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with hedge fund manager Erik Townsend

Julian Brigden: The Truth about Central Bank Liquidity January 30th 2020

Erik: Joining me now is our first feature interview guest this week, [Julian Brigden](#), founder of [Macro Intelligence 2 Partners](#).

And of course Julian is famous for his terrific macro slide decks. He has prepared another of those for today's interview. We strongly encourage you to download that handout from the Research Roundup email, where you can find the link.

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Julian, it's great to have you back. Before we dive into your slide deck, it's an FOMC week. Let's talk about the FOMC statement and market reaction to it.

What's your take?

Julian: Thank you very much for having me back on the show.

Look, I mean, what did we expect? I mean, Powell tried to say all the right things. I think he deftly avoided some of the issues that are out there, most noticeably the not-QE. He's definitively in the camp of believing that the repo and the Bill purchases are not QE.

I'd call him out on that. And I think that's going to be a large part of the conversation that we're going to have.

But I think he's made it clear that they are not going to raise rates anytime soon. They're going to try and run this hot. I think, unfortunately, they sort of snookered themselves, I'll be honest.

And I keep hearing from policy contacts who are in this sort of bizarre world where there's this sort of core group within the FOMC who don't want to call not-QE QE. They don't accept whether that's genuine or disingenuous. They don't accept that what they've done is QE.

But, apparently, now they're acknowledging the fact that, even if it's not QE, the fact that the market believes that it's QE is a bit of a problem.

I just think this thing has got so utterly out of control now that it's laughable and tragic at the same time.

Erik: Okay. Let's move on then to the slide deck, because that's the big topic.

I think it was Neel Kashkari who was the first – what did he say? I think it was a tweet where he said something like “Attention, conspiracy theorists...”

Julian: Yes, he did. He said QE conspiracists can say this is all about the balance sheet growth, but someone explain to me how swapping one short-term, risk-free investment (reserves in this case) for another short-term investment (Bills) leads to equity repricing. I don't see it.

Erik: It's so funny, Julian. I can't help but just add he's talking about that swap. What about the swap that came just before that one? That was the swap between thin air and the bank reserves that didn't exist five minutes earlier that he's now talking about swapping for another short-term, risk-free instrument.

Julian: You know, it goes back to – I think we've got to go back in time. And I think that's what I've tried to do in this presentation, Erik.

So if you look at Slide 3 – look, I think people misconstrue what central banks' policy is about. It really isn't about raising rates in isolation. It really is about affecting broad financial conditions. That's what – I know their instrument is interest rates, but they're trying to affect broad financial conditions.

And, as you can see from this slide, it used to be the case in the good old days (as you would imagine) that raising rates and tightening financial conditions went hand in hand.

You can see, I've put these green bars in here. You know, early '90s they're easing. Financial conditions are falling, and easing in that sense. (That's the Goldman Sachs Financial Conditions Index.)

You get to the mid-'90s, '94, they're hiking. Financial conditions are tightening.

And then you can see from 2000 onwards, this just broke down. It's utterly inverted. So you can see from 2000 they're easing like crazy and financial conditions are tightening.

In 2004, which is perhaps a little bit more a normal market, except it was in an equity bubble, the financial conditions are easing. I mean, this thing has flipped 180 degrees. And this, we think, is a singular problem.

So if you look at Slide 4, we think this is the reason.

We think that post the dot.com bubble, for a myriad of different reasons (which we probably don't have time to go into at this particular point, Erik), the ability of conventional monetary policy (in other words, fed funds) to direct stocks, which are an integral if not *the* integral part

increasingly in the world that we live in, in an asset-based world (and I know you've talked about and we've talked about this a lot), to control financial conditions broke down.

The correlation has completely flipped. Completely flipped.

So if you look at the early '90s – Let's look at this, '91 to '94. You can see I've taken the Value Line Geometric Index because it's just equally cash-weighted. It isn't distorted by some of these big stocks. Fed funds are falling (in orange). Geometric index is rising. That's what's supposed to happen. You've got a negative correlation, you can see on the bottom.

And then fast-forward to 2004 into 2006. They're hiking and stocks are rising. They've utterly lost control. The correlation has completely flipped.

This is a big problem. How do you control an economy when you have no ability to influence broad financial conditions through the only instrument that you have?

And for the Fed, if you look at the next slide [5], we think this became a singularly big problem. Because we all know that in 1998 Greenspan came out with the "put." I've shown it here.

They actually cut rates, he comes out and says, I'm ready to cut ready to cut rates. And that did something absolutely transformative for our financial world, Erik. And I don't think people understand.

Now, the Bank of England has a chart. I haven't put it in here; it hasn't been updated for a while. But it goes back 250 years. It's only banks like the Bank of England with wonks and the data availability that they have that have the ability to create charts like this. But it showed something amazingly interesting.

It showed the correlation between bond and stock prices – prices, not yields – had never, ever, ever, ever been negative prior to '98. 230 years' worth of back data, never negative.

On from '98, it's continuously negative. Why?

I think it's because, prior to '98, we are fighting inflation. In an inflationary world, the bond market is what you're trying to protect. You raise rates, bond prices fall and stocks also fall.

And, frankly, as a central banker, you don't care really about stocks because you're most focused on bonds. You're trying to protect the value of bonds against inflation.

Post '98, we move into this world where you're fighting deflation, disinflation. And, in that environment, stocks actually become more important.

In that environment, you actually cut rates to support stocks. So bond prices rise and stocks rise. Okay, you get these bouts where things go wrong like the Taper Tantrum, the Bund

blowup, 2016 meltdown in Treasuries. But, broadly speaking, you've moved into this world.

And the problem that you've got, as we just showed earlier, is your ability to influence stocks is increasingly uncertain.

Well, fast-forward to the GFC [Global Financial Crisis], and this becomes a big, bloody problem. Your equity markets collapsed. You've got down basically to the zero-bound. What do you do?

Well, the good news is they found a new toy. And the new toy was the balance sheet.

Erik: Okay, Julian. So this is Slide 5 that we're talking about so far. And, boy, that inversion of correlation, as you're saying, is so striking on this slide.

Let's move on to Slide 6. What are we looking at here?

Julian: As we've discussed, we've said monetary policy or rates should be able to influence financial conditions. It seems to have broken down post the 2000 dot.com bubble. Because of this flip, this inability to influence the equity market in particular, which is a huge (obviously) component of financial conditions.

And then you fast-forward to the global financial crisis. And obviously, as we all know, the equity market imploded in the Global Financial Crisis. The Fed is essentially out of ammo, in terms of conventional monetary policy.

What the hell do they do, Erik, to loosen financial conditions?

Well, they come up with a new toy. And this is the balance sheet. And the good news is it seems to have been really, really effective.

So if you look at Slide 6, what you've got here is once again the Value Line Geometric Index (in purple), equally cash-weighted broad equity index, which is what I want to look at. You've got the Fed's balance sheet in white. And you've got the correlation between the two below.

And, whoa, look what we see.

Despite the fact that we're told that this is not how it works in bouts of QE – and, in actual fact, in 2018 during QT, what did we see? The correlation goes to close to 90% in every single occasion where we've seen expansion or policy intervention. And this time around, not-QT has also approached close to those levels. Close to those levels.

So the Fed basically found a new toy.

Erik: Okay, Julian. So, clearly, in Neel Kashkari's eyes, you are a conspiracy theorist. You believe this story that it is about the balance sheet, that that's been what has been driving this

move in equity markets.

Julian: Yes, look. If you're in that camp – and I'm not the only person in that camp – I do think if it walks like a duck, looks like a duck, it probably is a duck. But there are Fed officials who've been definitively in that camp.

In the first slides, I quoted Richard Fisher the old Dallas Fed governor. I think he was one of the few people who was honest enough to admit that he thought that this is how it was influenced. We've obviously seen Kaplan as well, he's come out.

But they're not alone.

A year and a half ago, I was actually at a symposium where there was a recently retired Fed governor. And I asked him this question: I said, it seems if this is all about displacements and controlling the bond market. Why, when you turned off the tap at the end of QE 1, 2, and 3, did equities wobble?

