Jonathan Payne on Platforms, Tokens, DeFi and Smart CBDC

June 9, 2022

Unedited Webinar Transcript as provided by Zoom

Transcript:
Markus Brunnermeier: So welcome back everybody to another webinar organized by princeton for everyone worldwide we're very happy to have Jonathan pain here with us today hi Jonathan.

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00:08:07.530 --> 00:08:13.950
Markus Brunnermeier: good to see you Jonathan will talk about platforms tokens D Phi and smart CBC.

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00:08:14.460 --> 00:08:28.320
Markus Brunnermeier: And we're very curious to see what he has to say on this topics and he will follow not exactly the same water i've outlined here before we give the microphone to Jonathan, let me just give a few opening remarks.

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00:08:29.310 --> 00:08:35.610
Markus Brunnermeier: First, I would like to outline feud in a logical trends which you know will impact, finance and and money.

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00:08:36.150 --> 00:08:44.310
Markus Brunnermeier: So one is, of course, we have some big networks platforms emerging social networks which affect the citizens and platforms can potentially.

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00:08:45.000 --> 00:08:57.390
Markus Brunnermeier: Provide tokens and on the other hand, we also have supply chains and supply chains, there will be increasingly managed on blockchain as well, some P, to be and so forth industry 4.0.

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00:08:57.750 --> 00:09:04.230
Markus Brunnermeier: And the supply chains when I have a payment rail and a token of that, and this payment rail can be done.

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00:09:04.770 --> 00:09:17.370
Markus Brunnermeier: from abroad, and you can imagine, easily whenever there's a little widget from one going for one factor to another factory each widget in the future we'll have a sense on it, and it will be immediately recorded on the supply chains blockchain.

9
00:09:18.330 --> 00:09:26.880
Markus Brunnermeier: And then immediately the payment can happen as well, so there will be an explosion of payments, because you can immediately make the payments as Richard calls from one factory to another factory.

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00:09:27.330 --> 00:09:36.510
Markus Brunnermeier: And of course it can have a lot of contracts smart contracts automatically executed wherever this which of these or whatever their temperature is or whatever the details are.

11
00:09:37.140 --> 00:09:46.290
Markus Brunnermeier: And there's a lot of automatic execution and there will be probably a lot of trade credit on these blockchain as well, so what are the big advantages, of course, we have this.

12
00:09:46.680 --> 00:09:54.300
Markus Brunnermeier: distributed ledger technology and other blockchain technologies but it's not necessarily only the distributed aspects which are.

13
00:09:55.080 --> 00:10:08.760
Markus Brunnermeier: Advancing but there's also from other media and others data we can actually extract huge amount of data and the big advancements how we extract information from data, so we have all these artificial intelligence deep learning.

14
00:10:09.060 --> 00:10:17.280
Markus Brunnermeier: And much better ways to extract information from big data and, secondly, I think, which is equally important trump will allude to this as well.

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00:10:17.730 --> 00:10:24.420
Markus Brunnermeier: That you know you can be excluded from this platforms and that's very costly, so the platform has a power to exclude you.

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00:10:24.690 --> 00:10:32.250
Markus Brunnermeier: And this way it actually can enforce some of the payment of soft nodes much more easily than other entities could, for example, banks.

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00:10:32.610 --> 00:10:40.650
Markus Brunnermeier: And this exclusion power is very important as well, of course, these strengths will play out in different parts of the world differently, and it will also impact.

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00:10:41.040 --> 00:10:49.980
Markus Brunnermeier: What currencies, we use what tokens we use them might be a fragmentation of monies so a lot of different forms of monies floating around in terms of tokens.

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00:10:50.430 --> 00:11:01.950
Markus Brunnermeier: And the different continents different digital currency areas probably pursuing different strategies and he has a contraction what one can was potentially see coming.

20
00:11:02.490 --> 00:11:13.260
Markus Brunnermeier: But this is not a normative conjecture but it's like a conjecture as a positive one, the US there might be a lot of focus on stable coins, a lot of the stable coins at denominated in US dollars anyway.

21
00:11:13.650 --> 00:11:22.110
Markus Brunnermeier: And that will be easily connected with this program or tokens with this particular particular platforms like supply chains or social media.

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00:11:22.890 --> 00:11:32.550
Markus Brunnermeier: platforms and so forth, and the challenge is how to regulate the stable coins, we of course seen some stable coins collapsing, not being so stable as the name suggests, because there is no backing.

23
00:11:33.150 --> 00:11:44.100
Markus Brunnermeier: Do you make them, they are banks, how do you treat them and, more importantly, how interoperable will these various table coins be and how will be at their be interoperable with some digital form of.

24
00:11:45.330 --> 00:11:59.850

Markus Brunnermeier: Of the dollar, in order to avoid fragmentation, the Europe on the other hand, is focusing less on unstable coins it's focusing much more on CBC less focused on industry 4.0 it's much more focused on consumers.

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00:12:01.050 --> 00:12:09.960
Markus Brunnermeier: Then the question will be how can you combine the CBC with other forms of the letters which we have out there and are interoperable these letters.

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00:12:10.440 --> 00:12:17.670
Markus Brunnermeier: What role will receive receive play as a legal tender world is undermined some lending and turn of the will allude to that as well.

27
00:12:18.510 --> 00:12:31.230
Markus Brunnermeier: Then, if I go to China, China has a different strategy again it uses more is big platform tech companies Ali pay and witcher pay and also digital one to reach out to other countries.

28
00:12:32.070 --> 00:12:42.150
Markus Brunnermeier: And essentially it's very consumer convenience focused very much medium of exchange money focused so it's a different strategy again all of these three strategies.

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00:12:42.420 --> 00:12:51.270
Markus Brunnermeier: Actually, are expensive, in a sense that can actually reach out to other candidates and the currency areas can extend way beyond the boundaries or the national borders.

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00:12:51.660 --> 00:13:02.490
Markus Brunnermeier: Of the country, so the, of course, the emerging economies and developing economies, anticipating this that guy to fend off this digital dollarisation or whatever you want to call it.

31
00:13:02.820 --> 00:13:20.760
Markus Brunnermeier: They are facing a challenge on the monetary sovereignty and they're essentially creating alternatives their own CBD sees in order to fend off this other digital currencies taking over their monetary policy and hence there's more to keep their ability to conduct for the monetary policy.

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00:13:22.140 --> 00:13:34.350
Markus Brunnermeier: Nine general I think there's a huge political economy problem as well, so from the private sector and the focusing on the US, of course, companies would like to create stable coins in a first step.

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00:13:35.190 --> 00:13:43.830
Markus Brunnermeier: create a lot of initial coin offering 70 will scenery trigger revenue and then in the second step, get the regulatory stamp and guarantees from the government.

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00:13:44.130 --> 00:13:54.960
Markus Brunnermeier: So there's a way you can generate a lot of extra money and this way you can actually become a fairly wealthy from the private sector, and you can see some lobbying pressure in this direction.

35
00:13:55.590 --> 00:14:01.410
Markus Brunnermeier: An alternative political economy story why you introduce etc, so of course is on a CBC is is a way to lean against that.

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00:14:01.800 --> 00:14:07.380
Markus Brunnermeier: Or at least use the CBC is that stable, because you have to be backed hundred percent with some CBC.

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00:14:07.980 --> 00:14:15.960
Markus Brunnermeier: Or the alternative ways or the official sector to push the private sector, a little bit to modernize the payment system.

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00:14:16.440 --> 00:14:27.090
Markus Brunnermeier: use it as a catalyst and prove the payment system like the European payment initiative to have some counterweight to push for more interoperability, a better execution and fast execution.

39
00:14:27.420 --> 00:14:43.050
Markus Brunnermeier: And also have some competition with credit card so provide, on the one in the public alternative but with this public alternative push the private sector, which is reluctant to give some of their benefits and advanced and Troy from the current system to really advance ahead.

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00:14:44.280 --> 00:14:53.400

Markus Brunnermeier: So with this a quick overview Olympic now move on to the poll questions Jonathan proposed, and then we have Jonathan they are floor.

41
00:14:53.970 --> 00:15:03.000
Markus Brunnermeier: So the first question was what makes money digital what makes digital money different is it a need for additional ledger was the program ability.

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00:15:03.390 --> 00:15:12.600
Markus Brunnermeier: And this was actually a question you could answer both A and B and actually most people said A and B, so that 62% and a and 64%.

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00:15:12.900 --> 00:15:19.740
Markus Brunnermeier: said, be so, the majority of things, so you know both makes digital money special second question was about define.

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00:15:20.370 --> 00:15:27.900
Markus Brunnermeier: Which statements, do you agree about the define so we'll define banks will not be needed anymore, and that will disappear.

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00:15:28.410 --> 00:15:36.900
Markus Brunnermeier: or it will be the case, thanks, will not be needed anymore, but there will stay because they have lobbying power and other interests that will try to stay.

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00:15:37.230 --> 00:15:44.790
Markus Brunnermeier: What do you think banks are really central's that will not go away and we really need them as well, and the answers, where i'm here, you could only pick one answer.

47
00:15:45.150 --> 00:16:02.730
Markus Brunnermeier: 5% 36% 58% so the maturity big maturity things thanks I central and diva will not eliminate the banks, and if there will be eliminated, there would still stay that study 6% very few people think that banks will disappear.

48
00:16:04.320 --> 00:16:14.370
Markus Brunnermeier: The third question was will firms be willing to put all the transactions on public ledger platforms, so if you do the supply chain and everything all the transaction it's Richard is moving one to the next.

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00:16:14.760 --> 00:16:24.120
Markus Brunnermeier: Should everything is recorded a blockchain will you make this available, this information will it be public information or not, and all the payments associated with that.

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00:16:24.570 --> 00:16:37.680
Markus Brunnermeier: And only 18% said yes 82% that nor there will not make this available finally what's is the most important role of CDC and here again, you could answer, more than one question.

51
00:16:38.640 --> 00:16:48.840
Markus Brunnermeier: Provide digital cash because cash is going away 42% said compete with private digital currencies like stable coins and all these things 24% and.

52
00:16:49.650 --> 00:16:54.360
Markus Brunnermeier: A capitalist to for modernizing banks, as I mentioned 42%.

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00:16:54.930 --> 00:17:04.890
Markus Brunnermeier: and integrated digital transactions in a universal ledger so you have a universal meter ledger where everything is going on an integrated payments that's 45% that is again.

54
00:17:05.370 --> 00:17:14.640
Markus Brunnermeier: and monitor criminal activity that's the motivation for CBC that's only 7% so most people say I would say the big categories provide digital cash.

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00:17:15.030 --> 00:17:23.460
Markus Brunnermeier: catalyst for modernizing banks and integrate digital payment transactions in a universal ledger all of them had more than 40% of the answers.

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00:17:24.150 --> 00:17:39.270
Markus Brunnermeier: With that I pass on the with this insights from you from the pole a pause on the MIC to Jonathan he will enlighten us with his perspective on platform tokens defined and smart CBC thanks again.

57
00:17:43.320 --> 00:17:44.460
Jonathan Payne: Thanks very much Marcus.

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00:17:45.540 --> 00:17:47.580
Jonathan Payne: I can't seem to share my screen.

59
00:17:51.300 --> 00:17:52.200
Jonathan Payne: You need to enable me.

60
00:17:55.140 --> 00:17:56.970
Markus Brunnermeier: To just close here get.

61
00:17:57.210 --> 00:17:57.810
Jonathan Payne: sorted out.

62
00:18:02.820 --> 00:18:14.070
Jonathan Payne: Okay, thank you very much for for setting the scene and thank you to all your listeners for the poll questions I see some some pessimism that defy so let's see how it goes as we get questions through the talk.

63
00:18:15.480 --> 00:18:23.700
Jonathan Payne: So as as advertised i'm going to talk about tokens D Phi platforms smart TVs smart CBC I think it's fair to say that's a.

64
00:18:24.240 --> 00:18:35.550
Jonathan Payne: Title with a lot of kind of fintech like jargon, hopefully, as we we sort of go through the talk this jargon will become a bit clearer and we'll be able to get to the underlying economics of what what all this new technology is really about.

