
The Economics of Port Drayage and the Implications for Clean Air

Kristen Monaco
California State University Long Beach

What is the Structure of Port Drayage

- Hundreds of firms
 - Price takers (ocean carriers)
 - Disperse size
 - Brokers (?)
 - Thousands of drivers
 - Primarily owner operators
 - Capital and diesel risk
 - Recent immigrants
 - Low margins
-

Driver Survey Data Sets

- 2004
 - Focus on earnings, waiting time, chassis safety
 - 2006
 - Focus on driver expenses, truck financing, truck replacement and retrofitting
-

Comparing Demographics

	2004	2006
Percent Hispanic	92.9%	91.2%
Percent U.S. Citizens	57%	56%
Mode Education	High School Degree	Less than a High School Degree
Mean Age	40	39
Mean years as a truck driver	8.5	8.7

Comparing Wages and Work

	2004	2006
Percent who own their truck	81%	83%
Days worked per week	5	5.3
Hours worked per day	11.2	13.25
Hourly gross	\$19	\$25
Mean annual net	\$29,903 (2003 pay)	\$34,749

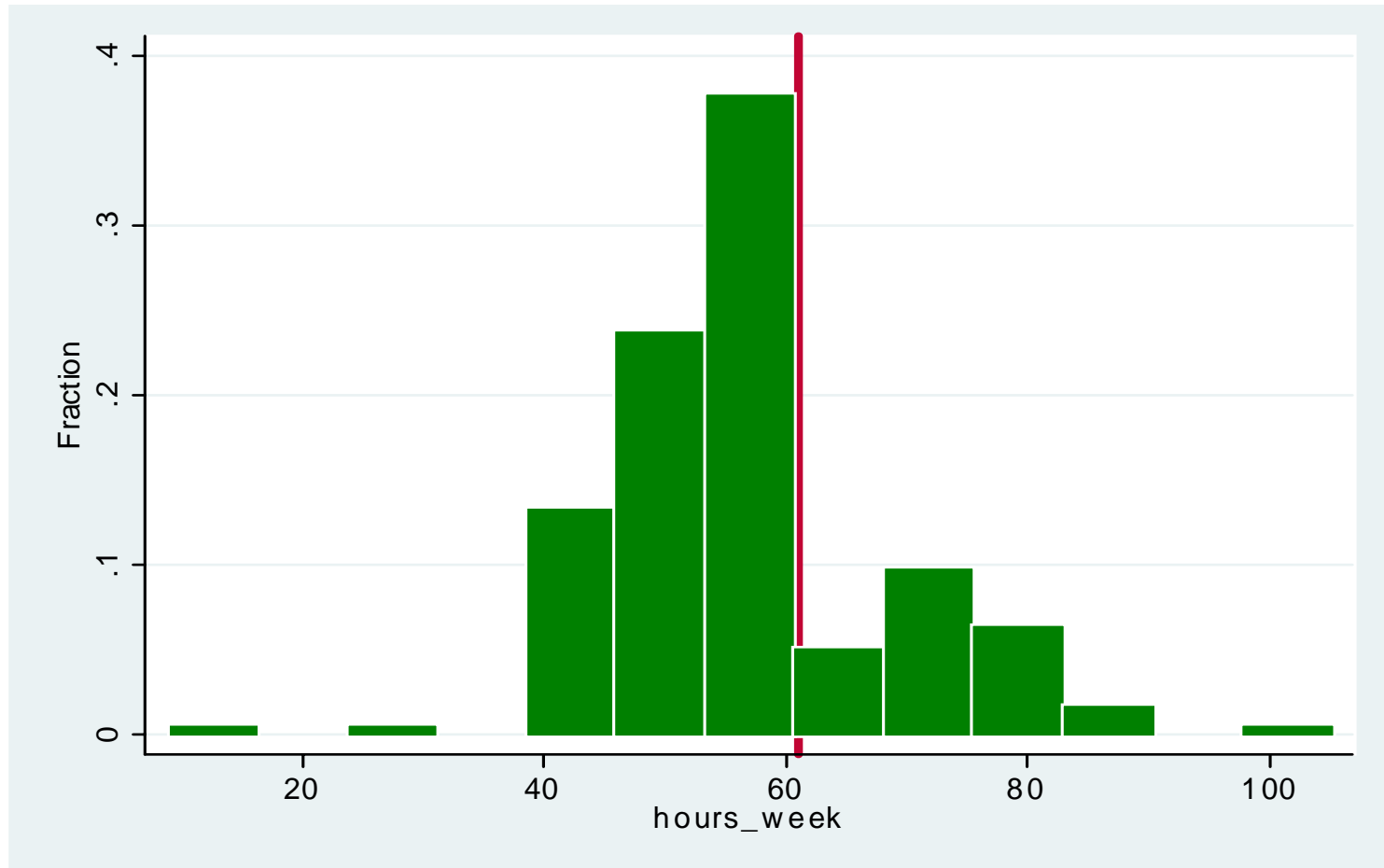
Changes in Real Net Income Over Time (income measured in \$2006)

	2003	2006
Mean	\$32,763	\$34,749
Percent Change		6.1%
Average Annual Percent Change		1.5%

