

illUminate Blog Transcript: Zach Zacharia on Supply Chain Risk - First Quarter 2021

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JACK CROFT: 00:14 Welcome. I'm Jack Croft, host of the ilLUMinate podcast for Lehigh University's College of Business. Today is December 16th 2020 and we're talking with Zach Zacharia about the new Lehigh Business Supply Chain Risk Management Index, or LRMI for short, for the first quarter of 2021. LRMI was developed by the Center for Supply Chain Research at Lehigh University, and the Council of Supply Chain Management Professionals. Dr. Zacharia is an associate professor of supply chain management, and director of the Center for Supply Chain Research at Lehigh, where he teaches graduate and undergraduate courses and supply chain operations management, and logistics and transportation. Dr. Zacharia, welcome back to the ilLUMinate podcast.

ZACH ZACHARIA: 01:05 Thank you.

CROFT: 01:07 With the COVID-19 vaccine distribution getting underway as 2020 thankfully crawls to a close, I know a lot of people are really looking forward to turning the calendar to 2021. Do supply chain managers share that feeling?

ZACHARIA: 01:22 Absolutely. Absolutely. We've gone through a lot of changes, as you know, with COVID-19 hitting the economy, hitting transportation systems, hitting things that we as supply chain managers really want to want to look at. So everyone is looking forward to turning the corner and getting the economy back to what it was running before COVID really hit us.

CROFT: 01:47 Now for those who might have missed our September podcast introducing the Lehigh Business Supply Chain Risk Management Index, can you just give us a quick overview of how the index is compiled each quarter, how the scoring system works, and how it helps supply chain managers manage risk?

ZACHARIA: 02:06 Sure, absolutely. So the basic idea of the LRMI, the Lehigh Risk Management Index, is that we send surveys out to supply chain managers all across the US and what they do is, is that they are given 10 questions and simply asked whether the risk associated with that particular category is increasing or decreasing for the next quarter. So in a way, you're comparing the current risk to next quarter's risk, and you're just simply indicating increasing, decreasing, or stay the same. And with that, we just simply compute the average for each of those different categories of risk. There's 10 categories and we will then look and see if there is a trend. In comparison to last quarter, is there greater risk going forward? And so this is a way for supply chain managers really to identify those risks that their colleagues in the industry are indicating that require more focus and attention, and some risks where you don't have to spend as much time focusing. And in a way, it really identifies where you should spend your managerial attention.

- CROFT: 03:23 Right. And I recall the idea for the index itself was because the supply chain was one area that did not have an index to help managers figure these things out. Is that correct?
- ZACHARIA: 03:38 Absolutely. This kind of risk index is patterned after what's called the Purchasing Manager Index. And the Purchasing Managers Index is just like ours. They go out to the purchasing managers and they ask them, "Are you going to purchase more product in the next quarter?" So it's a very simple question. And if more purchasing managers are going to purchase more products, it's a way to suggest that the economy is heating up. You're getting more companies or buying more products. And it's an indication of how active the economy is going to be for the next-- or the next month. The Purchasing Manager Index is monthly. We go on a quarterly basis, and we're just using it four times a year. But the idea is, again, it's a comparative kind of scenario. And the PMI is an excellent index that a lot of companies, Wall Street uses, and things like that. And we also feel that our index is going to be something that is going to be of value for not just supply chain managers, but managers in general to understand that, what are the areas of greater risk going forward?
- CROFT: 04:50 Right. Now you've just released the first quarter 2021 report, which marks the third report you've compiled since you launched this earlier in the year. And I notice looking back at the three reports that customer risk, economic risk, and supplier risk have each ranked in the top four for all three quarters so far. What does that tell us?
- ZACHARIA: 05:19 Actually, that's a great point you bring up, and this reminds me of one other factor that we actually get our respondents to do, and that is, they do what's called a head to head ranking. So we ask them, after they've done this analysis, or just individually consider each risk, we tell them to select their four biggest concerns, four biggest areas of risk across all 10. And that's what you're referring to here, where there's a ranking. And when you-- you notice that customer risk, economic risk, and supply risk were the top four, among the top four, then that clearly indicates that those are areas of risk that supply chain managers are extremely concerned about. Are their customers going to buy their products? Are their suppliers capable of supplying the raw materials and parts that they need to make their products? And then how is the economy going to bear up? These are areas that clearly supply chain managers have thought had been very important, and it continues to rank among the top four biggest risks of all the quarters so far.
- CROFT: 06:27 And in terms of customer risk, what are some of the factors that go into that?
- ZACHARIA: 06:36 So in each of these risk categories, we give examples of what are things that you would consider? And so for example, in customer risk, you're looking at you know fast changing customer demand. Is it easy to lose customer loyalty? Is there a changing customer base demographics? Is it hard to predict customer behavior? Is it hard to service the customer? These are all kind of examples that we get the supply chain manager to think about as they determine whether any of those factors are changing and therefore there's more risk associated with the customers they have for the next quarter.
- CROFT: 07:13 And I can see, for economic risk, increasing energy costs, obviously is a big thing in there. What are some of the other things that factor into the economic risk?

