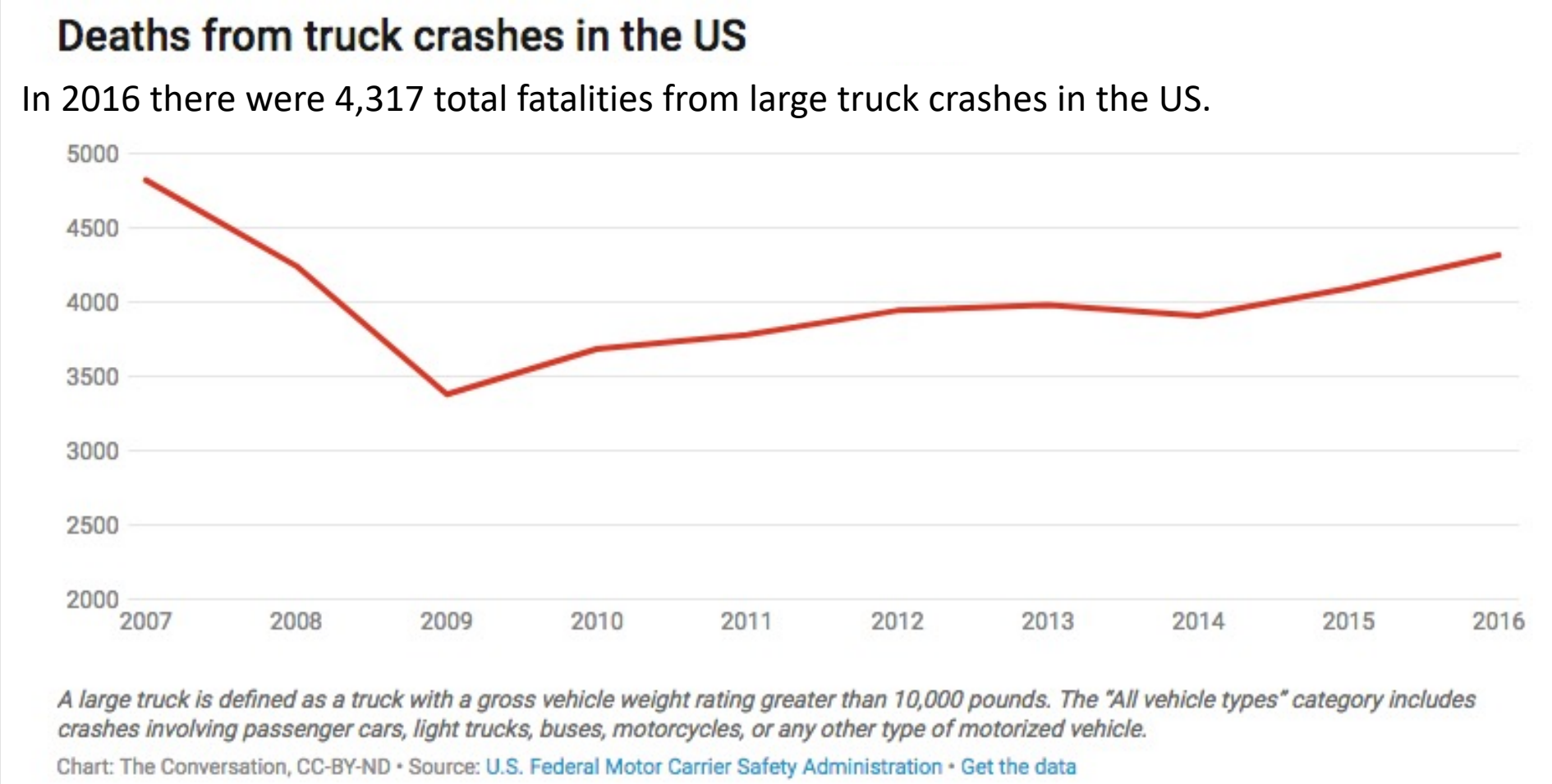
# LONG WORK HOURS AND LOW PAY
# How Trucking Gets Us Back to Basics

Open Markets Institute

April 12, 2022

Prof. Michael H. Belzer
Wayne State University, Detroit

# Truck Fatalities Rising




**Fatal truck-involved crashes are increasing:**

- 40% between 2009 and 2017
- Up 24% between 2014 and 2017
- Up 45% per VMT between 2009 & 2017
- 9% in last report year (2016 to 2017)

# BANG FOR THE BUCK

- Millions of dollars spent to reduce crashes and fatalities
- Yet crashes and fatalities still increase
- What can we do differently?

⇒ **Recognize that large trucks and truck drivers operate in a market and are subject to the market as a regulatory framework.**

⇒ **An unregulated product market puts continuous stress on the labor market.**

# ECONOMICS INFLUENCES SAFETY AND HEALTH

- "The Human Cost of Amazon's Fast, Free Shipping"
  - *NY Times* September 5, 2019
  - https://www.nytimes.com/2019/09/05/us/amazon-delivery-drivers-accidents.html
- "How Amazon hooked America on fast delivery while avoiding responsibility for crashes"
  - *ProPublica's* Big Story September 5, 2019
  - https://features.propublica.org/amazon-delivery-crashes/how-amazon-hooked-america-on-fast-delivery-while-avoiding-responsibility-for-crashes/
- "The Cost of Next-Day Delivery"
  - *BuzzFeed* August 31, 2019
  - https://www.buzzfeednews.com/article/carolineodonovan/amazon-next-day-delivery-deaths
- "Inside Documents Show How Amazon Chose Speed Over Safety in Building Its Delivery Network"
  - ProPublica December 23, 2019
  - https://www.propublica.org/article/inside-documents-show-how-amazon-chose-speed-over-safety-in-building-its-delivery-network

# AMAZON PASSES THE COST OF "FAST FREE SHIPPING" TO SOCIETY

- Cost not captured in price is external to the market.
- An "externality" is both inefficient and inequitable.
- External costs are paid by society in safety and health damage.
- Insurance could pick up this risk, but the trucking industry lobby has kept required liability insurance to $750,000/crash since 1983, so the insurance market doesn't work.