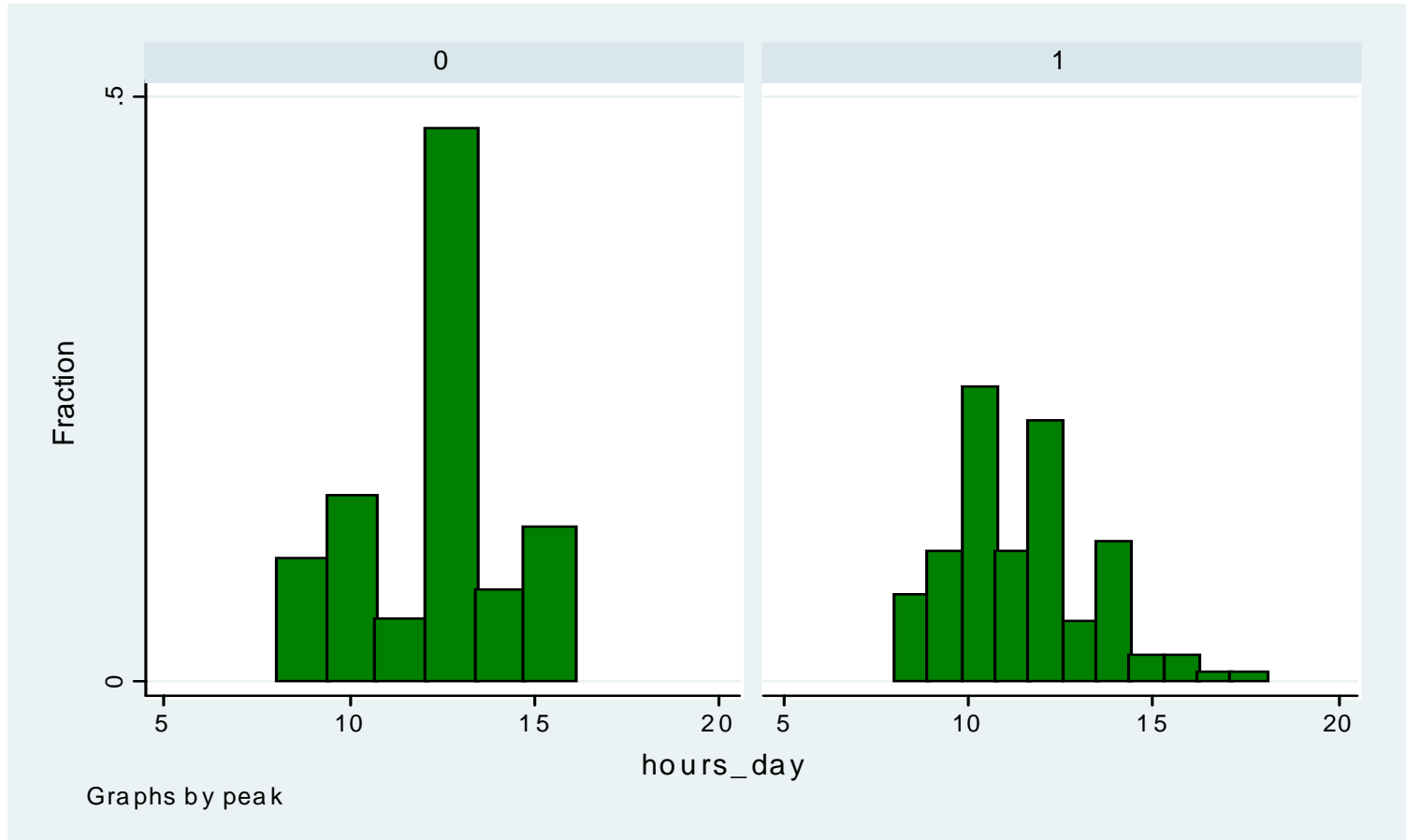
Opinions on PierPass

- Are you earning more income under extended gate hours?
 - Yes: 46.39%
 - No: 53.61%
 - Are you working more hours under extended gate hours?
 - Yes: 62.03%
 - No: 37.97%
 - Both differences are statistically significant at 5% level (or lower)
-

Hours Per Week



Hours Per Day Sorted by Peak



Hours Sorted by Peak

- Distribution of Peak/Off-Peak
 - 76.32% Peak
 - 33.68% Off-Peak
 - Mean Hours per day
 - Peak: 11.3 hours
 - Off-Peak: 11.87 hours
 - Difference significant at 10 percent level
 - Mean Hours per week
 - Peak: 57.47 hours
 - Off-Peak: 58.93 hours
 - Difference not statistically significant
-

Violations of HOS

- 33.5% violate “60 hour rule”
 - 12.7% violate “14 hour rule”
 - Probit of working in excess of 60 hours
 - Turns per day increase probability
 - Net pay is negatively related to probability
 - Probit of working in excess of 14 hours
 - Driving peak decreases probability of working in excess of 14 hours
-

