

iLLUminate Blog Transcript: Zach Zacharia on Biggest Threats to Global Supply Chain Heading into 2025

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- ANNOUNCER: 00:03 This podcast is brought to you by iLLUminate, the Lehigh Business blog. To learn more, please visit us at business.lehigh.edu/news.
- JACK CROFT: 00:15 Welcome. I'm Jack Croft, host of the iLLUminate podcast for Lehigh University's College of Business. Today is December 23rd, 2024, and we're talking with Zach Zacharia about the most significant trends in the supply chain in 2024 and the biggest threats facing the global supply chain as we move into 2025. Dr. Zacharia is an associate professor of supply chain management, interim department chair of Decision and Technology Analytics or DATA, and director of the [Center for Supply Chain Research at Lehigh](#). In August 2020, the Center for Supply Chain Research and the [Council of Supply Chain Management Professionals](#) launched the [Lehigh Business Supply Chain Risk Management Index](#), or LRMI, for short, to better understand the different kinds of supply chain risks businesses face. And that's what we're going to be talking about today. Welcome back to the iLLUminate podcast, Zach.
- ZACH ZACHARIA: 01:16 Thank you. Thanks for having me.
- CROFT: 01:18 Now, in 2024 and continuing into 2025, there have been two risk categories—Cybersecurity and Data Risk, and Government Intervention—that have pretty much dominated the list of risks that most concerned supply chain professionals each quarter. So if you could talk about what factors go into each of those risk categories and what accounted for the high anxiety caused by the threats they posed to the supply chain.
- ZACHARIA: 01:48 The factors in Cybersecurity that I ask the managers to consider are cyberattacks, data corruption, data theft, system viruses, hardware and software issues, and security platform controls. As you noted, Cybersecurity has been essentially the number one risk for the past year, except for one quarter when Government Intervention sort of jumped up. And there are a number of reasons why supply chain managers are particularly worried about Cybersecurity. The first thing that really sort of reaches out is there's an increased dependence on digitalization. In other words, we've moved to more working from home. We put more of that kind of information up on the clouds. We have a lot more things associated with the Internet of Things. The second thing that really has happened is that the criminals are getting much, much more sophisticated. They're using machine learning to automate these kinds of attacks. So the number of attacks has been increasing. There has been a real push to get state-sponsored agencies who are-- there are global conflicts, obviously, and there are other countries who are specifically targeting U.S. companies.
- ZACHARIA: 03:13 And finally, one of the things that has sort of come out of the rise in cryptocurrency is that now there is a way for attackers to get payments anonymously. And I know that there are people who believe there's a lot of value in cryptocurrency, and I'm not questioning that. But that definitely makes it easier for these criminals to receive these payments. And finally, it must be noted that many companies still have a lot of legacy systems that require a lot of work to fix. So this is a very, very top-of-the-mind issue. I then want to focus on Government Intervention. Now, the factors in Government Intervention are new regulations, tariffs and trade wars, government restrictions on source material methodologies or technologies. One thing I must say,

the Government Intervention really only jumped up to among a top risk really the third quarter when there was a lot of uncertainty in what was going to happen with the election. So it is the very first time in all the years we've ran the LRMI that Government Intervention became number one.

ZACHARIA: 04:34

And again, it sort of makes sense, because there was a lot of uncertainty about the election, what are the new policies of the incoming administration? The average risk for government intervention was 72. And then it jumped up to 81. And as you know, that is a very, very significant jump. But then it dropped down to 74. So people still see there's a lot of uncertainty, especially when it comes to tariffs. And so that is one reason why government intervention has jumped so high. And I still think that there's a lot of uncertainty about what's going to happen going forward.

CROFT: 05:10

Were there other significant trends before we leave 2024 that you think should be highlighted that you've seen over the past year before we move into the new year?

ZACHARIA: 05:24

I think it's worthwhile highlighting that Economic Risk has always been a significant risk over the last year. People are always necessarily worried about the economy. So I think that even though it has slipped or it has gone down to the fourth place, it is still something that people are very much concerned about. So I do think it's always worthwhile highlighting that Economic Risk is something that people worry about. They worry about energy costs, commodity prices, labor shortages, global energy shortages. So all of these things still play a role. So I would just like to highlight that we still need to think about what's going on in the economy.

