



Daniel Want: Systems Views of OTC Derivatives

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Erik: Joining me next on the program is [Daniel Want](#), cofounder and CIO at [Prerequisite Capital](#) in Australia. Daniel, thanks so much for joining us on the program.

I want to start with your overall view of the market, because you take a different approach than other people. You apply systems analysis to financial markets. What specifically do you mean by systems or system thinking? And how does that play into the way that you approach markets generally?

Daniel: Thanks, Erik. Basically, the majority of us are trained, when we go through university or even in a lot of the more conventional and institutional sort of career paths of fields of study, especially economics and finance, to think effectively in quite a linear, reductionist-type mechanical sort of manner.

When we talk about a systems view of the world, what it is doing is shifting our view of the world from the world operating as a machine towards the world operating as a living ecological-style adaptive system. So it's drawing on a lot of lessons from complex adaptive system theory and trying to better understand the interconnectedness, how everything fits together, and the knock-on effects, the relationships – the adaptive nature of all of these relationships and things and how it all transitions.

Instead of looking at, for example, a subsystem or a company or – in this case we're going to be talking a little bit about banks. Instead of looking at a bank in isolation through a reductionist mechanical view of the world, where we're trained to basically look at capital adequacy ratios and all of this sort of thing, at the bank in isolation.

What we're more interested in when we look at the banks, for example, from a systems perspective is the interconnectedness risks of that bank as a subsystem within a broader system.

So we're more interested in that web of relationships, their impacting flows, and the interconnectedness risks that puts that balance sheet at risk that either will present tailwinds or headwinds to that balance sheet.

When we look at a systems view, we're stepping right back, looking at how everything interrelates with everything else from a quantitative point of view. If we're looking at the world through our more conventional reductionist lens, ultimately we're making assumptions around

return distributions and all of this sort of thing, that probability distributions will be somewhat stable.

Whereas in a systems view of the world, we are more attuned to understand how the system is functioning and self-reinforcing with feedback loops, and when that system breaks down and transitions into different regimes.

And when that happens, those normal or those statistical distribution functions that we're assuming will tend to shift, and then we get fat tails and it's a very dynamic and evolving sort of set of circumstances.

Erik: I want to pick up on the theme that you mentioned around interconnectedness and interdependency. Because if I look at something like the OTC derivatives market, there's just trillions and trillions of dollars of these things. And the academic view is almost, well, yeah, everybody's got to be on one side or the other so it all nets out to a zero-sum game.

But when you look at this from a systems perspective, what risks exist as a result of all of the over-the-counter derivatives that are in existence and all of the exposures that so many financial institutions are exposed to in the system?

Daniel: Yeah, precisely. Obviously there is quite a significant discussion we're about to have on these topics. But part of the systems view of those interconnected risks is understanding how, when you get groups of actors all pursuing their own self-interest, seemingly independently of one another, when you combine all of those actors and participants together, quite often you can actually get emergent-type phenomena where the overall behavior of all of these people in aggregate start to have materially different characteristics to them.

So all of these people in isolation, when the academic world looks at derivatives (and even the regulators to a certain degree), they really take to an extreme the whole zero-sum theoretical foundation of the derivative world where you have a winning side and a losing side, it all washes out and, overall, there's not really any risk. It's sort of the extreme view on things.

In practice, however, both sides have to start provisioning balance sheet capacity to be able to actually even play the game and sustain any form of derivative exposures.

When we step back and look at the realities around both the size of what is going on in especially the over-the-counter derivative world and then the nature of the activities of all of these different participants, we also basically start to see some dynamics which, in some ways, are hiding in plain sight but I believe are quite underappreciated by investors and market participants generally.

There is one thing we probably need to touch on and that's some of the incentives around, say, the banking industry versus the regulators and all of this sort of thing. The OTC (over-the-counter) derivatives essentially are nothing but betting slips on future price

movement of certain financial metrics, whether they be markets or all sorts of things.

The banks, for the last decade or so – since 2008 especially – their fundamental business model has been suffering from a whole variety of headwinds that have been pressuring their earnings, return on assets, return on equity, all of these sort of things – everything from issues around net interest margins to compressing credit spreads to increased regulatory requirements where they're needing to boost capital buffers – all kind of putting headwinds on their return profile.

