

Broad Matters Season 7 Episode 2 “Five Myths About Supply Chain” with Jason Miller

Quinetta Roberson:

Welcome to Broad Matters.

Ken Szymusiak:

A podcast bringing you thought leadership, innovative perspectives, and real world impact from Michigan State University's Eli Broad College of Business. I'm Ken Szymusiak, managing director for the Burgess Institute for Entrepreneurship and Innovation.

Quinetta Roberson:

And I'm Quinetta Roberson, the John A. Hannah Distinguished Professor of Management in Psychology.

Ken Szymusiak:

With the holiday season officially here, I'm sure we're all wondering if any supply chain shortages are on the way. Today, we're going to hear five myths about the supply chain and what these might mean for the retail scene this year.

Quinetta Roberson:

And we've got Jason Miller here with us today. He's the interim chairperson of the Department of Supply Chain Management and the Eli Broad Endowed Professor. Jason is an award-winning researcher and teacher. He's frequently quoted by national media outlets and provides expert commentary via LinkedIn on various issues in supply chain.

Jason Miller:

The unique thing about a college of businesses is our lab is the business world, and so a lot of what we're doing in this college has a direct impact on industry and on policy.

Quinetta Roberson:

Welcome, Jason. We're eager to hear you bust the supply chain myths.

Jason Miller:

Hey, thanks so much for having me on. It's wonderful to be here.

Ken Szymusiak:

Now, before we dive in, please tell us a little bit about yourself and your role at the Broad College.

Jason Miller:

I'm the interim chairperson right now for the Department of Supply Chain Management as well as being a full professor. A lot of my academic research focuses on macroeconomic issues as they pertain to specific sectors of the economy, especially trucking, where I look at issues like labor economics, what companies are adding jobs, what companies are losing jobs. A lot of research on trucking safety, something very important because each year over 4,000 Americans are killed in crashes involving heavy duty trucks. And just to put that in perspective, that would be as though we were dropping a 737 MAX every couple of weeks. So that happens each and every month in the United States. And I do a lot of

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research then on issues like importing and exporting and trying to look at dynamics associated with reshoring and those various issues.

Ken Szymusiak:

So many topics to cover. This is going to be exciting. We're going to talk about five myths in today's episode.

Quinetta Roberson:

I'm excited and I want to jump in with the first myth. So Jason, for more than a decade, the American Trucking Association has been sounding the alarm, if you will, about a chronic truck driver shortage. But I understand that this isn't necessarily supported by labor market data. As our first myth, is there a shortage of truck drivers or, more specifically, is my stuff going to get here for the holidays?

Jason Miller:

Yeah. So this year you have no concerns about your stuff getting here. Right now we're well on the way through the worst of the supply chain glitches that were really endemic in 2020 and then 2021, the ports no longer have a backlog of container ships. Freight is flowing very smoothly. Right now we're seeing trucking companies accept about 96 to 97% of the freight they're offered in comparison back in the second half of 2020 and all of 2021, that number would've been maybe 80 to 85%. So we've got certainly enough trucking capacity right now to get those holiday goods moving.

And the real challenge that comes about is if you think about this argument that there's this chronic shortage of truck drivers. What that would mean is that you would one, never see the industry see a decline of employment. Because there would always be so much demand carriers would never be letting drivers go, yet consistently in 2015 and 2016, we saw carriers shed payrolls. In 2019, we saw carriers shed payrolls. When the COVID pandemic hit, we had a very rapid shedding of payrolls. And now in 2023, we've had a decline of payrolls of about 30 to 40,000. So that's one thing immediately that just doesn't sound right. If there's a chronic shortage, why would companies be letting go of employees?

And the other thing is you never see prices go down. Because if there's so much demand that it's outstripping supply, either basic economics is wrong or something would have to be up here. And when you take a look, prices for the most common trucking service, what we call dry van truckload, which is the standard dry van box moving really anything over the road. Prices of that service have come down 20% from this time last year. That is very inconsistent with a narrative that there's a chronic shortage of truck drivers.