# WHAT ARE THESE COSTS?

- Fatigue and associated risks
  - Stress-related illness
  - Stress-related injury
  - Stress-related crashes
- Crash costs are high, and victims pay due to under-insured vehicles, firms, and drivers.

➔ Economic costs are damaged market, unpaid taxes, and reckless disregard for the public

➔ There is no “driver shortage”

➔ There is a recruiting and retention problem.

# SHIPPER COMPETITION DRIVES CARRIERS TO LOWEST PRICE

- Transport is a commodity
  - Every unit is indistinguishable from another
  - Commodity production drives competition
- Lowest price drives carriers to lowest cost
- Lowest cost drives freight rates down
- Lowest freight rates squeezes drivers
  - Unqualified, dangerous drivers
  - Dangerous workplace pressure
  - Dangerous and unhealthy hours of work

# WHY DO I FOCUS ON SAFETY?

- The truck driver's workplace is the public road.
- If we can show that low pay predicts crashes, truck driver pay becomes a public safety issue.
- Surveys show that the public supports unions that work for them, not just for union members.
- Australia's Transport Workers Union created the "Safe Rates" campaign to build public support for better wages.
  - Labor government passed an Act creating safe minimum wage for interstate drivers in 2013
  - Liberal-National Coalition government repealed it in 2016.
  - "Safe Rates" is a major current Labor Party platform plank.
- US interstate trucking has no minimum wage because the FLSA effectively does not apply to those truck drivers.

# WORK STRESS AND CRASHES

- The stresses associated with work as a CMV driver put workers at significant health and safety risk
  - Irregular schedules
  - Intense economic pressure
  - Very long work hours
- Stresses associated with “Just In Time” logistics
  - Pressure for rapid, scheduled delivery
  - Pressure to cut cost
  - Long, irregular, and stressful work hours lead to fatigue
  - Fatigue leads to crashes and chronic illness.

# “WHY DO LONG DISTANCE TRUCK DRIVERS WORK EXTREMELY LONG HOURS?”

SOURCES


- Belman DL, Monaco KA and Brooks TJ. (2004) *Sailors of the concrete sea: A portrait of truck drivers' work and lives*, East Lansing, Mich.: Michigan State University Press.
- Belzer MH. (2000) *Sweatshops on Wheels: Winners and Losers in Trucking Deregulation*, Oxford, UK and New York, NY: Oxford University Press.
- Belzer MH and Sedo SA. (2018) “Why Do Long Distance Truck Drivers Work Extremely Long Hours?” *The Economic and Labour Relations Review* 29(1): 59–79.
- CHEN Guang X., Sieber WK, Lincoln JE, et al. (2015) “NIOSH national survey of long-haul truck drivers: Injury and safety.” *Accident Analysis & Prevention*: 66–72.
- Kudo, T, & Belzer, MH. (2019). “The association between truck driver compensation and safety performance.” *Safety Science*, 120, 447-455.
- Kudo T, & Belzer MH. (2019). Safe rates and unpaid labour: Non-driving pay and truck driver work hours. T*he Economic and Labour Relations Review*, 30(4), 532–548.