CROFT: 06:05

Now, this is a question I've asked you, I think probably starting two years ago when we did this. And I wish I didn't have to ask it again this year, but as we move into the new year, for the second year in a row, Israel's war against Hamas and Gaza continues. We're now on the verge of entering the third year of Russia's war against Ukraine. And most recently, we had the authoritarian ruler of Syria, Bashar al-Assad, was overthrown. So it's not unusual for the world to be in turmoil, but I'm wondering what effect these events are having in terms of the global supply chain.

ZACHARIA: 06:50

Global conflicts clearly affect the supply chain. And one of the things that we worry about is transportation. So, as you know, a lot of companies source globally, so you have to bring those products back to the U.S. So the first thing that happens when we have global conflicts is that there's going to be increased costs. There's going to be higher shipping costs. There are higher insurance costs. So first thing is it affects your bottom line. The second thing that happens is that now companies are looking to shift production from these high-risk areas. So again, you're seeing this, a lot of companies are trying to move production from China to neighboring areas like Vietnam. So that shift is actually happening. The third thing that is happening is that companies are looking at ways to stockpile more inventory. You're definitely seeing that they've learned their lesson with what happened during COVID and also some of these regional conflicts. So they're stockpiling more inventory, which again adds more inventory costs. Companies are looking for alternative ways to reduce risk by building redundancies. So all of these things definitely leads to greater costs for most companies going forward.

CROFT: 08:12

Now, in the new Lehigh Business Supply Chain Risk Management Index report for the first quarter of 2025, there are several, I think, really interesting results I'd like to explore in just a moment. But I think first we need to quickly recap how the LRMI

works. And as we've discussed on previous podcasts, the index value is a number between 0 and 100, where greater than 50 suggests increased risk, 50 suggests the same risk from quarter to quarter, and less than 50 suggests decreased risk. And the numbers are based on ratings submitted by participating supply chain professionals on whether they felt the risk for the upcoming quarter, in this case, the first quarter of 2025, compared to the risk in the fourth quarter of 2024, would likely increase, remain the same, or decrease for 10 different supply chain categories. So let's start with the overall average risk heading into the first quarter of 2025, which checked in at just over 66, representing a slight decrease from 67 and a half in the fourth quarter of 2024. So a decrease in overall risk is obviously better than an increase. So is this a reason to pop the champagne corks, or is a more measured response perhaps more appropriate?

ZACHARIA: 09:43

Well, reducing risk is always a good thing. But a reduction of 1.3 in average risk is of value. But to answer your question, it's not a reason necessarily to pop champagne corks. The highest, we've seen risk go up to 73. First quarter of 2022, there was a lot of worries about what's going to happen. So getting a number of 66 is significantly much less than what the feeling was two years ago. But clearly, people see that there has been a reduction in risk because, again, it's about uncertainty. When you reduce uncertainty, companies can operate. It's when you don't know what's going to happen that everyone gets a little bit more worried about, "How can I develop policies or develop methodologies to mitigate risk?"

CROFT: 10:50

Now, for the first quarter of 2025, as you mentioned with the opening question, Cybersecurity and Data Risk are back up in the top position. And you'd also mention that Government Intervention had bumped down pretty significantly by 10 points in one quarter. But it seems like that's not all there is to the story. And I'm wondering if you could talk about one of the things the index includes, which is in addition to looking at the 10 different categories and the way they stack up against each other. The head-to-head comparison seems to come to a different conclusion about how significant Government Intervention remains.

ZACHARIA: 11:41

When I ask people to look at risk for a specific type, like Economic Risk or Cybersecurity risk or Government risk, I'm simply asking you to consider that risk by itself and compare it to the risk from the last quarter versus the upcoming quarter. So that's a numerical calculation. More people think that risk is increasing. That number is going to go up. The head-to-head comparison is a slightly different way for the managers to consider risk. Because now I'm asking them, "Taking a look at all 10 risks, what do you think in your mind is the greatest risk in the upcoming quarter?" So what was interesting was that mathematically, Government Intervention has dropped down to the second highest risk compared to what it was a year before and compared to the Cybersecurity risk. But in a head-to-head comparison, Government Intervention was still number one. The big reason that that's happening is that I think supply chain managers are very much concerned about what is going to happen with the upcoming administration. There is a lot of discussion about significant tariffs that are going to happen. And tariffs have a direct effect on how all companies are going to be operating. So there's a lot of uncertainty. And therefore, head-to-head, Government Intervention is number one. Individually, Cybersecurity is number one.

