great inflation. People did a lot of investing in real estate, because it was an alternative to nominal bonds and also to an extent to stocks and because it was a way to save money in real assets for reasons we'll also discuss, that there was a lack of other alternatives like this. You see two ways it outperforms stocks. First, the return is just higher, you can see it went up. You know, by the end of the 70s, real estate was about— the price index was about 20%— also, was much smoother than stocks, you could see here where we've zoomed in on the stock market the stock market fell at 1.60% in a little over a year, no such thing happened in real estate. The other thing is, if anything, this price index understates the good performance of real estate because of course, when you live in a house, you're sort of earning the implicit rent that you don't have to pay. Or if you rent it out you'll explicitly earn that, and the price index doesn't take that into account so whatever percentage is the sort of dividends paid by houses i.e. the implicit rate should be added on top of this, and over a 17 year period, that would be quite a big additional return as well.

Alexi Savov: Okay, so that obviously begs the question: why did stocks do so badly during this period and what we're going to argue is that it was due to kind of intimately related reasons actually and one of them as Markus kind of alluded to at the beginning is that if you really look closely the great what we call the great inflation was actually the great stagflation. And stag here refers to the fact that the economy was not doing well, growth was low during this period, and in fact it was highly negatively growth with inflation. Whenever inflation went up in the time series, real GDP fell very sharply. I'll show in a second, there were in fact four very severe recessions during this period, and it was just a period of very high macro volatility so as you can imagine a stag— the stag party stagflation is very bad for stocks if, as the economy shrinks in real terms, firms profits decline, that is to say that lowers the real cash flows C , that stocks are claimed to and, of course, stock prices. For now the second reason, and like I said it's pretty related, is that during this period, as we will argue and will show, the financial system of the U.S. was kind of dysfunctional. I think this is not fully appreciated, but I hope we can convince you that there were big problems in the financial system. They go back to a very well known going to infamous banking law, known as regulation Q and Itamar and I, together with our co author Philip Schnabl have worked on on the impact of that before, and now we have also a new paper connecting into stagflation, we will give you a sense of what that's about.

20:03

What Reg Q did just to remind those of you who don't know, is it put a cap by law. It capped the interest rates the banks were allowed to pay on their deposits, and the interest ceiling right was about 5%. And it would stay there, so the positive would be stuck there, even when inflation was above 10% and double digits. So that of course made deposits extremely attractive and it led banks to experience very large outflows of deposits whenever interest rates rose above the deposit rates ceiling. So, as I'll show you in a second, deposit growth really plummeted whenever the Reg Q ceiling became binding and this exposed the banking system to very dramatic, very big credit crunches. Banks were forced to contract the balance sheet sharply by cutting back lending and this had an extremely negative impact on the ability of firms to get credit and, as we know from the macro literature friends depend a lot on credit, so a credit crunch hurts them very much. It makes it hard for them to produce, it makes it hard to finance your working capital, to pay up front for your cost of production. And so again in the sense what's happening is that the credit crunch does lead to a contraction and the cash flows, the real cash flows C , the profits of the firms that they're able to produce. In addition to that as well,

show you, these credit crunches also forced deleveraging by investors in the stock market, so, in addition to hurting firms profits, you're also making it harder for levered investors who are extremely important, as we know from the more recent intermediary based asset pricing literature, extremely important for the stock market. They had a very hard time leveraging because of the credit crunches, and this effectively means that you have higher risk aversion in the stock market because the most risk tolerant levered investors are forced out so that leads to a higher risk premium, just as Markus was saying, a higher discount rate R , and both of those effects together for stock prices to fall by as much as you saw in the picture, almost as much as in the Great Depression.

Markus Brunnermeier: So let's— can I throw in another reason? Franco Modigliani was pushing this money illusion idea that people mistakenly discounted the nominal rate, rather than the real rate for stocks. And that's what led to some argument; you would dismiss that reasoning?

Alexi Savov: I don't know if I would dismiss it, but I would expect to see it in housing too, right, that would be where you would expect that effective to be strongest because those are ordinary people, the graph Itamar showed was the median house price, so this is kind of where people are putting their money and that one behaved pretty well. While we don't know if there's no effect for it, I think I think there's more going on.

Markus Brunnermeier: Can ask another question, so if banks had a hard time to get deposit funding during that time, and people moved into money market funds, was there some wholesale funding for the banks possible through the money market funds, or was this not developed at that stage, they couldn't do that?

Alexi Savov: It's a great point, money market funds started in this period, exactly as a way to try to kind of get around Reg Q a little bit. They were still very small, they were orders of magnitude smaller than bank deposits and so whatever money came back in through that channel was pretty small, but it's also— one thing that's very interesting I'll mention when we get to it is the flows trying to escape Reg Q into things like money market funds ended up depressing t-bill rate, so one of the things you'll see is that the t-bill rate itself was kind of stuck at the Reg Q ceiling, the pressure was so massive that these little loopholes that people tried to find where were ending up affecting all these other assets and having a much wider effect.

