

# Ep.2.48 - Eric Shreffler and Kristin Dziczek

Tue, Dec 20, 2022 12:07PM 29:27

## SUMMARY KEYWORDS

chips, michigan, auto industry, industry, semiconductors, automotive, vehicle, eric, companies, investment, big, disruption, production, universities, launched, work, shift, talent, driving, world

## SPEAKERS

Announcer, Ed Clemente, Kristin Dziczek, Eric Shreffler

---

### A Announcer 00:01

Welcome to The Michigan Opportunity, an economic development podcast featuring candid conversations with business leaders across Michigan. You'll hear firsthand accounts from Michigan business leaders and innovators about how the state is driving job growth and business investment, supporting a thriving entrepreneurial ecosystem, building vibrant communities and helping to attract and retain one of the most diverse and significant workforces in the nation.

### E Ed Clemente 00:29

Hello, I'm your host today, and my name is Ed Clemente and we're coming to you with a little different edition of The Michigan Opportunity. We're sort of currently calling this Global Michigan Horizon. And it's sort of how the world sees Michigan and how Michigan sees the world. And today's topic is going to be semiconductors, microchips. It's not our usual format, but the intention is sort of the MEDC to identify key trends, options for future business or talent attraction, and also to be informative educational, and conversational, on key industries that are here in Michigan, or maybe in its near future. So let's get started. We're going to first introduce Kristin Dziczek. She is the Automotive Policy Adviser with the Detroit Branch of the Federal Reserve Bank of Chicago. Welcome to the show, Kristen.

### K Kristin Dziczek 01:18

Thank you for having me.

### E Ed Clemente 01:19

And we also have Eric Shreffler, who is the Senior Vice President Market Development at the Michigan Economic Development Corporation. And welcome to the show also Eric.

E

Eric Shreffler 01:29

Great, thanks so much, great to be here.

E

Ed Clemente 01:31

And a lot of people in the United States and even in Michigan, we see a lot of it, as we drive around Southeast Michigan, I do a lot of work over by Henry Ford Museum, and we can constantly see trucks, whether trucks, cars, Broncos, whatever's out there, how come there's this big lag of cars being parked all over the place?

K

Kristin Dzikczek 01:53

Well, it's the ever-present and long, lingering semiconductor crisis in the auto industry. So you know, the, the origins of this are fairly simple, although they're much more complex about why it hasn't resolved yet. So when the auto industry shut down production and 2020, they pulled back a bunch of orders. And at the same time, we had a big uptick in need for chips in, every kid needed a Chromebook, and every person upgraded their computer to work from home and lots more consumer electronics. And so there was a big shift in the industry to consumer electronics away from auto. And then auto came back much stronger than we expected. And you know, then we had to reallocate the capacity back to auto. And it wasn't that easy. And really, automotive sales have been very resilient, very strong, and production is having a hard time keeping up. And the orders for chips are they were irregular coming in like automakers would order and maybe get not as many as they ordered or different kinds. And the need of chips per vehicle has been going up. So the types of vehicles we're making right now are top of the trim level, they have hybrids, they have a lot of automatic safety features and other you know, bells and whistles that require chip. And the automotive industry, it's a complete set problem, you know, consumers don't want to buy a car that's missing a few parts. So we need to have all the parts and so those parked vehicles are waiting for a few parts. Most of the time, it's chips or something with a chip in it. Sometimes it's something else right now. I mean, there's a lot of wonkiness in the supply chain.

E

Ed Clemente 03:44

And your background, obviously, you work at the Fed now but you worked for the Center for Automotive Research before and I'd mean that, you probably can't get much better than that for background for the job and your position. Can you explain a little bit about, because it's so funny, I didn't know this till I was talking to Eric actually, but I didn't know how many chips usually go into a car and you wrote a brilliant article. I mean, I really loved it, it reminded me of a lawyer making closing arguments to build their foundation of why there's this problem. And could you kind of explain that that's that just fascinated me how many chips go into a car and the different types?

