

[Transcript] FYI - For Your Innovation / Big Ideas Monday Mini: Autonomous Logistics

Welcome to the Big Ideas Monday mini-series, brought to you by the For Your Innovation podcast.

Big Ideas is meant to enlighten investors on the long-term impact of innovation.

This annual research report seeks to highlight the technological breakthroughs evolving today and creating the potential for super-exponential growth tomorrow.

We believe that innovation is taking off now, corroborating our original research and boosting our confidence that our strategies are on the right side of change.

To learn more, visit arc-invest.com.

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Tasha Keeney again, director of investment analysis and institutional strategies at ARC.

Today I'm going to talk to you about one of our Big Ideas from our 2023 presentation.

Please check out the full deck on our website.

But right now we're going to talk about autonomous logistics.

So before I get into things, there are risks of investing in innovation that all investors should be aware of, that you listeners should be aware of.

Know that we do try to take these risks into account when we model and estimate future market sizes.

All right, autonomous logistics.

So we think that autonomous technology will not just change how we as people get around but also how our goods get around and get to us in e-commerce.

So this includes many different form factors.

In fact, we think there'll be form factors that exist in the future that we don't see today.

Different shapes and sizes of machines for purpose built applications that maybe we couldn't even dream of right now, but in the future they'll fit sort of the precise applications that are needed for specific pain points in the logistics system.

At ARC we focused on three of them primarily for now, trucks, drones, and robots that address the middle and the last mile of logistics.

So based on our assumptions, we think that autonomous logistics revenue could scale from roughly nothing today to about \$1 to \$2 trillion in 2030 and delivery charges could be as inexpensive as \$0.20 all the way up to \$10.

If you take a look here at the different form factors, starting with the largest, we think that an autonomous electric truck could price at \$0.03 per 10 mile.

That's less than half the cost of a human driven diesel truck today.

For local batch delivery, this is a robot that travels in integrated traffic.

Importantly, it's not a sidewalk robot.

It travels on the road with cars.

It might be a little smaller than a car, but it's purpose built to carry the packages that are inside of it.

We're looking at a specific use case here, so this is grocery delivery.

If you drive yourself to the grocery store, first of all, you're probably not getting paid for it, but it probably also costs you about \$2 to \$3 just for that journey.

A robot could deliver those groceries to you for about \$0.40 per trip, so six to seven times less expensive than today's human in the loop options.

Lastly, local small item delivery costs.

This is a drone.

This is for last mile delivery.

If you look at the most comparable option, which is an app-based delivery service, that's the instant delivery that gets you something in less than an hour.

That could be \$5 to \$6 to get something to your door.

A drone could do it for just \$0.25, so this will be extremely inexpensive.

It'll likely change the way you shop, and we're going to get into that later.

Starting backwards here with drones, ultimately, we think drones could deliver you both parcels and food.

That's food in the forms of meals, restaurant delivery, and similar to autonomous ride-hill, we think that this technology will have the most dramatic effect in countries that have more expensive delivery options today.

You can see looking across parcels here, countries that have fees that are as high as \$9 to \$10 all the way down to places like China and India, where it's \$2 or less for parcel delivery.

Drones will still be, by far and large, a less expensive option, but they will be dramatically less expensive in countries with high fees.

Same thing for food or meal delivery.

We see prices of \$5 to \$10 today.

If you look at Amazon Whole Foods, DoorDash, UberEats, all the way down to less than a dollar for Misfresh in China, of course, drones will still be less expensive, but again, more dramatic in countries with higher fees.

For real-time delivery, that delivery that you get in a specific window, let's say less than an hour, we expect this could be a \$1 to \$2 trillion addressable market in 2030.

We've done an analysis similar to what we've done for ride-hill, looking at price points based on the price support that we see from today's market options, all the way down to that \$0.20 to \$0.40 per trip option that we think will be unlocked with autonomous delivery options.

This is the point at which we expand the delivery market past what we see today in parcel and food delivery.

