



Safe rates and unpaid labor: Non-driving pay and truck driver work hours

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Workplace Safety and Health Requires Economic Analysis

- Competition drives carriers to lowest price
- Lowest price drives carriers to lowest cost
- Lowest cost drives rates down and squeezes drivers
 - Unqualified, dangerous drivers
 - Dangerous workplace pressure
 - Dangerous hours of work
- Safety cost pushed to public because carrier legal liability is limited
 - Since 1982, trucking firms need to carry only \$750,000 in liability insurance
 - That's \$2,046,000 in today's dollars
 - Victims bear this cost of risk



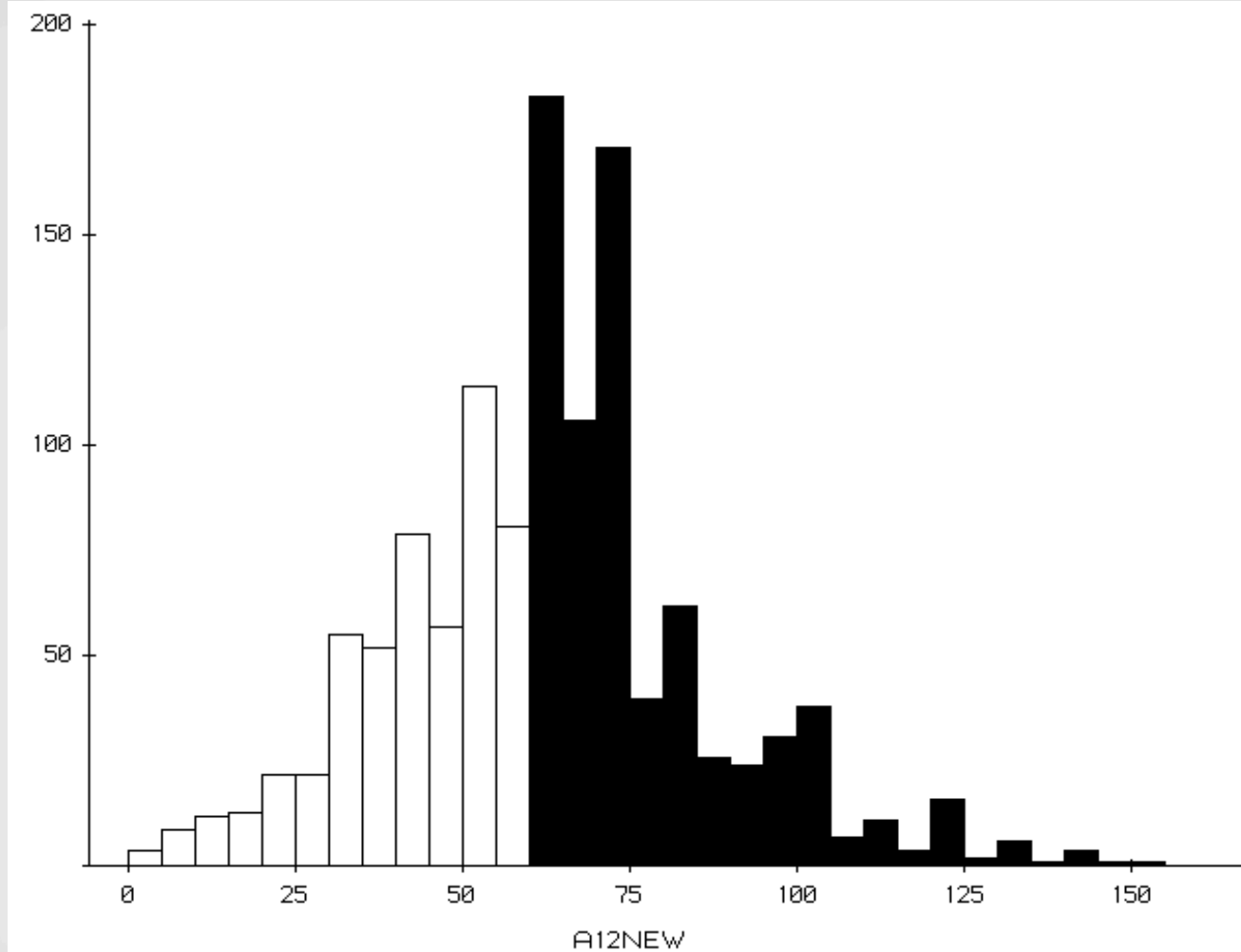
FACT: Truckers Work Long Hours

- UMTIP 1997 survey:
 - Median non-union driver worked 65 hr/wk
 - 55% of CMV drivers not paid for loading/unloading
 - 70% not paid for waiting or other on-the-job time.
- NIOSH 2010 survey
 - Median employee driver works 60 hr/wk
 - 20% exceed 75 hours/week
 - On average, 10.5 hours of work/week (22%) are unpaid
 - On average, 27% of employee drivers' work week is unpaid labor