Ken Szymusiak:

Is it because there's a high turnover in the job, like churn? Is that one of the reasons why they have to keep raising the flag saying we need more drivers or there might be a shortage?

Jason Miller:

There is certainly very high turnover but range between let's say 70 and 90%. But when you think of a lot of occupations, that actually is what we see. Think about fast food workers, you've got incredibly high rates of churn, much higher even than what trucking experiences. My general sense is the big argument for the shortage is to try to influence public policy and especially allow 18-year-olds to start driving heavy tractor trailers. So right now, current rules are: intrastate driving, so driving that does not leave a state, you can be 18 and do that. So a trucker could drive from Miami, Florida to Pensacola,

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Florida with a load at age 18, and that's okay, but the moment you go from Florida to Alabama, you have to be 21. So the argument is that through 21-year-old requirement to have a commercial driver's license and operate on an interstate basis causes many individuals to not get into the truck driving profession because they leave high school and then they-

Ken Szymusiak:

Find something else.

Jason Miller:

Exactly. They find something else. We do tend to find many individuals who enter trucking are actually in their thirties and forties. They may be folks that got laid off of another job and they look at trucking as a way that they can make a decent living. So it's somewhat unclear how much of a labor supply change that would bring about. I tend to be very skeptical of 18-year-old, primarily men. Trucking is still 96% men and there's, to me, nothing more terrifying than an 18-year-old operating an 80,000 pound piece of equipment.

Ken Szymusiak:

Yeah. Thanks for those insights. Now let's jump into myth number two. And this has been a hot topic over the last few years given the state of global affairs. Let's talk a little bit about tariffs and whether or not they benefit the US manufacturing industry on aggregate. I think many people think that imposing tariffs on let's say China for instance, actually benefits the US manufacturing sector or maybe benefits the US consumer. How does it impact us?

Jason Miller:

This is the challenge is the intuition is as you make imports more expensive and they'll just be replaced with domestic production. All of the data right now in several working papers from economists at the Federal Reserve Board and other institutions like Michigan State points to the exact opposite. Raising the cost of inputs especially, so take something like steel, actually hurts us manufacturing. And the reason is one, the largest importers are also the largest exporters, Boeing and General Motors. So you raise their input costs, you make their exports more expensive and so less competitive against countries like China or anywhere in the European Union.

And typically what we'll see is tariffs, especially on inputs to manufacturing target fairly narrow industries. Take steel, there's about 80,000 to 90,000 individuals employed in steel mills in the United States today. Back 60 years ago, that number was over 500,000. We still produce almost the same amount of steel though that we did back in the 1960s. It's just we've had incredible increases in productivity. But so you have tariffs that are protecting an industry that doesn't employ many people. Yet when you look, there's over 1 million individuals employed making fabricated metal products. Those products heavily rely on steel. There's over a million individuals employed in machinery manufacturing that heavily uses steel. There's over a million individuals employed in motor vehicles and parts that heavily uses steel. So what you end up seeing is essentially this dynamic where we almost punish these industries with a lot more employment on the benefit of very small number of employees.

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Ken Szymusiak:

Kind of posturing when it comes to tariffs and implications there. If you put yourself in the shoes of the Chinese companies making decisions about where to locate, is it merely just gamesmanship then to some extent and how they get around the system a little bit?

Jason Miller:

So I'd say more than anything, it is a real shifting of manufacturing locations. So the great example is over a decade ago we started tarrifing washing machines produced in Korea. So what we then mysteriously saw was a dramatic increase in washing machines made in China and shipped to the United States. Yet the UN's Comtrade database, which tracks flows of imports and exports, showed all of a sudden a tremendous amount of washing machine components manufactured in Korea started to flow to China. Then, we tariff washing machines made in China, and all of a sudden a tremendous amount of washing machine components made in China and Korea start flowing to Vietnam. So essentially, the final assembly gets moved, but the real challenge of moving a lot of products is this network of intermediate inputs. As an example, take things like cell phones. Producing these in the United States would be very challenging from a standpoint not only of a labor cost issue, but many of the components come from Korea, Taiwan, and Japan.