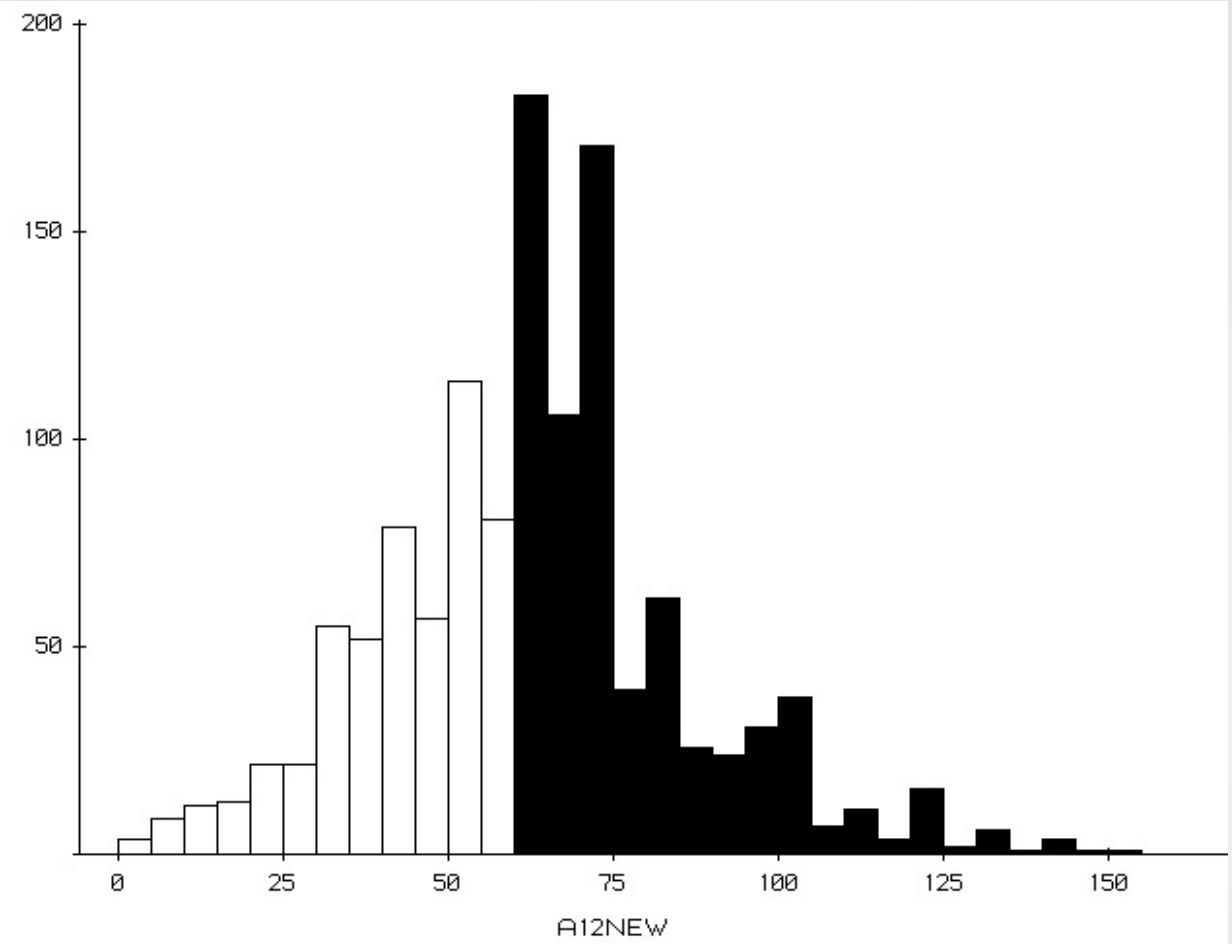
# TRUCKERS WORK LONG HOURS

➔ Truck drivers are not paid for all work time.

- UMTIP 1997 survey showed median non-union driver worked 65 hours/week
  - 55% of drivers not paid for loading/unloading
  - 70% not paid for waiting or other on-the-job work time.
- NIOSH 2010 survey shows median employee driver (non-union) works 60 hrs/week
  - Employee drivers average 63 hours of work per week
- NIOSH 2010 survey also shows 20% of long-haul drivers work more than 75 hours/week
  - Drivers average 10.5 hours of unpaid work per week
  - On average, 27% of employee drivers' work week is unpaid labor
  - Drivers log this work off duty

# DRIVERS IN BLACK WORK EXCESSIVE HOURS

Number of drivers




NIOSH 2010 Survey of Long-Haul Truck Drivers

Hours worked/week

- Median: 60 hours
- Average: 61.5 hours
- n = 1,254 long haul truck drivers

# WHY SO MANY HOURS?

- If the regulations restrict CMV drivers to 60 hours of work per week, why and how do at least half of all long-haul drivers exceed this limit?
- How do carriers and drivers get around the rules?
- How do FMCSA regulations continue to effectively permit excessive hours?
- **The answer rests in conflicting definitions of "work".**
- Compounded by  loopholes in the regulations

# DOL-FLSA DEFINITION OF WORK

- All time during which employees work for an employer, **including waiting time**, is payable:
  - Unless employer frees the worker from work for specific time and employee knows in advance when work time starts and ends; and
  - Unless worker has practical freedom to leave the place of work to go about his/her personal activity; and
  - Unless worker is not engaged in the work for which he/she was hired, including being available for a call.

➔ All time is payable if worker is located away from employer's place of work.

➔ Wait time, and even sleep time, is part of employee's regular work unless otherwise negotiated.

# DOT-FMCSA DEFINITION OF WORK

- Waiting time is non-work time if:
  - "The driver is relieved of all duty and responsibility for the care and custody of the vehicle, its accessories, and any cargo or passengers it may be carrying."
  - "During the stop, and for the duration of the stop, the driver must be at liberty to pursue activities of his/her own choosing."
    - Off duty driver can look at his phone, TV, or read [circumstances limit choices]
    - Driver can sleep, eat, take care of personal hygiene [if facilities available]

    ➔ Companies may interrupt driver's free time and sleep time.

    ➔ Off duty time during a shift may have indeterminate start and end time.

    ➔ Driver cannot practically choose personal activity.
- FMCSA regulations allow carriers to order drivers to log non-driving DOL-FLSA-defined work time as off duty.
  - Drivers have economic incentive to log unpaid work time off duty.
  - Since FMCSA has no position on driver pay, grounds for definitions are quite different.
  - Results are inconsistent with policy goal to limit hours of work.

# ECONOMIC RESEARCH ASSUMES TIME IS MONEY

- Economic theory predicts that workers will trade labor for leisure as their earnings increase.
- We can see this rarely in labor market data but long hours in trucking makes it observable.
- Our research tests the “Target Earnings Hypothesis”.
  - Drivers work to reach their earnings targets
  - Workers seek target earnings to pay their bills
  - We expect that drivers will reduce work time after reaching their targets

# DATA FROM UNIVERSITY OF MICHIGAN TRUCKING INDUSTRY PROGRAM DRIVER SURVEY , 1997-98

- Truck stop survey of 233 employee drivers
- These employee drivers worked an average of 64.5 hours per week with a minimum of 25 and a maximum of 126 hours
- Drivers earned an average of 28.6¢ per mile
  - 45¢/mi in 2019 dollars
  - Inflation-adjusted wages are similar today

# WE USE A TWO-STAGE LEAST-SQUARES MODEL TO ESTIMATE PAY AND HOURS

- Stage 1:
  Estimate pay rate based on driver and job characteristics
- Stage 2:
  Use pay rate to estimate hours of work

# STAGE 1: ESTIMATE PIECEWORK PAY RATE

$$Rate_i = \beta_1 + \beta_2 X_{i2} + \beta_3 X_{i3} + \ldots \beta_K X_{iK} + \varepsilon_i$$

- $Rate_i$ is the mileage rate for the $i^{th}$ driver
- X's represent characteristics of the driver and job that are relevant to determining the mileage rate
- $\beta$'s are the parameters to estimate
- $\varepsilon$ summarizes the random components and unobserved characteristics of the individual driver and job.