23:47

So I'll show you in a second, the spread on t-bills, it's pretty pretty remarkable. Here is just a picture of the stagflation. Like we said, stagflation refers to the fact that as inflation goes up that's the red line here, real growth goes down, and you can see there's just an uncanny negative correlation. It starts in the very first instance of the increase in inflation, in the mid '60s and then it just keeps going and getting worse or worse kind of like ever expanding a negative relationship between inflation and GDP, so what that really shows you, and one thing that's a little bit different from today, when we have high inflation, we don't yet at least have the stag part. Output has not been dropping. What it shows is that during the period of the '70s, what really dominated the macro side were supply negative supply shocks. Why? Because we have prices going up and output going down. To explain that you need to really think hard about what are the supply shocks going on in the background. Now here's one way to kind of see them. We really liked this plot because I think it gets very directly to what was happening, and in some ways, shows you similarities again with today. Like now, the 1970s were a period of very severe supply shortages; people just couldn't get the goods that they wanted, and one way to see that is by looking at unfilled orders for manufacturing goods, so that's the black line here and what

you see is that throughout the period, unfilled orders are just climbing massively. People are ordering stuff and paying for it but it's not being delivered to them they're not getting it the orders are staying unfilled. Now, what's very different from now is that the unfilled orders during the 1970s, our highest precisely when output is lowest, when GDP is shrinking. So that again is the negative supply shocks coming to the foreground showing you that people— the firms are just unable to produce their production is shrinking and that's why the unfilled orders are piling up. And, the unfilled orders themselves are just super tightly related to the inflation pattern that is reminiscent of today and it kind of shows you that there's underlying supply shortages going on, that are that that line up with inflation patterns, such that it's not just something about unanchored inflation expectations kind of causing a drift inflation there's real shortages in the economy that are manifesting themselves again. Here, with very pronounced negative supply shocks. Now, when we talk about stagflation people always ask us about oil so let's look at the oil price real quick and when you can see that always shocks are bad, there's no doubt about it. Like now, it hurts to get a huge spike in oil prices, but they're really not the main story. You can see that by noticing that throughout the early part of this period until late 1973 the real oil prices actually declining. It's kind of flat or declining, even though we've already had two stagflation episodes. It kicks in with the oil shock, the OPEC shock of the end of 1973 really massive shock, but by then inflation is already running at 9% so it's kind of coming in late in the same cycle. I'm sure it made it worse, but it's not the main part of the story. The same is true of the second oil shock at the end of 1979 with the oil revolution. It certainly hurts but it can't be the main driver because, again, inflation is already running, almost you know above 10%, in fact, by the time that shock hits.

27:12

Itamar Drechsler: Okay, so I'll talk now about the financial side of this which Alexi already described a little bit and show you the details of how regulation Q had this effect, and I think here we think the timing of some of these things is very striking and it sort of shows that it makes a very forceful case that that this is at the heart of a lot of what was going on. So Reg Q was put on the books in the 1930s, it was actually done to avoid banks speculating people's deposit money. And so, mostly it was meant to prevent kind of crazy speculative behavior and so the ceiling was of Reg Q, this deposit rates ceiling, which prevented banks from paying a deposit rates above the ceiling. The ceiling was set pretty high, so it actually really didn't matter, but then in 1965, the Fed decided to use this as an instrument of monetary policy in what was then known, both in the U.S. and other countries that practice similar kinds of measures of financial repression as credit control. And what they were thinking is that if we put a ceiling, banks won't be able to pay higher deposit rates, even as interest rates rise, say as we raise the Fed funds rate and that'll make deposits less attractive. And why would they want to do that? They thought of deposits as money and if, in their logic, having a lot of money or high money growth which leads to inflation, this is a kind of a monetarist or quantity theory of money point of view— so if we make it unattractive, people will take out deposits and there'll be less money growth and this should help us to fight inflation. So you can see from the minutes of the Fed's discussions, they thought that this potentially is a powerful inflation fighting tool when they started to be a little bit of inflation. This is still very low levels. Now, as you see, throughout this time period— I'll get back in a second to the issue of whether it really does that or whether it really should have been interpreted that way, but in actual practice, it did not— you could certainly argue that it did not have that effect what you do see that it is. Whenever the black line, the Fed funds rate broke through the ceiling it in fact did, for the first part was right, it made deposits less attractive and then immediately the positive growth fell off. You can see very clearly from the very first period, there's very strong deposit growth coming into 1966. As soon as the black line goes through the red line it just falls off. And then whenever inflation goes back down a little bit and the Fed lowers the Fed funds rate in deposits are not so attractive they

