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## EPISODE 182: RAM GANESHAN – SUPPLY CHAIN IN 2022

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### Female Speaker

From William & Mary in Williamsburg, Virginia. This is Leadership & Business, produced by the William & Mary School of Business and its MBA program. Offered in four formats the full-time, the part-time, the online, and the executive MBA. For more information, visit [wm.edu](http://wm.edu).

### Ken White

Welcome to Leadership & Business, the podcast that brings you the latest and best thinking from today's business leaders from across the world. Sharing strategies, information, and insight to help you become a more effective leader, communicator, and professional. I'm your host, Ken White. Thanks for listening. Well, last summer, William & Mary business Professor Ram Ganeshan joined us on the podcast, talked about where supply chain stood in 2021. A year ago, we were experiencing lumber shortages, new furniture was challenging to find, and chlorine for the backyard swimming pool was in short supply. We'll fast forward one year to today, and we're faced with new supply chain issues, some we could never have imagined a year ago. For example, the baby formula shortage continues, semiconductors are in short supply, and the Russian-Ukrainian war has caused a number of critical shortages affecting people all over the world. Professor Ganeshan joins us again to talk about today's supply chain issues, how they began, and what might be ahead for customers, companies, and countries across the globe. Here's our conversation with William & Mary business professor Ram Ganeshan.

### Ken White

Ram, thanks very much for joining us. Nice to see you.

### Ram Ganeshan

Yeah, nice to see you too, Ken. Nice being here.

### Ken White

It's been a year. Last summer, you and I sat down. We were talking about the supply chain issues and where things might go. Did you expect the state of affairs to be where they are now? A year ago, when we talked.

Ram Ganeshan

Yes and no, things are improving in certain sectors, but we've had somewhat setbacks in the past years, like the war in Ukraine, for example, and the impending recession in America. So we don't know how that's going to sort of eventually resolve itself. But yes and no is the answer.

Ken White

There are a number of issues in terms of supply chain that it seems like everybody talks about. People are quite aware. The first one is the baby formula shortage. How did this happen?

Ram Ganeshan

Yeah, interestingly, if you look at the baby formula, it's sort of like a microcosm of what has been happening in the pandemic. Interestingly, if you look at baby formula demand, I'm talking a little bit technical here. The demand is somewhat constant. The babies don't. It's not a seasonal thing. It's fairly constant. And it turns out that the average demand is around 60 million 8-ounce bottles, which is how they measure baby formula. And a typical baby, it's been a while, but my kids are teenagers now. But it's somewhere between seven and eight-ounce bottles a day. So that's 60 million a week of eight-ounce bottles is the demand. And that's been constant for the longest time. So as you can imagine, supply chains have sort of organized themselves to make 60 million as efficiently as they possibly can.

Ken White

Sure.

Ram Ganeshan

And one of the ways that the supply chain is organized it's become highly concentrated, which means three companies, if you take Abbott and Nestle, the folks who make Gerber and a couple of others, account for pretty much all the production. And Abbot Nutrition, just in their one plant in Sturgis, Michigan, makes 20% of all baby formula that's made.

Ken White

Wow.

Ram Ganeshan

And of course, baby formula being like a critical product, it's regulated by the FDA. And part of the FDA rules stop us from importing stuff from outside, even from Europe, where nutritionally they may be better. They don't use corn syrup, that sort of stuff. So we can't import there are a few people making it, and then 50% of those who buy baby formula

from the shelves. The demand are through what is called the WIC program, which is the Women, Infant, and Children program, which is you get vouchers for families who can't afford it. And they would go and buy, and the vouchers would let them buy only certain types of baby formula. So if your vouchers would let you buy Similac, for example, that's what you'd buy, you can't buy another brand. So somewhat restricted in what you can buy that way too. Most of the demand now. So typically, this was last year, what they call an out-of-stock percentage. You go to the store, how often it's not there, it's about 1-2%, 3%. Right. So that's common. And then suddenly, though, in April, it started to be close to 40%. Geez, what's going on? It's got all the parents up in arms because they can't find baby formula. Turns out that one of the plants of Abbott, which is in Sturgis, which I just talked about, which makes 20% of all production, they found cronobacter bacteria there. I don't know if you know the history of Cronos, the Greek god. I mean, this is the guy who ate babies, so it's kind of named that way. So it's kind of dangerous for babies, but it's in your kitchen sink. So there was a lot of debate about, gee, our cronobacter that's causing it? Because it's such and the company insists it's not there, but I won't go there for a minute. So what essentially ended up happening is they shut the plant down because they wanted to make sure there's nothing wrong. Think about it. You just pulled 20% of the supply out of the market, right? And that's where the domino started. So you take 20% of the supply out, and they also recalled many of the products they made. So the supply started going. So 50 of the demand is taken off the market. And immediately you started seeing and interestingly, another thing that happened was the news broke in April that, oh, geez, this April, that the shortage of baby formula. And then, when I follow sales data, this company called IRI releases sales. So I talked about 60 million 8-ounce bottles being the demand. Suddenly now, it's 75 million 8-ounce bottles. Clearly, they're not more babies, right? So maybe people are holding it in their kitchen shelves. That's a possibility. So the demand bumped up by about 10% or 15%, and the supply reduced by 20%. And go figure, right? So that's what put us in this hole.