And in public he evaded the question. And then afterwards, over drinks, I sort of got the guy in the corner. And I said, oh, we've got this mutual friend in common and he completely opened up. And I said, would you mind, sir, answering the question now?

And I kid you not, Erik. His index finger came out and he started punching the air. And he said it's all Bernanke's fault. He started this nonsense and we've got to keep it going till we can't stop.

Erik: Wow. That's a big statement.

Julian: Yes.

Erik: Did you get a video. Can you post it on YouTube?

Julian: No, I didn't. And I'm not giving you his name. But I reeled back and I went, oh my God, I thought I was dark. I thought you guys had the solution.

I don't think they have the solution.

And I think the problem is – and we've seen this through history, Erik. I mean balance sheet expansion. Quantitative easing is just a veneer, a G7 21st-century veneer that you wrap around monetary debasement.

I've got a client who made a lot of money in Zimbabwe in the '90s as they debased, owning tangible assets, because he had a claim on tangible assets that initially were very, very cheap and then repriced as the currency collapsed and they printed more money.

The same is true of the Weimar Republic, between the wars. As Germany printed more and more money, actually equities kept pace because they are a tangible asset.

This is no different than that. It's just wrapped up, as I said, in this veneer of G7 central banking.

And the true test of this, I think, is in Slide 7. I don't think they've really appreciated what they've created here. And I think it's manifest in Slide 7.

So this model in white here is actually based upon a Fed model. It was the Atlanta Fed shadow fed funds model. And it was designed to measure the efficacy of QE. And you can see, when we hit the zero-bound in 2009 (which is the yellow line), QE kind of pushed that effective fed funds rate almost down to about 3%.

And, remember, Janet told us, oh, QT is just going to be like watching paint dry. Well, according to their own work, in actual fact the whole tightening cycle, when you take the balance sheet into effect, was enormous.

I mean, in terms of fed funds they did 225 basis points. If you take the balance sheet into account, arguably, 750 basis points.

So I don't think they've appreciated the power of the beast that they've unleashed. And I think this is a singular problem.

Erik: Okay, Julian. Let's move on to Slide 8. What are we looking at here?

Julian: This, I think, is the end result of QT.

They unleashed this powerful weapon they don't understand. I don't think they appreciate how powerful it is. Maybe that's disingenuous, an element of them being disingenuous. But the fact of the matter is, as I said, Janet said that QT was going to be like watching paint dry.

But we fast-forward to the end of last year and we all know that that wasn't the case. That, because of the mechanical changes which, once again, I don't think they understand – or certainly didn't – they broke the money markets.

The end result is that, once again, they had to resort to liquidity. And we get this explosion of repo (which is in white here), which pushed the overall balance sheet, together with some of the Bill purchasing that it started in October, this \$60 billion a month, also up to higher levels.

You haven't got quite back up to the prior highs, but they have definitely added to liquidity.

Erik: Moving on to Slide 9, why does Powell keep insisting that this repo stuff is not QE? Why is he so set on that? And is it QE?

Julian: Look, I think it's a little disingenuous, as I said. What I'm told from policy contacts is that the group that – and it fits with the previous quote that I gave you from that retired Fed official – there is a group within the Board who are suspicious that it may be influencing stock prices. But to admit it now would admit that they've inflated an asset bubble in risk assets.

And, in a way, they can't. Hence that sort of ridiculous tautology where I said maybe they're acknowledging now – and this is what I'm hearing from policy friends – that the market believes it's true, so they haven't got a choice but to believe it's true, even though they don't believe it.

I mean, it's got increasingly ridiculous.

But I think what I find very disingenuous is, if you look back at the past – let's take, on Slide 9, 2008 –

Now, as we know, at the end of the year we were doing QE. But we didn't start off with QE. What we started off with is we started to get problems with AIG, was actually a repo expansion. Ultimately, that didn't prove powerful enough but, at least initially, was seen as fungible with QE.

It's not long-dated; it's shorter. It's a Band-Aid, let's say, rather than a true solution.

But you can see on this slide how the correlation between that expansion of that repo agreement and the S&P really kicked in. To me, this is another indication that the thing actually is the same.

And if we move on to Slide 10, here is the ultimate testament, I think, of the power of short-term liquidity.

Now, in 2000 (and this is the Nasdaq from 2000), we were rolling into (as you and I can remember, Erik) Y2K. The whole world was going to blow up because we couldn't put a digit on a PC.

So what did the Fed do? Well, they didn't do QE. What they did do was offer a short-term repo facility, essentially. A liquidity facility. It only lasted about five months. You can see when it opened; you can see when it closed.

But in that period, Erik, the market that was up 100% year to date as you'll remember at that point rose 80%. The impact was incredibly profound. And right before the top the smart money two weeks before the facility actually expired, went away, the money had to be fully given back – took their profit.

I mean, to me this is a classic example of, yes, it isn't QT but it's short-term liquidity. And in that same vein, yes, the repo isn't QE and the Bill purchase arguably isn't QE. But, bloody hell, short-term liquidity also seems to be able to work.

Erik: Okay, Julian. Well, that obviously begs a question. If last time the thing to do was to get the heck out of the market two weeks before those facilities expire, excuse me, but I think that when the current operation expires has been a moving target that nobody can figure out, including the Fed themselves.

So as we move on to Slide 11, what's next here? What do we expect? What do we do?

Julian: Well, I think Slide 11, to me, is another illustrative example of – in a way it's quite similar to the 2000 analogy. And that's because it looks superficially, Erik, that, as in 2000 when the money went to where the momentum was and pushed it to real extremes, we've done the same again.

So if we look at Apple, which is a stock that's been doing very well, it's the darling of the market. It's in every single ETF, as we damned well know.

But the repo pushed this and the Bill purchase pushed this 50%. I mean, an enormous, enormous all-P expansion, mostly. And it looks to me that that's where this has gone.

If we look at Slide 12, here's another one.

And obviously this has gone up again after they posted their results. But the point is Tesla was a deeply debated stock (let's call it that) where we basically for three years sat in a range of 180 to 390 dollars.

Alright, there'd been no resolution of it whatsoever. The bulls had been in charge. The bears had been in charge. This thing just couldn't be resolved – until the repo came out. And one of the most shorted stocks gets squeezed to death.

It's now worth \$115 billion, biggest car company on the planet and everything is great. But the point is, this thing really jumped.

Another sector, if we move on to Slide 13, semis.

Now, semis are very sensitive to the economic cycle. As we all know, there is a lot of talk about this recovery in this economic cycle. I'm less convinced, I must admit, that the fundamentals are following, this time, the equity market.

But, nonetheless, we can see how the SOX, or the semiconductor index (in blue here) has just exploded away from the underlying fundamentals, heavily driven by names like AMD, which I do think a classic bubble. And we'll come to in a second.

But the point is, this liquidity has driven this divergence. We now have a divergence, which you can see is as extreme as in the dot.com bubble.

And what's very noticeable, Erik, is, unlike 2016, where the Fed pivoted last time and we got the reflation story, the fundamentals aren't following. In 2016 (I've circled here) how the stocks picked up and the underlying data, in this case Korean semiconductor exports, picked up two.

Erik: Okay, Julian.

Moving on to Slide 14, I'm sure many of our listeners know AMD is to Intel as Pepsi is to Coke. It's the other big manufacturer of CPU chips. What Do we see here? It looks like that classic bubble pattern.

Julian: It is. I mean, this is not actually the classic bubble pattern, but I think it's manifest of the same thing, Erik. This is just looking at the rate of change of AMD. This thing has been explosive. Utterly explosive.

We can see how the rate of change is now through where it was in 2000, through where it was in 2006. And that's fine, conceptually. But it does remind me of something that I wrote in the end of Q3 of 2018, just before we got the big collapse.

Now, back then, the drivers of the equity market were Amazon, Netflix, NVidia. And they were all in those classic parabolic moves.