So you're still going to have to import those components into the United States for final assembly, where we've seen industries where there has been local sourcing is take automotive. So in the Japanese automakers came over, they brought their supply networks with them, but that's because that was organic expansion. That wasn't in response to tariffs. In terms of revitalizing US manufacturing output, we've got more opportunities with sort of organic expansion, but, if the goal is to expand, you need to export more and tariffs end up being the exact opposite of what you want in that regard.

Quinetta Roberson:

There's data that show that manufacturing plants in the US shipped \$7.16 trillion of goods and contributed \$2.6 trillion to the US GDP. But at the same time, myth number three is that the US doesn't manufacture anything anymore. It still feels like everything is made in China.

Jason Miller:

And this is one I encounter all the time, is this idea that the US doesn't make anything anymore and nothing could be further from the truth. So as an example, US manufacturing output today dwarfs what we produced in the 1950s, 1960s and 1970s when folks have this golden age idea of manufacturing. I think what really affects a lot of folks is when the consumer's out shopping, when you think of the things that go into a household, you're out buying furniture. A lot of that is produced overseas. When you're out buying household products, so plates, silverware, things like that. A lot of that is produced overseas. Toys are almost all manufactured overseas in China and Vietnam.

So people look in the things that they're handling are now made overseas, but what we produce so much of here in the US accounts for a tremendous amount of output, over a trillion dollars in the United States. Things like food and beverage. We're huge exporter food. Most of what we eat, we make in the US. A sector that you have to typically be in the supply chain space to think about is chemical products. Chemicals go into everything. Plastic resins are in these microphones that we're talking into right now. We produce a tremendous amount of chemicals. We're one of the world's top chemical producers. We refine a tremendous amount of gasoline and petroleum products. We're a huge net exporter of gasoline and things of that source-

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Ken Szymusiak:

That's such a myth. So many people, they think we're so dependent on foreign oil.

Jason Miller:

We are the least dependent today that we've been since probably the 1960s at this point in time. It's like machinery, things like farm equipment. Farmers are using combines made in the United States. The vast majority of us are driving cars made in the United States. The vast majority of steel that we consume is made in the United States. So a lot of what we don't necessarily think about is manufactured in the US and there is some truth that we don't manufacture as much stuff today as we did in the late 1990s or right before the global financial crisis, like 2005 through 2007. And it is true that some industries like furniture has never recovered from the global financial crisis. We've never seen sort of a rebound on that front, but other industry's growth, for example motor vehicle and parts, has offset that on an aggregate basis.

Quinetta Roberson:

Do you have any predictions for what sectors may be experiencing further growth or shrinking?

Jason Miller:

Yeah. So right now, in terms of sectors that are doing well and will keep growing: food and beverage, we have a growing population. So that will be a continued upward growth. 2023 is going to be a record year for industrial production of motor vehicles and parts in the United States. So that sector's certainly one that's growing. We're certainly seeing more semiconductor plants built in the US so there is going to be increased output in this broad computer and electronic product sector. We are seeing a revitalization and will probably return to output levels that we saw before the global financial crisis.

There are, though, other sectors that are in a secular downward decline. Take paper products. Paper production in the United States, at least in 2017, the amount of what we call ton miles, which is how we measure transportation demand. Paper production involve more ton miles of shipments by trucking companies than all of steel, all of aluminum, all forging activity, or motor vehicles and parts, or machinery. So a sector like paper, tremendous driver of demand for freight, paper's on a secular downward decline. We reach peak paper in the 1990s and we're down almost 40% from that and there's no sign that that's going to suddenly pick back up. So sectors like that, yeah, they're on a downward trend.

Ken Szymusiak:

This brings us to myth number four, which I think is on everyone's mind for lots of different reasons: The impacts of artificial intelligence. Maybe you can share with us how it might impact the supply chain, maybe from a management perspective, from jobs perspective.