The only area where they have a little bit of give or some flexibility in terms of driving earnings and even earnings growth – and we're talking about the 12 to 15 major banks in the world that account for the majority of this over-the-counter derivative activity – and these tend to be the largest banks in the world anyway. From a bank's perspective, when they are dealing in over-the-counter derivatives they're essentially the bookmaker.

Because of the way the academic world and even the regulatory world view over-the-counter derivatives, especially this netted version of the zero-sum risk in the system and the way accounting works and all of this sort of stuff – When the banks are dealing in and selling basically over-the-counter derivative instruments – they call it securities, but really all they are are just betting slips or just contracts, not much more than just a wagering operation. When they sell these things it has minimal balance sheet impact.

In fact, most of it hits their P&L in terms of fees and commissions and all of this sort of thing, because of the accounting and the regulatory framework that we have.

And, in some ways, they're rightly viewing a lot of this stuff through a netted perspective in that reductionist, isolated sort of sense. And so bankers can actually drive earning by just selling more of these things. And all of this over-the-counter derivative activity more so hits their P&L and it is incredibly profitable activity. A lot of this stuff goes straight to the bottom line and it has minimal implications for their balance sheets.

So they've got huge incentives. And the only way a lot of these banks have really been able to maintain their earnings profile and even see a little bit of growth in earnings – and so bankers hitting bonus targets and all of this sort of stuff – is in this over-the-counter derivative world.

The other complicating factor is that, because a lot of these over-the-counter derivative instruments and their uses beyond just speculating on financial market prices and movements and things, you can use over-the-counter derivatives to synthetically re-create funding arrangements.

So bankers – there's been lots of anecdotal evidence and there's a lot of incentives for different types of businesses to re-create off-balance-sheet-style funding arrangements, liabilities, and basically playing games to game the system, especially under existing accounting standards and treatments and regulatory frameworks.

So the risks, in addition to issues around maturity matching where they're effectively funding long-duration assets with shorter-duration funding structures using combinations of derivatives and wholesale funding market instruments and all sorts of things that are not necessarily fully appearing on balance sheets – both in banking and financial system realms and also in the real world, in normal businesses, even government entities – have been caught out playing games like, for example, Greece and the Goldman Sachs debacle that unfolded there.

Erik: Daniel, let's come back to the subject of netting versus gross exposures and how much risk exists there, because I think it's something that's really not discussed very much. All these banks will tell you, look, we're 99 gazillion dollars short something, but we're also 99.1 gazillion dollars long the same thing because we're market-makers and that's what we do and it's not a big deal. It all nets out. It's no problem. Net, net. There's not that much risk.

The problem that that ignores is if one of the counterparties fails and all of a sudden some of that exposure is absolute and it doesn't really have the hedge that they think they have. All of a sudden they've got a huge uncovered risk.

How realistic is that scenario where one of their counterparties fails in a way that creates a systemic risk? And is there a risk of that cascading through the system and magnifying to the point where it becomes a systemic risk to the overall financial system?

Daniel: Yes, you're right. One of the responses to the 2008 financial crisis where clearly deficiencies around counterparty risk and all of this sort of stuff really came to the surface is the regulatory response.

Part of it has been trying to move the over-the-counter derivative world towards centralized clearing houses to put a counterparty in between all of these other counterparties to manage the counterparty risk. Even just this month, the Bank of International Settlements put out in their quarterly review quite a reasonable article actually starting to raise concerns and doubts around the abilities of the centralized clearing parties and operations – we've already started to see incidences of the reserves of these centralized clearing houses almost being wiped out.

And we're not even in stressed conditions, now albeit the examples that they were citing were derivatives relating to fairly illiquid sort of exposures. But, nonetheless, there's already concerns and cracks appearing with the whole theory around moving towards these centralized clearing parties.

It's a step in the right direction. But when you really dive into the realities of how it works and how they calculate and drive the margining requirements, it falls massively short of the intended objectives of the regulator push.

