Robots, Drones, Self-Driving Cars, A.I.—Oh My!!

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Introductions

Manu Diwakar - Ceres Imaging
Carina Federico, Crowell & Moring LLP
Jackie Guilbault, Skycatch
Alvaro Luna, WeWork
Travis Thompson, Sideman & Bancroft LLP
William Hays Weissman, Littler Mendelson, P.C.
Are Robots and Automation Taking Over the World?

• Should humans be worried about robots and automation replacing them in the workplace?

• Or do robots and other types of artificial intelligence improve human efficiency and actually increase productivity?
Traffic Signals

• First introduced in 1914 in Cleveland, Ohio by James Hoge.
• By 1930, all major American cities had at least one electric traffic signal.
• Between 1914 and 1930, motor vehicle fatalities fell by more than 50%.
• Initial human reaction: “Drivers are abandoning their humanity and civility because they no longer have to acknowledge humans at intersections.”
Autocorrect

• Introduced by Microsoft in 1993.
• Improved overall workplace human efficiency.
• Helps all people remember how to spell the word “judgment”
• [Insert Laughter]
• **Initial Human Reaction:** “People will lose the important skill of spelling.”
What is Automation?

• Automation is defined as the use of largely automatic equipment in a system of manufacturing or other production process.
What is a Artificial Intelligence?

- **Simple definition**
  Machines acting in ways that seem intelligent.

- **Artificial**
  Something that doesn’t occur naturally.

- **Intelligence**
  “The ability to solve problems, or to create products, that are valued within on or more cultural settings.”
  
  (Howard Gardner 1983)
Types of Artificial Intelligence

- **Robotics** – automated devices that perform physical tasks in the real world.

- **Natural Language Processing** – enables machines to understand and generate language in its written and spoken form.

- **Machine Learning** – predictive computer programs that automate learning through experience using large data sets.
Potential Effects of Automation and A.I.

- Human Workers could be replaced by automation and the introduction of artificial intelligence into the workplace.
  - McKinsey study found that “half of today’s work activities could be automated by 2055.”
- Government tax revenues become lower
- Demands on government services increase

Computers and Typographers

March 2016 Harvard Business Review*

• “Most jobs using computers have seen growing employment, not job losses.”
• “The growth of jobs comes at the expense of other occupations, but does not decrease the overall number of jobs.”
• “The introduction of computers in the early 1980s dramatically reduced jobs for typographers, but it was not the case of computers replacing typographers, but the substitution of one occupation for another.”

Current State of Tax Affairs

• Current tax law supports growth in automation and Artificial Intelligence

• Majority of tax revenue comes from labor income
  • Robots don’t incur payroll taxes used to fund Social Security and Medicare

• Incentives
  • Accelerated depreciation for capital investments
  • Research and development credits
  • Qualified Opportunity Zones (not tied to employment)
A Tax on Robots?

• Bill Gates made headlines in 2017 when he proposed a tax on robots
• Lawrence Summers (former economic advisor to President Obama) strongly disagreed
• Presidential candidate Andrew Yang is proposing a universal basic income funded by a tax on automation
• U.S. Representative Alexandria Ocasia-Cortez voiced support for taxing Robots.
• EU considered a proposal to tax robot owners to pay for training for workers who lose their jobs, but this was ultimately rejected
• In 2018, South Korea instituted a type of robot tax by reducing a tax deduction on business investments in automation.
Maryland case addressed whether life-sized singing mechanical puppets at Chuck-E-Cheese were “performing” for purposes of Maryland’s admissions and amusement tax.

The Court took use the ordinary meaning of the term performing or “a formal exhibition or skill or talent...”

The Court held that the admissions and amusement tax did not apply because “a pre-programmed robot has no ‘skill’ and therefore leaves no room for spontaneous human flaw in exhibition, and cannot ‘perform’ a piece of music anymore than a jukebox.”
What About Employment Taxes?

• Federal Income, Social Security, and Medicare Taxes
  o Employers generally must withhold federal income taxes from their employees’ wages.
  o Employers generally must withhold part of social security and Medicare taxes from employees’ wages. Employees pay a matching amount.
  o Withheld wages must be deposited on either a monthly or semi-weekly schedule chosen at the beginning of the calendar year.
  o Employers also must withhold the Additional Medicare Tax on employees’ wages and compensation that exceeds a threshold amount.

• Employers must also report and pay Federal Unemployment (FUTA) tax
  o Employees do not pay this tax or have it withheld from their pay.
  o Deposits for FUTA are required for the quarter within which the tax due exceeds $500.
  o The tax must be deposited by the end of the month following the end of the quarter.

• Individuals who work for themselves must pay self-employment tax
The Debate on Taxing Robots

• Pros:
  o Can use money to retrain or support people that lose their jobs to automation
  o May slow speed of automation, which will give policy makers time to counteract potential unemployment

• Cons:
  o Could stall innovation and put us behind in AI and robotics fields
  o Could slow GDP and wage growth
  o Fears about job loss from automation may be overblown
  o Local taxes would not prevent shifting jobs from one jurisdiction to another
Examples- Taxes on Autonomous Vehicles

• Massachusetts
  o In 2016, established an Autonomous Vehicles Working Group
  o State legislature introduced a bill in 2017 that would tax self-driving cars by mileage
  o Bill would also allow some large municipalities to ban autonomous vehicles

• Tennessee
  o 1-cent-per-mile tax on autonomous cars and a 2.6-cents-per-mile tax on autonomous trucks with more than two axles
Potential Effects of Autonomous Vehicles on Taxes

• Disruption to state motor vehicle-related revenues
• Potential reduction in excise taxes
• Lost motor fuel tax revenues
• Decrease in parking tax revenue
• WeWork designs and builds physical and virtual shared spaces and office services for entrepreneurs and companies.
WeWork Discussion

- What is the potential human impact of WeWork’s technology?
- How does the new technology improve efficiency?
- How would a tax on the technology impact the company?
Ceres Imaging

• Aerial spectral imagery company that helps growers optimize their water and fertilizer application.
• High-resolution multispectral images are captured via low-flying plans and processed using highly advanced image processing and crop modeling techniques.
• Images reveal highly accurate, real-time information of the water and nutrient status of every plant in a field.
Ceres Imaging Discussion

• What is the potential human impact of the imaging technology?
• How does the new technology improve efficiency?
• How would a tax on the technology impact the company?
Sky Catch

• Offers an autonomous aerial data capture solution to construction, agricultural, mining, and solar industries.
• Offers an automated and autonomous unmanned aerial vehicle solution to acquire high resolution aerial data for real-time mapping
Sky Catch Discussion

• What is the potential human impact of the drone technology?
• How does the new technology improve efficiency?
• How would a tax on the technology impact the company?
Questions?
Thank you!