Ken White

Makes perfect sense.

Ram Ganeshan

Yeah.

Ken White

Yeah, but now it's gone all the way to the White House to try to come up with solutions.

Ram Ganeshan

Absolutely. Clearly, it's a news story that you don't want to be linked to. Right. And the first thing people did is link it to the White House. So they had to do something about it, and they have. So the first thing Biden did was I talked about how the FDA rules didn't

allow us to import. He relaxed some of those rules, saying, yeah, we can import. And he started this program called the Flight Freedom Program, where baby formula was being imported from other countries in Europe and Mexico and Australia, and so forth. But so far, we've only imported about a week's worth of supply. Sixty million bottles, nearly not enough. Right. But we have promises for six weeks worth of demand. So it's coming. And knowing supply chains, maybe sometime in the end of September, we're going to have way too many baby formula cans than we know what to do with. The second thing he did was invoke the Defense Production Act. So if you are baby formula manufacturers, all the things you need to make baby formula are now available to you. You're at the front of the line from these suppliers. Of course, you have our own Department of Defense planes, transport planes, moving these baby formula around, all the supply chain congestion, so trying to get it into the system quickly. Plus, he's doing all this. And all the companies involved Abbott, and Nestle, and Reckitt. They're all reconfiguring their production lines to make more. But that takes time. It's not quick. So there is still a significant supply drop. And to add to all this, the Abbot plant in Sturgis came online, and then there were floods in Michigan. So it got flooded, and they had to close it down again. So the supply hasn't caught up, and not enough has come in. So we're not able to bridge that gap. Another thing states are doing, I talked about the regulations, and the WIC program is now they're giving waivers so you can get those vouchers and buy anything on the shelf. From a state's perspective, you want contracts with some manufacturers because you can get a better deal, right, so large quantities. But now you can buy any on the shelf that are not contracted by you too. So that might give the other manufacturers a little bit more incentive to put stuff on the shelf. So it's still not caught up, the supply and demand. And retailers are now being able to ration these products too. So hopefully, I'm thinking maybe another six weeks or so. I mean, the White House is monitoring this very closely, and they're putting pressure on all these manufacturers. So hopefully, in six weeks, that's my guess. But let's keep our fingers crossed here.

**Ken White**

Yeah, it's amazing, and like you said, it takes time. It just takes time.

**Ram Ganeshan**

Yes, because of lead time, at least you're talking here a plant in Michigan, a phone call away, and you can drive there in a day, right, if you want to meet somebody. So the point really is how these supply chains are organized. They are highly concentrated and highly specialized. Few people do all things. And now you sort of expand this to the globe, right? Imagine it's not Michigan but somewhere in Taiwan. It just takes longer for everything to happen and get here. And that's what's happening. It's this crash in slow motion. Let me put it that way. And we're trying to recover from it.

## Ken White

We'll continue our conversation with Professor Ram Ganeshan in just a minute. Our podcast is brought to you by the William & Mary School of Business. If your business or organization is interested in retaining your best people, consider enrolling them in one of our MBA programs for working professionals, William & Mary's online MBA, part-time MBA, and executive MBA programs are designed for the professional who works full-time. So both the employee and the organization benefit. Show your employees you care by investing in their growth. Check out the MBA program at William & Mary at [wm.edu](http://wm.edu). Now back to our conversation with William & Mary business professor Ram Ganeshan.

## Ken White

The semiconductor issue, the CHIPS Act, another area that is just people are watching it and kind of scratching their heads what's taking place there.

## Ram Ganeshan

Yeah, so I think we had this conversation before. If you look at the semiconductor industry, it is very similar to baby formula in many ways because really three countries pretty much make all the semiconductors Taiwan, Japan, and South Korea. Not only that, but I would say maybe five firms make most of the semiconductors. So you got Taiwan Semiconductor, Samsung, LG, and maybe perhaps SMIC, which is in China. What had happened there was the pandemic had slowed the supply of these folks, and we couldn't get anything from SMIC, which was in China, because it was blacklisted by President Trump. So there was a supply drop, and there was a demand increase on the other side. So there was the same sort of things happened. So clearly, it has been a year, and obviously, for supply chains, semiconductor supply chains, trying to increase capacity is not an easy thing because these machines literally cost several hundred million dollars. Setting up clean rooms takes several months. So you can't just snap your finger and say, I'm going to make 20% more. It's going to take you eight to ten months to even get there. And they have been working towards that. But of course, on the flip side of it is, this has also gotten into the political discourse, saying, hey, why are we dependent on Taiwan and China? Why can't we make our own chips? And that seems to resonate with a lot of folks, and that's what the CHIPS Act was about, saying we make about less than 10% of the world's semiconductors. We just design them here in the United States. So the CHIPS Act is going to give incentives to set up fabrication facilities. Intel has already said they're going to put up some facilities in Ohio. Micron has said they're going to put up a facility, but those things are going to take a few years before they even go online. So until then, we are left with what we have, which is most of the semiconductor supply base is still in East Asia, and most of the largest companies, like Apple's biggest suppliers, are in China and Taiwan.