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00:18:36.420 --> 00:18:42.630
Jonathan Payne: Okay, so With that in mind i'm going to try to answer four main questions in this presentation.

66
00:18:43.260 --> 00:18:52.890
Jonathan Payne: So i'm going to start by talking about what's really different in the economics of digital money and digital ledges is it you know to what extent is it just the same old economics, with new labeling.

67
00:18:53.130 --> 00:18:58.350

Jonathan Payne: and to what extent is something really new going on, we need to think about and integrate into our modeling.

68
00:18:59.820 --> 00:19:12.360
Jonathan Payne: Then, once we understand a bit what these digital monies are really about, and then I want you to think about to sort of, if you like, the two extremes and the different ways, you could respond and use this new technology.

69
00:19:12.840 --> 00:19:21.150
Jonathan Payne: So one extreme is the so called D file decentralized finance movement which really wants to eliminate banks and instead build other.

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00:19:21.990 --> 00:19:29.340
Jonathan Payne: sort of new financial infrastructure on a decentralized ledger that is not controlled by any particular intermediary right, so this is sort of.

71
00:19:29.880 --> 00:19:31.290
Jonathan Payne: Getting rid of intermediation.

72
00:19:31.980 --> 00:19:42.180
Jonathan Payne: And then I want to think about the other possible extreme and the way things could go, which is tech firms really moving in and exploiting synergies between having digital legends and all the other things that tech firms do.

73
00:19:42.720 --> 00:19:53.070
Jonathan Payne: So they can sign of extend credit services and extend market power so one extreme would be intermediation kind of goes away the other extreme is we get even bigger intermediaries and.

74
00:19:54.210 --> 00:20:02.040
Jonathan Payne: So I want to talk about these two kind of different ways that this technology could be used, and then finally we'll talk a bit about how regulators might respond.

75
00:20:02.520 --> 00:20:12.630
Jonathan Payne: How would we think about something like open banking legislation in this world where users have the right to control the portability of their own data, how we think about something like CDC and can these things.

76
00:20:13.920 --> 00:20:20.340
Jonathan Payne: I guess, as you know, all this is coming from our recent paper on tokens platform and interoperability.

77
00:20:21.690 --> 00:20:21.960
Okay.

78
00:20:23.580 --> 00:20:32.610
Jonathan Payne: So let's get into it, so we live in a world with many different varieties of digital means we have in our digital reserves at the Fed.

79
00:20:32.910 --> 00:20:38.970
Jonathan Payne: We have digital dollars in bank accounts and digital wallets like PayPal a DEMO all these different things and.

80
00:20:39.630 --> 00:20:46.680
Jonathan Payne: Then we've also seen in the past 10 to 15 years a whole bunch of sort of fear cryptocurrencies emerged like bitcoin and ether.

81
00:20:47.640 --> 00:21:06.210
Jonathan Payne: And then we've also seen a whole bunch of stable points and merge like us CDC tether I guess the somewhat ill fated terror lunar debacle, but a whole bunch of attempts to have some kind of digital digital currency that's the links to this page to the value of the dollar.

82
00:21:07.590 --> 00:21:10.020
Jonathan Payne: But it's on something like a decentralized ledger.

83
00:21:10.590 --> 00:21:21.150
Jonathan Payne: And then, as we'll talk a bit about later in this talk we've also seen the move of supply chains and other platforms to a token based system where people using the supply chain and receiving and holding tokens.

84
00:21:21.660 --> 00:21:32.580
Jonathan Payne: Okay, so seen a lot of different varieties of these digital monies and what really makes them different the cash and what really distinguishes these different digital mines.

85
00:21:33.150 --> 00:21:41.760
Jonathan Payne: Well, I think the to me sort of I guess the biggest are studying studying sort of difference really between all of these digital monies and something like cash.

86
00:21:42.240 --> 00:21:52.980
Jonathan Payne: Is it all these digital monies need a lecture so if we think about some of the you know these really interesting stories we have in economics about why money evolves we think about like cultural approaches money as memory.

87
00:21:53.490 --> 00:22:02.820
Jonathan Payne: kind of work part of the idea is that money emerges to replace the need for the job because it summarizes the net position and we don't have to store information about history.

88
00:22:03.570 --> 00:22:06.480
Jonathan Payne: And the complication with all of these digital monies.

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00:22:06.990 --> 00:22:15.960
Jonathan Payne: Is that we need to somehow keep track of who owns want on some kind of digital ledger and so all of these digital monies end up being bundled with some kind of ledger technology.

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00:22:16.440 --> 00:22:28.350
Jonathan Payne: And a lot of what makes them different is what these digital badges end up looking like so i've got here a few examples of some of the differences that I think are important, or at least relevant for the talk today.

91
00:22:29.490 --> 00:22:41.490
Jonathan Payne: between these different kinds of digital edges, so we can think about who controls the ledger so if we think about sort of reserves that the Fed controlled by the Fed we think about bank accounts with the ledger is really controlled by the Bank.

92
00:22:42.540 --> 00:22:55.020
Jonathan Payne: Or we can think about sort of crypto where it's the point of distinction is the ledger is not controlled by a central authority instead the control is decentralized across a whole bunch of different users and you end up essentially.

93

00:22:56.010 --> 00:23:10.170
Jonathan Payne: Voting or deciding through a consensus protocol how the legend should be update, we can also think about how transparent lecherous is it hidden away and nobody can see it or is it something that's upfront that everybody can look at and engage with and do things with.

94
00:23:11.850 --> 00:23:18.180
Jonathan Payne: So here we have you know if we compare sort of a bank to a crypto or a supply chain.

95
00:23:18.540 --> 00:23:24.480
Jonathan Payne: blockchain you're in the bank, the ledger is there, but you never see if it's kind of hidden in the background of the Bank.

96
00:23:24.750 --> 00:23:35.790
Jonathan Payne: One of the big changes that we've seen in some of these new monies is trying to bring these legends forward so everybody can kind of look at them and see them and respect them that's certainly the case on the crypto currencies is also the case on the.

97
00:23:36.060 --> 00:23:41.040
Jonathan Payne: Supply Chain blockchains you mentioned in your introduction and we'll talk more about later in the talk.

98
00:23:41.790 --> 00:23:44.070
Jonathan Payne: We can also think about how anonymous payment is.

99
00:23:44.430 --> 00:23:54.660
Jonathan Payne: Where we we sort of live in a current ecosystem, where you know you do your transactions in some sense it's anonymous from other people, but it's certainly not anonymous from the bank, the bank sort of knows a lot about what you're doing.

100
00:23:55.500 --> 00:24:08.010
Jonathan Payne: I guess, we have the crypto that wants to move to full anonymity and then we also have these sort of supply chain ledges where we want to move to no anonymity we're kind of see what everybody's doing and we use that to organize the supply chain.

101
00:24:08.460 --> 00:24:17.400

Jonathan Payne: And then, finally, we can think about who can access them and the big distinction between the government digital money of reserves and all of these other attempts at trying to provide a digital money.

102
00:24:18.270 --> 00:24:28.650
Jonathan Payne: is the only banks can hold the reserves there's all these other all these other attempts at providing money you're trying to fill the gap and give your private individuals, the ability to hold some kind of digital money.

103
00:24:29.790 --> 00:24:30.120
Jonathan Payne: Okay.

104
00:24:32.160 --> 00:24:32.310
Jonathan Payne: or.

105
00:24:32.700 --> 00:24:37.020
Markus Brunnermeier: Financial inclusion thing will be on the public access that's one of the arguments.

106
00:24:37.380 --> 00:24:40.170
Jonathan Payne: As one of the arguments with financial inclusion, yes, so.

107
00:24:41.700 --> 00:24:52.050
Jonathan Payne: Also, about the financial inclusion is also about providing lending services so it's also a question of you know who has control of all the information that's on this ledger and how can they use them.

108
00:24:52.590 --> 00:24:57.150
Jonathan Payne: Banks use them with some kind of credit score, which means some people get access, some people don't.

109
00:24:57.540 --> 00:25:08.430
Jonathan Payne: Going back to your introduction is a push in fintech more generally to open up, who is able to access all this information and how you would use the information to offer offer lending and hopefully your.

110
00:25:09.420 --> 00:25:13.110

Jonathan Payne: The idea would be to offer it to people at previously not served by the banking sector.

111
00:25:16.260 --> 00:25:19.350
Jonathan Payne: Okay, so lots of monies lots of different legends.

112
00:25:20.730 --> 00:25:30.510
Jonathan Payne: So we need these legends for digital currencies and that's that's introduced a hold of design challenges, and I think spurred a lot of innovation and how we think about organizing benches.

113
00:25:31.530 --> 00:25:35.160
Jonathan Payne: In particular, what we sort of focus on today what we're going to discuss.

114
00:25:35.520 --> 00:25:44.610
Jonathan Payne: Is the emergence of these these so called transparent programmable ledges something you hear things like a theory on July avalanche but also these logistical used on.

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00:25:44.940 --> 00:25:51.870
Jonathan Payne: On supply chain blockchains and and what more generally, and so the key thing about these legends is not only do they have.

116
00:25:52.440 --> 00:26:01.980
Jonathan Payne: token accounts that record your net position, but they also have these things, called smart contracts just really just a fancy term for the ability for ordinary users.

117
00:26:02.610 --> 00:26:13.830
Jonathan Payne: To be able to write computer programs that sit on the legends the code system religious everybody can see it, and then, when certain conditions happen these contracts are triggered and.

118
00:26:14.670 --> 00:26:19.980
Jonathan Payne: You whatever is specified in the code is going to happen so various transactions might take place.

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00:26:20.550 --> 00:26:28.380

Jonathan Payne: So if we think about you and me, you know we might both have positions and a legend so say I have 10 tokens you have 15 tokens That would be an APP token accounts.

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00:26:28.920 --> 00:26:35.220
Jonathan Payne: But then the feature of these legends is I can write a contract that says, if some event happens then.

121
00:26:36.060 --> 00:26:48.030
Jonathan Payne: I will automatically have been there will be an automatic transfer of say five tokens from my account to York, so we have this ability to to write contracts to interact interact with what happens on the stage.

122
00:26:49.230 --> 00:26:49.500
Okay.

123
00:26:50.550 --> 00:26:53.790
Jonathan Payne: So we've seen we've seen this innovation.

124
00:26:54.960 --> 00:27:00.300
Jonathan Payne: And I think one of the things that changes here is how we should think about when you can do contract enforcement.

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00:27:01.560 --> 00:27:10.140
Jonathan Payne: Of course, called it a different enforcement paradigm, maybe it's a bit strong, but I think we need to think through what it means to be able to enforce enforce these kind of contracts.

126
00:27:10.620 --> 00:27:18.720
Jonathan Payne: So if you want to be able to do that, you really need two things you need access to the flow of information about transactions and other activities right.

127
00:27:19.110 --> 00:27:25.650
Jonathan Payne: So if the information is specifically about what happens on the legend so if the contracts is Jonathan pays Marcus.

128
00:27:25.980 --> 00:27:39.450

Jonathan Payne: If Marcus makes a transaction and tokens on the ledger in all the information is already there another job and that's relatively straightforward, but a lot of the contracts, you might want to write, for example, your Marcus receives a payment of goods.

129
00:27:41.850 --> 00:27:44.040
Jonathan Payne: In that case, we want to trigger a contract.

130
00:27:44.910 --> 00:27:58.080
Jonathan Payne: For a lot of the contracts, you want to write, we need to draw in all kinds of information from the rest of the world and we somehow need to bring that information on to the lecture this book it's called the kind of Oracle problem in in digital legend.

131
00:27:58.440 --> 00:28:02.700
Markus Brunnermeier: Which word example would be one of that but, like your widget example right so.

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00:28:02.850 --> 00:28:09.390
Jonathan Payne: suppose you have all these widgets being transferred and based on when the widgets arrive some kind of transaction happens on the ledger.

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00:28:09.840 --> 00:28:13.860
Jonathan Payne: The ledger needs to have the information about when the when the widgets and moving.