K

Kristin Dzikczek 04:25

Well, there's 1000s of chips in a car. And you know, some of those features I was just talking

well, there's 1000s of chips in a car. And you know, some of those features I was just talking about, electric vehicles have twice as many as an internal combustion engine vehicle. Those safety features that you have that you know, adaptive cruise control, and lane keeping and crash avoidance and all of those things. That's twice as many semiconductors too. So, and that's not even getting to the vehicles, you know, when we get into higher levels of automated driving. So there's just increasing chip content per vehicle. So, you know, one of the things that I say every once and awhile, if we had all the chips we had in 2019, we couldn't make the same number of vehicles we made in 2019 because of this increasing chip content per vehicle.

E

Ed Clemente 05:10

And we're gonna come back to you. But let's jump to Eric for a second. Eric, I know Michigan and Federal Government has been doing some responses, can you elaborate kind of what we're doing in Michigan?

E

Eric Shreffler 05:22

Yeah, well, you know, appreciate Kirsten really kind of laying out in one very crucial industry segment to Michigan, this issue with respect to the importance of semiconductors, the increasing need for them across a number of different product lines. This is expected to be a \$1 trillion global business by 2030. And the largest growth area within semiconductor verticals is going to be the automotive or mobility industry. So not only are we talking about vehicles, that you and I would drive, but our military also has vehicles that need to be driven. And they also need the same type of chips that we're talking about here. And so the Federal Government really started taking a look at the importance of reshoring the manufacturing of this industry, going back a couple years ago now. This is another one of those instances where the United States with all of our innovation and talent, developed an entire industry and then essentially allowed the manufacturing to go to other parts of the world. And now we're playing catch up again and having to spend money to bring it back. And so the Federal Government, again, over the last couple of years put together what came to be known as the CHIPS Act, it was signed several months ago, or earlier in in, in 2022. That's really looking to invest co-invest with companies and states to bring production back to the United States to build that market share that we've lost over time. One of the elements I just alluded to that is going to be successful for a company that's looking to get federal funding is that they have to partner with the state. So you've seen some examples already in Arizona, the President visited Arizona in December to talk about an investment by TSMC, the world's largest chip producer. We've seen announcements on Intel and others. There are a lot of companies right now that are looking to make these investments. And because of the growing opportunity in automotive, with the move to EV, ultimately autonomous, that's going to add a whole nother layer of shifts that are going to be required as well. In our history of building things and innovating, Michigan is really positioning itself as a great partner, for companies to expand and grow in the United States. There's a lot of interest, right, right now, we're having lots of conversations, our universities are really bringing a lot to the table as well in terms of research development and talent development for the industry. And so it's a, it's gonna be an incredibly interesting time. As the CHIPS Act gets launched, the actual program and investment program gets launched sometime in early 2023, you're gonna see a lot more announcements coming out.

K

Kristin Dziczek 09:57

K KRISTIN DZICZEK 08:57

If I put in a little bit of context too, so you know, Eric's right that, like, you know, the chip industry grew up in the United States. And there's this great book that just came out the first of October, called Chip War by Chris Miller. I recommend that to anybody who's interested in like, how this evolved, and how we got where we are, and what you know, are really the stakes in this industry at the moment, but, you know, the US made 37% of all chips and in 1990, and it's down to 12%, in 2020. So it's been a long slide from making all of them when they were first invented, because they were invented here, to just 12% of the world's market. And it's a very global and integrated industry. So, even you know, if we have a chip fab here that those chip fabs may make wafers that then have to be packaged and tested in other places and we may not have all of that supply chain to, Right now a chip may be made in Taiwan and then be sent off to Korea or Malaysia or Japan and they have many miles on them before they get here at the moment, to bring a lot of that back to the US is a monumental undertaking.

A Announcer 10:15

You're listening to The Michigan Opportunity, featuring candid conversations with Michigan business leaders on what makes Michigan a leading state to live, work and play. Listen to more episodes at [michiganbusiness.org/podcast](http://michiganbusiness.org/podcast).

E Ed Clemente 10:31

Kristin, one other thing too, and I thought you pointed out that in your article a little bit that the difference between like say the analog chips versus the more demand for the higher tech, like both of you were just saying for during COVID, how many kids were playing more games at home or whatever it was, so the demand shifted around. But could you break that down a little bit, just to show why the demand isn't as lucrative maybe or, or whatever way you said it.