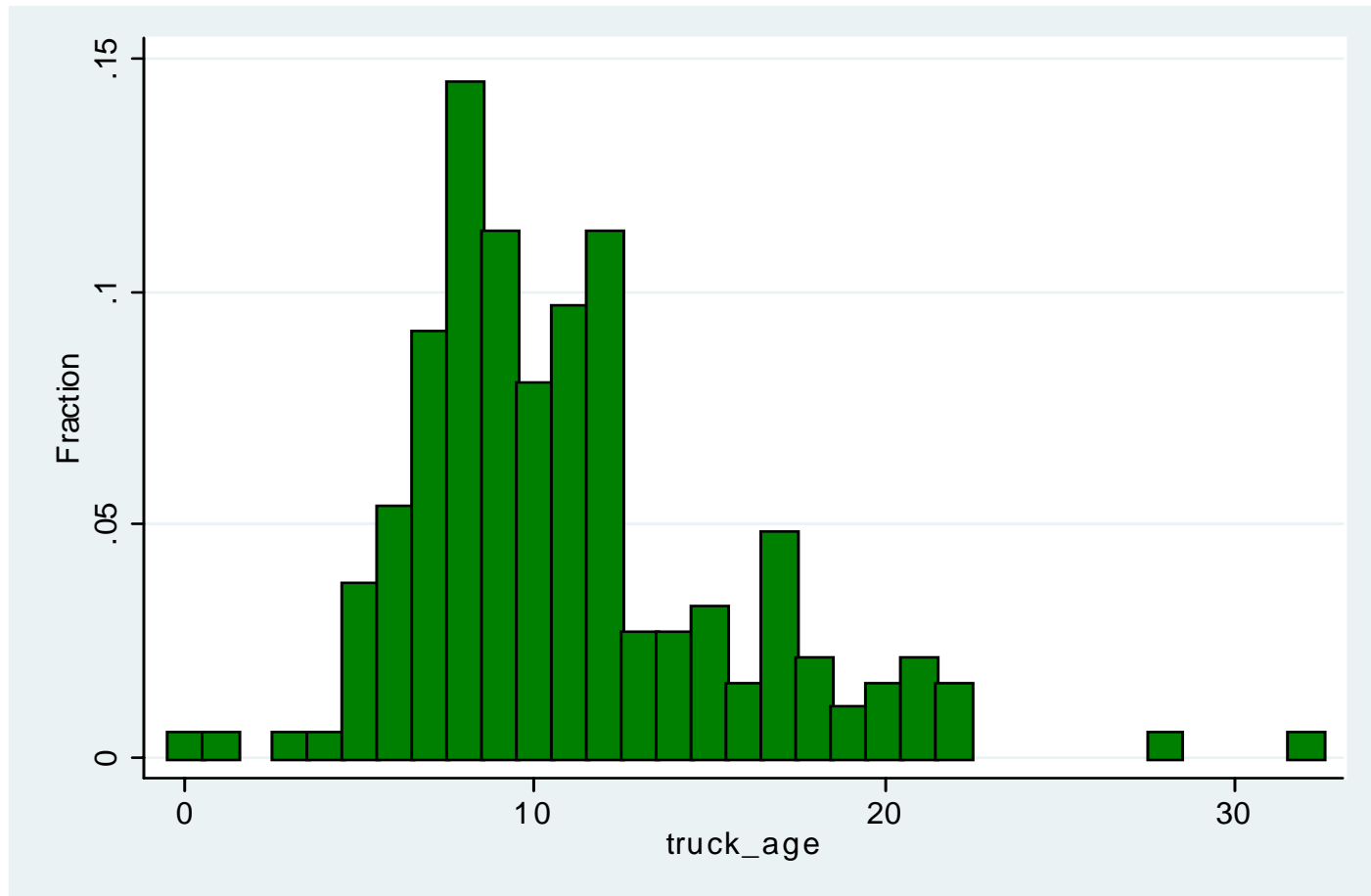
Truck Expenses

Expense Type	Median	Mean
Diesel	\$450/week	\$500/week
Insurance	\$600/month	\$606/month
Maintenance	\$5000/year	\$7044/year

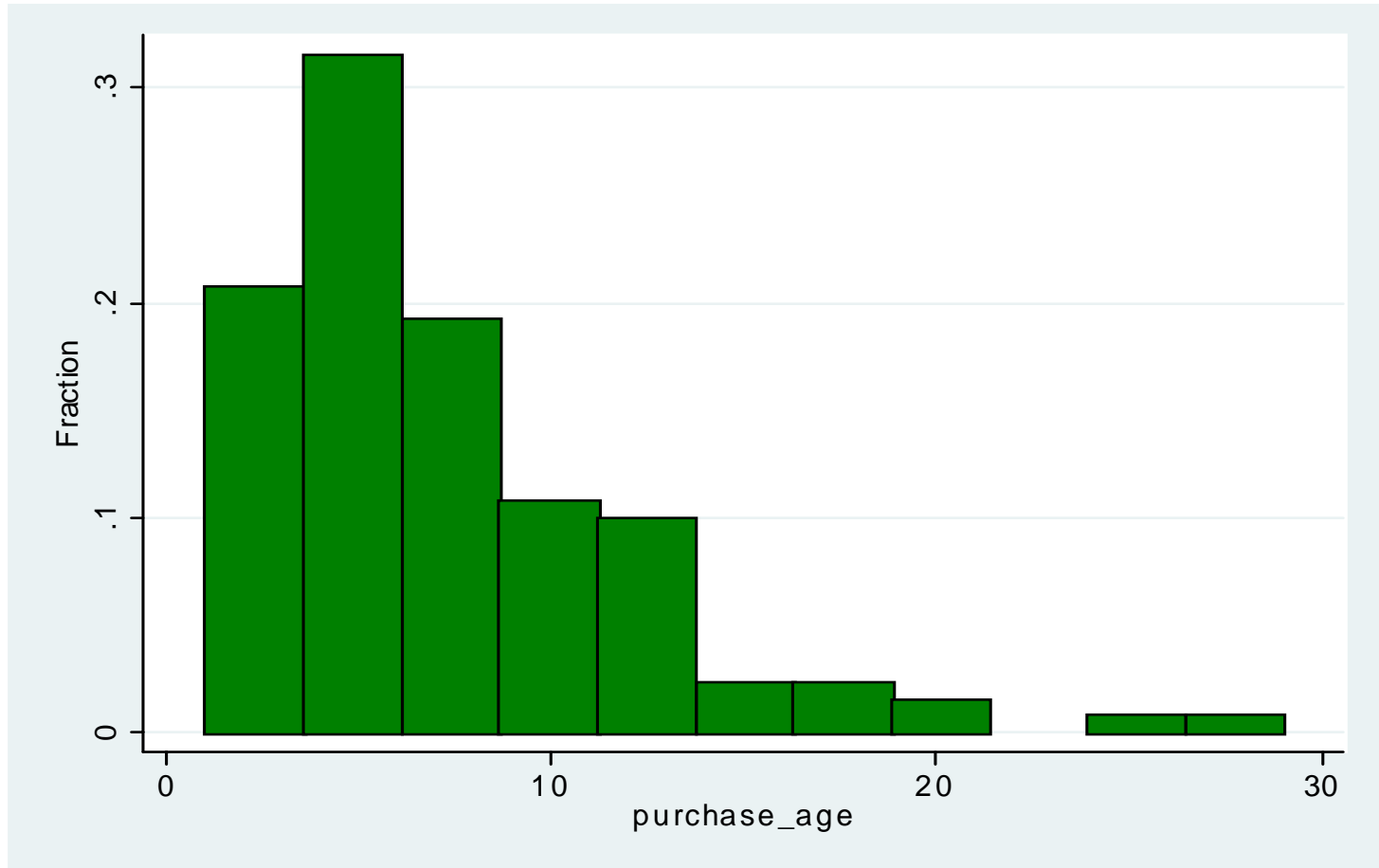
Truck Age

- **Distribution of Model Years**
 - Range: 1974-2006
 - Mean: 1995
 - 25 percent: 1994 or earlier
 - 75 percent: 1998 or earlier
 - **Age of Truck at Purchase**
 - Mean: 7 years
 - 25 percent: 9 years or older
 - 10 percent: 13 years or older
-