And this is what I wrote:

That brings us to the big daddy Amazon, where given that 90% plus of analysts have a buy recommendation, it is sacrilegious to suggest that we might have a top in place. However, we aren't interested in fundamentals, just chart patterns. In that context, the doubling of the stock [price] since (the end of) last October, which in the process has added a mind blowing \$500bln in market cap –

(Let's remember Apple has added that in five months.)

– certainly counts as a parabolic move, i.e. the blow off final move of the "Mania" phase. As we've discussed, while these moves always look like they can go to the moon, the reality is that just like a jet fighter that "goes vertical" at some point, it runs out of oxygen or, in the case of Amazon, marginal buyers to suck in. That's a tipping point, because it doesn't fly off to the side but loses momentum and drops sharply.

So when I look at some of these other momentum stocks like Apple, the fact that it appears that they've been juiced – or Tesla – by this liquidity binge, okay, that worries me, Erik.

Because if anything comes along, even though those moves look incredibly powerful – right

those parabolic moves look really, really powerful – the reality of the situation is there is an inherent vulnerability in that the move cannot keep going forever.

And as soon as you lose that momentum, okay, then they don't fly off to the side. We didn't see Amazon back in 2018 fly off to the side. We haven't made new highs in Netflix. It dropped very, very sharply, as we all know, in Q4 of 2018 into the beginning of 2019.

This actually creates an inherent vulnerability.

And if we move on to Slide 16 I think this sort of sums it up. As in the past, I'm afraid that the Fed has created this vulnerability.

My base case for the recovery of the US economy and the fact that we were punting the reflationary cycle – like we had in 2016 was 60% to 70% – that we would pull it off. I was actually not quite as enthusiastic as I was in 2016.

I think the underlying signs of reflation are much weaker. I think we're much further along in the cycle. But I'd thought, on balance, that the Fed could actually do it.

What's actually worried me now is the fact that they've created this inherent vulnerability in the equity market by goosing things just simply too much.

And the fact of the matter is, look, as we look forward we've had, starting in September, about \$100 billion added to the balance sheet. In January, when we started to see some wobbles in the market, no surprise: That growth in the balance sheet has shrunk considerably.

Now, going forward, we were told by Powell that they're looking at tapering the Bill purchases. Which certainly, post the peaking of the repo (which happened at the end of the year), is going to be the biggest element of their purchase.

That could start to get tapered in April. We have about \$20 billion in mortgage-backed securities that rolls off. So that reduces that add. The repo itself has started to flatline.

So the point is, the rate of change of that balance sheet while it's still growing has dropped considerably. And you're left with these perfect stocks at absolutely pristine high levels. Well, I think that creates a vulnerability.

And if you look at prior examples in the same vein as the question I asked that retired Fed official: End of QE1 what do you get? Correction. End of QE2 what do you get? Correction. End of QE3 what do you get? A series of corrections.

So I think that that is the vulnerability that the Fed has actually created. And I'm praying that they haven't created so much vulnerability in this thing that we have something much uglier than that. I think at this point we're looking at probably a 10%, maybe a 20% or sub-20%

correction.

But I do think this overdoing it, this misunderstanding of the power of the tool that they've unleashed, the tool which gave them the ability to push things, I think, is really – they misunderstand or they're just being totally disingenuous.

Erik: Julian, we're going to need to leave it there in the interest of time so we can leave room for our second feature interview today.

Before I let you go, tell us a little bit about what you do at MI2 Partners.

Julian: MI2 Partners has been around now for eight, nine years. We write an institutional product which we call our MI2 Partners product. You can, if you're interested in finding out about that, contact us at support@mi2partners.com.

We also, in conjunction with Raoul – I know you've obviously talked to him on many occasions – we produce the [Macro Insiders product](#). If anyone is interested in that, they can reach us at the support email or reach out to [Real Vision](#).

Otherwise, if you just want to follow my on Twitter, it is [@julianmi2](#).

Erik: Well, Julian, I can't thank you enough for another terrific interview. We look forward to getting you back on in a few months for another update.

Now, listeners, Julian has just given you excellent reason to be concerned that the market is overdue for some kind of significant correction when a catalyst comes along. What could that catalyst be? Might it be this coronavirus outbreak?

Let's go now directly to our second feature interview with Dr. Chris Martenson, coming up right after this.

Transcription: Chris Martenson Interview

Erik: Joining us now is [Dr. Chris Martenson](#), who holds a PhD in pathology with a specialty in toxicology from Duke University and is also the founder and CEO of [PeakProsperity.com](#).

Chris, thanks so much for joining us. We've got a lot to talk about, so let's dive right in.

I personally hold a very out-of-consensus view. And, frankly, my greatest hope is that you're going to tell me that I have it all wrong and things are not as bad as I think.

Most people that I encounter on financial Twitter keep telling me, look, there have been no deaths outside of China. This thing is nothing more than a glorified seasonal flu. So, Erik, stop being an alarmist. Stop acting like this thing is going to be another SARS. That's crazy, it's irresponsible. Don't say that.

Chris, quite frankly, based on what I've seen, I think it would be godsend if this turned out to only be as bad as SARS. And that's definitely not consensus view. I fear that it's going to be worse.

But I don't hold a PHD in this field and you do.

So let's start with the big picture. What's your view of the situation, based on what we know so far? Is this thing likely to be more bad or less bad than the 2003 SARS epidemic?

And, let's just say overall on a scale, if you said that a bad seasonal flu season was the good end of the scale, and a repeat of the 1918 Spanish flu which killed more than 50 million people would be the extreme bad end of the scale, which end of the scale are we on? And where is this thing headed?

Chris: Well, Erik. First, thanks for having me on and I wish it was under different circumstances. This viral pandemic really has me pretty worried. And there is just a number of things that I know we'll get into that sort of define that. And this is where everybody – including your listeners especially, of course – need to be aware of the details of this.

Listen, none of us wanted to become viral epidemiologists. None of us wanted to know things like R_0 ["r nought" or "r zero"] (which I know we're getting to) and various terms. But, by the numbers, this is everything we've been expecting and worrying about and fearing would come as a pandemic.

And it's like right out of central casting, you know. It's from the movie Contagion.

This is a virus, a corona virus, which is an RNA virus, which has its lineage as coming from a bat, passing through a snake, picking up some mysterious middle zone which seems to confer the ability to attach to human tissue, jumped into humans, and then it's doing human-to-human transmissions.

And it's got some pretty bad statistics coming out of China. But I don't trust those. I think they're probably close to accurate in terms of their overall percentages and ratios. So the total infected, total serious complications, death rate, those ratios might be close to right.

But the total numbers, I'm sure, are being low-balled by China because that's politically what they want to do. And I don't know anybody who really trusts those numbers.

So, with that caveat, the numbers we're seeing are showing this to be on a perfectly exponential growth curve right now, which is what you'd expect for a cross-species-jumping virus where there is no herd immunity whatsoever. It's coming into a completely fertile field to expand within. And it's doing that.

So, yes, this has me very concerned.

Where is it on the spectrum? Well, if our health authorities really drop the ball, yes, this could be as bad as the Spanish flu and maybe worse. Because there's a couple of statistics we can get to later that are far more virulent and possibly pathogenic than the 1918 flu was.

And, again, a little caution. We didn't have the best data gathering back then.

But comparing what we know, this has all the hallmarks of being on that end of the scale, not on the flu end of the scale.

Erik: Okay, as you say, there's quite a few important concepts that we need to get to for our listeners.

So let's start with something called **asymptomatic transmission**.

What does that phrase mean? And, more importantly, why is it so important to understand its implications on the authorities' ability to contain the outbreak using the same technique that they were able to use in order to contain the SARS outbreak?

Chris: Well, sure.

Let's just break that word right down. "Asymptomatic" has its root as "symptoms." So what's a symptom of flu? Well, fever, chills. You've got aches and pains. Runny nose. Things like that. Coughing.