ZACHARIA: 07:24

Well, commodity price volatility, labor shortages. I mean this is a big issue for us in supply chain because with COVID-19, there's been many indications where manufacturers have not been able to get enough about labor, warehouses, transportation companies, because when people become sick, they're not able to come and do the work. And then is the area that they're working in properly ventilated with enough social distance so people can actually work? So many of the managers that I talk, at warehouses or talk about running transportation companies have told me some of the process they have in place. For example, a very simple thing that a manager at a very, very large warehouse, actually told me that for the first time when COVID hit, they had to make sure that there was no overlap of employees coming from one shift to the other. Because in the past, you would have people come together and explain, hey, this is what's going on, this is what you need to look out for. But clearly the space is not designed to have social distance. So here's another example of where a lot of companies have put changes in place because of COVID-19 restrictions, which also affects the efficiency of what you're doing, and the reliability. Do you have enough people to be able to do the work that you need to get done? So again, these are things that companies look at in terms of the economy. And they want to see, is there going to be enough demand? Are they going to be able to produce what they need? So all of these factors affects economic risk.

CROFT: 09:06

Right. And I'm guessing the same is true for supplier risk, as well, that in terms of everything from personal protective equipment to the labor shortages, again, being a factor, certainly, on the supplier side as well.

ZACHARIA: 09:26

Absolutely. And you know the other thing with the supplier side that it's worthwhile mentioning is that there is a huge imbalance in cost right now with bringing containers of products from China. Many of our companies rely on supplies or suppliers that are based in China. And you have got a significant increase in costs associated with getting containers, and that they are running into bottlenecks all along the supply chain, because we don't have that nice easy flow. And so you've got - we're not putting enough containers back into China, and that's causing some sort of an imbalance with these things. And so when companies are relying on suppliers, international suppliers, it still has not reached the kind of ease that you had before COVID times where containers are flying or going on ships very easily.

CROFT: 10:25

All right. For the new report, the fourth risk which actually is number one this time around-- Transportation disruption risk tops the list, and it's been in the top for two of the three reports to date. What is that telling us? And you've touched on this some and I know that transportation is one of your areas of expertise and research. So what is this telling us about the disruptions to our transportation network now?

ZACHARIA: 10:58

Well the real big issue with transportation, clearly, it is Christmas time. Clearly there has been a huge increase in e-commerce. And one of the things that you have to think about is that even though-- and I always tell this to my students, it's great that you can click on a button and you can order a product. But at the end of the day, some person has to take that product from whatever shelf it's on, put it onto the back of a truck, get it to some other warehouse, it goes into another product, and then some other person takes it out of another truck and puts it on your door. So there is-- and the only reason, of course, I mentioned truck, because of course there's obviously rail and air, but well over 85% of all transportation shipments end up on a truck somewhere. So guess what's happening? You've got a huge increase, a significant

spike in e-commerce because, again, it's Christmas and people have now started ordering. And Amazon tried to deflect some of this by saying that they have, I guess Cyber Monday prices a week before, because they're trying to move this demand earlier. Because remember, whenever you're actually looking at the-- when you're looking at designing any kind of a system, you're always looking at capacity. And do you build for peak capacity? Do you build for running capacity? What happens if the demand goes over a certain amount? Well, the thing is that in every viable business, you can't necessarily build for just one week in Christmas. You have to make sure that, we have to look at maybe alternate sources of supply to handle that peak.