- FMCSA 2014 and OIG 2018 "Detention Time" studies
 - 10% of all stops experienced 2+ hours detention time
 - Mean detention time 1.4 hours (3.4 hours total)
 - First 15-minute delay beyond 2 hours increases the average expected crash rate by 6.2%
- That is why surveys show long-haul drivers regularly work an impossible (illegal) number of hours.



Drivers in Black Work Excessive Hours

Number of drivers



Hours worked/week

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



Research Literature

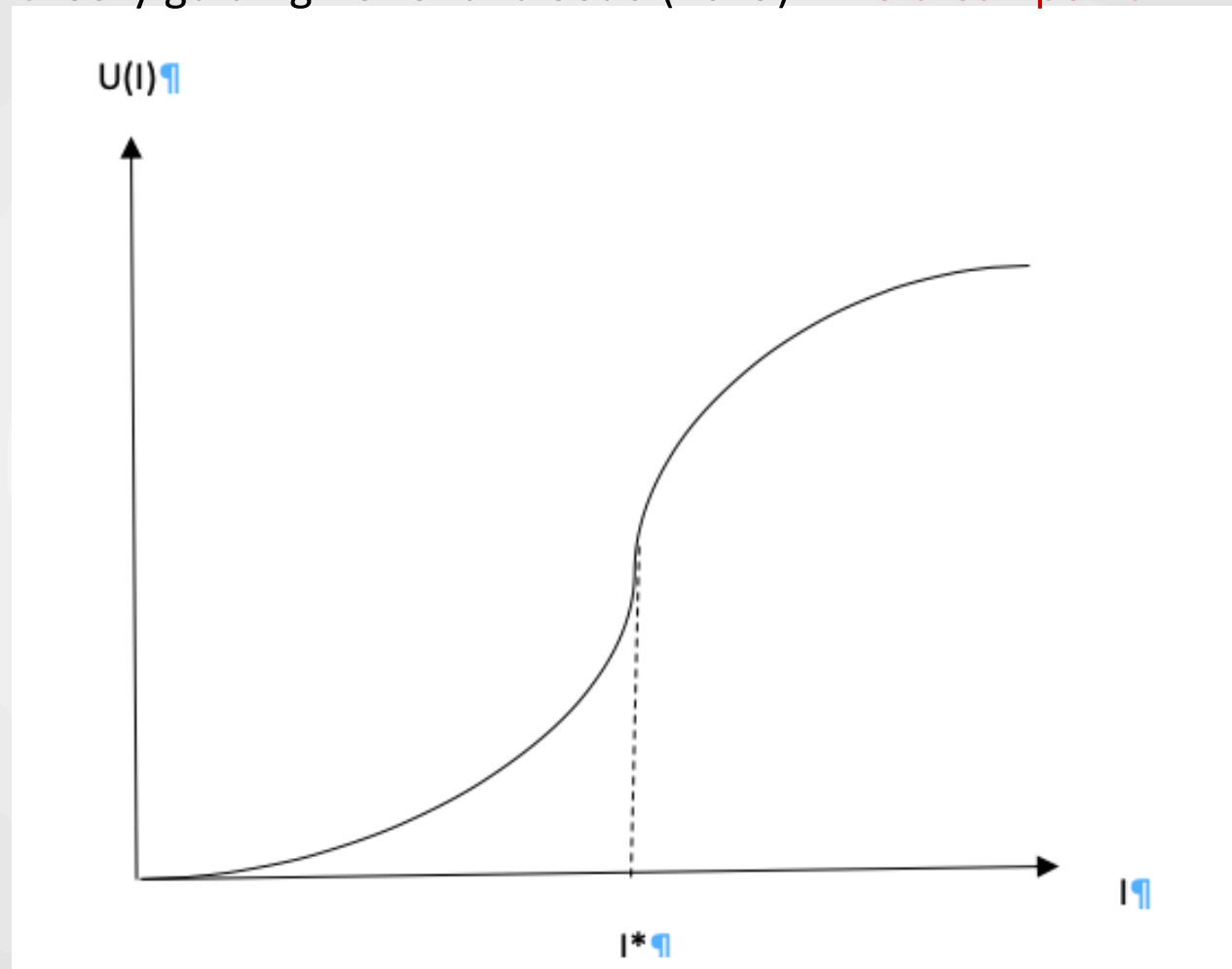
- Belzer and Sedo (2018) show the relationship between pay rates and work hours
 - Backward-bending labor supply curve shows that drivers work fewer hours as pay rates go up
 - This is called “target earnings”
- Taxi drivers make the same choices
 - Camerer et al. (1997); Crawford and Meng (2011); Martin (2017)
- Workers generally who earn more than their expected income significantly reduce work hours
 - Drakopoulos and Theodossiou (1997)
- Lack of data on both non-driving hours and pay makes it hard to estimate the effect of non-driving labor on work hours