K Kristin Dziczek 10:58

So you know, the, the auto industry, you know, put something in a car, it needs to be durable, reliable, and safe. And a lot of times that durability, reliability and safety is using an tried and true and older technology. You know, I don't leave my iPhone in the driveway, when it's raining or snowing or, you know, all these harsh conditions that your vehicle goes through, I don't you know, rattle it down, I 94, I try to take very good care of that thing. So, but my vehicle does all of those things. And you know, it has to work in an environment that's dirty, that has petrochemicals all kinds of stuff. So these more tried and true what's called mature technology chips are ubiquitous in the auto industry. But it's a big, big investment to build a chip plant. And part of the way you pay off that investment is to sell those chips to the first buyers at a big premium. There's no big premium on older chips. So making that investment, the ROI makes sense is difficult. But that's exactly the kinds of chips that we need to fuel the auto industry. Now, however, we're also in the midst of this big shift to what's called the software defined vehicle. And so the types of chips that we may need, you know, 10 or 15 years down the road, we may shift our mix to more of the high tech chips in a software defined vehicle. So it's really a, you know, a chicken and egg problem, we need them now, we need a lot of them now. But and there will still be mature chips in its software defined vehicle but maybe not as many. So, you know, it's it's a real challenge for the industry to meet this burgeoning need at the

moment. And Ed, that's why the aggregation of opportunity is so important right now, it's not just, you know, we in Michigan, of course are very attuned to what's going on with the vehicles that we want to buy and drive, but I mentioned the military, same, a lot of the same type of chips go into medical device technology as well. And so, you know, one of the roles that we're trying to play here at the MEDC and State of Michigan is bringing together potential customers in an aggregate way to help make that business case that Kristin just talked about. And I would imagine that, you know, those types of investments are going to be made with the, with the current opportunities in mind, but with the flexibility to change over time to adapt to new, new technologies that are probably going to be you know, more cutting edge chips, as we move forward with more feature-rich products. So and, you know, the, the auto industry is also responding in in ways, you know, prior to the pandemic, chips were sort of a commodity, you know, you let the suppliers get the chips you needed, like there wasn't there were there were enough, so nobody was really super worried about this as a strategic resource as it is now. So auto the auto companies have gotten involved in making deals with chip maker,s with trying to use the same type of chip across a broader range of their uses in the vehicle so that they can be a bigger buyer have these partnerships up front, qualify more production sources up front so that if there's a disruption in the supply chain, say due to you know, a COVID outbreak somewhere in the world, they can easily shift to another production source. So the auto industry is involved in you know, sort of aggregating and making joint ventures and partnerships with the chip industry to, you know, be more strategic about this sourcing.

E

Ed Clemente 15:04

So, so there's obviously a couple of different levels to this, but there's the traditional chips, but then there's the new R&D that's got to be done for the future. And I know Eric, you and I have talked a couple of times. So what is sort of the ecosystem, some of the companies in Michigan you think that it sort of fulfill in some of that ecosystem?

E

Eric Shreffler 15:24

Yeah, well, we're blessed on on the kind of pure R&D front, with great work being done at University of Michigan and Michigan State. University of Michigan is doing a lot of work in what would be called the, you know, the the memory chips, the design, package and test of new memory devices. And then Michigan State, just recently in October of 2022, launched a new Space Electronics Center, in conjunction with the Facility for Rare Isotope Beams, which was also launched in 2022. A US Department of Energy user facility that is unique in the world. And so that's basically a place where you can take these shifts, as Kristen said, she's not gonna leave her iPhone out on the driveway, but they're going to be testing for radiation because these things are gonna go out into space. And so there's there's great work being done at universities. We're also blessed though that we've got one of the world's largest tooling and testing company in KLA, based in Ann Arbor. Again, that University of Michigan tie, both from a research perspective but also the talent pipeline, that's also very important obviously.

K

Kristin Dzikczek 16:50

Eric, I know how much it pains you to say nice things about my alma mater, I really appreciate it. I'm sure they do too. Eric's Spartan and I'm a Wolverine.

E

Eric Shreffler 17:03

That's why I expounded and expanded on the FRiB at Michigan State University but yes.

K

Kristin Dziczek 17:08

They're both great universities.