Truck Age Distribution



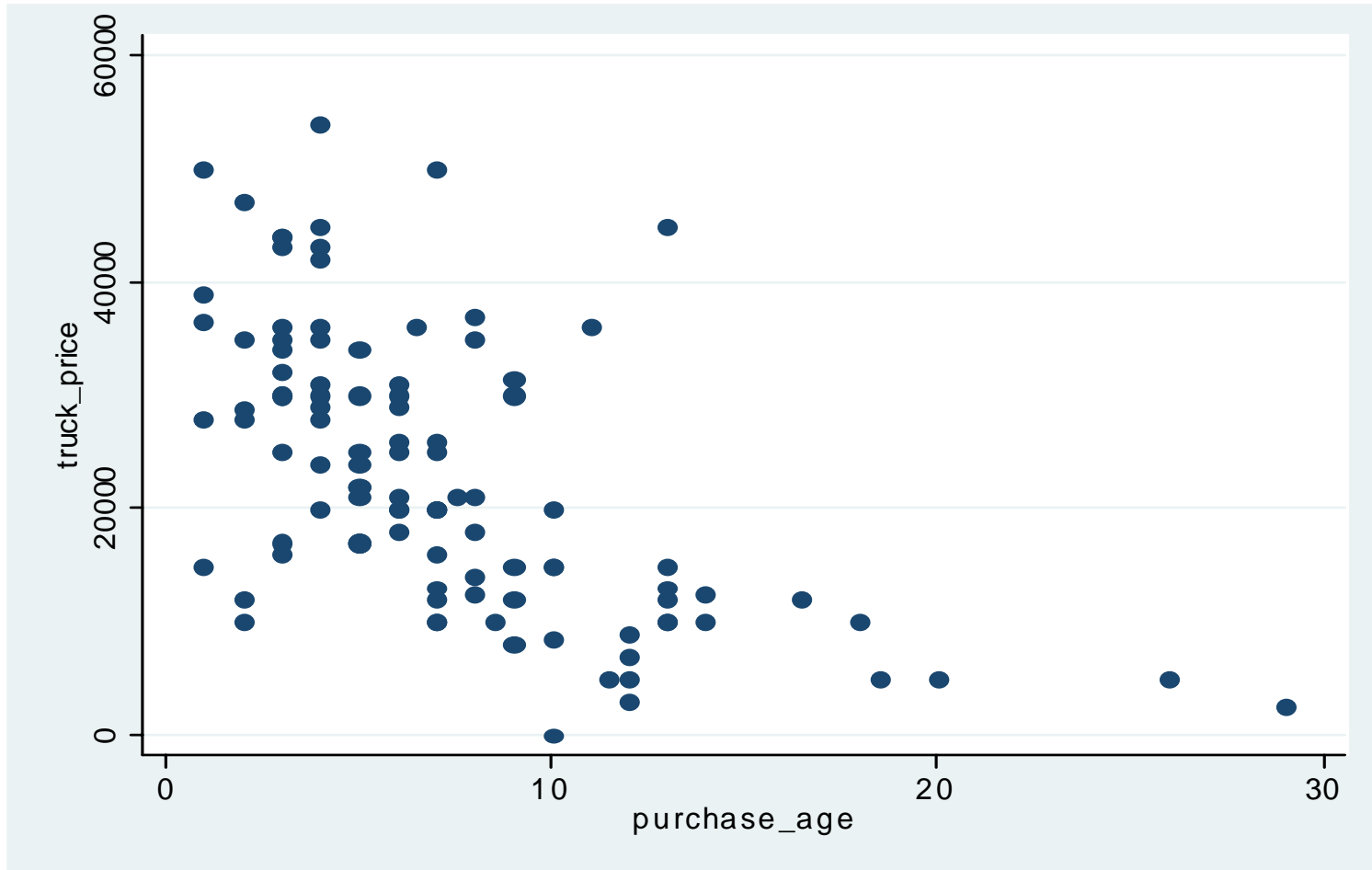
Truck Age At Purchase



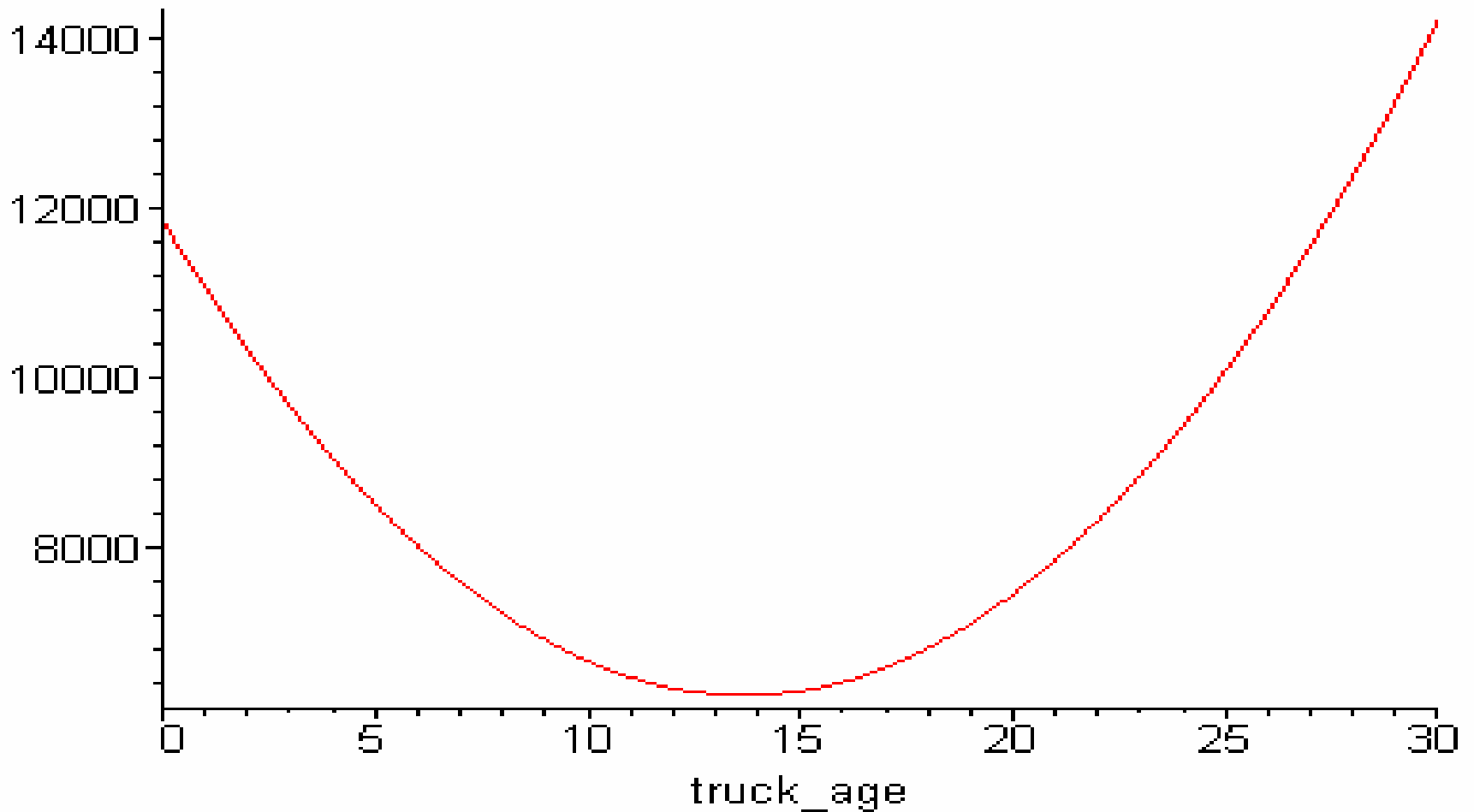
Truck Financing

- Bank Loan: 47 percent
 - Mean interest rate of 14.7%
 - Mean payment of \$892/month for those still paying off loans