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00:28:14.400 --> 00:28:21.450
Jonathan Payne: This gets called this kind of article problem that we need sources of information from outside of the ledge integration to these contracts.

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00:28:21.990 --> 00:28:33.150
Jonathan Payne: So one thing we care a lot about is the flow of information and, obviously, we also need to control the payment for it right, so you can't execute the contracts, if you know if we're doing side contracts and physical cash, we can execute.

136
00:28:33.690 --> 00:28:37.320
Jonathan Payne: The payments have to be happening through the ledger to be able to execute these contracts.

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00:28:38.430 --> 00:28:45.030
Jonathan Payne: So I think technologically we move into a world we have something much more like sort of segmented enforcement.

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00:28:45.480 --> 00:28:58.200
Jonathan Payne: So we think about the current legal system, we really have imperfect enforcement in a similar way in a pretty wide range of situations where you have to go through the legal system to try to try to enforce contracts.

139
00:28:59.130 --> 00:29:02.190
Jonathan Payne: With these digital ledges we move into a world where.

140
00:29:02.760 --> 00:29:11.190
Jonathan Payne: If it's happening on the ledger, then we have kind of perfect enforcement, we can rightfully contingent contracts, but as soon as we move off the ledger there's not a lot that can be done.

141
00:29:11.670 --> 00:29:25.230
Jonathan Payne: And so, in this sense we we enter a world where a lot of the economics end up away about being trying to find ways to incentivize agents to use this ledger so we can move activity into this world where we can do a lot of enforcement.

142
00:29:25.920 --> 00:29:34.770
Jonathan Payne: And this is where the ability of the tech platforms to do things helps because they can generate very strong network effects and make it very attractive to move people into these searches.

143
00:29:35.490 --> 00:29:49.500
Jonathan Payne: Okay, so move to this world where we want to try to get information flows through the ledger and we want to try to get payment close to the ledger and we have to think about who who which which institutions in the economy or best placed to incentivize that activity.

144
00:29:55.680 --> 00:29:55.980
Jonathan Payne: Okay.

145
00:29:57.300 --> 00:30:02.550

Jonathan Payne: So, with that in mind, I want to go through a bunch of different ways that we see.

146
00:30:03.240 --> 00:30:11.580
Jonathan Payne: You know responses to this this new technology so we're going to start with decentralized finance then we'll talk about sort of supply chains and programmable edges on supply chains.

147
00:30:12.030 --> 00:30:19.140
Jonathan Payne: And then we'll talk about these two policy responsive sort of open banking and centralized digital currencies right.

148
00:30:21.210 --> 00:30:30.810
Jonathan Payne: So let's let's start with this define so, in short, what defy wants to do is they want to rebuild the financial system without intermediaries.

149
00:30:31.380 --> 00:30:39.390
Jonathan Payne: And they want to replace these intermediaries by a collection of financial instruments that are built up using these smart contracts on.

150
00:30:40.110 --> 00:30:48.150
Jonathan Payne: The centralized blockchain ledges okay so that's a bit of a mouthful let's think about what some of the sort of key features of what they have in mind.

151
00:30:49.260 --> 00:30:53.880
Jonathan Payne: So the big one, as suggested by the name is they want decentralized control.

152
00:30:54.300 --> 00:31:04.740
Jonathan Payne: So if we think about what kind of legends are going to use defies built off blockchain legends that are updated by consensus protocols, rather than by any kind of centralized into media.

153
00:31:05.190 --> 00:31:17.100
Jonathan Payne: Okay, so if you think about bitcoin or theory or any of these these crypto blockchains and it's not some central power that updates it instead all the users of the network have to decide how to update.

154

00:31:17.640 --> 00:31:26.520
Jonathan Payne: that's part of the decentralized part of the fun, the other part, is decentralized they put a lot of emphasis on is decentralized governance.

155
00:31:26.940 --> 00:31:35.280
Jonathan Payne: So the voting power for what's going to happen with all these financial instruments, for example, what kind of interest rate would you set on lending on a different system.

156
00:31:35.610 --> 00:31:43.620
Jonathan Payne: of voting power to set interest rates and other features of what of what these financial instruments look like is typically a proportion by tokens.

157
00:31:44.220 --> 00:31:49.320
Jonathan Payne: And those tokens are usually located in the southern part to sort of users or creators on a platform.

158
00:31:49.710 --> 00:32:02.940
Jonathan Payne: So could be there, the transaction tokens utility tokens are often where they have a specific governance tokens and, as you hold more data governance tokens you can have more say in how and how this this financial instrument is going to be organized.

159
00:32:03.660 --> 00:32:11.760
Markus Brunnermeier: So that decentralized control could be done by proof of stake, I guess, and then the governance could be done by different tokens doesn't need to be the same.

160
00:32:11.760 --> 00:32:22.050
Jonathan Payne: stakes doesn't have to be the same token, and yet so so we've seen you know so with blockchains in general we've seen a bunch of challenges in trying to scale up.

161
00:32:22.650 --> 00:32:27.570
Jonathan Payne: Decentralized consensus updating, so we started with you know I think many of the listeners have probably.

162
00:32:28.050 --> 00:32:33.480
Jonathan Payne: heard about bitcoin and that there's some proof of work where, in order to get the right to update the blockchain.

163
00:32:33.960 --> 00:32:47.790
Jonathan Payne: You have to solve a complicated mathematical task so it's it's computationally or you sort of cpu intensive to try to update the blockchain and that prevents any particular agent from doing a lot of updates and sort of gaining control of the ledger.

164
00:32:49.080 --> 00:32:51.150
Jonathan Payne: But a lot of these blockchains particularly a theory.

165
00:32:51.750 --> 00:32:57.810
Jonathan Payne: They tried to move away from something like proof of work, because it takes so much energy and it's not very environmentally friendly.

166
00:32:58.110 --> 00:33:09.120
Jonathan Payne: They tried to move to alternative arrangements where it's proof of stake in the sense that agents that hold more of the coins, for example, if you hold more of the ether tokens on a theory.

167
00:33:09.870 --> 00:33:16.740
Jonathan Payne: Then you have a greater chance or a greater right to be able to update the ledger and verify which transactions are right and do all those things.

168
00:33:17.790 --> 00:33:24.750
Jonathan Payne: I think there's an open question here about whether, when we moved from proof of work to proof of stake it's really still decentralized.

169
00:33:25.230 --> 00:33:31.590
Jonathan Payne: Because, if you think about why we trust it, I guess, going back to your paper with Joseph right, so if it's if it's a proof of work.

170
00:33:32.040 --> 00:33:37.500
Jonathan Payne: blockchain we trust it because it's hard to update right and that, since it is kind of decentralized.

171
00:33:38.070 --> 00:33:42.870
Jonathan Payne: If it's proof of stake well there are big players that hold a lot of the tokens to get to update it.

172
00:33:43.200 --> 00:33:48.960
Jonathan Payne: And ultimately be trust them several that have skin in the game right they hold a lot of the wealth in the system, so they don't want to destroy it.

173
00:33:49.470 --> 00:33:51.990
Jonathan Payne: But that's actually fairly similar to why you might trust the bank.

174
00:33:52.320 --> 00:33:57.840
Jonathan Payne: Right, the Bank has some franchise value we don't want them to lose them so there's an open question about how these centralized.

175
00:33:58.110 --> 00:34:08.130
Jonathan Payne: These platforms end up sort of really being as we move away from proof of work based so that's partly a sort of philosophical question about what we call what we call the centralization.

176
00:34:09.090 --> 00:34:19.080
Markus Brunnermeier: Is decentralized governance, the different decisions like setting the interest rates on doing some other regulation, you could have different tokens you can have interest rate tokens.

177
00:34:19.860 --> 00:34:21.990
Jonathan Payne: And he has a lot of flexibility and how you want to.

178
00:34:21.990 --> 00:34:31.050
Jonathan Payne: Do this this governance, I mean if you like, I mean, in some ways, there is an analog to equity here right, so these governance tokens look a little bit like tradable equity.

179
00:34:32.970 --> 00:34:42.990
Jonathan Payne: When I you know when I talked to people in define you know what, why is this not just like equity well part of it is about the ease of issuance in the tokens and part of it is the ease of trading.

180
00:34:43.650 --> 00:34:50.400
Jonathan Payne: But, in principle, from an economic point of view it does look somewhat similar to having something like a tradable stake in the overall platform.

181
00:34:50.970 --> 00:35:00.990
Jonathan Payne: That gives you some kind of right to influence the way, update and I think, with a lot of these problems, both with the decentralized control and decentralized governance.

182
00:35:02.220 --> 00:35:16.140
Jonathan Payne: In some sense what you're seeing is that the the Defense industry is kind of rediscovering some of the problems of traditional finance, you know and politics right because we start off with this something looks like kind of a direct democracy.

183
00:35:16.140 --> 00:35:19.830
Jonathan Payne: where you have a whole bunch of people that all vote on how to update the ledger.

184
00:35:20.370 --> 00:35:32.310
Jonathan Payne: And then, over time, they have to work out how to delegate responsibility, how to set up governance structures had to discipline the governance structures, the same way we sort of moved to other voting systems we move to kind of equity based corporate governance.

185
00:35:33.030 --> 00:35:43.890
Jonathan Payne: And they're kind of wrestling with the same difficulties about how do you how do you get kind of user input into the update of the system in a way they think works better than the current plan equity shareholder arrange.

186
00:35:45.450 --> 00:35:47.970
Jonathan Payne: OK so maybe in the interest of time, we should.

187
00:35:48.720 --> 00:36:01.770
Jonathan Payne: We should move on and send the fight the final thing I just want to mention, though, is the systems are built to be very modular right, so the idea is to use the smart contracts to create kind of building blocks these financial primitives such as you know.

188
00:36:02.070 --> 00:36:10.230
Jonathan Payne: The ability to hold tokens in custody or swap tokens or create new types of tokens and then these are building blocks to building out all these applications.

189

00:36:10.710 --> 00:36:19.290
Jonathan Payne: And so to give an example, I think of how this is meant to work, so I teach the you know the the fintech course here and my students have to do a term project and.

190
00:36:19.950 --> 00:36:28.470
Jonathan Payne: You know, half of the groups ended up using the theory and programming language to build out decentralized applications and they were able to take a hold of the building blocks.

191
00:36:28.740 --> 00:36:39.420
Jonathan Payne: And relatively quickly turn out quite quite impressive and sophisticated sort of new financial applications, if you like, the attempt here is to to do to.

192
00:36:39.840 --> 00:36:45.570
Jonathan Payne: Finance what happens in the rest of the Internet, if you want to set up a website, you can pretty quickly just set up a website.

193
00:36:45.900 --> 00:36:58.860
Jonathan Payne: The idea of defies to make finance similar you want to launch a new financial product fine there's a whole bunch of sort of building blocks out there you take the code you quite quickly get up and running, your financial product that's kind of the idea of what we want to have.

194
00:37:00.960 --> 00:37:11.160
Jonathan Payne: This part of a bigger movement from sort of Web 2.0 and centralized platforms to this decentralized Internet but we'll leave that for the moment listeners can ask more questions if they want.

195
00:37:12.390 --> 00:37:12.600
Okay.

196
00:37:13.740 --> 00:37:19.920
Jonathan Payne: And so what so what's the interval it, so this is a pretty ambitious and interesting kind of.

197
00:37:20.790 --> 00:37:23.820
Jonathan Payne: attempt to rebuild finance what are they trying to do here, well.

198
00:37:24.150 --> 00:37:34.620
Jonathan Payne: I mean one thing, obviously I think the most the most basic goal here is to decentralize control financial services and eliminate these is what they see a sort of rent seeking intermediaries and things and.

199
00:37:35.580 --> 00:37:48.990
Jonathan Payne: they're also very concerned about privacy and anonymity, so they want to wait and do financial transactions, where no one can simply see what you're doing and so some some in Ghana will not see, but you have anonymity and how you do all these transactions.

200
00:37:50.070 --> 00:37:54.330
Jonathan Payne: as per the example of kind of my students and quickly building applications.