- ZACHARIA: 13:13 And as we discussed, global cybercrime costs have been increasing. There has been greater frequency of these attacks. So it makes sense that Cybersecurity would still remain a very important mathematical high risk.
- CROFT: 13:28 On a related note, it seems that the Supplier Risk, which you had mentioned earlier, rose into a tie with Government Intervention for the second spot in the new risk index. And as you were just talking about, again, the issue of tariffs and trade wars seems to be driving a lot of that. I'm wondering, what are you hearing in the surveys for the first quarter specifically that people are concerned about with the approach to tariffs?
- ZACHARIA: 14:02 Well, what we're actually talking about-- as you know that I actually have executives as part of the Center for Supply Chain Research. We have meetings where we talk about what's going on in the economy, how are we dealing with the economy? And interestingly enough, because they're worried about tariffs, many of the executives told me that they are buying ahead of when the administration comes in and these new tariffs take into effect. This is the term we call forward buying. As long as the orders were placed before the end of the year, you can avoid those tariffs because, of course, transportation can take a while for it to actually come in. That means a lot of companies are doing that. And as I had mentioned earlier, companies are stockpiling inventory. So I think that people are now worried about, will their suppliers be able to provide the products that they are asking for with, again, some of the global conflicts you talked about? Will the shippers, will the transportation actually be able to bring those products in without a significant increase in cost? So people are worried about suppliers. And that's why Supplier Risk has jumped essentially to a tie in second place with Government Intervention.
- CROFT: 15:27 Now, I find it interesting that at this time, just last year, Customer Risk was ranked second behind only Cybersecurity and Data Risk. So basically, it seems Supplier Risk and Customer Risk have flipped in the past year. And I'm wondering what that tells us because there was a lot of concern about the uncertainty of what customers wanted a year ago. That category has fallen all the way down to 8 out of 10 this time. Is there really a significant change there, or is that just kind of the way the numbers came out?
- ZACHARIA: 16:10 Well, I think that it is significant. In other words, I think a lot of companies are actually thinking that customers is not necessarily a problem. When you actually define-- the kind of things that I ask people to look at is fast-changing customer demand. Is it easy to lose customer loyalty? Changing customer demographics. Are we finding hard to service customers? And I think that it is clearly apparent in this last LRMI survey that people are not as much concerned about demand as they are about supply. Are we going to be able to get the products in? And this whole uncertainty of tariffs really affects what is the actual cost that we're going to have to pay when our suppliers bring those products in. So I think the fact that customer risk fell to eighth place suggests that people aren't really worried about demand. And that's what I'm hearing from all the executives that I talk to. They're more worried about how can we get that product into the hands of their customers.
- CROFT: 17:19 Now, you had also mentioned Economic Risk in the context of other trends from this year. And specifically from the fourth quarter of 2024 to the first quarter of 2025, it also, similar to Government Intervention, dropped 10 points, which is a pretty

significant risk in one quarter. So what's going on there? And obviously, it remains in the top four categories. So it's not like it's gone away, but what is that shift telling us?

ZACHARIA: 17:57

So again, remember because we're always comparing risks, and in this case, Economic Risk still has always been among the top three. And this particular quarter, it dropped to the fourth, but it is still relatively significant. People are still really worried about price volatility, increasing energy costs, global energy shortages. They are factors that are important, but other risks have become more important. So by virtue of the fact that other risks have moved up, Economic Risk has gone down. So again, goes back to that idea that people are not as worried about demand as they are worried about supply. So I think that that's definitely something to go there. One other thing that I might actually bring up which might go with the idea of Supplier Risk is that a lot of the executives that I talked to are very much concerned about labor shortages being that, it's not because people want to produce in China or in other countries. It's because it has been very hard to get labor for manufacturing.

ZACHARIA: 19:18

There has been a recent trend, especially after COVID, where the executives are telling me that they are hiring workers who want to look for options to work from home. Well, you can't load a truck from home. You can't produce syringes sitting at home. I mean, manufacturing, warehousing, all these things actually need to be at the factory. And there has been a problem in getting enough workers to do this. So there has been this increased focus on automation. And all of these things, again, goes to that idea of the supply side. Will we be able to manufacture enough to meet demand? So I think that that's also worthwhile considering when we're thinking about Supplier Risk and in some sense, Economic Risk.

CROFT: 20:12

Labor has obviously been an ongoing issue since the LRMI started. And for various reasons. Obviously, the pandemic was a giant sea change in terms of how people worked, and we're still trying to figure out the ramifications of that long term afterwards. But Technological or Competitive Risk has been trending up over the last three quarters and made it into the top five for the first quarter in 2025. So what are the main concerns driving Technological or Competitive Risk?