# TABLE 1: MILEAGE RATE EQUATION

| *Variable* | Estimate | Standard Error | t-value |
|---|---|---|---|
| *Constant* | 0.241*** | 0.016 | 14.918 |
| Experience | 0.002** | 0.001 | 2.133 |
| Experience$^2$ | -4.1E-05 | 0.000029 | -1.437 |
| Tenure | 0.004** | 0.0017 | 2.049 |
| Tenure$^2$ | -0.00011** | 0.000054 | -1.972 |
| HS Degree | 0.000574 | 0.008 | 0.076 |
| Union | 0.097** | 0.057 | 1.726 |
| White | 0.016** | 0.008 | 1.858 |
| Union by White | -0.04 | 0.058 | -0.695 |
| Previous Moving Violation | 0.007 | 0.007 | 1.051 |
| Medium Firm | 0.013** | 0.006 | 2.065 |
| Large Firm | 0.026*** | 0.009 | 3.164 |
| Private Carriage | -0.020 | 0.010 | -1.900 |
| Dry van | -0.008 | 0.007 | -1.221 |
| Miles per Dispatch | -0.00002*** | 0.000006 | -3.276 |
| Unpaid Time | -0.010 | 0.008 | -1.192 |
| Paid Days Off | 0.001** | 0.0004 | 2.071 |

| | | | |
|---|---|---|---|
| Sample Size | 233 | Dependent variable: | Mileage Rate |
| R-squared: | 0.385 | Rbar-squared: | 0.340 |
| Residual SS: | 0.431 | Std error of est: | 0.045 |
| F(16,216): | 8.457 | Probability of F: | 0.000 |

Experience, tenure, union representation, white, paid days off, and larger firms predict higher mileage rates.

Longer trips pay slightly lower mileage rates because drivers earn uninterrupted pay when they do not have to stop.

# STAGE 2: ESTIMATE WEEKLY HOURS

$$Hours_i = \gamma_1 + \gamma_2 * W_i + \gamma_3 W_i^2 + \gamma_4 Z_{i4} + \ldots \gamma_K Z_{iK} + \varepsilon_i$$

- $Hours_i$ are the weekly hours of the $i^{th}$ driver
- $W_i$ is the fitted wage of the $i^{th}$ driver which we plug in from the wage estimation equation
- Z's represent characteristics of the driver and job that influence the number of hours worked
- $\gamma_i$ is the estimated coefficient of each variable
- $\varepsilon_i$ captures the random components of the hours worked not included in the explanatory variables

# TABLE 2: WEEKLY HOURS OF WORK EQUATION

| Variable | Estimate | Standard Error | t-value |
|---|---|---|---|
| *Constant* | -116.29** | 52.88 | -2.199 |
| Fitted Rate | 776.75** | 370.8 | 2.095 |
| Fitted Rate$^2$ | -1266.30** | 637.3 | -1.987 |
| Age | 3.119*** | 0.849 | 3.674 |
| Age$^2$ | -0.035*** | 0.001 | -3.578 |
| Married | -4.853* | 2.548 | -1.905 |
| Other Income ($1,000) | 0.021 | 0.067 | 0.348 |
| % Night Driving | 9.241 | 5.598 | 1.651 |
| % Non-Driving Time | -21.820** | 9.788 | -2.229 |
| Unpaid Work Time | 11.066*** | 3.441 | 3.216 |
| Union | 10.842 | 9.372 | 1.157 |
| Miles per Dispatch | 0.0007 | 0.002 | 0.313 |
| Private Carriage | -4.082 | 3.464 | -1.178 |
| Tenure | -0.365* | 0.201 | -1.820 |
| Last Home | -0.006 | 0.125 | -0.045 |