ZACHARIA: 12:38

Here's the problem. Everybody's relying on that extra source of supply. Everybody's relying on UPS and FedEx to actually handle this kind of increase in demand. And so everybody-- supply chain managers realize that they have to get products on the back of trucks, and they're competing with everybody else. The retailers are trying to take advantage of the fact that it's the Christmas season. Also another factor which, I don't know if you'll have time to discuss, is that the COVID-19 vaccine is being rolled out, which is a very separate supply chain on its own. So I'm clearly thinking that supply chain managers are seeing that these kinds of increase in demand is happening. And even though Amazon is asking for more drivers, more people to man their warehouses, so there's a real increase in trying to hire more people. it's limited capabilities. And so we're reaching past that point of capacity. It's full.

CROFT: 13:40

And I'm guessing just intuitively that the greater demand for online retail, online sales, has actually been going on at least since March, with people nervous about-- well, first of all, because stores have been closed for parts of the time in different parts of the country. Going into supermarkets, going into department stores, makes a lot of people nervous now. So it would make sense that the amount of demand for products being shipped and delivered has probably been increasing all year and even before this tremendous end of year rush.

ZACHARIA: 14:27

Absolutely. One of the things that has really become apparent, I do research in this area, and that is that, I've got managers, senior executives that are telling me that they had all planned to invest into e-commerce. But what COVID-19 did was, it is something that they're planning over the next five years or seven to eight years to roll out. They realized they had to put that investment in now. So they are putting in money to make that capability happen, this year alone. So when you have large retailers who are planning to roll out this capability, they all learn on the fly, because as you pointed out, customers were not walking into their bricks and mortar store. So you had to build that capability in. And so you've got a huge investment. And one thing with COVID-19, it is clear to see that there are clear winners, and there are losers because of COVID-19. Several transportation companies have executives who have told me, this has been their best quarter ever in their history because of the increase in demand and the way that the prices are actually, perhaps, sticking. UPS had one of their best quarters I think going back all the way to 2000-- in the last 10-15 years, because the demand has really gone up. So what's happened is that this ability to switch to e-commerce has just been accelerated, and all the companies are realizing they need to invest, because that's the direction that it's going. And companies are scrambling, but the successful ones are the ones who are going to be able to adjust and adjust quickly.

CROFT: 16:10

Yeah. All right ,going back to the latest index. Aside from you know the top four categories, the four biggest risks, are there any other interesting insights we should take away from the report, or the supply chain managers should be looking at?

ZACHARIA: 16:35

Well the one other thing that it's kind of useful, in any kind of a report. First of all, yes, it identifies the four risks that supply chain managers need you to notice. The other thing is what I would call sort of a trend or a comparison. And that's in the overview page right at the very beginning of the report where we identify what the actual number was last quarter and what the current risk index is this quarter. And we use a red arrow to indicate that it's increased. So if I could just quote these numbers to you. So just remember that 50 is where there is really no change in risk and the risk index is a number between zero and one hundred. And any time the number is greater than 50 that suggests that there is greater risk that is associated with that particular thing going forward. So when you look at this trend, let's look at transportation disruption. For example, last quarter the index value was 69.6 which is high. Clearly well above 50. But here's the interesting thing. It jumped up to 77.34. The number is not as critical as the fact that it almost increased by 8, and it has increased significantly. So the magnitude of the difference is interesting, and the fact that it's increased.