So “asymptomatic” is just putting the word “a” in front of that, meaning “no.” So no symptoms. So “asymptomatic” means we haven’t got any symptoms. We feel perfectly healthy. We look normal. A doctor could take all sorts of measurements and, say, can’t tell that you’re not just an uninfected normal person.

And then “transmission” means the ability to transmit this virus.

There’s lots of data now that there is this asymptomatic transmission: Individuals with no outward expression of symptoms have the virus, are replicating the virus, are shedding the virus.

And that’s a big, big problem for containment. Because if you can’t detect these people, but they’re out there spreading the disease. It makes it very difficult to contain.

And this was, of course, one of my earliest complaints that I put out there. January 24 was the first day I put out an alert to everybody who follows me.

And I said, hey, not only is this seemingly to be a pretty bad virus in the scheme of things. Not only should we be taking it very seriously.

But these efforts (air quotes around that word) at the airport where you have the people holding up the little fever detector that they point at your forehead, the temperature reader, are totally ineffective if you’ve got asymptomatic transmission. Because you’re only going to detect people who have a fever, which is fine but it’s not nearly enough.

And the key with something like this – you talk to any epidemiologist, any virologist – the key to stopping a pandemic like this is you have to contain it. And if that means a full city-wide quarantine that nobody can escape, that’s great.

But allowing planes with people whose condition you don’t know to jet all over the world is actually not the right way to go about this – if you have asymptomatic transmission.

Again, I don’t have direct confirmation of that. But I have reports out of China saying that that’s the case here. Especially among children.

There’s a number of cases of young children 10 and under who have the disease who test positive for the disease who are expressing no symptoms. And that’s quite a worry.

Erik: Okay, Chris. Let’s talk now about a number that epidemiologists call R_0 .

What does that mean? Why is it so important? And how does the R_0 value for nCoV, the new virus, compare with something like SARS or other well-known diseases such as, let's say, the regular seasonal flu?

Chris: This is a little bit of a technical concept, but super-important, one that's well worth grasping. Not only for this particular incident but to understand it in general. It's handy during any flu season.

So R_0 is just a measure that asks and tries to answer this question: For an average person who is infected with that particular virus, how many other people are they going to pass it to while they're in their communicative stage of this, or transmissive stage?

So an R_0 of 1 would mean, gosh I have a chance of passing it on to one other person. And R_0 of 1 is sufficient for something to stay resident within a population. It just keeps passing from person to person and it lives. But it doesn't really explode. It just kind of stays there.

An R_0 of less than one: Say I have a .5 chance of passing it to somebody else. Those will actually self-limit and die out over time. Perhaps your listeners have heard of these mystery diseases that sort of emerge and then go away again. Many of those have low R_0 or less than 1 R_0 – can be an explanation of why that happens sometimes.

But things start to get a little tricky when you get over 1.

So let's take a normal flu season. A lot of people have said – and I heard you say it at the intro – hey, flu kills 8,000 people a year. This is no worse than the flu. In fact, it's only killed a fraction of the people that flu takes out – in the United States. That's a United States figure alone.

And they've got a point.

But the R_0 of flu, seasonal flu, is 1.28, which means –

Let's take this through 10 hops. And what I mean by that is, I've got the flu, I pass it to 1.28 people on average. Those 1.28 people pass it to another 1.28 people on average. And these 10 hops –

Let's make it easy. These hops happen in a day. I become infective in a day. In 10 days' time, with an R_0 of 1.28, there would now be 139 people out there infected with this disease compared to my original 1.

And if those hops take three days, that's a 30-day window. And if they take seven days – you know, just keep multiplying. But we're just trying to catch the number of hops. I hope I'm making that clear.

Well, now let's jump up to, say, an R_0 of 2. And it's thought that the Spanish flu had an R_0 of 1.8,

so it's slightly less than these numbers. But I'm just taking whole numbers, so it hopefully makes it easy.

That means that 2 people get infected from me. And then those two infect four and then eight, 16, 32, 64. And it jumps like that. After 10 hops with an R_0 of 2, we have now seen an infection of 1,048,576 people. Let's call that 1.05 million people. Compared to 139 when we had an R_0 of 1.28.

So that's what happens when you go from 1.28 to 2.

Now what happens when we go from 2.5 which is the low end of the R_0 scale estimate for this nCoV virus? And, again these numbers could all change. And I'm really worried we have bad data out of China. This could be too high; it could be too low. We don't know. But right now it's the best number we've got.

An R_0 of 2.5, you take that through those same 10 hops we've been talking about and that infects about 91 million people. So this is why the R_0 not matters a lot. It's an exceedingly sensitive number.

If it went to 3, that would become 3.4 billion people.

So that just tells us – the R_0 doesn't tell us that 3.4 billion people would get infected. But it tells us how infective this is. And it begins to help us understand –

You know, when we were looking at China it was like, oh, there's 1,000 cases, less than 50 deaths. And, next thing you know, they're shutting down Beijing and Shanghai and really going quite serious in their efforts. This begins to explain why, because it's a very, very infective disease.

Erik: Okay, so it's too early to know exactly what the value of R_0 is going to be. But what we do in finance and what you do in science is the same thing. If you can't predict something, you start looking for a proxy that will give you a sense of it.

Now, I know you have been watching, as have I, the almost perfectly exponential growth rate of the case count coming out of China. A lot of people are really on my case on Twitter saying, why the hell are you trusting Chinese statistics? And the answer is I'm not. But, if anything, China is under-reporting this. I don't think it's actually better and China is telling us it's worse than it really is.

So if I just go by the statistics that the Chinese government is giving me, to me it seems like we're on a perfectly exponential growth path.

What do you make of these data? And what does it tell you about the contagiousness of this nCoV virus? And how does that relate to the R_0 concept?

Chris: Well, first, we need to understand that, yes, these are low-ball numbers. These are going to be the rock bottom.

And there's a number of reasons for why we would not trust the Chinese data, even beyond we don't trust the Chinese government to tell us the truth.

The simple truth is they didn't have the ability to test properly for this early on. It's a very sensitive test. It's a polymerase chain reaction test, test kits. It takes time to assemble them. It takes time to process them. Labs have only so much capacity.

If this thing is an order of magnitude more prevalent than we think it is, the cases reports could simply be something where that's as many as they could detect, because that's how many kits they had.

And I know they're ramping up kits, but their most recent statement was they're going to be able to do 2,000 kits a day. Well, that doesn't help you when you're getting 4,000 new infections a day when you get to that part of the curve. And we're pretty close to that at this point, based on the data we have.

So that's Part 1.

Part 2, it's really important to note the trajectory of these things. And it maps into the infectivity or the transmissiveness of this.

So when we look at SARS, it first started getting tracked in March of 2003. And there were a few cases then. And that's when it sort of blossomed into awareness.

But when they did the forensics on it and they went back and they said, jeez, how far back? Where did this start? Because that's always the question you want to answer and ask in this particular question: Where did it start?

And that tells you a lot about how it spread and what the mechanisms were. There's a lot of information in that particular piece of information.

Well, the farthest back they can trace SARS was in November, 2002. So from November to December, January, February, April, May – all the way on out. It took months for it to even burst onto the scene.

Now, our first reports were that December 8 was the first known case. I think they're trying to back that up into maybe October or November. It's still a little murky where this thing started and when it started.

But, even with that – let's back it all the way up to October somewhere, somehow this thing got

out into the public.

The early data says that the pace of the spreading of **this** – and the case count and the death count – vastly exceed anything that we've seen in SARS, vastly exceeds anything we see in Swine flu, and every other sort of pandemic that's come along that we've been worried about lately. MERS, all of that.

This thing is spreading a lot more easily and it's actually blowing the doors off of any other disease that we've had out there.

And the press has done a magnificently, terribly, horribly bad job of trying to compare this to SARS to say, look, it's not that bad. When they're comparing apples to oranges, statistically. And they don't understand that this is a time-series data, not one where you get any information from just looking at total numbers.

"Well, SARS had 8,000 cases. We only have 6,000." Totally irrelevant.