come roaring back. When things go the other direction, because inflation ticks up a little bit and the Fed raises the Fed funds rate, again they plummet. In each of these situations where deposits flow out very strongly is a giant credit crunch because banks are primarily funded via deposits and not being able to raise deposits, because they couldn't pay the fair rate, they have to shut down credit to a lot of sectors of the economy, and these are really very large swings in deposit flows. And that continues throughout the time until the very end of Reg Q and they lift the ceilings and you can see that, here in the red line jumping in 1982. And then the savings deposits pair theory and at this point, you see deposit growth being very massive coming back in. So each of these created that, but one second to go back, so regarding the issue of the money, if you like to think in terms of quantity theory of money or monetarist, you can sort of see why this was a mistake in the thinking, although many economists were involved and it was very prevalent with thinking around the world. It is true that it led to the creation of less deposits, so if you think of that as money there's less of it, but every dollar of deposits was much more money, because what characterizes money is that it doesn't pay the competitive rate. Like let's say currency doesn't pay any interest rate, and so to hold it, it's dominated by giving up the interest rate; here, deposits were paying a fair rate before so you want to give anything up to hold them. But suddenly they're paying much below the fair rate and they're burning a hole in your pocket. They are becoming much more costly, just like currencies. So there were fewer dollars of deposits, if you think about how much money-like each dollar of deposit was, it became much more so. So a more sophisticated measure of the quantity of money should have actually shown them that it was going up strongly because they were turning these trillions of dollars of deposits from something that was bond-like into money-like.

31:51

Markus Brunnermeier: But Itamar, can I ask a quick question? At that time the Fed was not targeting the Fed funds rate, no, it was looking at, as you said, the money supply and they're probably like that, when inflation was going up, that they brought down the total money supply by the positive numbers going down. Is this fair to say?

Itamar Drechsler: Yes, the question of course is which way you think the causality is running. And as we've argued in our work using cross sectional regressions. We believe the causality is running from the credit crunches to the inflation and you saw on the unfilled orders and we have that in our work to that the inability to fund working in capitals, leading to the unfilled orders which is then coming a little bit before the inflation. I think the causality is running the other way, but also remember that if they're counting money growth in terms of the number of dollars, it would lead you mistakenly to think that there is less money. But in fact what you've done is taken at the time, maybe a trillion dollars of deposits, which were fine and competitive and people were happy with, and suddenly they're paying 5% when inflation is 12% in 1975. And you're losing 7% a year on this and it's becoming like currency, it's becoming something you're trying to get rid of. It's penalizing you from saving so really they should have weighted it by sort of this money premium but that's kind of a more modern, you know more asset price and then.

Markus Brunnermeier: I have a clarification question by Klaus Masuch which refers to an earlier part of your presentation, when you talk about real interest rates: is it the ex-post real rate or is it the ex-ante real rate?

Itamar Drechsler: I think in a macro sense, both of them were low in this time period because they didn't expect— they knew that when inflation was high, they knew, if it is high today it will be high tomorrow, it's not like— it was fairly persistent from one month to the next. And they kept the Fed funds rate as you saw in some of our other figures pretty close to the inflation rate from

about 1973 onwards, and so the actual real rate both ex-ante and ex-post is pretty close to zero throughout most of the time. The literature's critique of the Fed at that time is about that, thinking that that's what drives this, that it drives high demand. We're arguing here that it's really you know there's probably that, too, but that there's a big problem on the financial side and on the supply side, ultimately leading to too little production, which is driving up prices.

Markus Brunnermeier: So I might be jumping a little bit... Regulation Q is essentially a financial repression tool, and this way, the government gets rid of its debt or could inflate away its debt level more easily, particularly when the t-bill rate is very low. Would you say the damage on the economy is much bigger than the advantage of reducing the government debt level and, hence, when the economy is damaged, you also get the tax revenue. Was it at the end purely from a debt to GDP level, the government perspective was it helpful, the financial repression through regulation Q or not, can you see something along these lines?

34:47

Itamar Drechsler: Alexi, you wanna make a comment here?

Alexi Savov: Yeah, I was gonna say that it's definitely true that a lot of the financial repression was kind of put in with the debt in mind from the build up around WWII so that's why we see it in a lot of other countries that had a lot of debt, if you look at the U.S., though, the debt to GDP ratio had already come down a pretty good amount, so I don't think it was that important for that in the case of the U.S. and so on that, you'd much rather pay off the debt by growing the economy, then through financial repression. And here we had an economy that had been roaring throughout the '60s and now here in the '70s, with the credit crunch and stagflation, we're sacrificing that so it really doesn't look like a good deal to me at all.

Itamar Drechsler: I would add one thing is they certainly didn't do it for that purpose. You know they tried very— they agonized over inflation, a lot, and felt like, no matter what they're doing they can't make it go away. Our argument in one of our two papers on this is because, in fact, even as they raise the Fed funds rate, most households and most people and then banks couldn't pay that. The banks couldn't pay the higher rate and the people couldn't get the high rate. So to them, the fact that some money market rate is going up doesn't help them at all, and so they're kind of pushing on a string in that sense, but they were agonizing over it tremendously. The other part: so it certainly did bring down the debt to GDP ratio further, although, like Alexi said, it was already kind of low coming into this time period. I will say that they paid it back somewhat in the '80s, I think people didn't completely understand why inflation was high, and as a result of keeping money very tight in the '80s real rates were very high, and if you know at the time, into the beginning of the '90s, the concern was that the interest being paid on the debt is very big and is growing the debt very quickly, and extrapolating from that people got concerned. To some extent you always pay it back, because if you penalize people with inflation, they'll worry about it, and if they believe you'll do it again, they'll charge you for it even when you're on your best behavior later so there's a little bit of payback later. Okay, so to continue with this, let's talk about the credit crunch. So you see that, when the same deposit flows here, when deposits were going down, whenever the rate crossed the deposit ceiling. We claim that there were credit crunches, banks reduce credit, and we do show that. In our case, we jumped right to the effect, looking at what happened on output and it's really striking, you see it almost the best in 1966 when this hit by surprise. Which is that there wasn't even that much inflation at that point, it was just starting to rise, but the rate didn't cross the ceiling and the deposits fell off the cliff, and the economy basically had like a mini heart attack and GDP growth