ZACHARIA: 20:55

As you noted, technological risk has never made it in the top five in the last three or four years that we've been doing the Lehigh Risk Management Index. First of all, let me define technological risk talks about disruptive or replacement technologies, introduction of new competitor firms or ineffective or nonexistent regulations for competitors. The real big key issue that everybody's worried about, and I think that fits under the technological risk category, is the role that AI is playing going forward and the role of machine learning. Large language models have become sort of ubiquitous. Everybody knows what ChatGPT can do. And obviously, there are errors in ChatGPT, but I clearly see that it is actually affecting a lot of people. We are all looking for ways that we can actually utilize it. There are some greater efficiencies that could come out of it, but people are very much not sure exactly all the ramifications as they introduce AI. So I think that this particular risk captures the concern that supply chain managers have when it comes to AI and machine learning going forward.

CROFT: 22:15

It's an interesting point. It just kind of dawned on me that both the Cybersecurity and Data and Technological and Competitive Risk, we're going through this period of large disruption in the way the technology is affecting everything about our lives at this

point. So the uncertainty probably links those two together for why they're both as high as they are now.

- ZACHARIA: 22:46 Risk is looking at ways to manage uncertainty. And so people can see that there are more ways that criminals are attacking. Cyberattacks are increasing. And then what exactly is AI going to do? Is it going to take my job? Are there ways I can make it help me do my job? So yes, you're absolutely right. I think that that's definitely something that they sort of do go hand-in-hand with this idea of technology.
- CROFT: 23:17 Now, we've obviously covered a lot of ground here. Is there anything else in the report we haven't talked about that you think is worth highlighting for our listeners?
- ZACHARIA: 23:30 Well, I think you sort of brought this up earlier, but I just want to underline it. And that is that when you think that customer demand has dropped all the way to eight as far as the risk, that suggests that most supply chain managers see that the economy is continuing to grow. In other words, if people are worried about demand, they're worried about whether the economy is going to grow, the first thing you really worry about is your customers, right? And considering that they're not worried about their customers, I think is a very positive view that the economy is expecting to grow. There's going to be a growth going forward. So I think that's a very trend that we should highlight in this report.
- CROFT: 24:15 Finally, as we've done for recent years, since the New Year is usually a time for optimism, is to look at the report and say, what in the first quarter report of 2025 gives you hope for the new year?
- ZACHARIA: 24:38 It's kind of interesting we talked about AI. I think one of the key trends I think that's going to go on is an increased adoption of AI and machine learning. I think that we're going to become better at being able to harness the power of AI. And I think that's going to help all of us do our jobs better. And I think that that's going to be of use going forward. Next thing I think is going to be likely, we're also going to get better at automating more robotics because as we do that, I think we will be able to improve some of the economic efficiencies and not have as much issues with the labor shortages that are really going on. I think also companies are going to get better at diversifying. Perhaps maybe not onshoring as much, but look at ways to do nearshoring, look at ways to diversify their manufacturing bases, and look for some ways to bring production closer to home, maybe diversify from their suppliers. And I think that companies are also going to get better at managing their inventory. I think that this is something that obviously is important in your supply chain.
- ZACHARIA: 26:00 And finally, with a little bit of optimism, I'm hoping that there is going to be greater stability. Unfortunately, I think we'll still be talking about major global conflicts. But hopefully, going forward, they'll look for ways that they could stabilize some of those things and perhaps figure out ways to continue to make the supply chain more efficient and hopefully lead to, I guess, a more successful 2025.
- CROFT: 26:35 Well, Zach, it's always a pleasure. And I'd like to wish a Happy New Year to you and yours. And thank you again for being with us on iLLUminate today.
- ZACHARIA: 26:44 Thank you so much, Jack. I always appreciate the opportunity. All the best.
- CROFT: 26:49 Zach Zacharia teaches graduate and undergraduate courses in supply chain operations, management, and logistics and transportation. As director of the Center

for Supply Chain Research at Lehigh, Zach and the faculty and students at Lehigh Business are generating new ideas for education and future knowledge in the field of supply chain management. This podcast is brought to you by iLLUminate, the Lehigh Business blog. To hear more podcasts featuring Lehigh Business thought leaders or to follow us on social media, please visit us at business.lehigh.edu/news. This is Jack Croft, host of the iLLUminate podcast. Thanks for listening.