It'll give many people access to inexpensive delivery that may not currently have it today.

It could cause you to order things more often, order things in smaller quantities because they'll be delivered by a drone or robot for less than a dollar.

Actually, our estimates for drone delivery are larger than we had initially expected.

We expect the delivery fees generated off of parcel delivery could be as high as \$500

billion, and for meal delivery, it could be roughly \$200 billion by 2030.

That's about five times greater than we previously estimated.

This is because of the updated pricing analysis that we have done, again, looking at the price support that we see from today's delivery options.

Early on, we expect higher prices to come in in the initial days of robots and adoption all the way down to that \$0.20 estimate.

Drones could actually carry a meaningful portion of volume.

We think they could carry more than half of the \$20 trillion in e-commerce and the \$2 billion that we see in meal purchases in 2030.

Moving on to robots.

For grocery delivery, right now, online or e-commerce accounts for roughly 6% of grocery sales globally.

This is our estimate.

It's as high as 20% in places like China, but globally, on average, roughly 6% of groceries are ordered online.

The interesting thing here is this is not equivalent to what is delivered.

Actually in the US, of those online orders, people are still choosing to pick up their groceries 30% to 40% of the time.

You can imagine that this is the first part of the market that goes to autonomous delivery because this is going to be a lot more convenient and inexpensive than you going to the store yourself to pick it up.

This could be an immediate win in that case.

Ultimately, we think that robot grocery delivery could generate about \$40 billion in fees in the next 10 years by 2030.

That may sound like a relatively small market opportunity, but I want to highlight that this will completely change the dynamics for, first of all, the companies that are offering groceries and e-commerce.

Autonomous delivery will give you a significant competitive advantage over peers.

Again, we think that robots could capture a meaningful portion of the volume of delivered goods.

We think in 2030, e-commerce could capture about 35% of the 11 trillion grocery market globally, and robots could account for more than half of those deliveries, so \$40 billion in fees but carrying trillions in goods.

Looking at real-time delivery, this is both robots and drones.

We think all in all, \$700 billion in fees could be generated in 2030.

Companies that are working on this are far and wide.

They range from Domino's to Walmart to Alibaba, JD in China, Maytuan, Amazon Prime Air, Neuro, Google Wing.

Again, this is an earlier stage market than the autonomous car space, and there are many looking to tackle this opportunity, and you can see why.

In the middle mile part of the logistics supply chain, autonomous trucks will likely dominate, so an autonomous electric truck, as I said, could price at \$0.03 per 10 mile.

That's less than half the cost of a human-driven diesel truck, but importantly, it's also cheaper than rail.

Rail and trucks are roughly tied for ton mileage.

In the US, it's about a 60-40 relationship, but you can imagine that a lot more goods will travel over the truck market than currently do today.

That will have really wide-ranging effects.

Of course, it actually might cause more damage to our roads.

Ultimately, we think that this will be convenient as it offers an inexpensive point-to-point solution for goods delivery, but if you look at the rail industry and the amount of money that's spent on maintaining and investing in that infrastructure, globally, that's over a trillion dollars per year, and China actually accounts for more than half of that total.

The fixed assets that are in rail are at risk in this transition, and countries that are investing a lot more in the rail network might feel this more heavily than other countries. Global autonomous delivery revenue could total \$1-2 trillion by 2030.

This includes the last mile real-time delivery options that could total \$700 billion, as well as autonomous trucks, which could total about \$800 billion in gross revenue in 2030.

This will totally change our shopping habits, as I said.

You might not choose to have a pantry anymore because you're ordering groceries delivered every day by a robot.

It's that convenient and inexpensive.

You do more trips, and you buy less in bulk.

You could, of course, transition more to e-commerce.

You stop going to stores entirely.

It's just much more convenient to order everything online every last piece.

This will change the logistics supply chain and reshape things for sure, but this will also have a dramatic impact on consumers.

It should allow for more money in consumers' pockets as they save on delivery fees.

For more research, check out arc-invest.com.

Thanks again for listening.

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