Economic Theory is Simple

The utility function with 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.



Data

- National Survey of Long-Haul Truck Driver Health and Injury (2010)
- “Long-haul truck drivers are drivers of heavy and tractor-trailers (trucks having a capacity of at least 26,000 pounds Gross Vehicle Weight [GVW]). Their freight delivery routes require them to sleep away from home” (NIOSH, 2015) <https://www.cdc.gov/niosh/topics/truck/default.html>



Descriptive Statistics, Continuous Vars

Table 1: Descriptive Statistics of Continuous Variables

Variable	Mean	Median	Std Dev
Weekly Work Hours	63.03	62.00	24.21
Annual Income	51,622.14	50,000.00	20798.29
Annual Miles Driven	114,546.70	120,000.00	42250.34
Mileage Rate	0.68	0.43	1.50
Age	46.48	47.00	10.32
Weekly Non-Driving Duty Hours/Weekly Work Hours	21.79	17.64	17.54

Notes: Mileage Rate is the ratio of (Annual Income/Annual Miles Driven). Type distinguishes drivers who drives enclosed vans from those who drive other trucks.



Descriptive Statistics, Indicator Vars

Table 2: Descriptive Statistics of Categorical Variables

Variable	Percentage
Non-driving pay	48.53
Team Drivers	13.57
Union	2.52
LTL	20.28
Enclosed Van	50.35
White	70.63
Education	78.74
Male	93.15
Married	51.89

Notes: 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 as they are paid for a piece of non-driving duties, the variable equals one. Enclosed Van distinguishes drivers who drive enclosed vans from those who drive other trucks. Education distinguishes drivers who have a high school diploma from those who do not have one.



OLS Statistical Model

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

- Variable of interest: **nondriving**
- WH = natural logarithm of weekly work hours
- Nondriving = pay for nondriving labor
- $\ln(\text{MileageRate})$ = natural log of estimated mileage rate. These data only allow us to divide all annual earnings by annual mileage estimate, so mileage rate is 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.



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. ln(Mileage Rate) is the natural log of the ratio of (Annual Income/Annual Miles Driven). Enclosed Van distinguishes drivers who drives enclosed vans from those who drives other trucks. Education distinguishes drivers who have a high school diploma from those who do not have one. Male distinguishes male drivers from female drivers.



Discussion

- Paying for non-driving work significantly associated with reduced truck driver work hours
- Drivers compensate for the loss of income from nondriving work by working longer hours
- Results support the target income hypothesis
- Unpaid nondriving time encourages detention time
- Remember that first 15 minutes beyond two hours of detention is associated with 6% higher crash rate
- Tells us nothing about increments before 2 hours



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