201
00:37:54.600 --> 00:38:06.720
Jonathan Payne: They really want to decrease these barriers to entry, so that you get the kind of innovation in finance you've seen in many other areas of digital life know this explosion of kind of new new ideas and applications and software coming in.

202
00:38:08.670 --> 00:38:19.500
Jonathan Payne: They want financial inclusion, in particular, they want to move to a world where users, a profit participants, so the idea is, as you start using these platforms, you get the tokens they use the tokens or the.

203
00:38:19.770 --> 00:38:24.270
Jonathan Payne: The governance tokens or many different types of tokens and as the platform becomes more attractive.

204
00:38:24.540 --> 00:38:30.360
Jonathan Payne: Your tokens become worth more right, so if you've got a theory early in a theorem but being a user in the system.

205
00:38:30.540 --> 00:38:33.060
Jonathan Payne: That a theory and appreciates or at least that's the idea.

206
00:38:33.240 --> 00:38:43.290

Jonathan Payne: And so you you share in the profits right so it's a little bit like that's the sense in which you're being paid a little bit in tradable equity, so your trade you're you're paid in something that makes your profit participant.

207
00:38:43.530 --> 00:38:50.970
Jonathan Payne: In how this whole system is going to be used is he's going to work and increase interoperability and increased transparency so that.

208
00:38:51.120 --> 00:38:57.390
Markus Brunnermeier: But if you don't have any difference at all you don't have any franchise value that limits, you also what you can do I guess.

209
00:38:58.890 --> 00:39:00.750
Jonathan Payne: What do you mean by what you can do you mean.

210
00:39:01.080 --> 00:39:04.830
Markus Brunnermeier: If you don't have franchise value it's the enforcement is is probably limited.

211
00:39:06.150 --> 00:39:07.800
Markus Brunnermeier: Even within this digital space.

212
00:39:08.370 --> 00:39:20.940
Jonathan Payne: Yes, I think that's fair, so we might think that a lot of the reason that might think the part of the reason banks can offer some of the contracts, they do is because they have this franchise value from the rent seeking.

213
00:39:21.780 --> 00:39:31.080
Jonathan Payne: I think that's a challenging question for 35 I guess this comes to the next slide, so I think certainly I find I find the SCI fi very interesting exciting you see all this.

214
00:39:32.760 --> 00:39:43.020
Jonathan Payne: sort of I mean for people to think about financial theory it's kind of very interesting, you see, always you're rebuilding from scratch, you see all this financial theory kind of being worked out and rediscovered and work through.

215
00:39:44.040 --> 00:39:53.490

Jonathan Payne: But I think there are kind of two challenging questions and one of them very much relates to what you say, which is is this decentralization and disintermediation kind of really, really possible.

216
00:39:54.300 --> 00:40:09.660
Jonathan Payne: So it seems sort of a bunch of recent attempts, for example, the peer to peer lending systems that came in, not that long ago, which were meant to kind of lead to kind of decentralized finance with the individual borrowers, then you know borrowing from to the individual mom and pop lenders.

217
00:40:10.740 --> 00:40:23.190
Jonathan Payne: But what we saw happening was the banks kind of moving and end up kind of using this is more like a retail arm of the banking sector, so we saw we've seen kind of recent attempts at a decentralization of disintermediation kind of fail.

218
00:40:24.300 --> 00:40:36.090
Jonathan Payne: And this goes very much to your question right, so I think that the claim from a lot of the people in defy is the reason that we have you know that disintermediation has not been able to be achieved is really a technological reason.

219
00:40:36.120 --> 00:40:38.160
Jonathan Payne: We haven't had the right technology to be.

220
00:40:38.160 --> 00:40:40.560
Jonathan Payne: able to have something like a decentralized ledger.

221
00:40:42.090 --> 00:40:50.190
Jonathan Payne: But as you alluded to, there might be a lot of other reasons why right, so it might be important, it might be that the regulatory barriers to entry and.

222
00:40:50.490 --> 00:40:56.010
Jonathan Payne: It might be that this kind of anti competitive behavior by banks and other financial intermediaries, it makes it hard to enter.

223
00:40:56.550 --> 00:41:05.400
Jonathan Payne: Or, as you say, it could be that the rents, the banks get right I fundamentally important in terms of them being able to provide the services right that's another another issue.

224
00:41:06.510 --> 00:41:16.080
Jonathan Payne: And I think more generally, I mean for a lot of economist, I think we would probably think there's some kind of economies of scale and intermediation the bundling a lot of these different services.

225
00:41:16.530 --> 00:41:26.340
Jonathan Payne: Potentially leads to greater efficiency and part of the reason why defies fan founded sort of hard to compete on the cost friend is because it can't access the same economies of scale.

226
00:41:27.570 --> 00:41:41.250
Jonathan Payne: So this kind of is difficult open question here about to what it, you know what what is the reason we have intermediaries in the first place, and is it really just a technological issue others, there are other more fundamental economic reasons why we end up with the intermediate.

227
00:41:42.960 --> 00:41:49.680
Jonathan Payne: And I guess the other thing to think about here is how important decentralization really is for for these goals right.

228
00:41:51.060 --> 00:42:00.270
Jonathan Payne: So if we think about you know decentralized control can be an end in and of itself, and I think many of the people involved are very, very keen on decentralization.

229
00:42:00.990 --> 00:42:07.770
Jonathan Payne: But if we think about many of these these goals it's not clear whether the decentralization part is the most important thing.

230
00:42:08.100 --> 00:42:12.720
Jonathan Payne: Or whether having kind of this new ledger technology is flexible programmable ledger's.

231
00:42:13.050 --> 00:42:20.070
Jonathan Payne: is more important right, so if we think about the need for transparency, we can have transparency potentially on a ledger that centrally updated.

232

00:42:20.430 --> 00:42:33.030
Jonathan Payne: Similar with interoperability potentially similar with barriers to entry, so I think it's also an open question how how important the actual decentralization part is to this and how important the the ability to.

233
00:42:34.050 --> 00:42:44.370
Jonathan Payne: Have kind of us a user built programs on the ledger and have this sort of different kind of access to the ledger and how important that is relative to the decentralization.

234
00:42:46.890 --> 00:42:49.920
Jonathan Payne: But overall, in terms of you know, for Economics right.

235
00:42:50.190 --> 00:43:02.520
Jonathan Payne: I think what we see here is, we really We really need to think about the interaction of these digital legends with something like industrial organization right, so this is what it's understanding this connection that really helps us to answer.

236
00:43:03.120 --> 00:43:13.530
Jonathan Payne: These kind of difficult questions about what beef, I can do, and, more generally, about what what's going to happen with with these sort of digital ledger's being increasingly integrated into the rest of the economy.

237
00:43:21.060 --> 00:43:23.520
Jonathan Payne: want me to pause for questions Marcus push on.

238
00:43:23.670 --> 00:43:26.160
Markus Brunnermeier: No other thing let's push on okay.

239
00:43:27.780 --> 00:43:29.220
Jonathan Payne: So let's let's.

240
00:43:29.910 --> 00:43:32.430
Markus Brunnermeier: dismiss the fight let's see what you're coming up now.

241
00:43:32.820 --> 00:43:33.420
Jonathan Payne: This mistake.

242
00:43:35.550 --> 00:43:35.880
Jonathan Payne: Okay.

243
00:43:36.390 --> 00:43:38.130
Markus Brunnermeier: Well, questions Christian defined.

244
00:43:40.230 --> 00:43:42.120
Bendheim Center: I wonder what happened to YouTube, though.

245
00:43:43.350 --> 00:43:44.490
Bendheim Center: Probably nothing.

246
00:43:45.000 --> 00:43:45.720
Markus Brunnermeier: JESSICA you're.

247
00:43:45.900 --> 00:43:47.130
Jonathan Payne: Sick I think we can hear you.

248
00:43:51.300 --> 00:43:52.620
Markus Brunnermeier: Okay, so I think.

249
00:43:53.010 --> 00:43:56.580
Jonathan Payne: Sorry, there was a so all action, I think the defy gets everyone excited.

250
00:43:58.470 --> 00:44:09.120
Jonathan Payne: they're missing Okay, so I want to jump to the other extreme right so that's the attempt to remove intermediaries, but going back to the desire question you know what about if.

251
00:44:10.260 --> 00:44:15.930
Jonathan Payne: What about a sort of tech firms kind of interest and potentially had the sort of bigger intermediaries and sex.

252
00:44:16.950 --> 00:44:28.200

Jonathan Payne: Okay, so here, I draw in our paper when we attempt to build out something like a model, the interaction between digital ledges and platform competition so an iot digital legend model.

253
00:44:29.160 --> 00:44:37.140
Jonathan Payne: So we think about a world where there's a supply chain and in the supply chain, the agents transition from being produces to sell as Tobias.

254
00:44:38.160 --> 00:44:45.300
Jonathan Payne: When they produces they need to borrow but they lack collateral and commitment, so we have to be under collateralized borrowing to start the supply chain.

255
00:44:46.920 --> 00:45:00.600
Jonathan Payne: Once they've produced the whole inventory and they're a seller looking to sell their goods and after they've sold the home currency and they're a buyer looking to buy and both cases they have to trade search for trading opportunities, so there are matching frictions in this market.

256
00:45:02.280 --> 00:45:08.250
Jonathan Payne: And then, finally, the the bias, they need currency for these transactions cases and need for a store of value in this world.

257
00:45:09.600 --> 00:45:18.090
Jonathan Payne: Well, so into this we insert a private platform that offers credit services matching services and a digital veteran.

258
00:45:19.350 --> 00:45:30.390
Jonathan Payne: And they do this, and when they do this they have to compete in three dimensions, they have to compete with an ancient private platform that offers the same services that they do so it's a contestable markets model.

259
00:45:30.840 --> 00:45:44.760
Jonathan Payne: And they also have to compete with a public marketplace that uses public money, so this competition around the entire kind of platform ledger dimension and there's also competition with kind of money used in the general marketers OK.

260
00:45:45.420 --> 00:45:47.940
Markus Brunnermeier: So the public marketplace doesn't have a ledger.

261
00:45:48.660 --> 00:45:54.810
Jonathan Payne: The public marketplace doesn't have a digital lecture yes that's right, so they use the money anonymous.

262
00:45:56.550 --> 00:45:58.560
Markus Brunnermeier: And why do you need both forms of competition.

263
00:45:59.730 --> 00:46:01.590
Jonathan Payne: So we want both forms of competition.

264
00:46:03.720 --> 00:46:14.430
Jonathan Payne: Because, ultimately, you want to use this model to think about something like the introduction of CDC and when we think about when we think about introducing this, we need to understand.

265
00:46:15.090 --> 00:46:20.970
Jonathan Payne: How it affects competition along the dimension of sort of legends but also in terms of our regular currency.

266
00:46:21.840 --> 00:46:33.360
Jonathan Payne: Because it's having having this overall ledger dimension that generates the synergies in this world, so we need to think about how something like a CDC coming in, would compete with the part that's going to generate these images.

267
00:46:34.800 --> 00:46:35.040
Jonathan Payne: Okay.

268
00:46:36.180 --> 00:46:43.590
Jonathan Payne: So in this world Okay, so the the incumbent platform then uses this ledger to to organize payments and contracts.

269
00:46:44.580 --> 00:46:54.450
Jonathan Payne: And when they do this they have to design the setup of this lecture so they have to design interoperability, in a sense, they have to work out the exchange rate for moving tokens of religion.

270
00:46:54.990 --> 00:47:05.940
Jonathan Payne: And they have to work out the portability of all the information that sits on the ledges to avalanches, this is the the currency interoperability and the overall ledger information interoperability.

271
00:47:07.830 --> 00:47:17.310
Jonathan Payne: So to reinforces i've got a sort of diagram to think through what's happening here, so we have a platform that provides you know.

272
00:47:18.060 --> 00:47:30.240
Jonathan Payne: A ledger that upholds tokens it holds contracts, and they also provide a matching service in this market for bringing buyers and sellers together, then there's also a public marketplace, that the trading with mine.