Jason Miller:

So there's no doubt we're starting to see with generative AI, a lot of routine and mundane tasks are being automated away. So as an example, talking to one freight broker, they were telling how a few years ago they would have an email box for inquiries if a shipper would contact them saying, "Hey, can you give me a quote for hauling this freight from let's say Lansing, Michigan to Atlanta, Georgia." And what would happen is they'd have somebody monitoring that email box, they would get the quote, they

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would put that data in this company's pricing engine, and then they would get a price and they would email that back.

They've trained an AI system that will say, "Email came in that asks for price quote. I'll put the price quote into the system and I'll send the email back." So they've said that, now, over 90% of their transactions, they come into this email system, are now handled by an AI and they just have to have somebody check it periodically to make sure that it's not doing something absolutely crazy in terms of-

Quinetta Roberson:

iRobot.

Jason Miller:

Yeah, exactly.

Ken Szymusiak:

It didn't go Zillow. It's not buying homes on accident or something like that.

Jason Miller:

Yeah. Routine mundane tasks like that, those are going to be automated away. And would that affect some jobs? It likely will, but on the other hand, what things like that are doing is going to free people up for much more creative problem solving, much more management of relationships and things like that. I see that that's where it's going to play a tremendous role. When you look at, I'm going to say the first wave of industrial robot adoption that was really the 1990s and the first decade of the two thousands, it tended to be relatively narrow industries. Auto was front and center. The auto industry adopted industrial robots way before. Really at most other sectors.

And you saw that between the late 1990s and the mid two thousands, we saw a decline of almost three or 400,000 folks producing motor vehicles and parts. But production went up over that time period. And again, what was that? It was jobs like welding. That was a very routine task that didn't require specialization, was welding the same joint of a car that got automated. We're going to see generative AI do the same type of task for more mundane things like, "you want a quote, I'm going to throw it in the pricing engine and ship it back to you." It has been interesting, let's say on the retail side.

Ken Szymusiak:

I was going to ask about retail.

Jason Miller:

So there's a lot of possibility, but it's been fascinating to see Walmart, Costco, a lot of these entities are moving away from self-checkout because they've found so many problems with that system. So then you start to wonder, okay, where does this play a role at? AI for forecasting purposes, it can be wonderful, but my general sense, and I say this as a statistician is managers get really worried about black boxes. And if you say, "I put this in the machine learning algorithm and it did a neural network with all of this," and you're like, "What are you talking about? Where's the word trees, nodes? What is this?"

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Ken Szymusiak:

If I look at the last four years, I needed X number of this product on their shelf to meet demand. Then they have that.

Jason Miller:

Versus a forecast that's developed by somebody who's an expert in that space. And usually the best practice with forecasting is you use a statistical model, but then you tweak it based on what's going on.

Quinetta Roberson:

So we were talking about robots, which takes us to myth number five. With self-driving cars, making their way onto the streets and self-driving trucks being tested, I'm assuming that that could significantly shift the supply chain industry. And we also talked about the safety issue, 18-year-olds driving and other trucking accidents. The question I want to ask is, will we be seeing self-driving trucks dominating the industry in the next few years?

Jason Miller:

Yeah. So this is one of the things I hear all the time, and I chuckle and say no. We're nowhere near what we call a level five fully autonomous truck that doesn't have a driver in it. There's several factors at work here. Piece one is the current regulatory system is the only way to justify the much higher cost of a self-driving vehicle, even if it was there, would basically be to change the regulations to allow these things to drive 24/7. The challenge with that is going to be owner operators in every congressional district who are going to very strongly be calling their Congress folks and saying, "You better not change this regulation." So there's a regulatory hurdle that's here. There's a tremendous amount of small trucking companies that do not have the ability to pay for this type of equipment that are also going to be calling their Congress folks and saying, "Do not approve this."