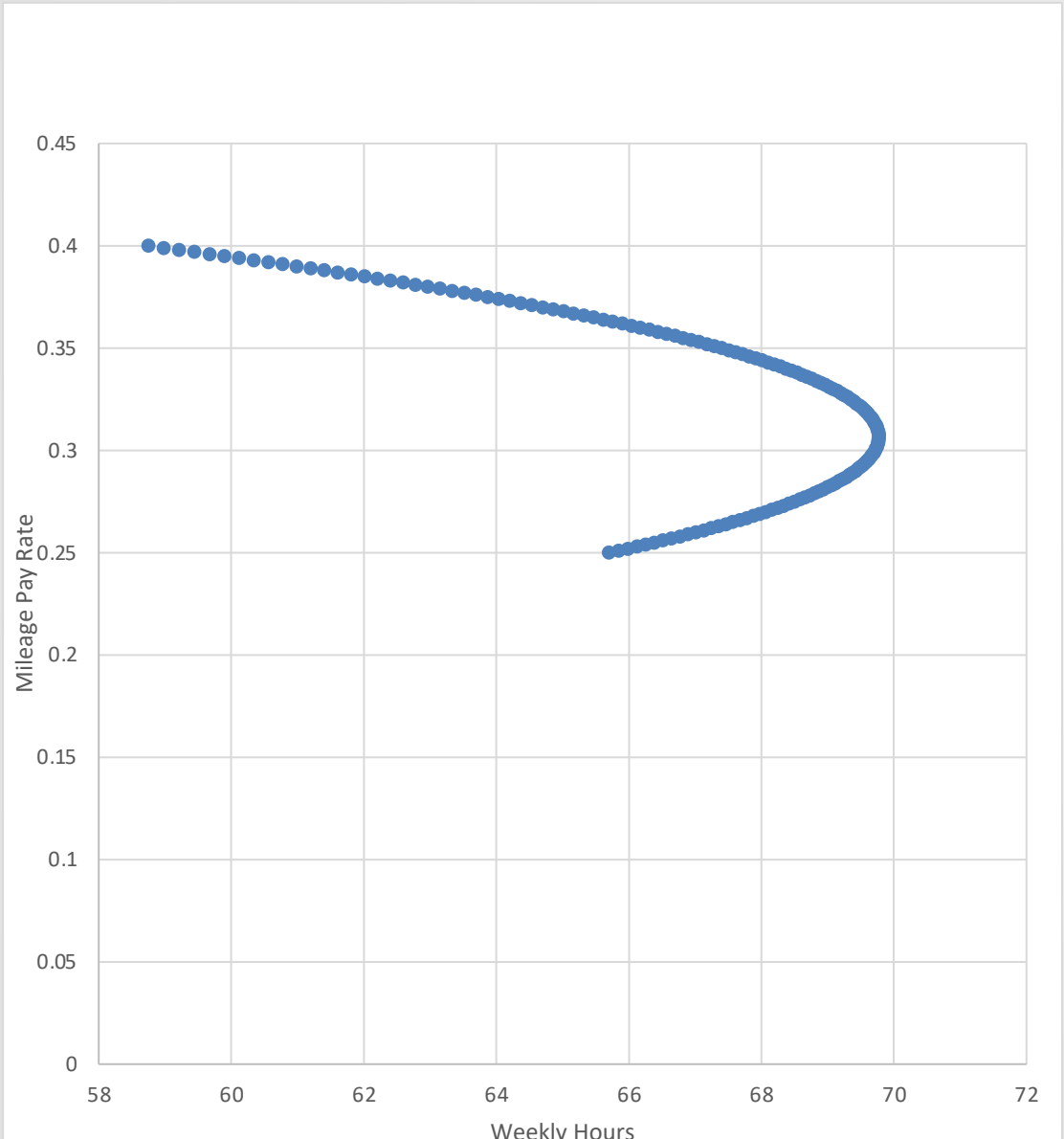
| | | | |
|---|---|---|---|
| Sample Size: | 233 | Dependent variable: | Hours per Week |
| R-squared: | 0.164 | Rbar-squared: | 0.111 |
| Residual SS: | 63611.8 | Std error of est: | 17.082 |
| F (14,218): | 3.061 | Probability of F: | 0.000 |

The Fitted Rate is the wage associated with hours worked, but the square of the Fitted Rate is strongly negative, showing that the curve bends backwards.

Drivers with more Unpaid Work Time work more hours.

The % of Non-Driving Time shows that drivers with more paid non-driving time may work fewer hours, while those who have more unpaid non-driving time may work more.

# ESTIMATED LABOR SUPPLY CURVE FOR LONG-DISTANCE TRUCK DRIVERS




We estimate that drivers would work 60 hours at just less than 40 cents/mile in 1997 dollars.

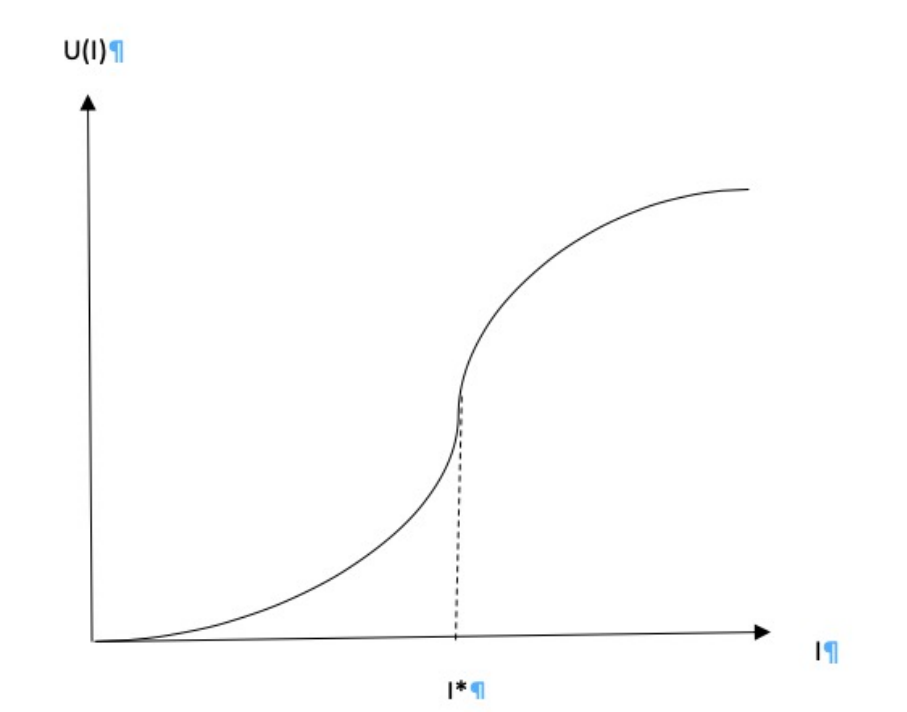
That is 60 cents/mile in 2017 dollars.

➔ If 60 hours per week is safe, this is the "safe rate".

➔ Biggest problem is unpaid nondriving work, which mileage rate masks.