E

Eric Shreffler 17:11

I love both of them for my job. So but yes, that that connection, like I said, the KLA had with some of its executives and just having worked with University of Michigan, I think led them to to pick Ann Arbor as a great spot to gro. And they they have been growing very steadily since they opened. We've also got large materials suppliers, so both Hemlock Semiconductor which is making polycrystalline silicon as well as SK Siltron, which is producing silicon carbide. Silicon carbide is actually kind of a base material that is ideally suited for automotive applications because it has better properties with respect to heat and the environment, but also provides more power. So the power electronics that are really driving the technologies in these in these EVs, silicon carbide is a great a great material for that. I mentioned the space electronics, Calumet Electronics up in the Upper Peninsula, a wonderful company that's growing, they've got an incredible portfolio of products that they are delivering directly to the Department of Defense. So as you look across the state, both from a research perspective with our universities, as well as the suppliers that we have here, it's an ecosystem that's ripe for for growth. And it's an ecosystem that companies that we're currently talking to that are interested in CHiPS funding are finding great opportunity and value in Michigan as we go forward here, combined with the fact that we've got a very strong and robust customer base that needs their product.

E

Ed Clemente 19:10

And, you know, I know this is a shorter sort of time to cover off these different topics, but one thing more on the macro level, and another thing, I'm not trying to say I really loved your article, but I did really like the part. [I think you did.] I did like it, I read the whole thing over twice. And so but I thought the trends you mentioned, and Eric, anything you want to say after she maybe just highlight some of those trends. Of what how those are going to be disruptors for Michigan, you know, I think is important because that's kind of what the podcast is all about a little bit, at least this one special, because I think this is also supposed to be sort of aspirational for people out there, companies in Michigan, even in the United States to say, you know I mean, we're going to try to be the best competitor we can, given the tools we have. And so if you could maybe highlight some of those, Kristen, if you don't mind.

K

Kristin Dziczek 20:09

You mean my little black cloud section at the end?

E

Ed Clemente 20:11

Yeah, at the bottom of it. Yeah, that was, I found that helpful actually.

K

Kristin Dziczek 20:16

So I've had a glass on my, on my desk for a long time, that said, the glass is officially half empty. Really, the glass is just twice as big as it needs to be. So really, you know, practically, you got to look at you know, what other things can happen. We're, you know, we've got really snarled supply chains are starting to work their way out, and those lots are clearing out around here, cars are being delivered, there's a little bit more inventory. But you know, there's other things that are not being delivered at that moment. So you always have to look for areas of weakness or areas where we could have, you know, disruption in these very complex global supply chain for the auto industry. So these disruptions are more frequent, more persistent, you know, climate change is part of it, the global pandemics are part of that. So maintaining production levels that meet demand is really going to be challenging throughout. There's some increasing trade tensions between the US and China, particularly, US just ramped up a bunch of actions from the Bureau of Industry and Security to try to limit China's advancement in those high tech chips. And China's kind of coming back with their policies now. So you know, there's trade tensions, there's geopolitical tensions around Taiwan, the major center of semiconductor manufacturing. There's always, you know, other industries that need chips, you know, when the new iPhone launches, there's a big push to make a lot of chips for that. There's this really crazy problem that the companies that make the tools and the machines to make chips, were having difficulty getting chips themselves to make the equipment. They're not big buyers, they're not high volume, but they still need chips, and they were having a struggle getting what they needed. Lots and lots of improvement of attention on the investment upfront for these chip fabs, these wafer fabs, that's what TSMC is putting in, in Arizona, and you know, all these other big huge investments. But there's all these other steps in making chips that may not getting that investment at the same pace or two, you know, so that could create future bottlenecks. If everything doesn't expand at the same rate, when those fabs are up and making chips. Then, you know, there's workforce challenges, which Eric mentioned, the other state is working to, and many states that are interested in the auto industry are working to address that, you know, when these investments come in, there's actually workforce to do there. And then, you know, the semiconductor industry has had a long history of booms and busts. You know, there was actually part of the reason why I wrote this piece, not just because the auto industry has been suffering production restraints for so long but there started to be news about a chip glut. And well, there's there might be a chip glut in certain types of chips. And I started explaining like, well, there's this different kinds of chips, and there's not a glut of the kind we need. But this is an industry that really goes through booms and busts. And so, you know, a bust could be coming, and we don't know whe. So, you know, in this land rush to invest there may be overinvestment in some places, that leads to some some, you know, difficulties for the industry. And if they overinvest, and then they are stuck for a few years and they underinvest, that creates, you know, future supply chain snarls for us too. So you know, even study investment would be great. But that's not always feasible.