went from about 8% down to you know basically not growing and just growing a little bit. Basically, this is a kind of uncanny correlation between the deposit outflows i.e. the credit crunches and GDP growth. If anything, deposits lead a little bit, which is what you'd expect them to do. And it's not just on the downside, when there were deposit inflows, when the rate would go down and be briefly below the ceiling, then GDP would bounce back so fast, these are very fast recoveries, but a lot of cyclical. Then it would go down finally at the very end, you see, that when deposits jumped in very strongly, GDP growth did come roaring back. This is like the morning in America time period.

38:38

Markus Brunnermeier: So there's a question: when the deposit outflows, what does the money go to? Were the bank's able to— so the deposit included CDs by banks and owners?

Itamar Drechsler: Yes, that's right, it includes everything. So there's sort of— that's always the question, there's kind of two ways to think about it. One is that people do try to invest in other things, let's say real estate which we do see and that's some of “where the money goes to.”

Markus Brunnermeier: If you buy a house. I have a deposit for somebody else. It doesn't go away, no?

Itamar Drechsler: Well, but you know... that's true that you can be borrowing through a mortgage, but you can also prepay a mortgage and then that way, invest in it and destroy the amount of debt, so they can be.

Markus Brunnermeier: Essentially total credit went down too, essentially.

Itamar Drechsler: Yes, total credit, but remember the economy also shrank. So part of it is that there's just— one way that you get rid of stuff is just the economy is shrinking and there's just less of it, which is obviously not a good outcome. So the other thing we want to think about is it's not simply like where's the money. Even if the amount of money stayed the same, think about it, the banks do a very important function, allocating credit to the place where it's most effective and by not being able to do that, even if you didn't destroy credit, you allocated badly. You do it through other informal means or you send it to whoever can borrow on the bond market, which is not that big, who doesn't really need it, but at least can find a way not through a bank to get it from you. And so allocations are messed up tremendously, and this can just be very bad for productivity, even if the total amount of credit is not destroyed, though I agree with you, it was.

Markus Brunnermeier: But do you see, I mean what's not clear to me, so the banks essentially issue fewer deposits, but in order to satisfy the total quantity, they also have to give fewer loans and credit and mortgages are going down.

Itamar Drechsler: During the credit crunches, credit and mortgages are going down.

Markus Brunnermeier: And not by the lending side?

Itamar Drechsler: Yeah, of course, and we have a similar chart like this for bank assets, they followed deposit growth. We didn't include it, because it starts looking like the same line over and over again, basically bank assets follow bank deposits on the way down. There is no real substitute. I mean they tried on the margin, they developed the euro dollar market in Europe as

an attempt to substitute a little bit, but that's like a tidal wave, you know, this is a tidal wave, so they basically bank assets just track deposit.

41:11

Markus Brunnermeier: But you think that the deposit channel is or the deposit side is the driving force regulation Q?

Itamar Drechsler: Yes, yeah and you can see that, because every time it crosses the ceiling is when this happened. That's what I meant on the timing. Also, in the bond market there were, actually, firms that could issued more in the bond market, so if you already know that maybe it's all just demand going down, you see that firms that did have access to bonds and only like 200 of them at the time, bond financing goes up. If it's all demand, why would the firms that can access this suddenly increase their bond financing at the time. We're very confident about that.

Markus Brunnermeier: We would like to know another good question: if you look at other countries with similar high inflation, but no regulation Q, did you not find this?

Itamar Drechsler: It's an excellent question, most Western— most developed countries, you shouldn't say Western, because you can include Japan this— practice this idea of credit control. So being very sure that expansionary credit was the source of inflation, it's actually not a stupid idea, and so many countries: the UK, France, Italy, the Netherlands, Japan, for some of the 1970s practiced versions of financial repression. They did have some of them deposit controls, but some of them did it in other you know parts of the pipeline, for example, the UK had something called the corset. And the corset was they allowed that in theory banks to raise deposits, but they prevented them from making more loans to firms. So now, if you can't make the loans to firms, it ends up being kind of the same thing. You also don't have a reason to raise deposits. Now Germany's an excellent counter-example, Germany got rid of its deposit controls in 1967. And that I think harkens back to the Weimar experience, where they thought that if you can't pay a fair rate on deposits, you're screwing over regular households and given that Germany had that terrible experience, they thought this was very unfair. So they didn't want to practice this credit control and you do not see much credit crunches in Germany, and similarly, output is less volatile in Germany, there's also less inflation in Germany. I think, if anything, Germany is a very— people usually tell other stories as well, I think Germany is an excellent example of a place that did much better and did so because it did not have credit crunches.