# "SAFE RATES AND UNPAID LABOR: NON-DRIVING PAY & TRUCK DRIVER WORK HOURS"

Kudo and Belzer, *Economic and Labour Relations Review* (2019)




**Economic theory**: Workers trade labor and leisure. The utility function shows the point of regime change: the level of income at which marginal utility of income decreases acutely if income exceeds it.

Very similar to the theory guiding Belzer and Sedo (2019).

**I* is break-point.**

# OLS STATISTICAL MODEL

**Data: NIOSH Long Haul Truck Driver Survey**

$$\ln(WH)=\alpha + \beta_1 \times nondriving + \beta_2 \times \ln(MileageRate) + \beta_3 \times LTL + \beta_4 \times Team + \beta_5 \times Union + \beta_6 \times EnclosedVan + \beta_7 \times white + \beta_8 \times HighSchool + \beta_9 \times age + \beta_{10} \times age^2 + \epsilon,$$

where:

- ln(WH) = natural logarithm of weekly work hours
- Nondriving = pay for nondriving labor
- ln(MileageRate) = natural log of estimated mileage rate. NIOSH data only allow us to divide all annual earnings by annual mileage estimate, so mileage rate is noisy & inflated.
- We would have used two-stage least squares, but weak instruments left the F-ratio of the first stage at less than 2 and the $R^2$ smaller than 0.10.

# SELECTED OLS REGRESSION RESULTS

Table 3: The Results for the Work Hours Equations

Dependent Variable=ln(Weekly Work Hours)

| Variables | Model (1) | Model (2) | Model (3) |
|---|---|---|---|
| Intercept | 4.08*** | 4.10*** | 4.51*** |
| Non-driving Pay | -0.093*** | -0.089*** | -0.089*** |
| ln(Mileage Rate) | -0.029 | -0.023 | -0.022 |
| LTL | | -0.10** | -0.10** |
| N | 715 | 715 | 715 |
| F-statistic | 4.34** | 2.67** | 2.10* |
| R-squared | 0.012 | 0.022 | 0.034 |
| Adjusted R-squared | 0.0093 | 0.013 | 0.018 |

Notes: ***p<0.01; **p<0.05; *p<0.1. All p values are for two-tailed tests. Non-driving pay distinguishes drivers who are paid for non-driving duties at least in part from those who are not paid for non-driving duties at all. If non-driving pay is paid, drivers are not necessarily paid for all non-driving duties. As long they are paid for some non-driving duties, the variable equals one. In(Mileage Rate) is the natural log of the ratio of (Annual Income/Annual Miles Driven). Enclosed Van distinguishes drivers who drives enclos vans from those who drives other trucks. Education distinguishes drivers who have a high school diplom from those who do not have one. Male distinguishes male drivers form female drivers.

# SUMMARY OF RESULTS

- Pay for non-driving work time cuts driver work hours significantly.
- Drivers reduce work after reaching target earnings.
- Consistent with backward-bending labor supply curve (Belzer and Sedo, using UMTIP data).

Takeaway:

- If pay rate is low, drivers can and will log unpaid non-driving labor off duty, allowing them to drive more hours and reach target earnings.
- Drivers paid for non-driving work will reduce their work hours to a safer level – particularly if the carrier requires them to log it.

# DETENTION TIME:
# EXTRA TIME DURING WHICH CARGO OWNERS HOLD UP DRIVER PICKUP OR DELIVERY

SOURCES


- Office of the Inspector General. (2018) “Estimates Show Commercial Driver Detention Increases Crash Risks and Costs, but Current Data Limit Further Analysis.”

- Dunn NJ, Hickman JS, Soccolich S, et al. (2014) “Driver Detention Times in Commercial Motor Vehicle Operations”. Washington: Federal Motor Carrier Safety Administration, xiv; 49.

- Speltz E and Murray D. (2019) “Driver Detention Impacts on Safety and Productivity”. American Transportation Research Institute.

# DETENTION TIME ADDS MORE RISK

- Office of the Inspector General (DOT-OIG) of the US DOT performed "detention time" study in 2017.
  - "Detention" was defined as holding up drivers more than two hours loading and/or unloading
  - OIG reports this is "industry standard"; measures only "excess" time
  - Two-hour "industry standard" was created during the regulated era (before 1980), when tariffs allowed two hours of loading or unloading before cargo owner incurred "demurrage" charge.
- **BEFORE 1980**, Teamster collective bargaining contracts required payment for all work time according to **FLSA definition of work, not DOT definition of work**.
  - Most drivers were paid for all time because 60+% were Teamsters.
- After deregulation, unionization dropped by about 90%.
  - Shippers still expected two-hours free time.
  - Non-union trucking companies could not collect from cargo owners and stopped paying drivers.
  - Declining union bargaining power meant fewer drivers could collect.
  - Two hours became unlimited free time.

# DETENTION TIME AND ELBs

- Electronic logbooks (ELBs) cannot determine driver activity
- They record only that the truck is **moving or stopped**.
  - FMCSA allows carriers to tell drivers to log off duty when they get to shipper or receiver.
  - Logbook reports location in GPS terms only, but FMCSA does not require that drivers report or verify their activity.
  - FMCSA inspectors have to take their word that they really are off duty. This is trust without verification.
- Drivers log off duty what FLSA defines as work time because they don't get paid for it and because their bosses tell them to do it
  - FMCSA permits this if company authorizes it.
  - This is why surveys show most drivers exceed 60 hr legal limit.