E

Ed Clemente 24:04

Just one side question before Eric responds to some of those if he wants to, but this same

problem, is there cars being parked like in Germany on the sides of roads, Japan, Korea, South Korea I mean. Is that same thing going on and all those countries do?

K

Kristin Dzikczek 24:21

Well, you know, I follow a lot of the industry sources that track disruptions. There's a lot of disruptions, and it's hard to tell how many of them are for chips and how many of them are for other reasons. You know, they're still like COVID outbreaks, there's impacts of the war and the energy prices and energy availability in Europe. You know, Japan has been a little bit better supplied only because they have these keiretsu families of, of companies that they work with and have those deep supplier relationships and that thought of chips as a strategic source for longer than other manufacturers maybe? You know, they're also more proximate to the production, there's there's a lot of chip production in Japan and South Korea. So those countries are not seeing as much disruption. But you know, tons of things that are happening. So it's not always very clear why those vehicles are sitting around. But yeah, there's there's some sitting around inventory in places where they it's called 'Build shy.' They build it shy of a few parts.

E

Ed Clemente 25:22

Ah, Eric, you get the last word here as we close out.

E

Eric Shreffler 25:28

Well, thank you, just a couple of quick things, one on talent and then on the, on the comments that Kristin offered about kind of the, in some cases, boom, and bust cycles. Certainly we've seen some of that in the automotive industry over time as well, but I think, you know, as we are working with companies, obviously, any company in this industry that we think can be a solution provider, and as a good fit for Michigan, we're going to work with, there's no doubt about that. But as we proactively engage with companies, we are definitely looking at the ones that are, in our minds, the best fit for the types of product that is being built here in Michigan. And so that's not to say that there will never be ups and downs there, but if if we are able to work with those companies that are providing the products, primarily for automotive or automotive-like applications, again over the next decade, that's one area within the semiconductor industry, that is that is going to be leading the growth. And so I think there's maybe less short term risk for working with companies and investing in those types of opportunities. One quick thing I want to mention, you know, we're, we're trying to position Michigan, I think have done a fairly decent job of it here, as a wonderful place, you know, within the Midwest, that is kind of an untapped reservoir of talent and opportunity for this industry. And have built a program launched in late 2022, called the Talent Action Team, focused on this industry, working with industry, working with University, four year and two year, because this is another industry very much like the auto industry that runs the gamut of the types of skills and credentials that you need to be successful. But then also looking at how do we begin to impact K through 12, and STEM education and positioning the students of those universities and ultimately the workers of the future to understand what their opportunities could be? Because these chips, we've talked a lot about auto because of of where we sit, but just about everything you've come across in life these days is going to be impacted by micro electronics,

semiconductors. Michigan has a role to play. We've got great leadership at you know, the state level, the federal level, and we're all in in really driving partnerships and collaborations for the future.

E

Ed Clemente 28:22

Well I know we probably could have done this show for at least an hour and still not even scratch a lot of the surface. But once again, I want to thank again, Kristin Dziczek, she is the Automotive Policy Advisor at the Detroit Branch of the Federal Reserve Bank of Chicago, and Eric Shreffler, who is the Senior Vice President Market Development at Michigan Economic Development Corporation. And thank you to both of you, I know it took a lot of time out of your day to be here, but we appreciate you taking time to explain this complicated issue to us too.

E

Eric Shreffler 28:55

My pleasure, Ed. Great to see you again Kristin, take care.

K

Kristin Dziczek 28:58

Thank you.

E

Ed Clemente 28:59

Join us next week we have the father daughter team of Pranadia Koradia and her father CK from Transphere Logistics and Supply Firm.

A

Announcer 29:11

The Michigan Opportunity is brought to you by the Michigan Economic Development Corporation. Join us and make your mark where it matters. Visit [michiganbusiness.org.radio](http://michiganbusiness.org.radio) to put your plans in motion