On the basis of the timing of this and how fast it came out and the nature of its perfectly exponential curve right now (which, again, might be based on low-ball data), tells us this is something that's worthy of our **strongest respect**.

I'm not asking people to be afraid and panic and do all that stuff. But I am saying, oh, this is something that deserves your attention. And people should decide that for themselves and not rely on whatever it is the World Health Organization or CNN is saying. Those organizations are always going to be a day late and a dollar short on a story like this.

Erik: Okay, so we don't know what the real numbers are going to be. But the data that we do have available to us is suggesting that this is more contagious than SARS or the common flu or MERS or any of these other things. Swine flu and what have you.

Meanwhile, unlike SARS where they knew how to contain it, because they take your temperature because you get the temperature or fever before you become contagious, all they have to do is quarantine you, test you for it. It's a pretty straightforward process there. It doesn't work there because of asymptomatic transmission.

Now, a lot of people despite all this are saying, look, okay, we get it. China is clearly in a crisis. But there hasn't been a single death outside of China thus far. (I think that's actually not true anymore. There was one in Thailand.)

But they're just saying look, okay, so don't go to China. But, aside from that, stop worrying. This thing is only affecting China.

Chris, is that logic sound in your opinion? And if not, specifically why not?

Chris: Well, I just did a podcast the other day with John Barry. He literally wrote the book on the Spanish flu. And he's really just a world expert on this and has served on a bunch of panels under various presidents around virus infectious diseases.

So when we look at what's really happening here and how it's spreading, I like to think of it –

You know those brush fires that we've seen in Australia where there is that main contagion, that main fire is burning? That's China. What you have to watch out for are the sparks that are heading outside.

And firefighters can get in there and when there's just a few embers flying forward from the main fire area, you can knock those down. That's what's happening right now. I mean, last count yesterday, there were 18 countries that had detected this. I'm sure it's higher now.

We had a really worrying case in Japan where their second case was a bus driver who caught it earlier that month, this month (And we don't know what that means. Was that four weeks ago? Three? We don't know.) from a group of tourists from Wuhan and then eventually had symptoms and presented.

Now, that's worrying because it's a bus driver.

And somehow he caught it from somebody on one of his buses. We're going to assume that they weren't being physical and chummy and things like that, because I don't think that's how those two cultures interact. So this was airborne.

And then if he had an asymptomatic transmission phase, as a bus driver there's no way you're going to track down everybody who was on every bus that this gentleman drove. So that's where it becomes worrying.

And then those sparks that are flying around out there, eventually there is a spark that you don't catch, there is a spark that catches fire. And by the time you get in there, you find that you're fighting a second fire in a second country.

That's the thing we've been waiting for. I think that's just a matter of time.

And, again, we're going to have to defer here to something called the **law of big numbers**.

When this thing was first erupting up through about the 20s of January, say the 19th through the 25th or something – there were still, I think, a relative handful of cases. Even if it was 10 times more than China was admitting to, that's a relative handful.

When, now, at the exponential phase, with each hop we're adding about 40% more new cases per day, which means in two days you've doubled the entire previous case count. Welcome to the doubling functions of exponentials.

And that's the concern with every one of those doublings. You just now have more opportunity statistically for one of those embers to escape your quarantine, to jump the border, to get out of control and land there.

To me, it's just a matter of time, at this point, before we see that take hold in another country.

Erik: Okay, we have a disease that is contagious for a full week before the person who is contagious even knows that they're sick. And it's also considerably more contagious than the common cold or a regular seasonal flu.

Now, here's where I'm struggling, Chris, to understand what might be coming next. Because, with SARS, they could contain the outbreak by scanning people's temperature. You quarantine people who have a fever. It's a pretty clear process there.

And that worked so well because people got the fever before they got contagious to other people around them. But that's not true with nCoV.

So what I'm struggling with is what should we expect in terms of what the authorities could even do?

Obviously, the extreme draconian response would be to shut everything down, declare martial law, and tell everybody in society not to interact with other people unless they're both wearing an N95-rated face mask (which, by the way, I want to ask you more about later on).

But that would have an insane impact on society. So, clearly, that's not practical. What could they do short of that, though, in order to contain this thing when you consider that the people who are transmitting it don't have any symptoms?

Chris: Well, I think it's too late to talk about what we could do to stop this thing. That horse is out of the barn right now.

Next, you would say, okay, given that – I mean, the earliest thing to do would have been to say, wow, they detect this stuff in Wuhan and that's it. No flights out. Severely limit the traffic and just see if you can contain it there. Very hard to do.

The containment numbers have to be nearly perfect. Like 99.5%. Like, nobody's walking across the countryside and riding their bicycle across the woods to get away from this thing.

You'd have to have nearly perfect containment. And, even then, you would have to have the containment in place long enough for this illness to burn entirely through that population and to basically go away. Very, very difficult to do.

So now what do you do? And this where, again, I've been very critical of efforts.

Because the proper way to deal with something like this is you want to immediately get people engaging in proper hygiene, everything the CDC would recommend in their pandemic handbooks:

- You're going wash your hands.
- You're going to carry around hand sanitizer.
- Everybody's wearing masks.
- You're going to have social distancing, like keep at least six feet away from people.
- Don't go into places with large crowds.
- Maybe even you shut down schools and other public gathering places like that, for a while.

And that's not to stop the disease. It's to **slow it down**.

Because what you don't want to have happen is for the disease to rampage through your population to the point where it overwhelms your local hospital systems. It's still going to come and it's still going to work its way through.

I think that everything we've seen, **unless** this virus does some magic mutation to suddenly become transmissible but not lethal or problematic, unless we get one of those magic things, **this thing is going to burn until we get a vaccine developed. And that's going to take some time.**

Erik: Okay, Chris. Now, it sounds like, no matter what, we're going to get a really big outbreak in the sense of this spreading to a lot of people. And that's people all over the world. It's not going to be contained to China.

Flights have been going in and out of China every day. And, as of the 30th, the day that we're speaking, they're still sending flights in and out of China every single day.

But what the mainstream media and the financial Twitter crowd are all saying is, look, it might be a really big deal and a lot of people are going to get it. But what they're going to get is just a jazzed-up flu. It's not like SARS, which has a really high fatality rate of between 9% and 11%, depending on which statistic you look at. It's much closer to a seasonal flu.

So, okay, maybe a whole bunch of people get sick and miss a few days of work. Big deal.

In particular, they've pointed out that, when you calculate the fatality rate, which is dividing the death toll by the case count, it's only about 2%. Now, frankly, Chris, 2% sounds pretty bad to me, since it's like a 10th of 1% when we're talking about the seasonal flu.

But I know you just wrote an article debunking that method of calculation in the members' area at PeakProsperity.com. So please give us the overview of that article. How should we be

thinking about case fatality rate for nCoV if it's not the simple calculation of divide the death toll by the case count, which is what everybody is doing?

Chris: Absolutely. And let me start by just framing this, saying there are three big things. Remember, I said we shouldn't all have to become viral epidemiologists? But here we are.

Three big things to know about:

One is the **case fatality rate**, and we're just about to discuss that.

The second is the **R_0** . We've discussed that.

The third is what is the **serious complication rate**?

And when you put those three pieces together, that's when you get a full view of any particular virus – and any particular pandemic, in this case.

So let's back up to the **case fatality rate**. The mistake that's being made all the time is exactly what you said, where the current case count is divided into the known death count. (And, again, both of those numbers might be wrong due to bad reporting for a variety of reasons, some legitimate, some illegitimate.)

But, taking that as it is, let's pretend we had perfect numbers, that's still the wrong way to go about it. And here's why.

Each and every day, the people who are being diagnosed with this, that number is growing by 40% a day. So it's growing really, really fast.

Second, even if you get diagnosed with this (ahh), you don't die like 10 minutes after you get diagnosed – if you're going to die. It takes time for this to develop.