273
00:47:33.450 --> 00:47:46.200
Jonathan Payne: On this in this world, there are two types of agents, there are these these debtors to borrow from the platform via contracts on a legend in order to get the funds to create inventory.

274
00:47:46.830 --> 00:47:54.690
Jonathan Payne: And then they're also going to be currency holders to hold potentially tokens and hold potentially money in the public marketplace.

275
00:47:57.090 --> 00:48:03.660
Jonathan Payne: So one type of competition here is this competition between the platform and this public marketplace.

276
00:48:04.380 --> 00:48:18.720
Jonathan Payne: So when trade takes place buyers and the sellers give the goods to the buyers and the buyers make payments, so I think if they use the platform, then they make payments in the tokens offered by the platform on religion.

277
00:48:19.500 --> 00:48:27.270
Jonathan Payne: If they trade in the public marketplace, they would have to take their tokens off the ledge and convert them into money and trading, the public markets.

278
00:48:27.810 --> 00:48:38.460

Jonathan Payne: And the platform can control the exchange rate at which these tokens are taken off right, so they can penalize or charge a fee when people exit the ledger take the tokens off dimension.

279
00:48:40.440 --> 00:48:49.470
Jonathan Payne: Okay, so that's one dimension of competition, but then there's also a dimension with a potential entrant ledger right but also offers tokens contracts and matching.

280
00:48:50.310 --> 00:49:01.080
Jonathan Payne: And yes, we also have the the token exchange ability so there's a question of what exchange rate, can you move your tokens of one ledger into dollars and back onto the new lead gen right.

281
00:49:01.920 --> 00:49:08.010
Jonathan Payne: But then we also have to think about additional features, we have to think about how information that was on the original ledger.

282
00:49:08.430 --> 00:49:17.280
Jonathan Payne: would potentially get moved over to a new ledger that comes in right, so you need to think about the portability of all of the contracts that are on this legend.

283
00:49:17.580 --> 00:49:30.450
Jonathan Payne: me to think about the portability of all the transaction histories, that you know from all these transactions that have been done over time and have been recorded on this legend OK, so we also have to think about what we call this iota which is this information portability.

284
00:49:31.980 --> 00:49:32.160
Jonathan Payne: Okay.

285
00:49:33.540 --> 00:49:37.860
Jonathan Payne: So to summarize the results in this model, I think we get to the main findings so.

286
00:49:38.190 --> 00:49:53.400
Jonathan Payne: The first is this digital ledger technology does create synergies right, so in this world, the incumbent platform has information about all the trades and they have control the

token ledger so they have the two features that are required to execute these kind of smart contracts and.

287
00:49:54.480 --> 00:50:07.050
Jonathan Payne: Plus, they have the capacity to exclude he comes from the platform if they don't use the token nature, so they also have the ability to really strongly incentivize people to be on the ledger and to participate in this contract enforcement.

288
00:50:07.740 --> 00:50:09.060
Markus Brunnermeier: They don't seem to like it can you.

289
00:50:09.090 --> 00:50:17.220
Markus Brunnermeier: tell us a little bit you mentioned earlier, this Oracle problem, so when the good moves from one to the next that's the the platform observes that.

290
00:50:17.490 --> 00:50:28.800
Jonathan Payne: Right so, but the fundamental synergy here is by bundling the the retail platform with the digital ledger the retail platform has all the information about these trades.

291
00:50:29.340 --> 00:50:35.160
Jonathan Payne: So, because these two things that combined we solve the Oracle problem that's the sort of fundamental synergy.

292
00:50:35.970 --> 00:50:44.250
Jonathan Payne: That means that it's very helpful to connect the information from retail trade into the information on the digital nature.

293
00:50:45.180 --> 00:50:54.720
Jonathan Payne: So here we have this one organization that bundles all these things together, of course, you could also imagine that a theorem signs a contract or something with.

294
00:50:55.530 --> 00:51:09.420
Jonathan Payne: Amazon, and all the information is automatically shared you could imagine information sharing, without a conglomerate, but here we focus on a world where you need this conglomerate, in order to get always information sharing to happen to the frictionless the onto the lecture.

295

00:51:12.270 --> 00:51:13.560
Markus Brunnermeier: And so, essentially.

296
00:51:14.910 --> 00:51:20.760
Markus Brunnermeier: If you can do that or Amazon can do that because the two or three services, but the Bank, a normal pain could not do it.

297
00:51:21.720 --> 00:51:27.600
Jonathan Payne: Right so here the extra information and extra enforcement that comes from being a retail matching platform.

298
00:51:28.290 --> 00:51:37.800
Jonathan Payne: gives you this extra synergy that means you can provide more on collateralized trade credit in the supply chain than would be provided by some other kind of financial intermediary back.

299
00:51:39.210 --> 00:51:47.070
Jonathan Payne: that's the basic synergy here that you can you can create you can provide trade credit in this environment that otherwise would be quite difficult to provide.

300
00:51:48.180 --> 00:51:51.630
Markus Brunnermeier: Because you see the sales revenue is actually happening in a particular way right away.

301
00:51:52.050 --> 00:52:00.750
Jonathan Payne: Because you have all the information and all the control of the retail platform plus all the all the information and control on the digital imagine having both these.

302
00:52:03.060 --> 00:52:06.030
Jonathan Payne: Okay, so we have this this synergy.

303
00:52:07.260 --> 00:52:13.290
Jonathan Payne: But we also see the platform is able to use this ledger or they control the ledger to increase their market CAP.

304
00:52:13.440 --> 00:52:20.730

Markus Brunnermeier: or can it just sorry this power to exclude you from the platform, so the capacity to exclude agents you didn't mention.

305
00:52:21.960 --> 00:52:23.370
Markus Brunnermeier: But it's important as one.

306
00:52:25.260 --> 00:52:44.730
Jonathan Payne: So, so if we go back to so contract enforcement here right so forsman in this world, we need the information flow, we need the payment flow, I mean either way of incentivizing agents to provide what the information flow is provided by the bundling of the retail platform with the ledger.

307
00:52:45.840 --> 00:52:53.490
Jonathan Payne: But we need to incentivize agents to do their payments through the system and the ability to exclude is one way in which these incentives can be provided.

308
00:52:55.170 --> 00:52:55.800
Jonathan Payne: Some make sense.

309
00:53:02.220 --> 00:53:12.720
Jonathan Payne: So we see on the one side a synergy, we can provide more credit on the other hand, we see the potential for the platform to.

310
00:53:13.440 --> 00:53:16.020
Jonathan Payne: exploit their control the ledger and increase market.

311
00:53:16.860 --> 00:53:26.490
Jonathan Payne: So what the platform chooses to do is they choose to restrict the movement of tokens by charging exchange rate fees so make a costly for token holders to move to the new entrant platform.

312
00:53:26.910 --> 00:53:36.810
Jonathan Payne: And they restrict some information portability they restrict the portability of transaction history so entrance cannot use all of the information from all the history to provide better matching services.

313
00:53:37.440 --> 00:53:46.500

Jonathan Payne: But they end up promoting the portability of contract information so if people do move contracts can still at least partially being forced on other platforms.

314
00:53:47.430 --> 00:53:52.980
Jonathan Payne: They do all these things right, so all these things they do, they do it to determine new platform entry.

315
00:53:53.580 --> 00:54:01.920
Jonathan Payne: And so, by exploiting their control the ledger to restrict interoperability and determine your platform entry they're ultimately able to charge higher fees.

316
00:54:02.490 --> 00:54:12.870
Jonathan Payne: So in this sense, we see the defy fear in this model that the tech platforms, plus the digital ledges doing D, give us extra market power and higher markups in this world.

317
00:54:14.040 --> 00:54:14.250
Okay.

318
00:54:15.300 --> 00:54:26.520
Jonathan Payne: Okay, so we see the synergy, we see the potential for for greater market power, and I think a helpful way to think through what's going on in this world.

319
00:54:26.910 --> 00:54:35.550
Jonathan Payne: is to think in terms of the exposure the agents have to the legend so the way the way I think about this is there are buyers.

320
00:54:36.000 --> 00:54:43.980
Jonathan Payne: And they are currency holders and they really have a positive claim on the ledger right they have positive token holdings and they have a positive information position.

321
00:54:44.370 --> 00:54:51.090
Jonathan Payne: in the sense that all their transaction history is around the ledger and having those transaction history is really enables better matching right.

322
00:54:51.360 --> 00:55:01.350

Jonathan Payne: So it's like they have like a five star rating or reputation or various things that ultimately mean they can use the platform more effectively right, so they have a positive position in the information on the ledge.

323
00:55:02.280 --> 00:55:07.500
Markus Brunnermeier: Does it matter tokens I can pass on to somebody information my five star rating, I cannot pass on.

324
00:55:08.130 --> 00:55:17.430
Jonathan Payne: Right, so the fundamental distinction here between these these two dimensions is the tokens can be traded amongst the agents.

325
00:55:17.730 --> 00:55:23.730
Jonathan Payne: that's like the regular currency competition, but the information I can't just trade with other buyers and sellers.

326
00:55:24.510 --> 00:55:34.230
Jonathan Payne: But for that was that's relevant for the competition between the legends so that's another reason why we need to have these two dimensions of competition one dimension refers to.

327
00:55:34.980 --> 00:55:40.320
Jonathan Payne: You know tradable tokens and how how that ends up being how competition happens in that dimension.

328
00:55:40.740 --> 00:55:55.410
Jonathan Payne: But then to understand how the overall your overall exposure to information ends up feeding through into the platform competition, we have to have competition with another ledger that could potentially use all of the information that's there on the legend.

329
00:55:57.870 --> 00:56:03.240
Jonathan Payne: Right so buyers have a positive claim on both tokens and on information and.

330
00:56:03.840 --> 00:56:12.120
Jonathan Payne: sellers to hold inventory and loans, they really have a negative claim on the ledger they have a negative claim, both in terms of a negative token position.

331

00:56:12.390 --> 00:56:21.090
Jonathan Payne: They also have a negative information position in the sense that the contract information on the ledger that enables enforcement the information is hurting them and helping the platform.

332
00:56:21.960 --> 00:56:31.260
Jonathan Payne: So what the platform really wants to do in this environment they want to restrict interoperability, where agents, have a positive claim, and they want to promote interoperability with agents, have a negative claim.

333
00:56:31.590 --> 00:56:43.080
Jonathan Payne: Right, so they want to restrict the movement of tokens and transaction histories, because that locks in violence right the bias, have a positive value with the platform and you're making it hard for them to move their tokens and information or.

334
00:56:43.800 --> 00:56:44.610
Jonathan Payne: On the other hand.

335
00:56:45.180 --> 00:56:55.380
Jonathan Payne: You want to allow the sellers to move all their information with them the the sellers have a negative information claim and you want to make the ledger is portable as possible, so when the sellers move.

336
00:56:55.590 --> 00:57:01.170
Jonathan Payne: The negative information find moves with them right, so you want to allow interoperability with a negative claims.

337
00:57:01.470 --> 00:57:12.720
Jonathan Payne: And you want to restrict interoperability, where there are positive things that's kind of the fundamental force acting in the way that the platform things through, how to design this ledger to maximize their profits.

338
00:57:14.040 --> 00:57:14.310
Jonathan Payne: Okay.

339
00:57:15.840 --> 00:57:27.450

Jonathan Payne: So, with that in mind, we can start to think about two different policy responses, both to kind of the emergence of defy but also to this this possibility of kind of these big intermediate intermediaries and more market power.

340
00:57:28.590 --> 00:57:33.540
Jonathan Payne: So one response is this so called open banking or open data open architecture.

341
00:57:35.460 --> 00:57:50.430
Jonathan Payne: So if we think about traditional finance we think about intermediaries that control the portability of information, like the example we just went through right so intermediary decides is information portable and or in this case the platform ledger owner decides that the portability.

342
00:57:51.720 --> 00:57:55.410
Jonathan Payne: Open making as a lot of things, but for the purposes of this this talk.