Markus Brunnermeier: By credit control, I mean some of your deposit control, in a sense.

Itamar Drechsler: Right, you can see, in Germany, if you look we did this in our paper, if you look at one month CDs, which was the data that apparently the very common thing that German banks use, their rates track the Central Bank short rate pretty well, maybe not 100% but much better, there aren't these giant gaps that open up.

44:02

Markus Brunnermeier: And in the late '70s, you know the Carter administration had a lot of these credit controls directly on it.

Itamar Drechsler: Yes, yes.

Markus Brunnermeier: Directed credit, you found, this you don't find that, and things like...

Itamar Drechsler: The credit controls at the time were perceived as pretty much a debacle, and I think that we agree with that. That's like on top of it they're like you know... I think the way I sometimes say it is the reason they didn't get rid of this they thought that it was helping keep inflation lower than would have been otherwise. You know it's like you're giving the patient medicine and they're getting sicker, but you think the medicine is helping, so you have to give them more medicine. Yeah so let's turn to the stock market; these are new results, we have not presented in any paper, and if you follow that the credit crunches, the deposits, and the valuation of the stock market again it's just very striking and I think you would not see something that tracks, something like this tracking the stock market so closely at any other time period. And we take this is really a view like if the intermediate asset pricing literature should sort of be the very natural fit for this, which is that these deposits, that these banks are being used to fund levered investors like broker dealers and when the deposits are yanked, their leverage is becoming very expensive or getting cut off. So you see, we don't have it here, broker dealer leverage goes down a lot. But what that means is that the kind of natural risk takers in the market are being cut off, just like in 2008. And they have to sell their assets to let the more risk averse less levered people, people who don't normally want to own these kinds of things, and you can only do that at much lower values. So going back again, right at 1966 the stock market went down 20% when the deposits flowed out right at the ceiling. I mean the timing is down to like the week when these things start, if you look at it. And this is the very first credit crunch, indeed, the term credit crunch was used to describe what it is that they perceived that had happened, back to Burger 1969 who uses this term. And you could just see that deposit flows and the value of the stock market— this is a price index— track each other very closely, ups and downs, up until the end when the Q is removed and stock values explode at the end and from from this very low valuation, we have like the you know the 20 year bull run.

Alexi Savov: Jumping into another way to see the disruption in financial markets like the tightness of financial conditions, is to look at the spread between the Fed funds rate and the t-bill rate, so this is telling you how much banks, how much more banks have to pay over and above the t-bill rate to get a marginal dollar of funding. So it's measuring how tight their funding condition is as they're losing deposits. And what you see is that the Fed funds t-bill spread, which had been nice and low, kind of close to zero in the mid 60s right not tight at all, starts to kind of kick up the moment Reg Q becomes binding, banks become kind of start for deposits and that forces the Fed funds rate above the t-bill rate, the spread opens up. And then, from then on every time you see there's one of those inflation episodes, the Fed funds t-bill spread opens up, financial conditions are getting really tight, and that's exactly when the stock market, again the timing is down to like the week, crashes, and of course as financial conditions can normalize, the stock market tends to come back, but then again it spikes up. And just to put this in perspective, if you look at the peak of the Fed funds to spread here in 1974 it reached 5%, 500 basis points. The Fed funds rate was above the t-bill rate by that much by comparison. You know 2008, it never got above 1.35%, so there's just a massive disruption that shows you how big, just how tight financial conditions were and it makes it less surprising that the stock market is crashing and, of course the moment Reg Q ends at the end of 1982, banks have plenty of deposits at this point, they're not start for funds anymore, the credit crunches are over, the Fed funds t-bill spread collapses to zero, and from then on we don't have this problem anymore.

48:14

Alexi Savov: So our takeaways from this whole kind of exercise look at the history is that the reason stocks did terribly during the great inflation was not the inflation per se, but the stagflation and especially the financial disruptions that were caused by the credit crunch. Now, in our new paper with Philip, we argued that the credit crunches themselves lead to stagflation as Itamar was explaining, but it's really the combination of the two that's just devastating for