 - Trucking Company or Truck Manufacturer: 11 percent
 - Family/Friends: 17 percent
 - Cash: 24 percent
-

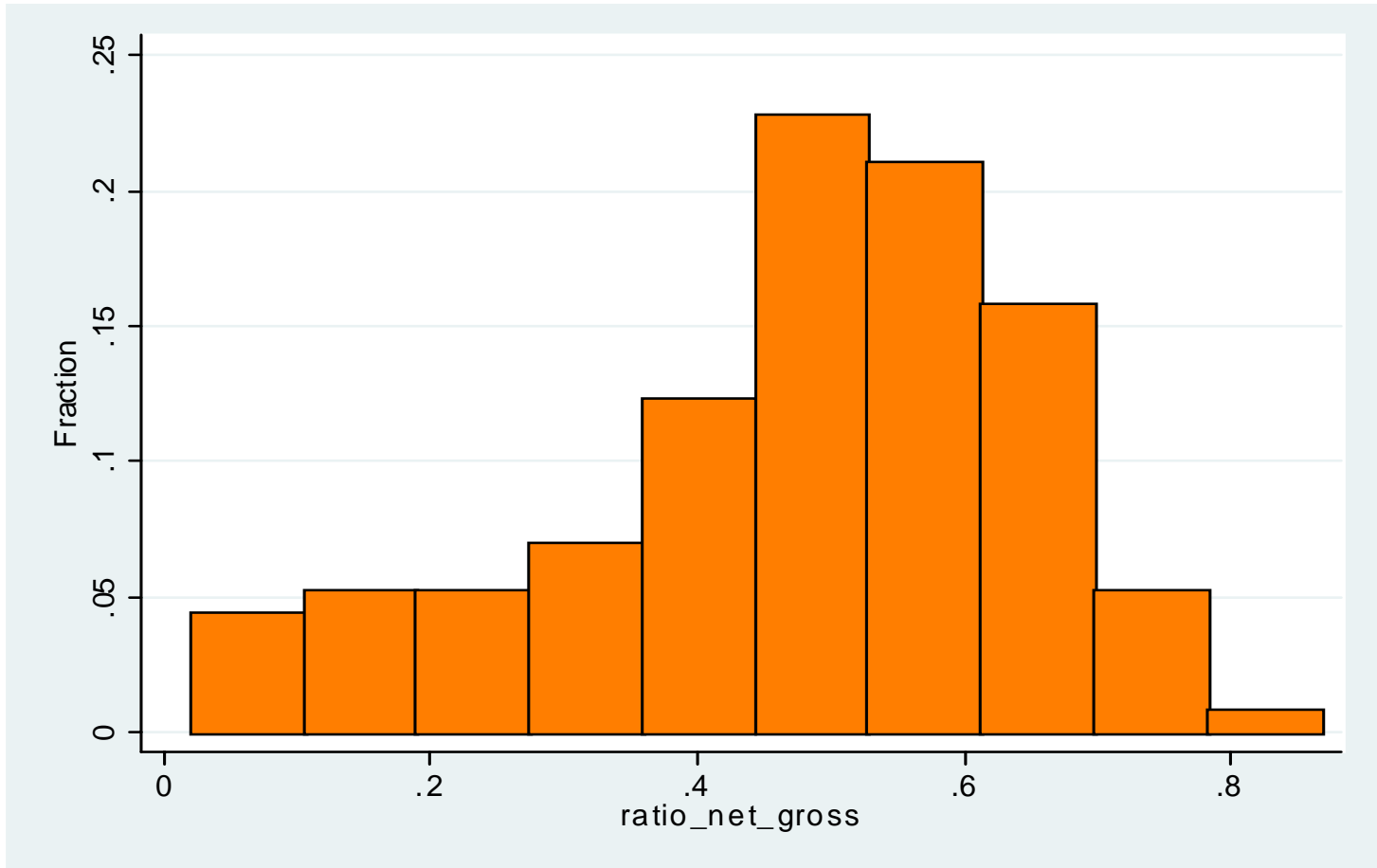
Age of Truck at Purchase and Price



Annual Maintenance as a function of Truck Age



Driver “Margins”