343
00:57:55.950 --> 00:58:07.650
Jonathan Payne: The thing we want to emphasize is it wants to give users control about what happens to their information they want to give users, control and how this information can be used, and here we focus on how this information is ported around.

344
00:58:08.340 --> 00:58:13.440
Jonathan Payne: So now model, the buyers would control the portability of their information which is always transaction histories.

345
00:58:13.830 --> 00:58:26.190
Jonathan Payne: And the sellers we control the portability of the information that relates to them, these loan contracts we've seen open banking introduced in a few different places like the UK so it's sort of important to think through what these implications.

346
00:58:26.820 --> 00:58:34.500
Markus Brunnermeier: But now you focus only on portability of information, the token positive and negative you have switched off mentally at least.

347
00:58:34.530 --> 00:58:44.880
Jonathan Payne: I think I think that's not the key thing for understanding certain things, so we we focus our focus in on this information, what ability to to think about what what this open banking, this is really about.

348
00:58:45.960 --> 00:59:01.800
Jonathan Payne: So if we focus in this way and we kind of compare what platform controller looks like to open banking well as we talked about the platform wants to stop the the transaction being moved so new entrance can't provide similar services later, but they want maximum portability of information.

349
00:59:03.090 --> 00:59:13.980
Jonathan Payne: With open making you would get the inverse relationship right, so the buyers, are the ones that have the positive information exposure, so they want to put all their information right they've got a great reputation on low platform.

350
00:59:14.910 --> 00:59:23.010
Jonathan Payne: Their platforms using that provide really good services to them, they want all that to move across to any new branch from that comes in right, so they want to put all the information.

351
00:59:23.400 --> 00:59:31.140
Jonathan Payne: and sellers have a negative information exposure, they do not want to learn contracts to move with them, they would like to leave alone context behind so they're able to do.

352
00:59:31.710 --> 00:59:38.730
Jonathan Payne: So you have this completely kind of inverse relationship in how the agents versus the platform want to move the information.

353
00:59:39.330 --> 00:59:42.600
Jonathan Payne: And we see when the platform controls it they end up with a positive value.

354
00:59:43.110 --> 00:59:56.190
Jonathan Payne: But when when the agents control that we end up with a negative value in the sense that the income, it would not want to set up this this loan market and collateralized line market in this world, where the agents themselves are controlling how the information with me.

355
00:59:57.930 --> 01:00:08.940

Jonathan Payne: So it's a little bit beyond the scope of the exact model, but I think we can see some similarities with this platform, control and what we see in the current banking system, this is saying you want to hide or your transaction history.

356
01:00:09.540 --> 01:00:19.920
Jonathan Payne: But you want to share information about contract default, so I think is a lot of what banks through right banks share they have credit registries we share information about who defaults and we have universal.

357
01:00:20.520 --> 01:00:27.150
Jonathan Payne: credit ratings right that's pretty much the ic right sharing information about learn contracts and default will lead information.

358
01:00:27.930 --> 01:00:41.010
Jonathan Payne: On the other hand, banks, want to hide all their information about transaction history and everything that helps them provide good services they want to hide all that information, but they want to share all the information about default and loans right and that's very.

359
01:00:41.130 --> 01:00:46.110
Markus Brunnermeier: Critical so far that open banking only means we heard credit registries because.

360
01:00:47.130 --> 01:00:51.060
Markus Brunnermeier: The person who defaults will say no, no, I don't want to have it on the credit history.

361
01:00:51.600 --> 01:00:53.070
Jonathan Payne: Yes, if you say.

362
01:00:53.130 --> 01:00:58.080
Jonathan Payne: Here, it would be like the open banking is you're choosing whether or not your information.

363
01:00:58.320 --> 01:01:09.390
Jonathan Payne: about your your deaths ends up feeding into a credit registry right that's what this ice is equal to zero, you will be blocking your information from entering in these kind of credit registries if you took this to the extreme.

364
01:01:10.440 --> 01:01:18.840
Jonathan Payne: And that's what you know and that's that's what hurts the platforms in the sense that, in that sense, you you're you're less able to track defaults across this whole system.

365
01:01:19.650 --> 01:01:29.130
Jonathan Payne: This isn't sensing which, in this model this and collateralized credit which was this positive synergy is quite fragile right, so we needed this and collateralized credit to initiate the supply chain.

366
01:01:29.520 --> 01:01:38.670
Jonathan Payne: and providing the credit always makes the incumbent platform vulnerable because the new platform can enter and often the Agency opportunity to move and default on their loans right.

367
01:01:39.150 --> 01:01:48.810
Jonathan Payne: And so the incumbents only going to set up this this and collateralized credit if they can get compensation right they need to be able to either force portability of the contract information.

368
01:01:49.290 --> 01:01:57.810
Jonathan Payne: or they need to be here or and or they need to be able to restrict the movement of tokens and transaction history so some other way of trying to get compensation.

369
01:01:58.440 --> 01:02:04.830
Jonathan Payne: For this ability of the the creditors are the people with the negative information position to abandon them.

370
01:02:05.400 --> 01:02:20.700
Jonathan Payne: So I think this should give us some cause for concern about trying to regulate something like total interoperability across all these tech financial platforms, we want to be careful that we don't we don't take away that potential synergies by forcing more interoperability that.

371
01:02:21.540 --> 01:02:30.900
Markus Brunnermeier: You assume is this perfect information sharing, or does open banking and there's no exchange rate fee when you swap your tokens for the dollars.

372
01:02:30.960 --> 01:02:34.560
Jonathan Payne: Is this called we could add in an extra point here, so you could also think that you know.

373
01:02:35.190 --> 01:02:47.130
Jonathan Payne: You could have open banking and perfect sharing of information if there was some other way for these platforms during the face of, for example, if they could charge exchange rate phase to lock people in that would offset this potential for.

374
01:02:47.910 --> 01:02:53.370
Jonathan Payne: into my losses on the ones right so cross subsidization between using.

375
01:02:54.450 --> 01:03:01.860
Jonathan Payne: token restricting heard of token portability to gain market power can can compensate for for setting up this learning network.

376
01:03:02.310 --> 01:03:12.690
Jonathan Payne: You can think of this this on collateralized credit is a little bit like a public good here, and you have to give them some kind of incentive to set this up, because once it's set up people can hurt you because it's been said.

377
01:03:13.710 --> 01:03:21.480
Markus Brunnermeier: But when you like total interoperability you mean interoperability in terms of information, but also in terms of smoking tokens into dollars or.

378
01:03:23.160 --> 01:03:33.840
Jonathan Payne: Not we have these platforms, they have tokens at information we enforce the government says everything has to be completely interoperable, you cannot charge any fees, you can lock in any information, you cannot do any of these things.

379
01:03:34.320 --> 01:03:38.460
Jonathan Payne: In this world, this would shut down the young collateralized prayer so start to take away this.

380
01:03:39.420 --> 01:03:55.530
Jonathan Payne: OK OK, so I just want to quickly finish off with the other, you know another much discussed public policy response, which is the CDC, and so we can consider two different

types of CBC here, so we can have a legal tender CBC on a kind of disconnected non programmable Belgium.

381
01:03:56.970 --> 01:04:01.440
Jonathan Payne: And this kind of CBC kind of shuts down synergies this starts to cancel synergies.

382
01:04:02.400 --> 01:04:11.310
Jonathan Payne: Because without the CBC the platform forces sellers to only accept tokens on their platforms, they can force payments through the ledger right that's how they enforce the contract.

383
01:04:12.030 --> 01:04:21.330
Jonathan Payne: But once you introduce a legal tender CDC they can no longer force the agents to use their tokens so now the agents can start to organize side payments in the CBC.

384
01:04:21.540 --> 01:04:33.420
Jonathan Payne: That enables them to circumvent the smart contracts to the CBC dollar rises these private platforms and forces the platforms to potentially intermediate payments or abandoned is kind of an collateralized ones right.

385
01:04:33.960 --> 01:04:46.020
Jonathan Payne: So a simple legal tender CBC with no non Perry ever religious disconnected that starts to really hurt the synergies and on the other hand, we think about the other extreme, but we like.

386
01:04:46.650 --> 01:04:52.470
Markus Brunnermeier: To say is helium platform and my CBC is not connected part of the theater in particular.

387
01:04:53.100 --> 01:05:03.450
Jonathan Payne: yeah I mean there's some CBC it sits on a ledger at the Central Bank, but it's not something we all see it's not something I can write programs on it's not something I can execute smart contracts on.

388
01:05:04.110 --> 01:05:13.560

Jonathan Payne: that's what I mean by be disconnected and so you can always sort of go through the CDC and avoid any any kind of contracts that have been set up in the rest of the system.

389
01:05:16.680 --> 01:05:18.480
Markus Brunnermeier: And because it's legal tender.

390
01:05:19.800 --> 01:05:25.740
Markus Brunnermeier: bias can always clear or the silicon always du monde essentially being pretence in dollars two vertices.

391
01:05:25.980 --> 01:05:36.900
Jonathan Payne: Right so giving a setup where the platform is so it's important for the synergy, we talked about for the platform to be able to force the sellers to use their token right.

392
01:05:37.470 --> 01:05:39.810
Jonathan Payne: You don't want to give them some option, where.

393
01:05:40.590 --> 01:05:46.710
Jonathan Payne: You have some other currency with that they can always say, they can always come to the platform and say, well, I just want to use this other currency.

394
01:05:46.950 --> 01:05:59.160
Jonathan Payne: And there's no way to integrate that currency in any of the contracting, and so they always have this side trade option, so you can use this trading vehicle This makes it very hard to kind of set up something like an automated contracting system.

395
01:06:00.420 --> 01:06:07.980
Markus Brunnermeier: Just to make sure that that comes across that token is always a stable coin there's no additional senior rich the platform gets from.

396
01:06:08.850 --> 01:06:18.750
Markus Brunnermeier: You know inflating away the value of the token, the only thing is conduct you're in and saying you cannot when you want to swap it into dollars, then you have to pay a fee.

397
01:06:20.550 --> 01:06:21.030

Jonathan Payne: I mean.

398
01:06:21.690 --> 01:06:27.450
Jonathan Payne: I mean, yes, I mean I guess it depends, where do you think of So if you if you issue a token.

399
01:06:27.810 --> 01:06:31.350
Jonathan Payne: traditions there's someone comes to you with $1.

400
01:06:32.460 --> 01:06:43.200
Jonathan Payne: And they swap it for a token one for one majority backing it by upside down, so the the signer age revenue to get each time is one minus of silence right so.

401
01:06:43.800 --> 01:06:53.040
Jonathan Payne: it's like somebody comes to the platforms is i'm going to give you $1 for a token and the platform says great if you come back and you convert the token back into balance, you only get upside down.

402
01:06:53.520 --> 01:06:57.000
Jonathan Payne: So one minus upsell on its kind of the signage benefits, you get.

403
01:06:57.420 --> 01:07:05.880
Jonathan Payne: So in some sense the lower abseiling is, the more the closer it kind of looks to a Fiat currency where someone is giving you money for something that.

404
01:07:06.150 --> 01:07:11.760
Jonathan Payne: you're not promising any kind of convertibility for so the upside is governing the degree of convertibility.

405
01:07:12.330 --> 01:07:20.190
Jonathan Payne: Yes, in this model we assume they can commit to whatever convertibility they promise and there's nothing like a kind of running problem So these are kind of fully backed.

406
01:07:20.550 --> 01:07:28.770
Jonathan Payne: Up to of silence, so you promised a certain backing and then that's the that that packing is committed to, but you can choose how much back in they have that's kind of the.

407
01:07:35.760 --> 01:07:36.060
Jonathan Payne: Okay.

408
01:07:36.870 --> 01:07:37.920
Markus Brunnermeier: Not from truces.

409
01:07:38.340 --> 01:07:39.630
Jonathan Payne: yeah the platform shoes yes.

410
01:07:40.350 --> 01:07:42.750
Markus Brunnermeier: Very good time for us excellent oh wow.

411
01:07:44.340 --> 01:07:46.950
Jonathan Payne: So we can have something like a legal tender CBC.