Let's say from – and we don't have the statistics on this yet, so don't hold me to any of this – but let's imagine it's five days. Let's imagine from the day you present at the hospital and you're like, jeez, I can't breathe. This is getting really bad. And they say, oh yeah, gosh, this is really bad. It might take five days for somebody who is going to die to die, on average.

So, therefore, what we can't do is take **today's** case number and divide it into **today's** death number. We have to take **today's** death number and **go back** five days in our case number and divide by that number.

And that will give us a very different case fatality rate. In this case, if we did that with this one (again, full caveat, using the data we've got), the question then is, well, **what is the case fatality rate if we do it that way**, Chris? And the answer is 11%.

Now, I'm not saying this is right and I'm not going to sit here and try and defend this. Because I don't know if it should be a five-day lag I don't know if it should be seven, it should be three. I don't know if I can trust these numbers.

But I will tell you that taking **today's case number** and dividing that into **today's death number** gives you an **inappropriately low number**.

And here's another thing. Here is an easy prediction: Every day you continue to do that, the case fatality rate is going to look like it's dropping, while you're in the exponential phase. Because cases are accumulating much, much faster than deaths. Because those two lines have very different trajectories. They're both exponential, but they have a very different rate underneath it. So when we look at that, this is a mistake that's being made a lot.

But I would agree with you: Even if we threw all of that out the window, 2% is an unacceptably high risk. And, as well, we have to understand that's not 2% for everybody. It's really, really **heavily clustered in the 50 and older crowd**.

And, paradoxically, it may look like – I made a prediction early, early on, on the 24th. Because it's a flu, it's a coronavirus, so I thought, jeez, old people and the very young – infants in particular – usually the people with weakened immune systems, those are going to be the most at risk.

Actually, we don't have anybody under the age of I think 38 was the youngest so far? Don't hold me to that, but I think 38 was the youngest. But, really no kids. And no infants.

So it honestly looks like that 2% is a zero if you're under the age of 30. But it might be much, much higher than even the 11% I talked about if you're 70, 80, 90, things like that.

Erik: Chris, I want to pick up on what you just said a minute ago. You said it's not just understanding this question of the case fatality rate, but also the **serious complication rate**. Tell us more about that.

Chris: The flu, the normal flu has a **serious complication rate** – by which I mean you require the ICU bed or equivalent at the hospital. You need ventilation, you needed really active support and aggressive medical treatment.

The serious complication rate for flu is typically under 1% in any given season. And for this nCoV, by the numbers, it's around 20%.

Now this all factors in because, as we've seen so far – I don't know, what do we got? Last count, it was, like, 70 confirmed cases outside of China? And people have been saying, hey, look, no deaths.

Well, actually, if the fatality rate was 3% or around there, we would have only expected maybe

two or three deaths out of that particular number of people who got infected. So it's zero, two to three. So we're not statistically in the clear yet.

But, as well, all those people who came out of China who were diagnosed with this, many of them were quite young. You know, below that magic 50-year-old mark I would say, somewhere in that zone. And all of them got the very, very best medical treatment.

And this is where the serious complication rate comes in. Because if we simply took the current rate of exponential growth, which is about 40% a day, and we take that with a 20% serious complication rate, and we just go out 30 days from yesterday, we find that at the end of that there's going to be about 23 million people world-wide with serious complications. 115 million are infected. (Again, if we continue the current trajectories.)

So what does that mean?

Well, now I think the case fatality rate actually ties into that serious complication rate. Because that low case fatality rate that you might experience when people are getting every all-hands-on-deck – they get their own isolation ward, they've got a team of doctors and supportive nurses and assistants.

That case fatality rate becomes very different when your hospital system becomes overwhelmed, like we saw in the early days of Wuhan's hospitals. (By the way, I haven't seen a single image from a hospital in five days through the media, so China has got a great firewall clamped down on all of that.)

But what happens – and this is the reason I get concerned and why I think it's appropriate to have a measured sense of respect for this particular illness – the kind of care you're going to get before your hospital system is overwhelmed is very different from the care you're going to get after it gets overwhelmed.

We saw the images from Wuhan, right? There's people in the hallways, they're lying on gurneys in the hallways. They're getting IVs while they're sitting in chairs.

That's the kind of care that you end up getting when a system gets overwhelmed. You're not in a private room with ventilators and 62 machines that go "bing." It's a different experience.

And so once, I think, the serious complication rate comes into play and it overwhelms your hospital system, the case fatality rate now is going to spike, simply because you can't put enough care in for people.

So let's imagine, just for the sake of argument, all 115 million of those cases came to the United States. (They'll mostly be in China in this 30-day example.) And we had 23 million serious complications.

I need to put this in context, because the United States has just under 95,000 ICU beds in its complete hospital system. Nearly all of those are already full with the usual car accident victims and people who have other end-of-life issues going on or other complications right now. So it's not like we even have 100,000 beds kicking around.

But the question becomes what kind of medical care are you getting when you have tens of millions of people requiring their serious complications to be dealt with when your system is swamped?

And that's why I take a complete opposite view where the CDC came out recently and said they didn't have any evidence that this was passing asymptotically. Therefore, they said, until we get that information we're going to act as if that's true.

I would take it completely the opposite. I would say, until you have evidence that it is not passing asymptotically, you should pretend as if that is happening. That would be an abundance of caution.

And I get it. From public policy, it's hard to make these sorts of decisions. You're going to shut the economy down. You're going to worry about angry senators and congressmen and people calling you because you've dinged the precious economy.

But in a case like this, with these numbers that we're talking about here, I think an overabundance of caution is the right way to go. And it makes a lot of sense because of what happens when you get to that point of overwhelming your hospital system.

And, by the way, China doesn't have a third-world hospital system. It's actually very good. People get really high-quality care there.

And we saw in Wuhan, even when they allegedly had less than 50 deaths on the books, they started building that emergency thousand-bed hospital thing that we've all seen. You know 50 excavators working at once.

They're doing a really amazing job building that. But they wouldn't have been doing that if they didn't have a severe need and a shortage. And this is in a city of 11 million.

They probably already had many, many tens of thousands of hospital beds, total hospital beds. And hundreds if not thousands of ICU beds. And, allegedly, this was all with only 2,000 people needing it. None of that made sense.

So all I can do is trust that the Chinese government is reacting from some data that they haven't shared yet. And it's probably on the high end of anything that you and I have talked about so far.

Erik: Chris, I just want to let our listeners know that the comments that you've just made

almost perfectly mirror the comments that I received from one of our regular listeners, who is an ICU nurse in the United States.

She wrote me and she just said, Erik, all the people, they're saying it's crazy to think about this like 1918's Spanish flu because we have modern medicine.

And she's saying, look, I'm modern medicine that they're talking about. And the way it works is we are just incredibly good in the ICU at taking incredibly good care of this tiny, tiny little handful of people, the very small percentage of people that need ICU care in the United States at any moment in time.

And she just said, look, we are not equipped, we don't have a system, we don't have a process, we don't have procedure. We don't know what to do with a pandemic that a whole bunch of people all need ventilators. We've only got so many of them. You don't just order another ventilator on Amazon. It's not the way it works.

So these comments – it was actually one of the questions I was going to ask you later on, so I just want to let our listeners know that.

But let's move on now.

Because what you've said is we're talking about a disease which is extremely difficult if not impossible to contain because of asymptomatic transmission and the very high contagiousness rate. So it's probably more contagious than the flu, maybe more contagious than SARS.

And now you're telling us that, after adjusting for the effects of exponential growth in the case count, maybe that case fatality rate that a lot of people have been not worried about because it was only 2% or 3% – which, frankly, I think is worrying by itself – that might actually be more of a SARS-like figure of 9% or 10%.

But, meanwhile, the mainstream media, everybody on financial Twitter, they're calling me a nutcase and they're telling me not to panic. And quite frankly, to quote Hugh Hendry, I'm kind of starting to think maybe it's time to panic, at least a little bit.

This is not my field though. You're the PHD here. Please tell me if I'm missing anything.

I would so love it if you just said no-no-no, you're panicking for no good reason. It's not time to panic. It's not going to be as bad as SARS. It's going to be better in some ways.