ZACHARIA: 18:02

So the other thing that you can actually, instead of just identifying the top four, it's identifying areas where the risk has decreased. So economic risk last quarter was 78, which was the highest risk last quarter. More supply chain manager suggesting it's dropped down to 72. 72 is still high, but compared to last quarter more supply chain managers are seeing that the economy's beginning to recover. And therefore, it has actually decreased in risk. Supply risk has come down as well, from 74 to 71. And then you've got things that have really dropped down. Technological or competitive risk went from 58 to 55. Environmental risk went from 59 to 53, suggesting that the risk in the next quarter as far as the environment is concerned is definitely decreasing. So the other insights that I always like to suggest that you should see is, what is the trend? What does it look like compared to last quarter? And then this suggest to you that, okay, looks like supply chain managers on the whole are seeing that, for example, the economy is less risky than it was in the fourth quarter.

CROFT: 19:13

So it seems that there's been a lot of, certainly some devastating effects of COVID-19 on the supply chain this year, and I'm wondering are there any lessons that the industry has learned? Any changes that have taken effect that are dealing with some of the things that have been happening?

ZACHARIA: 19:37

Yes, actually, COVID-19 has really caused companies, executives, to realize how important their supply chain is. In fact, they've started-- every company knows who their supplier is, who their customer is. But now because of COVID-19, companies have started to look at who their supplier's supplier is, and who their supplier's supplier's supplier is. We use this idea of tiers. So our immediate supplier is called the tier one supplier, their supplier's a tier two, and then tier three and so on. And what companies have realized is that even if a supplier is a tier three supplier, if that supplier doesn't provide the product, then you as a company are not able to finish your own product. And therefore companies have started to understand and spent more time and invested more resources into really managing their supply chain going two, three, four tiers away from their own location. The other factor that COVID-19 has brought is that you've completely started questioning some of the ideals associated with lean. Lean is all about minimizing the amount of inventory you

actually have, and companies really got burned with that when COVID-19 hit because they all of a sudden didn't have enough product to meet the needs of their customers. So now companies are no longer only trying to eliminate inventory. They're realizing that they need to store some extra inventory. And get this, a complete change from supply chain sort of ideas in the past, is that some of the larger retailers, I've been talking to some of the executives at the big 3PL companies that own their own warehouses. And you've got these large retailers have said, we need to get warehouse spaces much closer to our customers in these large cities, because customers are getting used to two-day delivery, and we've got to get that product out to them quickly. And the only way we do that is if we build or rent large DCs [distribution centers] closer to customer locations. So all of those factors are really sort of increased the importance of understanding supply chain and that really came out just from COVID-19.

CROFT: 21:58

Now we're also in, you know, in addition to still dealing with COVID-19, we're also heading into that last week of the holiday shopping season, and it's been unlike any other, certainly. I was talking with your colleague LudovicoaCesareo recently, and she had noted that online retail sales are expected to be up 35% this holiday season, that Cyber Monday this year was the biggest online shopping day in history. This greatly increased demand, with all of the other complicating factors that you've been talking about here, how is the supply chain holding up and adjusting to those things?

ZACHARIA: 22:49

Well I mean you know you bring up a great point. There has been a huge increase in demand. And Amazon tried to soften the blow a little bit, because they promised that they're offering Cyber Monday deals a week before Cyber Monday basically because they need customers to start purchasing, because there's this huge influx of demand and products that are going to be coming in that has always been the case for the Christmas shopping season. In fact, this just came out just a little over a week ago. But FedEx started, and UPS has followed in suit. And that is, they have started to limit the volume from their top customers. It doesn't matter that these are huge retailers that have been strong, stalwart customers, large customers for FedEx. FedEx needs to make sure they have enough capacity to meet the needs of all their customers and they were scared that if one very large customer takes up 20, 30% of their total capacity, they're not going to have the capacity to meet everyone's needs. So they've limited the volume from their top customers. UPS did the same thing. So there is just no way that these large retailers are going to be able to get all their products through, because the capacity is not available. They are capacity constraint. And you must also realize, the transportation companies, because they're viewed as essential, they did not have to shut down. So they are also fully busy. They have got as much people working around the clock to be able to deliver these goods.