Truck Retrofitting – Ability/Willingness to Pay

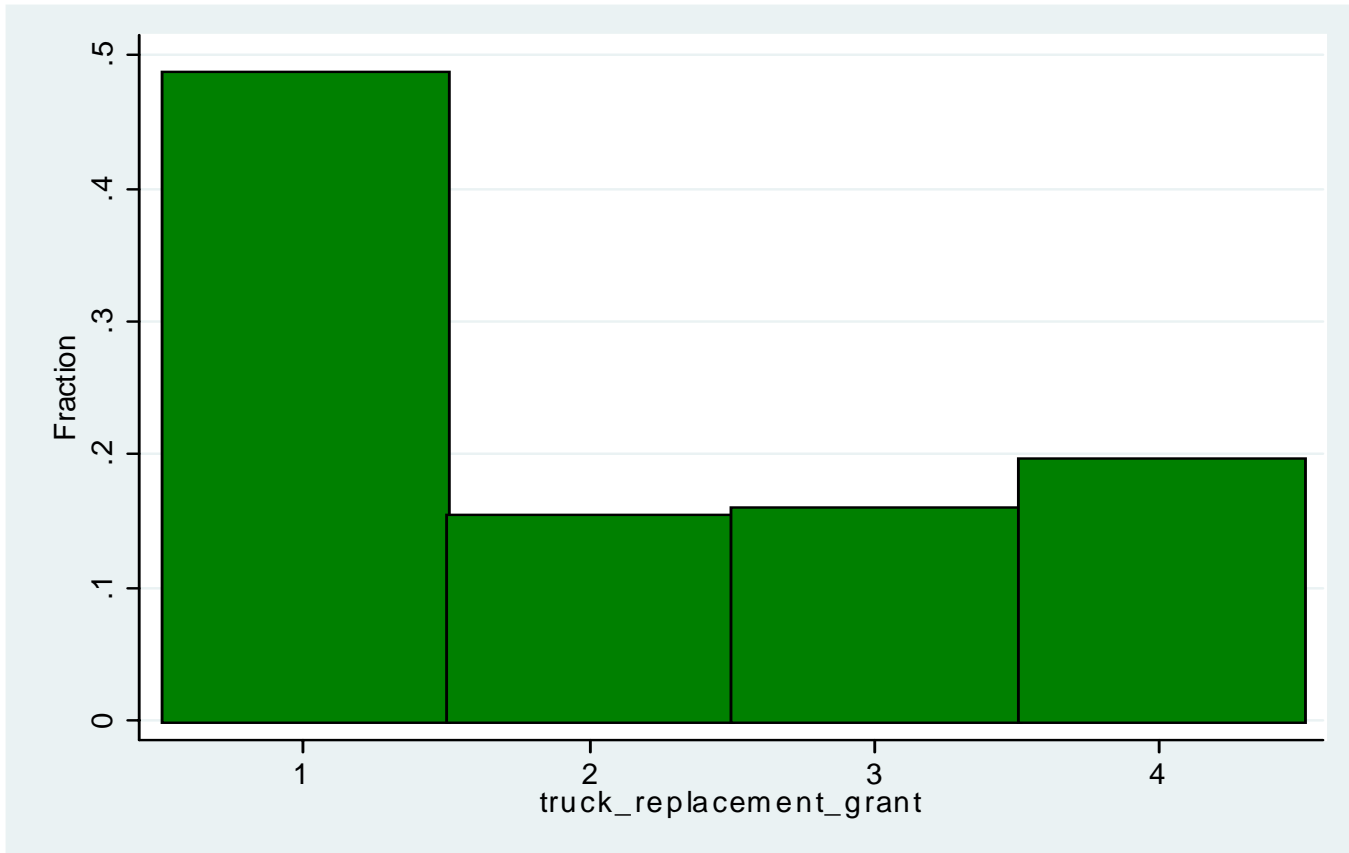
- Hypothetical \$16,000 device to clean truck emissions. How much could you afford to pay?