But that's not what I'm hearing here. So help me see what I'm missing, if I'm missing anything.

Chris: Well, you know, I've been having this debate. And I've been trying to focus my thinking around it. Because I get bombarded with that as well, with the people who say, Chris, you're panicking people. That's wrong.

And it's usually with a little bit of a paternalistic tone: Oh, not me; other people. So they're fine, but they're worried about other people.

And I happen to have a lot more faith in my fellow humans. I believe that if given the full complement of information almost everybody will do the right thing with that. A few may be unable to really process that.

But I'm really operating from a place of, listen, give people the appropriate information, they can make appropriate decisions. And so I'm not advocating panicking because that would imply making bad decisions and doing things that are more harmful than not.

So here's what I've been trying to do to sharpen this up. Let's imagine for the moment that you said, listen, don't spread any fear around this. I'm like, okay, can I spread facts about this stuff? Because that's all I've been doing. I'm like, here's the facts. And when they change, I'll change my view on this. But, as the facts stand right now, no, you're not being alarmist.

So here's how I've broken this down in my head:

Let's imagine we've said, okay, let's not, let's – no fear. Let's not, let's not give any caution to the public because you can't trust them.

Alright. So in a no-fear case, people don't know what the risk is, so they don't change any behaviors. They walk around, they're coughing. They sneeze without covering up. They shake hands. They touch their faces. Maybe they eat before washing their hands. They still congregate. They're not using proper hygiene.

Tens of millions under this scenario get infected. Hundreds of thousands develop serious complications. Tens of thousands die. Unnecessarily, because the hospital system got overwhelmed because people just let this disease rampage through their population.

So let's go with the fear. What is fear? It's not fear. It's just caution. It's just prudence, to me. So what happens if people are prudent about all this?

They take the data and they go, huh, well, okay. Maybe they are a little fearful because this is virus particles and we can't see them, so that makes us a little unnerved.

But, because they can't see this and there are those unknowns, they develop an overabundance of caution.

- They socially shame people who cough and sneeze without wearing face masks.
- They don't shake and touch hands or escalator railings, doorknobs, or any of that stuff without immediately using hand sanitizer that they now carry with them everywhere.
- They forego large gatherings, places where congregation might unnecessarily expose them

to higher odds of being near an infected person, symptomatic or otherwise.

And, because of that, there is a **vastly slower progression of this disease through the population**. The contagion, therefore, doesn't swamp the hospital system like your reader was talking about, that nurse saying there's only so many resources to treat the severely ill.

And because of that, because that contagion doesn't swamp the hospital system, many more people live.

So this is where I'm really at odds with the people who say "don't spread fear." Because I'm not spreading fear, I'm spreading information. And I'm saying if we treat this with appropriate prudence and respect, we have a chance of managing it.

But if we just keep people ignorant, that's where the trouble actually lies. And this isn't equivalent to saying, oh, I did this in philosophy class and we learned that yelling "fire" in a crowded movie theatre is a bad thing. This isn't a crowded movie theater. This is a very different situation. This is contagion.

You want people's behaviors to change. And that's really hard to do from a public policy standpoint.

Look, FEMA is out there in California every year reminding people they live on active fault zones. And people see the destruction every so often. And, with all of that, with all of that pushing, about 3% of the population of California has a 48-hour emergency kit in their closet. It's very hard to get people to change behavior.

So I think this is an important conversation and debate to have. But it's not binary. It's not fear/no fear. The question is: What's the right amount of emotional connection you want people to have so that they pay attention and actually change their behaviors?

Because information alone never changes behaviors. And that's the critical mistake that the no-fear crowd is making. They're thinking, oh, when it gets bad we'll just give people information, we'll change. That never works. Not in the real world. It doesn't work that way.

Erik: Okay, Chris, we're both telling a pretty grim story here. So in the interest of responsibly journalism, I want to intentionally take the other side of this argument.

You have admitted that we don't know what the R_0 value is. What we're doing is we're using the exponential growth rate of the case count as a proxy to tell us that it looks like that R_0 could be a pretty high number.

The thing is, the really scary scenarios that you and I are both looking at is **if that case count were to continue to grow exponentially, as it has been, on that same trajectory for the next two months, we'd be looking at hundreds of millions of people being infected.**

But you said yourself there is an exponential phase.

So is there an argument that says, okay, look, you go through a phase that we're going through right now where there is an exponential growth of the case count, but that peters off and then all of a sudden you get to a much slower growth and it's not so bad?

I'm not the PHD here. What other arguments are there that we should at least be giving some airtime to that make the opposite case, that maybe this is not as bad as you and I both fear it could be?

Chris: Well, the strongest argument I have right now is maybe all the data we have is just complete junk, that China is feeding us really bad information and even they don't know because their systems aren't good enough to track things appropriately.

So that would be my biggest hope in all of this is that China has bad information and so do we.

And, by the way, I'm really encouraged by the fact that we haven't seen a lot of spreading yet across other parts of the world. A few cases here and there, but almost all of those, Erik, are from people who just got off a plane from China. So that's really actually pretty good news.

And I don't have a great explanation for that yet.

So I kind of think that data is at odds with the China data right now. And I'm still – I think the next few weeks will tell us a lot.

Second, if you do look at something like SARS, the reason that that one levels off – It didn't really have a true exponential explosion phase and then it did level off – is because of everything you mentioned. Which is that this was something that you could actually chase down and prevent because, once somebody presented, that's when they became infective. So there was a little tiny window between when they might have been infective and when they got detected.

And, because of that, there were relatively few contacts that they had made socially and you could hunt all of those down.

The worry in this case is that, of course, if it is transmitting during an asymptomatic phase – back to that Japanese bus driver. We don't know how many people got on his bus and how many people they then contacted.

And also that five-day incubation period, which could be seven, it could be two, we're not really clear. It kind of looks like it's centering around five but, again, data could change. That means that there is plenty of time to make lots and lots of contacts.

So my hope at this point, to take the other side of this, is to say, well, maybe China's got it wrong. We haven't seen a real explosion in cases yet, outside of China.

So those two pieces together feel pretty good. And so I'm pretty hopeful around that.

But I don't have the hope that we're going to be able to contain this by tracking down all of the possible exposed people because, what do you do? Oh, there was an infected person on that plane flight. There were 238 other people on that plane and they walked through a terminal. You just can't. You're done. There's no good way to track all of that down.

So that's where we're just going to have to watch this.

And I would also remind people, this is going to go through **phases and waves**. The Spanish flu was three main waves. The first one was bad, but not that bad compared to the second wave that came, around six to eight months later. That one was really bad. And then the third wave was pretty bad too.

These things tend to go in waves because, again, we're starting from a population of about 7.8 billion with zero percent immunity. (Well, maybe there's a few naturally immune people out there for reasons we don't know yet. But, essentially, effectively zero.)

So it's going to take a while for the **herd immunity** to build up – these are people who get it and survive. And, by the way, most people do. So the herd immunity will build up.

And the other thing we're going to have to watch out for is the **mutations** that are going to be happening. This is an RNA virus; they mutate very, very rapidly.

I was reading about one cluster case of a family in China where they did RNA typing on all of these viruses and said, where did they get this? Because they were expecting them all to come from within that family. And they did. There was a person who brought it there.

But every single member had basically their own brand of coronavirus when they tested it. So it mutates very rapidly.

The hope is that it mutates in a positive direction. The fear is that it mutates in a negative direction.

But, let's be clear. **The one mutation that gets selected for always in a virus is the one that makes it transmit farther and faster.** The hope is that you get **that** mutation **plus** a mutation that makes it **less lethal** for some reason.

And, again, too early. We don't know really what's going on with this this yet. So the other thing I would caution people around is all of this information may well be very different by later today, tomorrow, next week. And it's just being gathered fast and furious and it's going to

sharpen and crisp up over time.

Erik: I haven't mentioned yet – and I probably should have – that we are recording this on the morning of the 30th before the WHO press conference. They may declare an international emergency at the press conference later today. They have not done so as of the time of this recording.