stocks. Now, what does that have to do with the current environment? Well in the current environment, there's much less risk of a credit crunch, it looks like the financial sector is fairly healthy for now you never know of course. And the risks of stagflation are not as obvious now, of course, things have become much more uncertain with the war in Ukraine, so we can see ourselves experiencing stagflation, which was reflected in the earlier poll. But so far, at least, underlying economic growth has been quite strong and so these risks are less suggesting the stocks might hold a better this time. Now, if you look at it, so far, within this high inflation episode that we're having so far, that's indeed the case, inflation is already pretty high and stocks have held up pretty well in big contracts, to what Itamar was showing you before. In the late 60s and 70s, where the moment the credit crunches came in, the stock market collapsed. In part two, we want to talk about the connection between inflation in the Fed Put and the Fed Put has kind of been a very prominent feature of the markets, and it's the idea that the Fed cuts rates when the stock market falls. As we've had crises and things, that happened a lot so it probably has a pretty strong influence on the kind of risk that investors face. So the Fed Put creates a negative correlation between stocks and bonds, because when stocks do badly the Fed cuts rates, causing bond prices to rise and when stocks go down, bonds go up. And this has led to the popularity of investment strategies, like the 60-40 stock-bond portfolio, because the two parts of the portfolio, in a sense, are helping each other out because they're negatively correlated. Now what's the connection of inflation? Well we're gonna argue that the Fed Put kind of appears in a sense, because inflation concerns become low. So why, why would that be the case? Well when inflation concerns rise or high, the Fed prioritizes fighting inflation and when they're low it focuses on other things, in particular the stock market. So recently, as inflation fears have come back, it has weakened the Fed Put as will show you some evidence and led the stock bond correlation to become less negative, more positive, and that's also made stocks riskier because there's less of this Fed Put. So again, starting with the period we talked about, because we think that that's where it all starts: in this period, going into this period there really wasn't much correlation between stocks and bonds. But over the period for the reasons I've described, the correlation got stronger and stronger and that shouldn't be surprising now given all we've talked about. Any sign of inflation was bad news because it's stagflationary, it's bad for leverage so when there's inflation, interest rates go up bonds go down, it's also very bad news for stocks for those myriad reasons and stocks go down as well, so they're positively correlated, and bad hedges for each other, they just keep going the same way. What happens afterwards? Well, the stock bond correlation remains very high, if anything, maybe even increasing well through the '80s and up to the mid '90s. And we think that that's because inflation concerns were really top of mind for policymakers and the market in the aftermath of this bad great inflation period.

51:57

So any sign of inflation— people feared that we would just go back there and so you have to kill it when it's small, and so the Fed would respond aggressively to any such sign which is driving this positive correlation. However, people who are old enough to remember the 90s, after the initial few bad years, started to be a very good period of strong growth and there was an expectation that there might be some inflation soon, but it just never came in, as the papers that we cite here show, the stock-bond correlation starting from about 1997 dropped pretty fast and turned negative, so the vast majority of at least my investing life has been the strong negative correlation and that's that's really interesting and it happened right as inflation concerns sort of just never materialized and seem to be something about about the past.

Markus Brunnermeier: So is that— if we go back to the figure, you think... you have it here, the LTCM sorry, I'll let you go.

Itamar Drechsler: We will talk about the news that...

Alexi Savov: We want to convince you that the stock bond correlation has a lot to do with the Fed Put, so what we can use is some very nice work by Anna Cieslak and Annette Vissing-Jorgensen in giving us a measure of the Fed Put by looking at Fed transcripts and how much people inside the Fed talk about the stock market. And what they show in this graph which we borrowed here is that the Fed didn't really used to think about and talk about the stock market during the great inflation and the Volcker period when inflation concerns were top of mind. The first time they really start talking about/worrying about the stock market is the crash of 87. But that's just a blip that pretty quickly goes back to sort of like not talking about it much. And there's a real change and inflection point as they point out in their paper is the rational exuberance speech that Greenspan gives in Indiana 1996. And from there on you see the Fed just talking much more about the stock market, and so, if we map these dates in this measure onto the stock bond correlation, as you see, they map very, very tightly so let me just jump to that figure. if you look at the stock bond correlation that itamar was showing before it had been very high throughout the Volcker period. There's a huge drop at the crash of '87, remember that's the first time the Fed starts kind of worrying/talking about the stock market. But it's short lived, the correlation started drifting back up because again there isn't much of a persistent Fed Put, it's a one time blip. It's really the irrational exuberance speech that Greenspan gives is really the peak, kind of the global maximum of the stock bond correlation. From there on the stock bond correlation starts dropping. What's happening is that Greenspan was signaling to the market that the Fed was going to not necessarily hike rates to try to burst the bubble, right. That was his language: we see there might be froth in the markets, but instead of raising rates, the puppet we're going to instead if necessary mop up after so that's very much the Fed Put kind of coming to the fore. And of course it took a while for it to become entrenched but the more it becomes entrenched, the more the stock bond correlation drops and it flips from a very high positive correlation to what you can see here very low negative correlations so that's just remarkable shift and, of course, that would be why something like the 60-40 stock-bond portfolio becomes extremely popular taking advantage of that negative correlation to reduce risk. Here's how this maps into the current environment.

55:21

Markus Brunnermeier: This is for the U.S., if you were to say there's a similar pattern also for other countries? Asking the earlier question just for this Fed Put.