WAYNE STATE

# DETENTION TIME AND LOGGING

- Economic principle behind detention
  - People will consume an infinite amount of a free good
  - Shippers and receivers have no incentive to conserve free worker and carrier delay time.
- American Trucking Associations (ATA) currently estimates the average length of haul at about 550 miles
  - **This means average driver may load and unload once/day**
  - **Means on average, even drivers who get paid for delays give away up to four hours/day free time.**
- Unpaid delay time values carrier (truck) and driver delay time at zero
  - Detention kicks in after two hours, technically, BUT
  - Carriers and workers have weak bargaining power
  - Hard to collect because there is no enforcement mechanism

# OIG DETENTION TIME STUDY RESULTS

- **First 15-minute detention** beyond 2 hours increases the average expected crash rate by **6.2%**.
  - Causes one additional crash per 1,000 power units
  - Causes 6,509 additional crashes per year
  - Crashes may increase just because detention time increases
  - **Every 5-percentage point increase in proportion of stops resulting in detention is associated with a 4.7% increase in expected crash rate**
- 2014 FMCSA detention study found that
  - 10% of all stops experienced 2+ hours detention time
    - Drivers may experience unlimited repeated 2-hour stops without pay
  - For hour stops greater than 2 hrs, delay time averaged 1.4 hrs
    - This means 10% of all stops had <u>total</u> stop time 3.4 hours
    - Smaller carriers had more delay than larger carriers

WAYNE STATE

# DETENTION TIME COSTS MONEY

- Detention is associated with between $1.1 billion and $1.3 billion lower annual earnings for for-hire CMV drivers in the truckload sector.
  - That's between $1,281 and $1,534 per driver per year
  - Helps to explain truck driver recruiting and retention problem.
- Detention reduces motor carrier net income by $250.6 to $302.9 million per year
- Unpaid delay time contributes to excessive driver labor time
- Excessive unpaid non-driving labor time drives up crash risk

# POLICY IMPLICATIONS FROM ALL STUDIES

- Higher pay rates and pay for all work time will reduce drivers' incentives to work illegal hours
- Requiring pay for all labor time would reduce incentive to log DOL-defined work time off duty
  - Drivers more likely will log all work time
  - This will reduce hours and improve safety
  - Driver incentives will line up with policy objectives
  - Cargo owners and carriers cannot race to the bottom for cheap labor.
  - Might make truck driving attractive again.
- The high-road path is the most straightforward solution to reduce driver hours and improve safety and health.

# SUMMING UP

- The USDOT Office of the Inspector General report on detention time shows the low road costs the economy billions of dollars yearly
  - Wasted time and money for drivers and carriers
  - Major contribution to the alleged “driver shortage”; drivers quit trucking
- Low road encourages inefficient use of all resources
  - Labor
  - Capital

  ➔ Reduces American Gross Domestic Product
- Profound safety and health cost, and lost productivity, reduces GDP.
- Because commercial transport is a business, economic forces explain safety and health outcomes.
- Economic approach to safety and health points the way to policy solutions.
- Safe rates will save lives, allocate resources efficiently, and grow the economy.

# PATH FORWARD

- **Match the definition of work** common to the production workforce **to everyone in the production labor market**.
- **Reconcile the definition of work so that the DOT definition matches the DOL definition**.
- **Pay truck drivers for all their work time**, including overtime, according to this common definition, just like other production workers.
- **Change regulations so that owner-operators must be true independent businesses, operating on their own authority, and not subcontracted dependent contractors**.

# PRESIDENT BIDEN'S TRUCKING ACTION PLAN

| No. | Policy Recommendation | Impact | Actor(s) |
|---|---|---|---|
| 40 | Urge Congress to eliminate the Fair Labor Standards Act motor carrier exemption.<br>• Complexity: Medium<br>• Cost: **$** (Low)<br>• Approximate Timing: Near-Term<br>• Mode(s): Trucking | Moderate | DOL, USDOT, Congress |

# References


- *2018 Pocket Guide to Large Truck and Bus Statistics*. (2018). Retrieved from Washington: https://rosap.ntl.bts.gov/view/dot/36537
- Belman DL, Monaco KA and Brooks TJ. (2004) Sai*lors of the concrete sea: A portrait of truck drivers' work and lives*, East Lansing, Mich.: Michigan State University Press.
- Belzer MH. (2000) *Sweatshops on Wheels: Winners and Losers in Trucking Deregulation,* Oxford, UK and New York, NY: Oxford University Press.
- Belzer, MH. (2018) "Truck Drivers are Overtired, Overworked, and Underpaid." T*he Conversation. July 25.* https://theconversation.com/truck-drivers-are-overtired-overworked-and-underpaid-100218
- Belzer MH. (2018) "Work-stress factors associated with truck crashes: An exploratory analysis." *The Economic and Labour Relations Review* 29:3. 289-307.
- Belzer MH and Sedo SA. (2018) "Why Do Long Distance Truck Drivers Work Extremely Long Hours?" *The Economic and Labour Relations Review* 29:1. 59–79. https://goo.gl/M5Xx47.
- CHEN Guang X., Sieber WK, Lincoln JE, et al. (2015) NIOSH national survey of long-haul truck drivers: Injury and safety. Ac*cident Analysis & Prevention* 85: 66–72. https://www.ncbi.nlm.nih.gov/pubmed/26397196
- Hedlund J and Blower D. (2006) Using LTCCS Data for Statistical Analyses of Crash Risk. Large Truck Crash Causation Study Analysis Series. Washington: Federal Motor Carrier Safety Administration, 1-12. https://ai.fmcsa.dot.gov/ltccs/data/documents/usingtheltccsdata.pdf
- Kudo T and Belzer MH. (2019) "The association between truck driver compensation and safety performance." *Safety Science* 120: 447-455.
- Kudo, T., & Belzer, M. H. (2019). "Safe Rates and Unpaid Labor: Non-Driving Pay and Truck Driver Work Hours." *Economic and Labour Relations Review* 30:4.
- Office of the Inspector General. (2018) *Estimates Show Commercial Driver Detention Increases Crash Risks and Costs, but Current Data Limit Further Analysis*. https://www.oig.dot.gov/sites/default/files/FMCSA%20Driver%20Detention%20Final%20Report.pdf
- Panel on Research Methodologies and Statistical Approaches to Understanding Driver Fatigue Factors in Motor Carrier Safety and Driver Health. 2016. C*ommercial Motor Vehicle Driver Fatigue, Long-Term Health, and Highway Safety: Research Needs*. Washington: National Academies Press. http://www.nap.edu/24818