	Yes	Cumulative
\$4,000	34.6%	34.6%
\$8,000	7.6%	42.2%
\$12,000	2.2%	44.4%

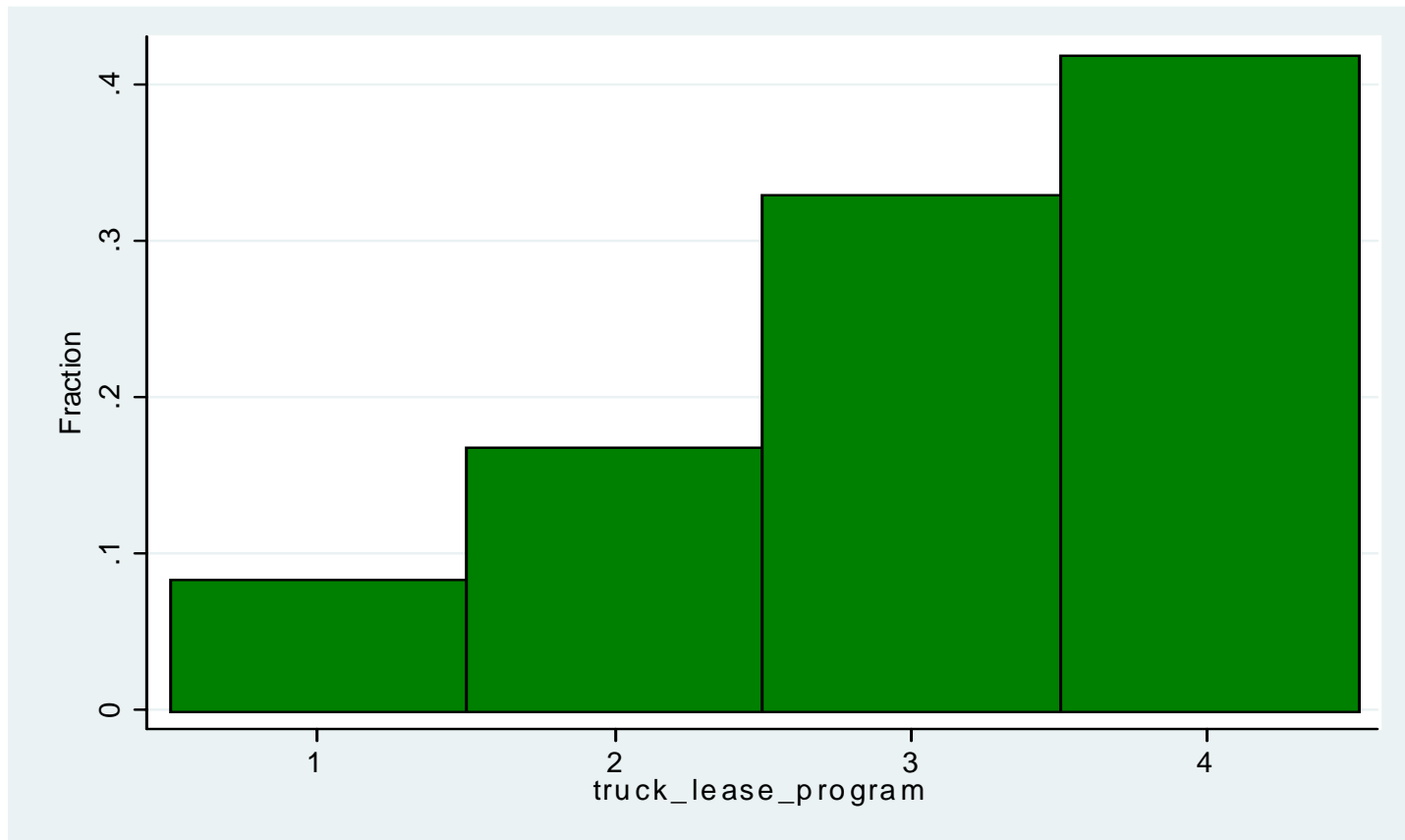
Ordered Probit of Willingness to Pay for Truck Retrofitting

Variable	coefficient	p-value
Net annual pay	0.0000141	0.001
Model year	0.0854888	0.009
Years as a driver	-0.0520264	0.024
Number of children	-0.0945045	0.303
Lung disease	-0.4392527	0.197
Turn off truck when idling	0.6343316	0.180
Number of observations	134	
Likelihood Ratio	28.09	0.0001

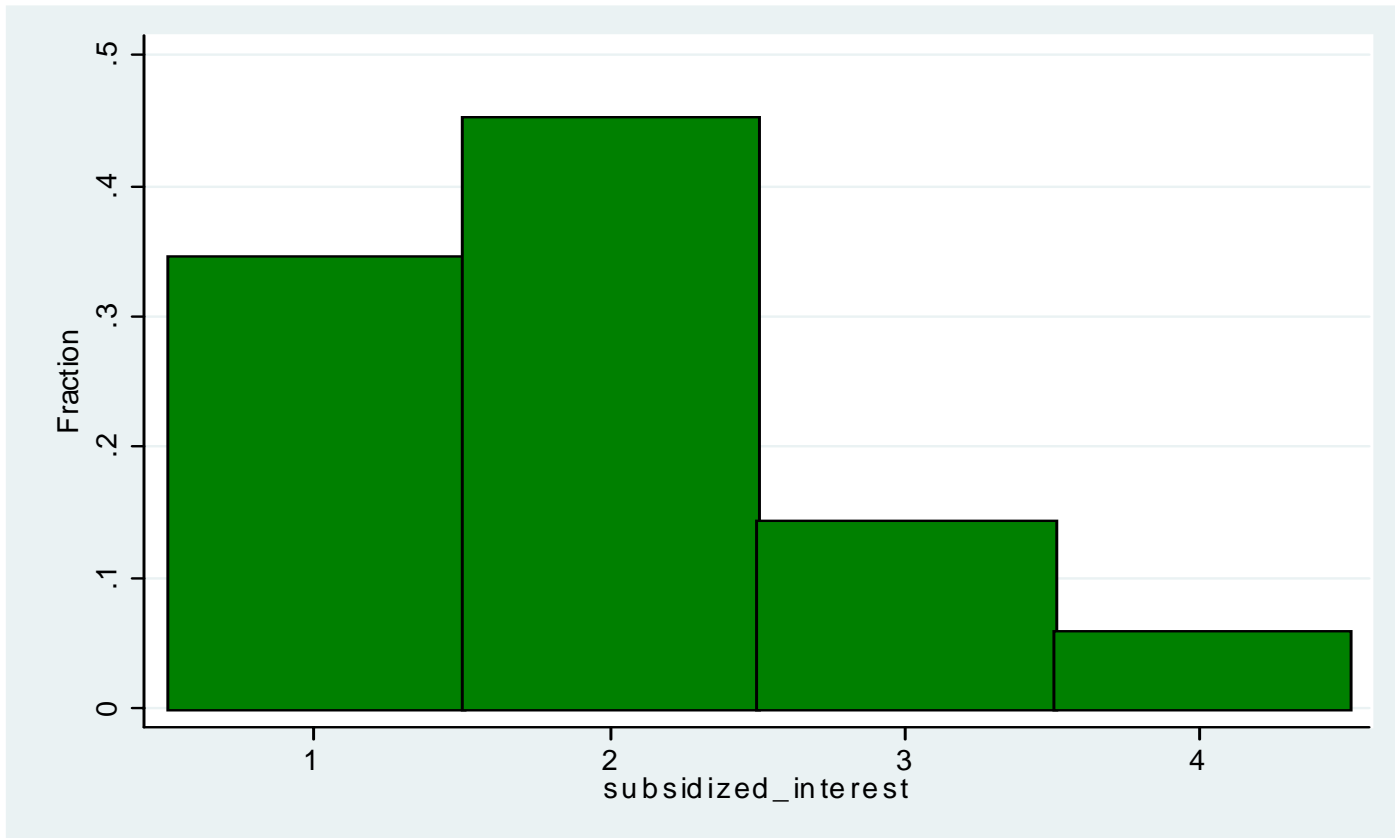
Truck Replacement Preferences – Grant Replacement Program