Alexi Savov: We haven't looked at that. I think it would be interesting. I would expect inflation concerns to decline for something like this to emerge in other areas, but I do think the Fed has been probably a little bit more explicit about it than others. It would be an interesting test. Here's the recent environment: going into Covid, the stock bond correlation was nice and negative like negative 60%, it's very strong, and it stayed that way through the initial phase of Covid why, the Fed was cutting rates and doing all kinds of things, necessary to support markets and to support the economy. So again, you had dropping interest rates, rising bond prices at the same time as stocks are falling because of Covid. But late in 2020 and especially early 2021, as inflation started kind of coming back, we see an increase in the stock bond correlation. And each of these spikes that you see here are actually can be mapped to specific dates, where we started having inflation scares, episodes first in February of 2020– 2021. That's this first spike here and then two more after that where inflation concerns suddenly came to the fore became more important, probably because inflation was accelerating and we were having discussions about it. Then in the summer of 2021, actually inflation– the Fed started talking about how inflation was

kind of transitory right? They weren't too worried about it and that's when the correlation starts dropping again and goes back to being nice and negative. Markets are perceiving inflation, the Fed is less concerned about inflation, the Fed Put is still available. So that causes the correlation to drop, then in the fall of 2021 we have our second inflation scare, inflation again accelerated. The Fed again had inflation kind of on top of mind, the perception that the Fed Put is being withdrawn causes the stock bond correlation to go back up toward zero and then this cliff here where it drops off is the omicron wave, the moment omicron comes in, we're back to sort of worrying about the economy, less about inflation. Correlation drops and then again now, in the winter, we have an ongoing, including today, increased concerns about inflation, perception the Fed Put is being withdrawn, and the stock bond correlation rising toward zero. Now it's not rising as high as it was in the '70s, because we have not, at least, yet had stagflation but the correlation has become less negative and as you can tell, also in the background, with the Fed Put being withdrawn, stocks themselves can become more volatile. We're seeing that every day, these days, and volatility has reason why because there's less expectation of support, should there be a downturn, given how much the Fed is now much more worried about inflation.

Markus Brunnermeier: So you would— can I just if you look at this figure would you say... you look at this slope of the inflation or the change in inflation, like a second derivative would give you a proxy for the correlation?

58:22

Alexi Savov: It lines up very well with the acceleration of inflation, but I think I make sense, you would expect the Fed's weight, you know inflation concerns of weight on inflation to increase when inflation is rising right. So the change of the correlations to the change in inflation that I think makes sense.

Itamar Drechsler: To wrap things up, we figured we look at just directly at the correlation between the returns on four types of assets and the measure of inflation expectations, that's the five year breakeven inflation rate, which is the difference between a five year treasury, nominal treasury's yield and the five year TIPS, the difference between them is the price expected inflation at least based on those those two instruments, and so we looked at the correlation between that and the returns on stocks, TIPS, bonds and then for good measure, bitcoin, crypto. What you see here is, you know take attention, look at the ranking and the ranking did change post the beginning of Covid, so prior to that actually stocks are in some sense the best hedge for inflation and I think that that was there positively correlated with that and that's— sorry, not the best hedge, they do the best when inflation concerns go up and why is that? Because at the time we're going through a decade of worries about secular stagnation, low growth, deflation, a little inflation suggests some growth would be a good thing, a good thing about growth. And then TIPS, and Markus, you had alluded to this, TIPS, which you think of as you know neutralizing you to inflation since they sort of do what TIPS do, they pay you a real amount and they just tack on the inflation on top of it. Well, even though we think of that as being an inflation hedge in a sense, it ought to be kind of... one way to think about it is not to be neutral, because whatever inflation is it just just pays you that and so the rest of it, the real payment on is kind of unaffected. And it is kind of close to zero, as is a bitcoin. and then nominal bonds as the theory 101 says, were by far you know the most negatively affected. Now, what happens when we get into the Covid time once the inflation scares go up it's the TIPS take first place in terms of being the most positively doing the best when inflation concerns go up and then, in one way that sounds natural and in other ways it's a bit surprising. I think what we think is actually happening here is so far, actually nominal rates haven't changed that much and as

inflation breakevens have gone up, what it's really done is push real rates down. In other words, the nominal bonds are kind of the same, but the TIPS keep getting more expensive because they're paying you the you know, in addition to the inflation rate and so TIPS have had a correlation of you know, getting almost close to one at times with the breakevens. Again, well actually during this time, the bond correlations become kind of low because, again, the nominal yield of bonds have been kind of strangely flat or inert during this time period. And perhaps disappointingly or not depending on your point of view, bitcoin has been just kind of orthogonal to inflation, it hasn't seemed to affect that one way or the other, and maybe that means it's an okay hedge, I don't know.

1:01:58

Markus Brunnermeier: You're talking about five year ten year, or what? Because if people think, inflation is a temporary phenomenon, and all this.

Alexi Savov: This is the five year but you get pretty much the same picture, with the 10 year.

Itamar Drechsler: Five years is not very temporary, yes. So that's kind of it for these for the asset classes.

Markus Brunnermeier: Very good, so Alexi, I wanted to ask you about some liquidity issues for the TIPS market because the TIPS market is not as liquid as the U.S. Treasury and when there's flight to safety, like what we have now with Ukrainian, the war in Ukraine, is this the case when there's flight to safety? Going to the U.S. Treasury proper, or going into TIPS and how do those two markets react this way differently, do you have a take on that?