WAYNE STATE

# Supplemental Resources


- Belzer MH and Thörnquist A. (2020, forthcoming) "Economic Liberalization and Governance: Road freight transport liberalization in the United States and the European Union." In: Sheldon P, Gregson S, Lansbury R, et al. (eds) *The Regulation and Management of Workplace Health and Safety: Historical and Emerging Trends*. London: Routledge.
- Boros C. (2018) *Romanian Trucker, Polish Wage, Dutch Workplace: How salaries migrate across the EU in the road haulage business*. Available at: https://theblacksea.eu/stories/romanian-trucker-polish-wage-dutch-workplace/
- Boros C and Eliassen I. (2018) *Exposed: Norwegian-owned firm making truck drivers cheat safety test; East European drivers are fed answers for road health and safety exam in Slovakia*. Available at: https://theblacksea.eu/stories/exposed-norwegian-owned-firm-making-truck-drivers-cheat-safety-test/
- Boros C and Poortmans J. (2018) *Deadlock in Brussels over Trucking Wages: Eastern and Western Europe are at war over the salaries of drivers. Only the European Parliament can resolve the crisis. But there is a stalemate*. Available at: https://theblacksea.eu/stories/deadlock-brussels-over-trucking-wages/
- Executive Office of the President. 2022. "Supply Chain Assessment of the Transportation Industrial Base: Freight and Logistics," Washington, DC: U.S. Department of Transportation, xxxv; 104. https://www.transportation.gov/supplychains
- Dunn NJ, Hickman JS, Soccolich S, et al. (2014) Driver Detention Times in Commercial Motor Vehicle Operations. Washington: Federal Motor Carrier Safety Administration, xiv; 49. https://rosap.ntl.bts.gov/view/dot/193
- Faulkiner MR and Belzer MH. (2019) Returns to compensation in trucking: Does safety pay? *The Economic and Labour Relations Review* 30:2. 262-284.
- Fink L. (2011) *Sweatshops at Sea: Merchant Seamen in the World's First Globalized Industry*, from 1812 to the Present: The University of North Carolina Press.
- Hedlund J and Blower D. (2006) "Using LTCCS Data for Statistical Analyses of Crash Risk." Large Truck Crash Causation Study Analysis Series. Washington: Federal Motor Carrier Safety Administration, 1-12. https://ai.fmcsa.dot.gov/ltccs/data/documents/usingtheltccsdata.pdf
- Rodriguez DA, Targa F and Belzer MH. (2006) "Pay Incentives and Truck Driver Safety: A Case Study." *Industrial and Labor Relations Review* 59: 205-225.
- Saltzman GM and Belzer MH. (2007) *Truck Driver Occupational Safety and Health: 2003 Conference Report and Selective Literature Review*. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. http://www.cdc.gov/niosh/docs/2007-120/.
- Speltz E and Murray D. (2019) "Driver Detention Impacts on Safety and Productivity". American Transportation Research Institute, 22. https://truckingresearch.org/
- Viscelli, S. (2016). *The Big Rig: Trucking and the Decline of the American Dream*. Oakland, CA: University of California Press.


WAYNE STATE

# Supplemental Resources

Regulations

- Fair Labor Standards Act (FLSA)
  - https://www.employmentlawhandbook.com/flsa/fair-labor-standards-act-time-suffered-or-permitted-to-work/
  - https://www.law.cornell.edu/cfr/text/29/chapter-V
  - https://www.law.cornell.edu/cfr/text/29/part-785/subpart-C
- Federal Motor Carrier Safety Administration Regulations on Hours of Service for Drivers: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&ty=HTML&h=L&mc=true&=PART&n=pt49.5.395 and Guidance: https://www.fmcsa.dot.gov/regulations/title49/part/395

Airline subcontracting

- Young R. (2010) "Flying Cheap". Frontline. USA: PBS, 56:32. February 9. https://www.pbs.org/wgbh/frontline/film/flyingcheap/

Amazon subcontracting

- O'Donovan, C., & Bensinger, K. (2019, August 31). "The Cost of Next-Day Delivery." *BuzzFeed*. Retrieved from https://www.buzzfeednews.com/article/carolineodonovan/amazon-next-day-delivery-deaths
- Callahan, P. (2019, September 5). "How Amazon hooked America on fast delivery while avoiding responsibility for crashes." *ProPublica*. Retrieved from: https://features.propublica.org/amazon-delivery-crashes/how-amazon-hooked-america-on-fast-delivery-while-avoiding-responsibility-for-crashes/
- Callahan, P. (2019, September 5). "The Human Cost of Amazon's Fast, Free Shipping." *New York Times*. Retrieved from: https://www.nytimes.com/2019/09/05/us/amazon-delivery-drivers-accidents.html

Professor Michael H. Belzer
Michael.H.Belzer@wayne.edu
go.wayne.edu/michael-belzer
LinkedIn: https://www.linkedin.com/in/soundscience

WAYNE STATE