412
01:07:48.630 --> 01:07:52.110
Jonathan Payne: And this makes it really hard to set up this whole system with automated payment.

413
01:07:52.890 --> 01:08:00.660
Jonathan Payne: We could also imagine an alternative kind of world where we have something like a so called smart cpvc so we can consider legal tender bundled with a program but.

414
01:08:01.530 --> 01:08:12.210
Jonathan Payne: They can integrate with any other contracts that are written or enables contracts Lee written on it, so that you could put this legal Center CBC directly into something like a you know digital ledger supply.

415
01:08:12.210 --> 01:08:12.810
Markus Brunnermeier: chain right.

416
01:08:12.960 --> 01:08:14.310
Jonathan Payne: So it could be integrated straight in.

417

01:08:15.330 --> 01:08:28.920
Jonathan Payne: In this case, we could think about the platform using the CBC ledger to write enforce contracts, so long as the CBC becomes the dominant currency and so long as all the other platforms and marketplaces provide information into the CBC ledger right.

418
01:08:30.210 --> 01:08:35.070
Jonathan Payne: So I think the the opening question here with something like an introduction of a CBC.

419
01:08:35.460 --> 01:08:45.360
Jonathan Payne: programmable ledger is what does it take to get all these different participants to start sharing information on to this kind of universal CDC ledger right.

420
01:08:45.720 --> 01:08:53.730
Jonathan Payne: So conditional on the other, platform sharing a platform has a much larger benefit from sharing information, so I put all my contracts onto this ledger.

421
01:08:53.970 --> 01:09:07.350
Jonathan Payne: And everybody else is putting their information, we can now enforce contracts, much more broadly, not just in people trade on my platform women they trade and other platforms that public marketplace, we have something much closer to kind of a universal enforcement system.

422
01:09:08.460 --> 01:09:12.930
Jonathan Payne: But it is all conditional on other platforms agreeing to put all the information on.

423
01:09:13.350 --> 01:09:19.830
Jonathan Payne: And so, this potential coordination problems and potential issues about to what extent platforms prefer to intermediate payments.

424
01:09:20.250 --> 01:09:30.420
Jonathan Payne: And so, really, we end up with this is interesting, but tricky question about how would you actually incentive ministering back to the poll question you asked at the start, how would you actually incentivize.

425
01:09:31.050 --> 01:09:36.120

Jonathan Payne: You know, all these platforms to start sharing a lot of this information through something like universal ledger.

426
01:09:36.690 --> 01:09:41.130
Jonathan Payne: Because we may have to split it into a trade off here between privacy and enforceability.

427
01:09:41.520 --> 01:09:47.460
Jonathan Payne: Right, you want to share a lot of information onto this universal ledger so you can do a lot of contract enforcement.

428
01:09:47.820 --> 01:09:51.840
Jonathan Payne: That means people have to be happy with having a very transparent world.

429
01:09:52.230 --> 01:10:03.330
Jonathan Payne: And that brings partially problems about not be able to protect your you know your ability to use your own information for your advantage but also privacy concerns that would be beyond the scope of this tape yes next.

430
01:10:04.410 --> 01:10:18.180
Markus Brunnermeier: Can you make it very concrete let's suppose there is a supply chain, the automotive industry has certain supply chain, on a blockchain and it has a payment rail the payment rail has to pretend be integrated with the central bank secrecy ledger.

431
01:10:18.630 --> 01:10:26.790
Jonathan Payne: Exactly so there's another is like a supply chain in the consumer goods market for like refrigerators and there's a supply chain for.

432
01:10:28.950 --> 01:10:31.980
Jonathan Payne: cars and these things kind of intersect at some point.

433
01:10:33.270 --> 01:10:40.620
Jonathan Payne: And then there's a CBC ledger and you would need to have the contracts are able to be enforced kind of via the CDC ledger.

434
01:10:41.340 --> 01:10:47.040

Jonathan Payne: Irrespective of whether then kind of written in the you know the auto goods supply chain other is.

435
01:10:47.310 --> 01:10:53.490
Jonathan Payne: written in the supply the refrigerator supply chain, or anything else so it's all about, to what extent, could you coordinate.

436
01:10:53.760 --> 01:11:02.910
Jonathan Payne: All of these different industries to start providing information through a common ledger that's really what would be required to get kind of the economies of scale.

437
01:11:03.180 --> 01:11:09.930
Jonathan Payne: So you could you could look at this and say, this is a little bit like a chicken model of the government of straw man model, the government in the sense that well you know.

438
01:11:10.530 --> 01:11:15.990
Jonathan Payne: We just you know if everybody can coordinate, we can have a really great enforcement system and if not, we can't.

439
01:11:16.290 --> 01:11:27.180
Jonathan Payne: I guess the way to think about our are richer question and just you know suppose the government can magically get everybody to enforce it so try to think through what you know what.

440
01:11:27.720 --> 01:11:39.870
Jonathan Payne: What would it take to get all of these different players in the market to start providing information through a kind of common ledger that's the incentive compatibility constraint, you would need in this in this government design problem.

441
01:11:40.380 --> 01:11:49.590
Markus Brunnermeier: But is there any smart technology, like a pseudo knowledge something where you can still protect privacy and nevertheless have everything on a common ledger.

442
01:11:51.930 --> 01:11:52.110
Jonathan Payne: or.

443

01:11:52.620 --> 01:11:54.960
Markus Brunnermeier: degraded interoperable lateral design.

444
01:11:55.170 --> 01:12:07.590
Jonathan Payne: Meeting privacy from I mean I guess this so and me, as you know, they've been a bunch of proposals for how you could do something like a CBC with privacy and trying to use the technology to think that, through and.

445
01:12:08.430 --> 01:12:17.070
Jonathan Payne: I think it's a bit early to say to what extent there is a privacy enforceability trade off right, so a lot of what being thought about is not.

446
01:12:17.460 --> 01:12:25.380
Jonathan Payne: How would you have privacy, but managed to enforce on collateralized credit across something like a more integrated universal.

447
01:12:25.860 --> 01:12:35.250
Jonathan Payne: ledger is something more like if I want to make payments, how do I work out who knows what and how do I kind of break up the information and these kind of things.

448
01:12:36.150 --> 01:12:42.840
Jonathan Payne: So I think at the moment is not entirely clear, we have, we have the answer to that question I don't I don't know if we know where the limit is and what this sort of.

449
01:12:42.900 --> 01:12:43.290
Markus Brunnermeier: made up.

450
01:12:43.740 --> 01:12:44.220
Jonathan Payne: looks like.

451
01:12:48.510 --> 01:12:53.040
Jonathan Payne: Okay, so I think the the overall so and I think I want to emphasize that CBC.

452
01:12:55.110 --> 01:13:00.390
Jonathan Payne: Is you know in in analogous work to sort of like what you want to current Martin right about.

453
01:13:01.320 --> 01:13:14.970
Jonathan Payne: Turkey, so you know this thing we want to think about is does the introduction of CBC breakdown synergies that exists in the private marketplace between offering something like a digital ledger a payment system and offering other services.

454
01:13:15.480 --> 01:13:24.930
Jonathan Payne: I think the contribution here is to think through a different kind of synergy so it's not a synergy with providing say credit lines and deposits or special Vending.

455
01:13:25.290 --> 01:13:36.360
Jonathan Payne: opportunities at the banking sector, this is a case where the the synergy is really about the ability to bring together the information and control from the retail platform with.

456
01:13:36.810 --> 01:13:42.990
Jonathan Payne: The the controller of a digital ledger bring those things together and provide credit and you wouldn't otherwise be able to provide.

457
01:13:43.530 --> 01:13:51.120
Jonathan Payne: And what what I think this type of would teach us about CDC is, we need to think hard about whether or not CBC sort of enhances the synergies.

458
01:13:51.330 --> 01:13:57.480
Jonathan Payne: or eliminates the synergies and I think a lot of that is about whether or not you could continue to to do something like.

459
01:13:57.960 --> 01:14:07.650
Jonathan Payne: Smart contract enforcement through a CBC ledger world or not, I think that's kind of the key issue for for trying to resolve that that particular question, at least for this particular synergy, of course.

460
01:14:07.980 --> 01:14:14.580
Jonathan Payne: There are many other issues about CBC you know, do you want to be able to put pressure on the banking sector to do things.

461
01:14:15.390 --> 01:14:23.610

Jonathan Payne: You know, do a worried about the traditional banking synergies there's a bunch of other reasons, you might be interested in this, but for this paper we focus on this energy.

462
01:14:25.530 --> 01:14:28.230
Markus Brunnermeier: For the first time summarize it it's all about the design of the.

463
01:14:28.230 --> 01:14:34.110
Markus Brunnermeier: Simplicity it's not about CPC yes or no it's like how to smartly to sign it, in order to not.

464
01:14:34.140 --> 01:14:45.030
Jonathan Payne: Think that's a good way to put it, so I think in this world, introducing CBC is not good or bad it's really about the design of the ledger which goes back to the initial point I think what really distinguishes these digital monies.

465
01:14:46.200 --> 01:14:55.920
Jonathan Payne: Is the different ledger design and CBC is the same, you could have CDC with very different kinds of legit design and the impact on competition and welfare look radically different.

466
01:14:56.820 --> 01:15:07.020
Jonathan Payne: So I think in some sense, we have to move away a little bit from thinking about sort of money as an amorphous thing and start to think about money bundled with the ledger and then you have to think about how this ledger is designed.

467
01:15:07.230 --> 01:15:18.270
Jonathan Payne: And how the design of the legend and integrates with other things that are going on in the economy, otherwise it's very difficult to think about what what benefits or or costs, you know CBC my impose on on the economy.

468
01:15:19.980 --> 01:15:20.610
Jonathan Payne: Does that make sense.

469
01:15:21.540 --> 01:15:23.250
Markus Brunnermeier: Yes, essentially.

470

01:15:24.300 --> 01:15:25.260
Markus Brunnermeier: Okay i'll let you conclude.

471
01:15:26.070 --> 01:15:31.290
Jonathan Payne: I was just gonna say you know I had four questions I think we're well well place to go back to those four questions so.

472
01:15:32.100 --> 01:15:37.620
Jonathan Payne: what's different about digital money and legends I think I think I feel it's very much this this need for.

473
01:15:38.220 --> 01:15:48.510
Jonathan Payne: You know what's different additional monies as need for a digital ledger, and this has led to a whole lot of innovation we've seen much more sophisticated ledges come in that allow for different kinds of contracting arrangements.

474
01:15:49.740 --> 01:15:56.250
Jonathan Payne: Can second question can financial services move from banks to decentralized finance well I think it's unclear that.

475
01:15:56.520 --> 01:16:03.090
Jonathan Payne: The new technology really overcomes all the forces that we're generating intermediation in the first place, I think, on that front, the jury's a bit out.

476
01:16:03.630 --> 01:16:11.790
Jonathan Payne: is still out, although sort of a lot of technological advances gone into trying to understand hey if you do something like decentralized signings and.

477
01:16:13.650 --> 01:16:24.840
Jonathan Payne: Third question can tech firms exploit synergies and extend credit services Well, yes, so we see we see new synergies of emerging, but we also see, they can use the ledger control to really increase market power right.

478
01:16:25.110 --> 01:16:34.560
Jonathan Payne: So we see the pro and a con here So yes, they would want to do it, but they only want to do it, to the extent they can use it to kind of increase that control the whole system and get bigger wins.

479
01:16:35.730 --> 01:16:47.910
Jonathan Payne: And then, how should a regulator respond well, I think the overall guiding principle for response here is, they want to try to preserve the synergies that come from integrating digital ledges with you know retail platform operations.

480
01:16:48.570 --> 01:16:56.730
Jonathan Payne: And there are ways, you could do that, where you enhance the synergies like we talked about the smart CDC or you could you could start to hurt them and that will give you very different kinds of responses.

481
01:16:57.540 --> 01:17:04.350
Jonathan Payne: that's my my short, you know short, sharp attempt to respond to the initial for questions that we opened with.