So that's one is the regulatory piece. But two gets into the nuanced economics. The challenge is that there's actually very few shipments in the United States that are going to go a long distance between two cities where there's a balanced freight flow. A good example is a tremendous amount of freight goes from Los Angeles to Phoenix because imports come in through the ports in Southern California and they go to Phoenix and hardly anything goes the other direction. So now, if I have a self-driving truck doing this long distance trip, I now need to somehow find outbound freight from Phoenix, to let's say, Dallas and then Dallas, well, back to Phoenix there's not that much. So I'm going to run into a challenge of really running a tour that is going to make a lot of sense and keep me interstate to interstate, to interstate to interstate.

And I don't think that problem is fully realized, but the more time vehicles are spent loading and unloading, that's going to be an issue. Which brings into another thing, Truck drivers do a lot more than just drive. They play a security role, that's very important. They do loading and unloading in many instances. They have a lot of activities they do that aren't just driving. So you're still going to need a driver in that truck in a lot of instance, which then ties into something that really isn't appreciated. But you have to look at the psyche drivers. No truck driver is going to want to babysit a computer. They want to be driving. This is how they show off their skill. This is where their occupational pride comes from. If anything, I think you'll see a lot of drivers will get out of the industry rather than use these vehicles. So I think that you're going to have a huge dynamic in that regard that's underappreciated.

And then lastly, trucking capacity has actually become more fragmented over time. So there's a greater share of capacity at small carriers today than there was 10 years ago. The top 50 largest firms in this dry

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van over the road truckload sector account for only 39% of industry output, which is super low compared to most industries. So most industries, the top 50 firms are 80 to 90% of output. So that means that penetration is only going to really be limited to the big carriers. And funny enough, the big carriers have moved away from long distance hauls. Self-driving truck is not necessarily the most attractive solution for these short hauls. And most freight that moves by truck doesn't go very far. So the self-driving truck is almost targeting a niche part of shipments that also, if you get really, really, really long distance, like 2000 miles, you're better economical solution is throw it on a train.

Ken Szymusiak:

A train, yeah. Jason, any further insights or last minute upcoming trends for 2024 we should be considering as we enter the new year?

Jason Miller:

I'd say 2024 is going to be, I think a continued year of normalization. You're not going to see all these negative headlines in the news that dominated 2020, 2021 and 2022. This process has taken a really long time, I think much longer than many of us even expected. But I think it's safe to say that supply chain is not going to be quite as top-of-mind as it was right after the pandemic. But I equally think that we're no longer the discipline that nobody really thought of until something bad happens. I think the biggest thing we're all looking for in our field, this is going to make it sound like macro economists, but when does the FOMC start lowering interest rates?

Because we're expecting that there's a pretty strong pent up demand in several sectors like housing activity that we start to see rates come down. There's going to be a quick step back, which is a dynamic that frankly we haven't seen since the eighties almost. That's just heavily because we had this huge wave of offshoring in the late nineties, early two thousands, and then the global financial crisis. We had a very poor recovery from that. So I think right now we're just trying to see, okay, what happens to an economy once we start to see interest rates decrease? Is there pent up demand? And does that trigger sort of a resurgence of activity in many sectors?

Quinetta Roberson:

Thank you so much for joining us on the podcast, Jason. How can we keep up with your work going forward?

Jason Miller:

Yeah. So I share a lot of content on LinkedIn, so I do a tremendous amount of engagement with industry that way. So definitely give me a follow. And then I would say, please come to our executive education programs in the college of business. If you're outside of school, we do a lot of continuing education here in the supply chain department through our wonderful exec ed folks, teach you how to use producer price indices to monitor inflation, and how to follow production in different industries and all of these type of things.

Ken Szymusiak:

Well, if you want more broad news and insights, you can follow us on social media platforms, @msubroadcollege, or visit us on the web at broad.msu.edu/news.

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Ken Szymusiak:

And I'm Ken Szymusiak. Join us next time to hear faculty and staff weighing in on relevant issues and discussing how their work makes an impact, illuminating how and why Broad Matters.