Can AI replace people? The truck-driving case study

Published 29 July 2022

Christopher Gannatti, CFA
Global Head of Research

In the current macroeconomic environment, there are many areas of employment where we might think it could make sense to have humans less involved. Human beings, for instance, might demand higher wages, which could, in turn, lead to high prices of certain products and services, further inflation, and demands for even higher wages. Economists term this the 'wage-price-spiral' and fighting it is a primary mission of central bankers.

However, if we can take humans away from certain tasks, then there are no more wages. As long as the system is maintained and monitored properly, a whole component of cost would melt away.

How close are we to being able to achieve this?

The case study of autonomous trucks

If we look at the business of trucking across the United States, there is already a chronic shortage of drivers. The American Trucking Association notes that there is a historic shortage of 80,000 drivers1. However, it's important to realise that all truck-driving jobs are not equal. You have2 long haul truck drivers, who could see their roles at the biggest risk, are spending the highest proportion of time driving on highways. Repetitive highway driving outside of cities and towns is where artificial intelligence (AI) is most likely to make an impact. Delivery drivers are at the opposite end of the spectrum. They frequently navigate small streets and other highly changeable environments.

We have to ensure we frame the topic accurately and recognise that autonomous delivery on small side streets in busy cities is quite a different problem to solve than trucks driving themselves long distances in highway conditions.

In fact, assuming good weather, which is generally the case in the Southwestern United States, an autonomous truck will see further than a human driver could. The system would also maintain the same attentiveness, never growing tired or drowsy. It could also operate 24 hours a day, 7 days per week, with the exception of fuelling time and maintenance time.

Labour costs typically represent 15% to 20% of the cost of operating a truck. Additionally, the law states that human drives need to rest, meaning that the truck can be used only about 30-40% of the time3.

If trucks could be run 24 hours per day, 7 days a week, it could increase asset utilisation by a factor of 2 or more.

To place the market size in context, the trucking market in the U.S. is around $700 billion in size, while globally it is roughly $4 trillion in size4. Even a small gain from autonomous driving in a market this size could equate to very big values.

Global companies are testing on public roads in the US

Einride AB is a Swedish firm with a very unique looking autonomous truck. It has been typical to have a truck looking at least somewhat similar to what we are used to. Einride's 'Pods' are stubby, snub-nosed vehicles, and there is no 'cab' where a human driver could sit and operate the vehicle by turning the wheel or pressing the pedals.

Testing of the Pods will be done in an operation with GE Appliances on a road between two warehouses in Tennessee.

The Pods have room for roughly 10 pallets of freight, a capacity of circa 57,000 pounds. Without onboard drivers, they are managed remotely, and operators can manage more than one vehicle at a time. Einride signed an agreement in 2021 to deliver 300 electric trucks to shipping giant A.P. Moller-Maersk A/S5.

Long-haul trucking can be the first step on a broader autonomous journey

Aurora is outlining a 'market entry sequence' for bringing various types of autonomous activity into the market. Trucking is first, for the rationale that we mentioned before, and Aurora has partnered with PACCAR and Volvo.

The next step regards 'passenger mobility.' Aurora indicates that the rollout benefits from the advances that they will make with the truck technologies. They have partnered with Uber and Toyota for this segment.

Finally, Aurora notes 'local goods delivery'. It could be that this is the most complex, but it is a large market opportunity valued with a total addressable market opportunity of about $100 billion6.

TuSimple is running a global operation that has made a lot of progress so far7:

- The firm notes more than 500,000 of level 4 test mileage in China
- Sensors are able to detect out to 1,000 metres
- There are around 25 current level 4 autonomous trucks in the TuSimple fleet

China's estimated road freight market value was $750 billion in 2020, and it could grow to $1.3 trillion by 2030.

While the players take different approaches and tend to focus in different markets, it's clear that significant progress has been made in autonomous trucking.

Still some years before massive human job replacement

Even with the significant progress that we can see, it is not clear exactly when we will see massive amounts of human jobs being replaced with autonomously driven trucks, and it is unlikely that in the current cycle of fighting inflation across the supply chain will be materially impacted by developments in this space. Still the

market is so large that we believe investors do have to remain attentive, and it's also clear that autonomous trucking could have the best chance for being utilised at scale.

1 Mims, Christopher. "Self-Driving Big Rigs Are Coming. Is America Ready?" Wall Street Journal. 18 June 2022.

2 Viscelli, Steve. Driverless? Autonomous Trucks and the Future of the American Trucker. Centre for Labour Research and Education, University of California, Berkeley, and Working Partnerships USA. September 2018. http://driverlessreport.org

3 Mims, 18 June 2022.

4 Source: Aurora Investor Presentation, Updated as of March 2022.

5 Young, Liz. "Sweden's Einride to Test Autonomous Trucks on U.S. Roads." Wall Street Journal. 23 June 2022.

6 Source: Aurora Investor Presentation, Updated as of March 2022.

7 Source: TuSimple 2022 Investor Day Presentation, 11 May 2022.

Important Risks Related to this Article

Important Information

Marketing communications issued in the European Economic Area ("EEA"): This document has been issued and approved by WisdomTree Ireland Limited, which is authorised and regulated by the Central Bank of Ireland.

Marketing communications issued in jurisdictions outside of the EEA: This document has been issued and approved by WisdomTree UK Limited, which is authorised and regulated by the United Kingdom Financial Conduct Authority.

WisdomTree Ireland Limited and WisdomTree UK Limited are each referred to as "WisdomTree" (as applicable). Our Conflicts of Interest Policy and Inventory are available on request.

For professional clients only. The information contained in this document is for your general information only and is neither an offer for sale nor a solicitation of an offer to buy securities or shares. This document should not be used as the basis for any investment decision. Investments may go up or down in value and you may lose some or all of the amount invested. Past performance is not necessarily a guide to future performance. Any decision to invest should be based on the information contained in the appropriate prospectus and affer seeking independent investment, tax and legal advice.

The application of regulations and tax laws can offen lead to a number of different interpretations. Any views or opinions expressed in this communication represent the views of WisdomTree and should not be construed as regulatory, tax or legal advice. WisdomTree makes no warranty or representation as to the accuracy of any of the views or opinions expressed in this communication. Any decision to invest should be based on the information contained in the appropriate prospectus and affer seeking independent investment, tax and legal advice.

This document is not, and under no circumstances is to be construed as, an advertisement or any other step in furtherance of a public offering of shares or securities in the United States or any province or territory thereof. Neither this document nor any copy hereof should be taken, transmitted or distributed (directly or indirectly) into the United States.

Although WisdomTree endeavours to ensure the accuracy of the content in this document, WisdomTree does not warrant or guarantee its accuracy or correctness. Where WisdomTree has expressed its own opinions related to product or market activity, these views may change. Neither WisdomTree, nor any affiliate, nor any of their respective officers, directors, partners, or employees accepts any liability whatsoever for any direct or consequential loss arising from any use of this document or its contents.