482
01:17:05.250 --> 01:17:22.890
Markus Brunnermeier: Thanks a lot Jonathan Lepage, just so you made a big point and a big push thing you know we live in the existing legal structure and the existing legal structure is much broader, but it is less precise as a digital the digital world where we can.

483
01:17:24.540 --> 01:17:29.970
Markus Brunnermeier: enforce things much more cleanly, but we have this overcome problem now, if you look across countries.

484
01:17:30.630 --> 01:17:37.410
Markus Brunnermeier: let's suppose you have certain countries where the legal structure is not so well developed or the court system is not working so wow.

485
01:17:37.920 --> 01:17:48.210
Markus Brunnermeier: Do you see that defy or you know doing some non device them, you know platform does show the natural connections and interoperability across that.

486
01:17:48.630 --> 01:18:03.630
Markus Brunnermeier: Because it has a big opportunity for these countries and they're moving faster in that space, because then the need is higher, how would you, is it a big opportunity to for developing countries to overcome some of the shortcomings that might face.

487
01:18:05.820 --> 01:18:14.760

Jonathan Payne: So, and I think the defining the story certainly sees that as a big advantage, so you know they often talk about the the need for.

488
01:18:16.290 --> 01:18:21.180
Jonathan Payne: Your to escape kind of financial repression you're in societies where the legal system is corrupt.

489
01:18:21.450 --> 01:18:27.780
Jonathan Payne: or there's some kind of authoritarian response and you need to be able to do transactions or write contracts outside of time.

490
01:18:28.110 --> 01:18:35.070
Jonathan Payne: And yes, they also talked a lot about cross border contracts, when you don't have the regular legal system and the ability to to try to.

491
01:18:35.640 --> 01:18:49.410
Jonathan Payne: Use the fly to do that, so I mean, I think the potentials there, I think the difficulty is the level at least currently the level of technical sophistication required to participate so part of the issue is that.

492
01:18:51.420 --> 01:19:02.910
Jonathan Payne: You know defies a little bit like the wild west of the moment I mean sort of by construction in a way, because you know it is trying to operate in something outside the traditional rules of the financial system and.

493
01:19:03.870 --> 01:19:09.870
Jonathan Payne: it's also something we have to be you know it's not the most user friendly interface right or.

494
01:19:10.320 --> 01:19:13.950
Jonathan Payne: The parts that are user friendly, you have to worry about to what extent.

495
01:19:14.310 --> 01:19:27.780
Jonathan Payne: In the back end there's something that might hurt you right because it's not a guarantee, if you don't understand the back end of the system that there's not something that can bite you later on, so at the moment I think it's a system that cries sort of a high level of.

496

01:19:28.980 --> 01:19:40.950
Jonathan Payne: Knowledge and a high level kind of skill to engage with I think there's an open question about to what extent that mitigates the current ability of the system to kind of service areas where there's kind of.

497
01:19:41.430 --> 01:19:48.600
Jonathan Payne: much lower you know areas that have maybe less economic development or less sophisticated.

498
01:19:50.040 --> 01:20:00.840
Jonathan Payne: Your financial and technical systems, to begin with right, so I think the the sort of barriers to use it at the moment might partly offset the potential to overcome these kind of.

499
01:20:01.380 --> 01:20:13.680
Jonathan Payne: These these kind of issues, but if interfaces can come in and it's clear how to trust the back end of kind of regular regular applications on it, then I guess yeah I think the potential is there in the longer term.

500
01:20:15.720 --> 01:20:19.710
Markus Brunnermeier: So two more questions one image just following up from the questions in the audience.

501
01:20:20.880 --> 01:20:32.940
Markus Brunnermeier: You could explain how the steamer would help for mortgages, for example, because at the end, ultimately, you still have to seize before closer house, so you still need a regular legal system to implement that that's.

502
01:20:34.200 --> 01:20:36.090
Markus Brunnermeier: You would dispute that I guess.

503
01:20:36.180 --> 01:20:45.090
Jonathan Payne: No, I don't get that and I think this is a that is definitely an open questions, I mean I there have been attempts, I guess, I did a webinar with her see for Johnny you.

504
01:20:45.150 --> 01:20:46.560
Jonathan Payne: run speaker, which is.

505

01:20:47.400 --> 01:20:55.440
Jonathan Payne: Quite focused on trying to do mortgage lending and so, in that, in that world they put all the features of the mortgages onto onto a blockchain and then they.

506
01:20:56.880 --> 01:21:02.310
Jonathan Payne: And then they use that to kind of find a way to to trade mortgages and do things and package mortgages.

507
01:21:04.020 --> 01:21:11.730
Jonathan Payne: Yes, but but definitely enforcement of physical objects to some extent, how much that happens in the real world.

508
01:21:12.930 --> 01:21:25.260
Jonathan Payne: And that's definitely I mean that's definitely a barrier in the sense that it's it's hard you know if you're operating in a much more digital space it's much easier to see how you could do enforcement purely in kind of like a different ecosystem.

509
01:21:26.100 --> 01:21:36.270
Jonathan Payne: Once you move away from that you, you have to think about yeah how you're going to integrate with with other aspects of it, I mean you talk about the supply chain example, which is a.

510
01:21:36.930 --> 01:21:43.140
Jonathan Payne: good example, in a sense of what they do on the supply chain is they put tokens to track the movement of all the different goods.

511
01:21:43.710 --> 01:21:59.190
Jonathan Payne: And so you work with a system where you withhold payments until certain things are done, and you can work out when things are done by tracking the movement of where everything goes, and so, in that sense, you try to integrate the the enforcement of the payment contracts with the.

512
01:22:00.450 --> 01:22:10.140
Jonathan Payne: With the with the payments, but if it's someone like a mortgage on a house, you know you've bought a house, you have to keep the personality it's very hard to point to a digital ledger and say, well, I own.

513
01:22:12.210 --> 01:22:17.310

Jonathan Payne: possession is yeah in that case position is going to be nine tenths of the law and that's going to be hard to shift, so I think.

514
01:22:18.690 --> 01:22:24.630
Jonathan Payne: There are some things that are particularly difficult to move into a D Phi like structure and.

515
01:22:25.860 --> 01:22:28.410
Jonathan Payne: If you listen to a lot of these podcasts you see a lot of them kind of.

516
01:22:28.680 --> 01:22:33.870
Jonathan Payne: will listen to you see them grappling with how to to think through these kinds of examples, because you go.

517
01:22:33.870 --> 01:22:43.680
Jonathan Payne: From digital objects that are very easy something like a supply chain, which is more easy, which is a bit more difficult, maybe still feasible, the things that are extremely difficult to try to integrate into this world.

518
01:22:45.300 --> 01:22:53.070
Markus Brunnermeier: So let's conclude with a final question, you said you look at two polar cases one is define everything is decentralized there's no concentration of power.

519
01:22:53.490 --> 01:23:03.600
Markus Brunnermeier: On the other end you everything moves much more to this platform structures with ledger attached to the platform and actually a universal ledger ideally combining everything.

520
01:23:04.590 --> 01:23:14.310
Markus Brunnermeier: We had to bet on one of the two outcomes that suppose you can only go for one of the two extreme outcomes which we will do think the future will look like in five years or 10 years.

521
01:23:14.520 --> 01:23:16.890
Jonathan Payne: And then I really a betting person, but I think.

522
01:23:17.430 --> 01:23:19.260

Markus Brunnermeier: we'll keep keep us percentages.

523
01:23:19.380 --> 01:23:19.740
and

524
01:23:20.850 --> 01:23:21.870
Jonathan Payne: that's even harder right.

525
01:23:22.710 --> 01:23:24.420
Jonathan Payne: you're running you're running a.

526
01:23:24.690 --> 01:23:25.680
Markus Brunnermeier: order book with all.

527
01:23:25.890 --> 01:23:37.350
Jonathan Payne: The go in your webinar right, you have a whole series of bets that over time and we should put we can put the betting on a decentralized system markets, and you can be leaving.

528
01:23:37.500 --> 01:23:37.800
today.

529
01:23:41.790 --> 01:23:43.410
Markus Brunnermeier: But the what's your what's your leaning.

530
01:23:43.410 --> 01:23:44.730
Jonathan Payne: I think I think for me.

531
01:23:45.570 --> 01:23:58.260
Jonathan Payne: I mean, I think it's pretty early with the D fi system mean it's not so early with with character, I mean bitcoins been around for a while, but we define as a very recent addition and we're talking about a you know, a couple of years it's really taken off.

532
01:23:59.580 --> 01:24:03.540
Jonathan Payne: I think it's so many senses pretty early to try to make the judgment, but I think.

533
01:24:04.620 --> 01:24:11.820
Jonathan Payne: For me it's, it seems, I can see a lot of reasons why, having transparent programmable legends are helpful right.

534
01:24:12.960 --> 01:24:20.220
Jonathan Payne: I think that the the barriers to entry and finance are very high, like it was it was extremely exciting seeing my students.

535
01:24:20.580 --> 01:24:28.500
Jonathan Payne: In the course of a semester go to being able to build quite interesting and sophisticated financial application that's a really exciting technology.

536
01:24:29.010 --> 01:24:45.600
Jonathan Payne: And it would be really exciting to see you know, innovation and entry into Finance and the way we've seen in so many other fields right I think that's so I can see a lot of excitement for that the decentralization and self though to me seems like a harder sell in the sense that.

537
01:24:46.710 --> 01:24:53.460
Jonathan Payne: If it's really proof of work, so you don't have to trust large players or you don't have like big owners having a bigger state.

538
01:24:54.060 --> 01:24:58.800
Jonathan Payne: I think the environmental costs to me is in very high, so I think that's seems prohibitive.

539
01:24:59.220 --> 01:25:09.270
Jonathan Payne: If we move to a world where like big players with big stakes control the system that doesn't seem as different to something like a traditional banking model where you trust the Bank, because they have a stake in the game.

540
01:25:10.350 --> 01:25:19.830
Jonathan Payne: So, in that sense, I think, to me that the decentralization aspect of it seems seems less exciting as compared to what you can do with this ledger technology.

541
01:25:20.400 --> 01:25:28.050

Jonathan Payne: So, in that sense, I guess, it seems like if the ledger technology is more exciting than maybe the decentralization itself.

542
01:25:28.410 --> 01:25:35.010
Jonathan Payne: And then that that would that would lend us to think that firms coming in and offering kind of easy to use ledger's.

543
01:25:35.610 --> 01:25:49.860
Jonathan Payne: That you can you know better control by some kind of central authority, like a bank or a platform that people can kind of work with and integrate and write write code on that seems like potentially a that seems potentially like a pretty attractive thing to see.

544
01:25:51.510 --> 01:26:02.070
Markus Brunnermeier: Thanks a lot Charles, and so let me just say so, ideally, you know the regulator should come in and also make sure that there's enough interoperability, but, as we have learned.

545
01:26:02.520 --> 01:26:14.460
Markus Brunnermeier: Interoperability is not a single thing it has many dimensions, you know whether the token is interoperable or the information is portable and all these things and it's quite subtle and perfect interoperability is not the ideal thing because it kills off exam dictated.

546
01:26:14.940 --> 01:26:24.840
Markus Brunnermeier: So it's a quite a subtle things with regulators have to be involved and stay on top of the game as well and, of course, the private sector is to push ahead and innovate in that space or.

547
01:26:25.320 --> 01:26:36.900
Markus Brunnermeier: And we will see in the next years or decades well how the financial system will look like our money will look guide but it gave us a glimpse today thanks again and I see you around.

548
01:26:37.320 --> 01:26:38.130
Markus Brunnermeier: And you.

549
01:26:39.210 --> 01:26:54.720
Markus Brunnermeier: Frequently all the time, and so, and thanks, and I think, to all the listeners for hanging out and being with us and learning with us, and then, if you please,

welcome hope to see you next week again next week, we talked about American immigrants and why they're so successful.

550
01:26:56.250 --> 01:26:58.650
Markus Brunnermeier: With Leah pusan provide.

551
01:26:59.550 --> 01:27:03.480
Jonathan Payne: Thank you, thank you Marcus Thank you Thank you everyone for listening and giving questions.