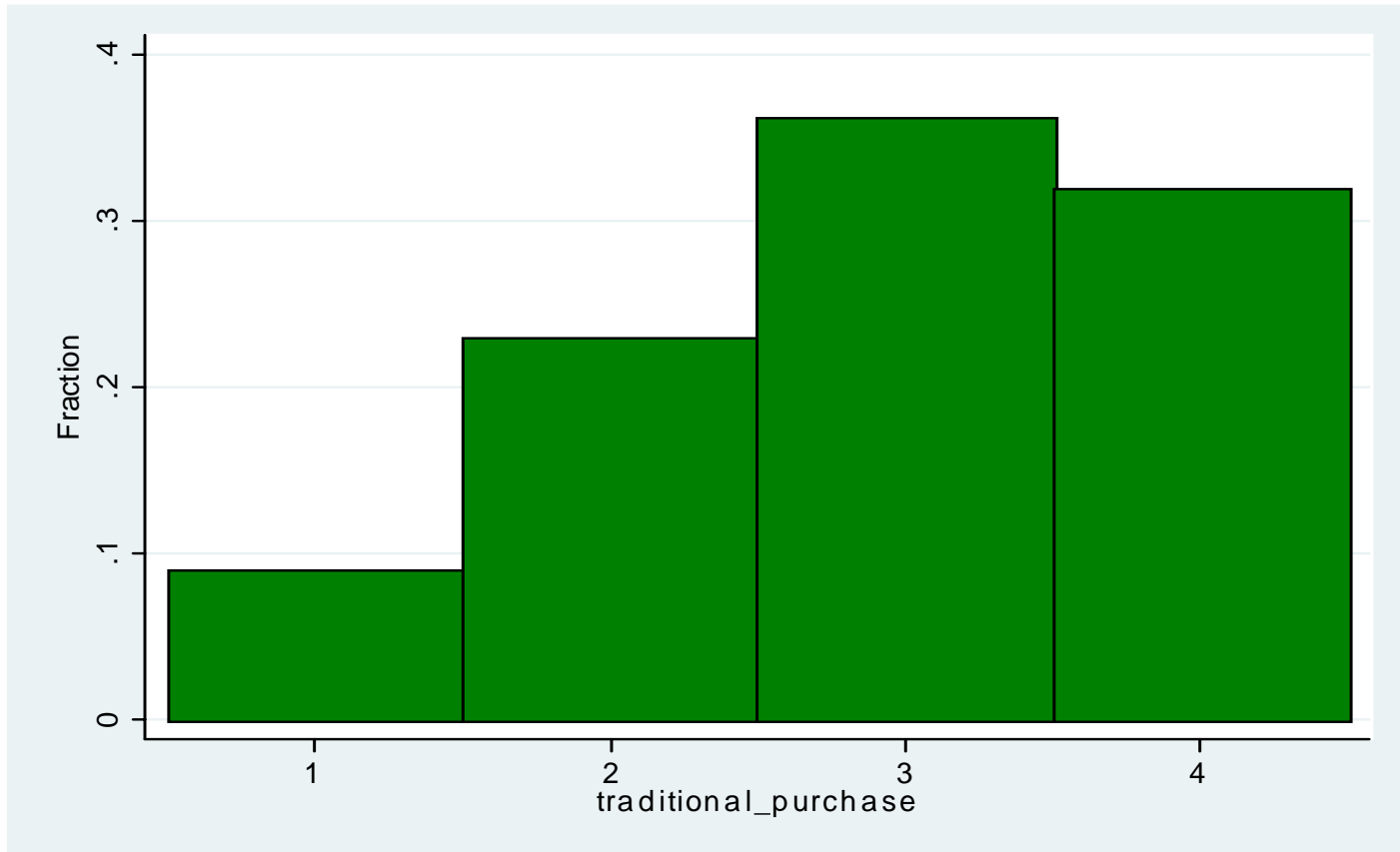
Truck Replacement Preferences – Truck Lease Program



Truck Replacement Preferences – Subsidized Interest Rate



Truck Replacement Preferences – Traditional Purchase



Truck Replacement – Sorted by Ranking

Ranking	1	2	3	4
Grant Program	48.2%	15.3%	16.0%	19.4%
Lease Program	8.2%	16.5%	32.5%	41.2%
Subsidized interest rate	34.1%	44.7%	14.2%	5.9%
Traditional	8.8%	22.4%	35.5%	31.2%

Multinomial Logit of Program Preference

	Relative Risk Ratio	P-value
Truck Leasing Program		
Weekly Net Pay	1.001437	0.137
Net/Gross Ratio	0.05321	0.066
Age	0.985616	0.741
Paid Cash	0.647801	0.706
Subsidized Interest Rate Program		
Weekly Net Pay	1.000653	0.383
Net/Gross Ratio	0.131339	0.167
Age	1.047463	0.097
Paid Cash	2.526649	0.086
No Subsidy Program		
Weekly Net Pay	1.00082	0.421
Net/Gross Ratio	0.189718	0.428
Age	1.139553	0.007
Paid Cash	1.656745	0.555

Conclusions

- Port drayage is a “competitive” market with respect to both the firms and drivers
 - Margins for drivers are low; decreased ability to finance truck
 - Who will pay for trucks? How will they be provided?
 - Drivers prefer ownership
 - Subsidized interest rates may allow us to spread cost over time.
-