Now, there's a second issue embedded in the question that you were referring to around netting. When you look at the over-the-counter derivatives picture, most people are looking at that picture from the perspective of the banks. It's like, in gambling terms, you're looking the

picture from the perspective of the bookie or the bookmaker. And everything nets out. They make sure it nets out. They capture a spread and they make their money in running the book.

That's why people tend to just worry about the netted terms. They dismiss the gross market value of derivative exposures that are out there.

But when you look at it from non-bank participant perspectives, when you step back to look at the broader system of all of the participants out there operating in the over-the-counter derivative markets – and evidence seems to suggest that the bulk of over-the-counter derivative activity is actually either directly or indirectly for speculative purposes; it's not in reality a useful economic hedging function like it's marketed to be – the bulk of activity is actually speculatively driven.

When we step back, the Bank of International Settlements probably provide the most reliable estimates of derivative exposures and activity out there. Every six months, they survey the world and basically publish a lot of statistics around these things. And three of the headline statistics that they tend to publish – obviously, there is the notional derivative exposures that everyone's heard about where we have something like I think it's 595 (or roughly) trillion US dollars' worth of notional exposure of derivative contracts out there.

Then a second item that they tend to identify is a line item called gross market value. The gross market value of derivatives basically measures – There's two sides to every derivative exposure. You've got the side that is basically in the money and the side that's basically out of the money or losing money.

So there's what they call gross positive market values and gross negative market values. And that's really just saying this is loosely – if we were to shut down the trade today, what the value of, say, the margin transfer or the money flow (roughly speaking) between the two derivative parties that are involved – remembering that the bank in substance is a bookie-type facilitator of this activity as opposed to – They obviously take directional risk in outright exposures to derivatives but, in this instance, we're more talking about these non-bank participants.

The BIS produced these estimates of measurements of the gross market values, which are an absolute combination of all the positive market values out there versus all the negative ones. and they add them together. So it's an absolute aggregate of the two sides of the trade.

Effectively, in substance, when you strip it all back to what the heck does that really mean? those gross market values are effectively like the balance sheet capacity that participants who are operating in the derivative world are having to provision like a margin to put up to be able to sustain those notional exposures.

Both parties, even the party that's in the money, because there's a lot of moving parts in the derivative world and, frankly, volatilities change and on a forward-looking basis even the party that's in the money is still at risk of swinging out of the money. So they're still having to put and

provision balance sheet capacity against these notional exposures.

Anyway, when we step back functionally in the broader system we have an estimate of the margining in balance sheet requirements of that broader system has to put up to sustain these notional exposures. And that's in the aggregated gross market value figures that we see.

In a perfect world, where we didn't have a lot of pro-cyclical moving parts like haircuts on collateral, re-hypothecation rates, and etc. etc. – a lot of technical dynamics – if we didn't have all of those moving parts, maybe we could take say 50–60% of that gross market value estimate and allocate that as the sort of margining requirements to sustain the notional over-the-counter exposures that the world has.

But, in reality of the sort of volatilities out there of markets and potential volatilities that we've experienced in broader history, and the fact that we do have a very cyclical set of moving parts in terms of collateral haircuts that is used and posted for margining requirements (and all of this sort of stuff), the actual reality of the margining requirements in the broader system to sustain those notional exposures is more towards say 70–100% of that gross market value that is recorded by the BIS.

So that gives us a bit of a summary, a rough estimate of the margining requirements out there in the broader system in the broader world of what it takes to sustain the notional exposures. And that tends to correlate, as we'll see soon, with capital-market implied volatilities and movements. Mainly because a lot of those margining requirements are calculated as a derivative of, say, what they call value at risk or VAR models which are all kind of derivatives of how volatile are markets out there.

The more volatile, the more margin and balance sheet capacity we have to put up. And the less volatile, the less margin, cash collateral, and balance sheet we need to provision to sustain these exposures.

And the swings in those margining requirements, they're one of the most material determinants of how much liquidity is in the broader global financialized system.

We're going to get into some charts now to actually have a look at what this all practically looks like. We'll jump through these charts selectively and pretty quickly because there is a lot information here. And this chart deck that we're providing is really best studied later on if you are interested. But Erik let's jump into some of the charts.