So, clearly, Chris, the important part of this story is its humanitarian impact, the implications socially, what people can do to protect themselves and their families from infection, and so forth.

The thing is, though, this is MacroVoices. This is an investment website. You already have a terrific website at PeakProsperity.com where you're covering all of those aspects of the outbreak. Our job here is to translate world events, even bad ones, into their economic and market implications.

So I'd like to tap your financial brain now and talk about what this is going to mean for the economy and financial markets. Let's start with the economy.

Now, SARS had very significant impacts in Hong Kong, where it was centered. But, really, in terms of global GDP, SARS was basically a non-event. It freaked a few people out. It blew over. It was forgotten about from an economic perspective, although it had horrific humanitarian implications.

How do you see this nCoV thing playing out, based on what we see so far.

Chris: Well, this actually has me very worried, economically speaking.

And I'm especially worried for my fellow United States citizens – everybody, everywhere, but in this country and, I think, Canada too, Australia – we're just loaded to our eyeballs in average or median household debt. The amount of savings people have is not high. And when you get something like this coming through, what people need to be prepared for, is the idea that schools may close for weeks, which they already have in Hong Kong.

If it gets bad enough, your whole city may shut down for a period of time, which we're seeing in Beijing, Shanghai, Wuhan – they look like ghost cities.

It's shocking in a way that's hard to convey. Seeing these eight lanes in each direction, sixteen-lane-wide boulevards that you can walk across without looking in either direction and be totally safe because there is nothing happening. No cars. No trucks. No buses. Everything is shut down.

That, to me, is the equivalent of riding your bicycle and shoving a fat stick through the spokes on your front wheel. Really, it's never the fall that hurts you. It's how fast you stop.

So this is a really, really sudden braking of the world economy.

And, as I'm sure your listeners are more aware than most, this is at a time of record-high indebtedness and a lot of fancy shenanigans in the financial system and financialization. All of which is kind of dependent on everything continuing to work just right.

So there is just that raw shock value, which just is something that can be very hard for financial markets to absorb and digest. It's a tough thing in a world where 16% (or whatever the number is now by the BIS) of companies are zombie companies. And things like that, where you kind of need everything kind of to cook along. You need your financial markets really operating well to keep zombie companies going.

And then, on the logistics and operations side, we don't know what this means. So Shanghai and Suzhou right next door, which is a major manufacturing center, are both effectively shut down.

And, hey, they were closed for the Chinese New Year, but they're not going to be reopening for sure until February 8 at the earliest, according to the official dictates. And that could change. It could be later, maybe earlier. But probably later.

So what does it mean? We can't really analyze that yet.

The global supply impacts are going to be just impossible to parse through and we're going to have to do it on a case-by-case basis. But we could do worse than to back up. Look at the London Metal Exchange and just see it cratering, looking at the price of copper. Cratering. Even as the stock price at Tesla vaults up – that's a story stock I'm tracking very carefully.

Two things:

One, the base inputs. This is going to be things like oil, coal, steel prices, copper, all those base inputs.

And then, as well, I'm looking at the edge of things. I'm looking at the triple-C credit that's sitting out there. Look at your HYG, your JNK as proxies. But also, if you can get your hands on actual triple-C credit spreads, things always start from the outside in.

And I'm worried that this is a financial shock that qualifies as the proverbial black swan. Nobody expected it and nobody knows quite how to process it and events are moving faster than people's ability to process them.

And so that shock value, I think, is the thing that worries me the most about such an over-leveraged system as the one – thank you, Federal Reserve and other central banks – the one that we've been granted in all of this. Because this sudden stopping or cessation, that's

going to be the thing that's going to really jar the system. And we're just going to have to watch and see what happens. But the risks are very elevated right now.

Erik: Chris, let's touch on gold briefly.

When bad things happen in the world, gold usually goes up. Now there is theory I've seen written about on the internet, which is that Lunar New Year, the big Chinese holiday, which has basically been cancelled, is a major gold-gifting and buying- period in a lot of Asia.

So some people thought that this was going to be a big down event for gold prices. So far, that is not what the chart is showing me. What is your outtake on what this means for precious metals?

Chris: Well, gold does really well in times of uncertainty. I have less analysis of it in terms of stocks and flows and all of that because, you know, there is quite a lot of gold floating around there. And really the question is: Why would people want to hold it?

And, for me, – and, again, I don't ascribe anything to this idea that you want to hold gold because it's an inflation hedge. That data just doesn't stack up well there.

But what it does stack up perfectly for – and I think I can make a logical argument for – is it does really well in times of financial uncertainty, especially if you think there is counter-party risk involved. It's a Tier-1 asset.

It not only behaves like money but it has a quality that most money doesn't have, which is that, when you own it, it's nobody else's liability. It's just an asset that you've got.

It's got a very special sort of a role to play, particularly during periods like we had in 2008 when nobody knew who to trust. And Lehman Brothers was going down. Oops, there goes Bear Stearns. And when people didn't have a lot of faith or trust, that's when gold has a very important role to play.

And, secondarily, we've been seeing a lot of people taking that sort of position anyway. All across Europe, a lot of central banks even getting back in on the buying game. And I think a lot of that is because gold is something you can be at least certain of to some degree during very uncertain times.

And my concern, and the reason I hold gold through all of this, is I don't like the central banks printing. And I'm convinced that Jay Powell is going to print more and so will the ECB. They'll do all of that.

But what they can't do is they can't print their way out of a collapsing Chinese oil demand. You can't print your way out of collapsing demand for copper. You can't print your way out of the fact that if a company is fundamentally unprofitable at its core it's never going to be a

profitable company.

We've got a lot of zombies out there. And we've got a lot of unicorns that are making negative cash flows. And we've got a whole shale industry that's still burning negative cash flows.

So those are things that you can't really fix with monetary policy. And the concern, the reason that I'm a fan of gold in this environment – and I won't be forever, but I am right now – is because I think that the central banks are going to continue to print until something just breaks.

And when it breaks, the amount of uncertainty in the financial system is going to be large enough that nobody is going to want counterparty risks. Everybody is going to be scrambling for non-counterparty assets. And there aren't that many of them. Gold is a tiny market compared to – well, even Norway's sovereign wealth fund, just to name one thing.

So that's really where I think that gold is going to do well, as it were. And I wish it wasn't going to do well for those reasons. But here we are. Nothing I can do about 10 years of really bad central bank policy.

Erik: Chris, I wish we could go on, but we're way past out of time. Before I let you go, and we didn't even get to N95-rated masks and the various precautions that people can take. You cover a lot of that at PeakProsperity.com.

So very briefly what is PeakProsperity.com? What can our listeners expect to find on your website?

Chris: Well, it's a wonderful community of people. This is where I post all my content of course. It's about 90% free. We have a place for subscribers as well, mostly people who want to go deeper and have some of those off-line conversations that aren't appropriate to have in public.

And my role in the world, I call myself an information scout. And I just do my best to make fast-moving complicated situations, like this one, simple. And as well to analyze through the big, big, big trends, like you.

And I'm also looking the economy, as well as energy, as well as the environment. I think we have to look at all three together. To me, those come up with a collective uh-oh and what do I do about that?

And then most of the work after the problem definition is done is around how do you prosper in this environment? What kind of changes can you make in your life, should you make? Across all sorts of dimensions including your health, the food you eat, where it's grown, your emotional health and capital, as well as your social capital.

So we touch a lot of dimensions because we see a world that's changing and our listeners and

subscribers want to be in front of those changes.

Erik: Chris, in closing, I sincerely hope that you and I are both completely wrong in the concerns and fears that we have. But, frankly, I would rather err on the side of caution than complacency. And I think a lot of people are erring in the direction of complacency right now. So I hope that people will ridicule us for being all wrong about this, but I'm afraid that might not be the case.

In any event, we're going to have to leave it there. Patrick Ceresna and I will be back as MacroVoices continues, right here at macrovoices.com.