Ken White

And again, patience. Right? Wow. Yeah. I think people would love an easy answer, but I think they know there isn't one.

Ram Ganeshan

Yeah, but it's also the domino effect. If you think about semiconductors and ask people where it's used. You have to think hard to think about a product that does not use semiconductors, and it impacts everybody in cars gee, I can't go to work. Our car prices have increased, computers so on. So yeah, it's the downstream domino effect that's also quite important.

Ken White

And then the war Russia and Ukraine has just disrupted like we couldn't even imagine. What are we looking at now?

Ram Ganeshan

Yeah, that was a surprise. I wouldn't say a surprise. I mean, we knew something was happening, but nobody really thought the war was going to actually happen, and it did. Keeping it semiconductors. Here's what we discovered when the war started. That Ukraine makes most of the world's ion, which is required ingredient in semiconductor manufacturing. In fact, two companies make 50% of the world's ion. One is in Mariupol. You've seen pictures on TV the city being destroyed.

Ken White

Yes.

Ram Ganeshan

They shuttered their operations immediately when the war started, and so did the other one, which is in the port city Odesa. So that's that. And if you think about Russia, they make 30% of the world's palladium. They are the second largest producer of nickel and the third largest producer of cobalt. And you might ask why this is important. I mean, if you think about palladium, it is one of the metals used in semiconductor manufacturing, and if you think about nickel, cadmium, and cobalt, they are all used in batteries and cars. So especially when the Biden administration is pushing electric cars and the future of energy has sort of got a setback here, and trying to mine these and get licenses is not easy. There are deposits available in Canada and Greenland, and Australia, but somebody has to prospect them, and somebody has to mine them, and it's not happening anytime soon. In the semiconductor industry, if you think about automobiles, if you look downstream in the supply chain, Ukraine also makes a lot of what they call wiring harnesses for cars. The first thing they do in a car is put the wiring harness in and hook

everything up to it. And that's how it gets its power. Volkswagen and BMW, they were getting their wiring harnesses from Ukraine, and as soon as the war started, that dried up. These car companies are using what they call just in time. Right. Very efficient. So when something when their supplier stops, so they have to stop their lines, making the ID four car Volkswagen, for example, which has American market. So BMW had to stop their production and look for alternative sources in Tunisia and China. It's coming down.

Ken White

Yeah, and then the food aspect of it as well. I don't know that people realize how much food came out of those two countries.

Ram Ganeshan

Yeah, I knew Ukraine was the bread basket, but I didn't think it made so much wheat to feed so much of the world. I think the sad part of that is many countries, like Egypt and Sudan, for example, get almost 100% of their supply from Ukraine. So now they're left in the lurch. I think it's dependent on the developing countries to come and help them. I think some of that is happening, but there is a lot of fear that they might be famine in many parts of the world because of this war. Yeah, that's pretty sad.

Ken White

Do you see things beginning to ease? Are you thinking looking towards the future overall?

Ram Ganeshan

I hope so. I noticed two things. One is many of the supply chain constraints that were in the earlier part of the pandemic, like lumber and accompanying house prices. The usual, see if you take masks and sanitary kind of things, hand sanitizers. We don't have a shortage anymore like our toilet paper. So we found a way to solve it. Cost of lumber is going down. Inflation from everything we've seen has peaked, and hopefully, it's turned a corner. And, of course, the Fed is putting pressure on the demand side of things. So hopefully, the supply and demand will be more in line. Hopefully, we have a soft landing. We'll see about that. And things are easing. But of course, there's the storm clouds in the horizon. And when Russia attacked Ukraine, China didn't condemn Russia. Not only China but India and the Middle East. So I don't know how that bodes for us. Especially when Speaker Pelosi went to Taiwan, you saw the geopolitical risk of that. And interestingly, there was an article on the New York Times. I don't know if you saw that, but how her plane had to make a circuitous route to avoid all the streets just for political reasons. But interestingly enough, when she landed in Taiwan, not only did she meet the political leadership, but she also met the CEO of TSMC, which is a big chip manufacturer. So let's hope the geopolitical risks die down, and let's hope Ukraine and Russia can come to some sort of agreement because I think the supply chain issues, I'm beginning to see an easing in the supply-demand mismatch. So let's hope that doesn't get derailed.

## Ken White

That's our conversation with Ram Ganeshan. And that's it for this episode of Leadership & Business. Our podcast is brought to you by the William & Mary School of Business, home of the MBA program, offered in four formats the full-time, the part-time, the online, and the executive MBA. If you're looking for a truly transformational experience, check out the William & Mary MBA program at [wm.edu](http://wm.edu). Thanks to our guest, Professor Ram Ganeshan, and thanks to you for joining us. I'm Ken White, wishing you a safe, happy, and productive week ahead.

## Female Speaker

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