Erik: Listeners, you'll find two downloads linked in your Research Roundup email. There is a PowerPoint presentation and a longer, more detailed book of charts. I encourage you to spend time going through both of those. Daniel has provided a fantastic wealth of knowledge that goes well beyond the amount of time we have for today's interview.

Just to get some highlights, Daniel, in your PowerPoint presentation, let's look at Slide 15 where

you talk about OTC derivatives from a systems perspective. What is this slide about?

Daniel: On Slide 15 here we can see basically a really rough approximate gauge of what we'll loosely call the margining requirements on the outstanding exposure of over-the-counter derivatives. Labelled "A" here, that's the notional exposure, and at the moment it's almost US \$600 trillion.

In blue, with the right-hand scale, it's actually the gross market values that we were just talking about before. When you divide the gross market value by the notional, that gives us probably the best rough estimate or approximate view on what the margining requirements – how much balance sheet capacity in the world is effectively being tied up to be able to sustain these over-the-counter notional exposures.

There's a few technical things which have caused a few different trends in these things, but the key takeaway is that we're now at lower margining requirements on this big pile of derivative exposures than we've ever been. Lower than 2007, even.

You'll see on the next slide, Slide 18, the 2008 global financial crisis effectively was a globalized scramble for cash and collateral. So it was like a big margin call. And because we can measure these things in a rough sort of way with these Bank of International Settlement statistics – Keynes used to say it's better to be roughly right than precisely wrong – well, this is a roughly right type of analysis from a systems view.

In 2008, from the lows in 2007 we can see that increase in margining requirements was actually a US \$24 trillion scramble for cash and collateral. And that more or less wiped out in the GFC overall US \$26 trillion of the value of global equity markets. So really what that was is a system-wide margin call where the volatilities in markets started to escalate, funding costs in wholesale dollar markets and the shadow bank world started to escalate, and we got a scramble for cash and collateral.

So all of this under-provisioned balance sheets in the world of these broader non-bank participants all of a sudden had to raise liquidity and provide balance sheet capacity to try and meet, basically, the margin call that was unfolding on their notional derivative exposures. That meant selling everything else in order to raise liquidity wherever they could. And that was effectively triggering off that reflexive deflationary shock that we saw in 2008.

Obviously, when liquidity really recedes it exposes the weakest areas first. And that's where we get the symptoms of a lot of these broader dynamics occurring in the form of the issues in the mortgage-backed securities markets and all of the popular understandings of what 2008 was.

Erik: Daniel, Slide 19. Give us the bottom line here on what this is telling us.

Daniel: Right now we're at all-time lows in margining requirements in the world on \$600 trillion worth of notional exposure.

If we were to just move back to say the mean or we actually have a reflexive event trigger in the world that sees volatility reflexively feeding on itself and basically a liquidity shock in the world, that step up in margining requirements on that notional exposure amounts to effectively between a \$8 to \$25 trillion margin call and scramble for cash and collateral. That's one hell of a bid for both, ultimately, US dollars, anything that serves as collateral especially the higher-quality collateral like Treasuries, and all of that sort of thing.

Now, it doesn't mean it would be triggered tomorrow. But this is one of the risks lurking beneath the surface. And when we analyze global system liquidity, this is probably one of the biggest stories that no one is really paying proper attention to. So it's well worth looking into all of this for yourself.

Erik: Needless to say, Daniel, there is so much more – a wealth of information in these two very substantial downloads that you've very thoughtfully made available to our listeners. Again, folks, that's in your Research Roundup email. If you're not registered yet you can find a button that says "[Looking For The Downloads](#)" next to Daniel's picture on our home page.

Daniel, we're going to have to leave it there. But for our listeners who are interested in following your work and learning more about what you do at Prerequisite Capital, how can they contact you?

Daniel: It's best to just jump on our website www.prerequisite.com.au and, basically, they can find out a little bit more about what we do. There's some samples on there of our research and all of that sort of thing. We're always happy to have a chat with anyone. Thanks a lot for your time.

Erik: Thanks so much. We appreciate your time, Daniel. Patrick Ceresna and I will be back as MacroVoices continues, right here at macrovoices.com.

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