ZACHARIA: 24:31

Now one of the things that I am really curious about next quarter going forward is that, Amazon has really sort of dictated that they're not going to charge extra for shipping. Well, so far, retailers have been absorbing shipping costs. But UPS and FedEx have had to increase their prices because demand is going up. So the question now becomes, what are retailers going to do next quarter? Are they going to continue to absorb these costs and thereby reduce their margins? And in some cases, these costs have increased so much in it, they're going to cut-- there is no profit. At that point, it is just, they're surviving at a loss. So the question comes up, does this mean that retailers, for the first time, are going to have to start passing those costs to consumers and their customers so that customers will have to actually pay for it? We

really don't know what's going to happen and it's gonna be very interesting to see what's going to happen going forward. And one other complication that I'm sure you're very well aware of, Jack, is that we've got the new vaccinations. We've got a whole bunch of product that has to be delivered very effectively. We're using Pfizer's as a cold-- has to use cold storage, the whole process. So that's also going to add even further strain on the capacity of the entire supply chain. So it is really going to be very interesting, what's going to happen at the supply chain level for these kinds of distribution that we need to do going forward.

CROFT: 26:09

Yeah, you had talked about Amazon again, and we've talked about this before as well. The kind of outsized influence they have on just about everything, it seems, these days. But I mean they are, everybody has to have free shipping because Amazon does it. Everybody needs be able to get stuff there fast now, and fast is now defined as two days or one day, even, because that's what Amazon has done. We've also just, I think within the last few weeks, Amazon is now going to get into the prescription drug market as well, I understand. So it just seems like Amazon has become a kind of constant disruption, in the financial business sense of the word, to the supply chain that, it's constantly forcing others to adapt and change.

ZACHARIA: 27:10

Well, that is really a credit to the way Amazon does business. And [Amazon CEO Jeff] Bezos has made it a point to really disrupt what they do. And when I talk about this in class, one of the things is that companies can either choose to continually innovate, or other companies can come in and take their place. I mean Netflix is the best example of the willingness to cannibalize their existing systems to constantly make changes. And they've done an amazing job and they've managed to survive. So Amazon, you're right, has made all these kinds of changes because they're innovating, their competitors are having a hard time following, and they're gaining market share. One other kind of surprising thing, though, to note that, yes, there's been a real increase in e-commerce and Amazon has got an increase as well. But their bottom line, their profit, hasn't necessarily kept pace with what you'd think for such a large company. And what this tells me from the outside, obviously, is that their costs are increasing as well. Amazon is also having to pay higher costs for their shipping and therefore that's eating into their profit margins. And maybe Amazon might revisit this idea. But I think definitely there is going to be a reckoning. Consumers have got it wonderful with not having to pay for any shipping costs at all. But even the large companies and the big retailers, for sure, and UPS and FedEx, and I'm sure Amazon is going to revisit the amount of money that they're losing. Because if no one is paying for it, then at some point the retailers that are actually paying for it, when they're shipping product at no cost. And remember, returns are six times more expensive. So what happens when people start returning things, you know?

CROFT: 29:05

Oh yeah.

ZACHARIA: 29:06

These are all factors that are going to directly affect the bottom line. But that's what makes the supply chain interesting. And that's why it's important to read the [Lehigh] Risk Management Index, participate in our survey, because we really think that this is an area of the economy that you really need to focus on for your long-term success.

CROFT: 29:27

And for those listening who would like to check out the full report, where can they find that?

ZACHARIA: 29:35

Well, simply they just have to search for the Center for Supply Chain Research Lehigh, which is the center that I'm the director of. All of our reports will be there. We'll also have a link if you want to participate in the next quarter's index survey. So all the information is there. And just, as I said, search for the Center for Supply Chain Research at Lehigh.

CROFT: 30:00

Great. Dr. Zacharia, thanks so much for being with us again today. I'd like to take this time to wish you and your family the happiest of holidays this year. I look forward to talking with you again in March when we'll look ahead to the second quarter of 2021.

ZACHARIA: 30:18

Thank you very much Jack. I really appreciate the opportunity to come and talk to you about this kind of information and it's always a pleasure to talk to you. Thank you, Jack.

CROFT: 30:27

Great. I want to again thank our guest Zach Zacharia. As director of the Center for Supply Chain Research at Lehigh, Dr. Zacharia 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, please visit us at business.lehigh.edu/news, and follow us on Twitter @lehighbusiness. Thanks for listening. [music]