Alexi Savov: Yeah I've noticed that too, Markus, I think there's clearly what you see as the extreme volatility in TIPS yields, you will notice today, for example, you know, we had the highest CPI print. The TIPS are up like 18 basis points which is, you know, huge intraday moves. We've seen 40 basis point moves in a single day, so that does suggest to me at least there is— the market is not quite large enough, perhaps for all the enormous pressure receiving. So they could, I think I was sympathetic to what you said that we might be now in an environment where people are thinking of TIPS more as the safe facet that they want to plow into when there's higher inflation concerns or even war in Ukraine, but the market's kind of not big enough, perhaps to handle that. And so we see these extreme swings, one of the big ironies of safe assets always, as you know, is when an asset starts to get used for safety, it actually makes it start to become volatile, but you know as the market gets bigger, hopefully that would become less of an issue.

Markus Brunnermeier: So I have two more questions for both of you. So one is that you know when you emphasize a lot of regulation Q, and that was actually one— or your reason to have the stagflation phenomenon, of course, this correlation can be the reason for the recession, could be regulation Q, it could be some old pressure, could be something else. In the future, might not be regulation Q, but you also think it's the fact that in the '70s U.S. was way more bank dependent was very important than it compared to today, so it couldn't happen today, because we are much less bank dependent, we are much more corporate bond markets, and the capital markets are much more further developed. And hence we don't have the same dangers with Regulation Q and financial repression and all that? Or would you say we could have stagflation, I mean you argued that because of the war there might be some stagflation, but can you put this in perspective with the bank dependency?

Alexi Savov: I do think, I mean I'd let Itamar jump in, but I do think there's less of a concern about a credit crunch, this time around. Now, I don't think we should ever assume that there can't be a credit crunch, just because we've gone to capital markets funding, as we know, like capital markets can seize up for reasons of their own. And so that doesn't mean that we're never gonna have credit crunches, I do think that we don't seem to be in one right now, that's maybe the most, we could say right now and I don't think it even is big because we become less bank dependent. Actually banks are still pretty enormous they're less important in some areas but they're still extremely important in other areas like mortgages, for example, and so it's not because banks are not so important, but because I don't think we're as actively practicing financial repression now. If that changes I'd become much more concerned.

1:05:52

Markus Brunnermeier: And the final question, perhaps to Itamar. You notice that when you go with this threshold of regulation Q suddenly things change, and do expect you know whether you go over the threshold, a little bit or a lot makes a huge difference and a huge nonlinearity there, or is it going up in linear fashion, so whether we have inflation or 5% or 10% is this a non linear relationship or you could argue that's more of a linear relationship.

Itamar Drechsler: In the '70s, we haven't gotten into the details to that level where we really tried to estimate that, it's a good question. I will say 1966, one of the reasons it is such an interesting thing to look at is not because it was the most important or biggest, but because it was so nonlinear. Which is why they paid attention to it inside the Fed, in academic communities, it was like a mini heart attack. Like things are going along fine, the economy is growing 8%, deposits are going 12% in real terms. They put the ceiling on, rates rise and people exit you know, the more perceptive people, the more sophisticated the richer exit, and the Fed really had a little panic there. If you just read minutes stuff, they're like "wait wait wait what happened here." They think it's helpful in some ways, but the banks and they to some extent really don't like the side effects of it, which is this drop in GDP and the stock market tanked, so I think I would say, I think the effect is pretty nonlinear there yeah.

Markus Brunnermeier: And so the banks did not lobby to get rid of regulation Q, I guess, even though the side effects are probably larger than the initial benefits they have.

Itamar Drechsler: They did eventually. So they kind of have two sides to it, the reason they got rid of it eventually is because, as you pointed out, they started to get competition, money market funds, and because the situation became very difficult to deal with, because of the loss of deposits. But there were lots of political economy aspects to it, for example, savings and loans, which did the majority of mortgages. Because politicians care about mortgages, they were allowed to pay a little bit more on deposits than banks and that's mostly what kept them in business. When they got rid of this ceiling is when savings and loans kind of lose their you know the reason for existence, and we know that eventually, a couple years down the line, ended with the s&l crisis, where they they didn't have this funding advantage, and so they started to try to gamble and do stuff and that sort of ended badly.

Markus Brunnermeier: Okay, normally, we end up with a positive note, can one of you two guys give me a positive ending saying of course you saying oh we're not in the 70s, is this your positive note, we're in a much better situation than in the 70s, because we don't have regulation Q anymore.

Alexi Savov: I do think you know, one of the important things to compare two episodes is to focus on, look at the differences, not just the similarities and on that dimension, I completely agree with you, I think that differences are important so I'm a little less worried than I guess the poll responders on stagflation. I hope I don't turn out to be horribly wrong, I would have voted with the one third that said it's less than 25% chance, so maybe that should be the positive note.

Itamar Drechsler: I think absent the Ukraine war, I would be more optimistic about that, but that was like, that just came out of nowhere and it's obviously very crazy, so I don't think that has much precedent or relation, it is pretty orthogonal, I don't think inflation has made it more or less likely to happen.

Markus Brunnermeier: And your portfolios are now 40-60.

Itamar Drechsler: I think we're more in stocks, which means we've gotten hurt badly lately okay.

Markus Brunnermeier: Okay, thanks, a lot to both of you, thanks Alexi and Itamar, it was good to have you and...

Itamar Drechsler: Thank you very much, it was a pleasure, thank you Markus.