Foundations of Econometrics
Assignment 8

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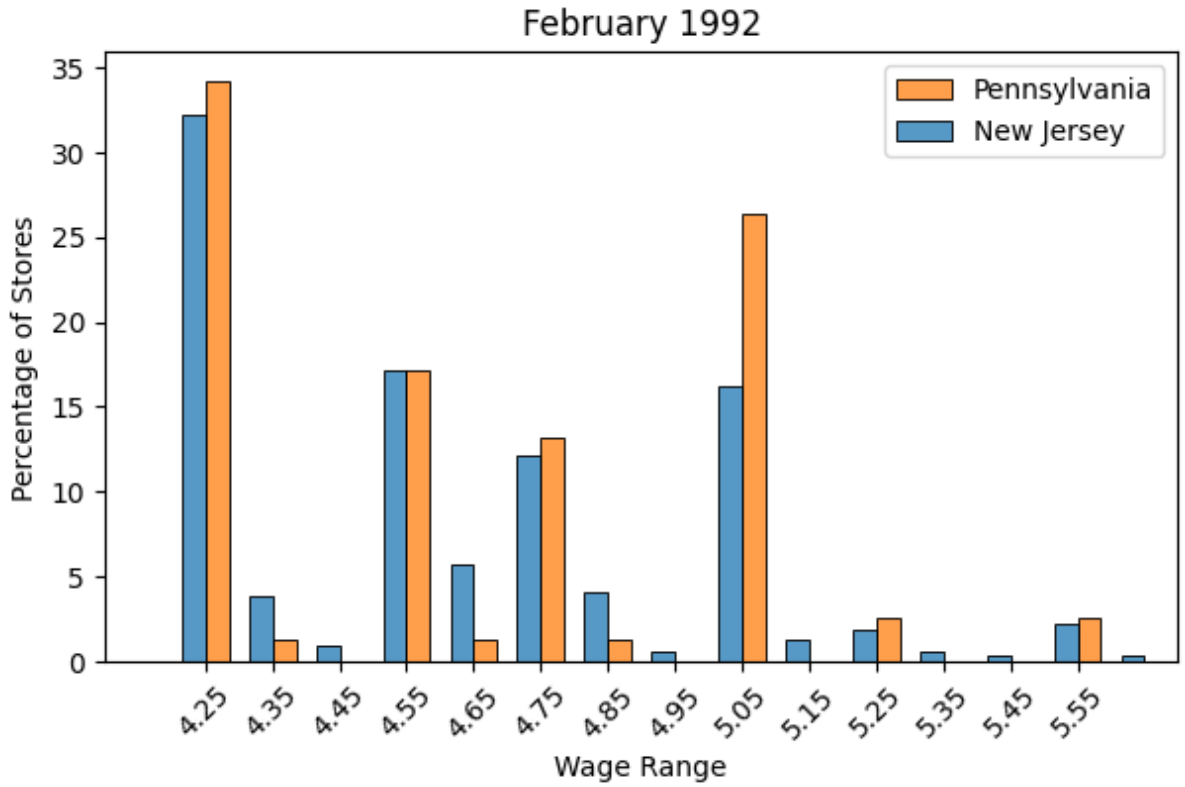
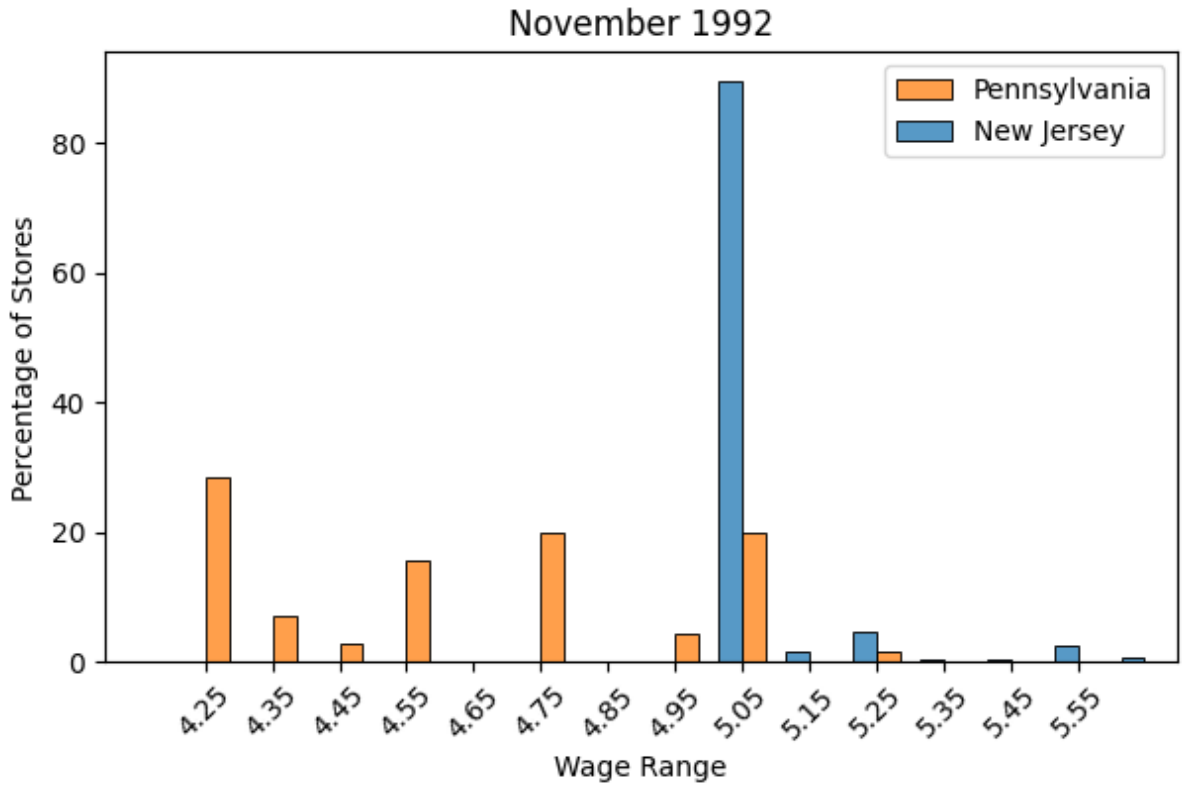
1.1 Recreating Figure 1





The graphs above recreate Figure 1 from Card and Krueger (1994). They display the wage ranges for Pennsylvania (control) and New Jersey (treatment) at two points in time: February 1992 (pre-treatment) and November 1992 (post-treatment). In the first graph, wages are distributed similarly across the range for both states, with a notable spike at the federal minimum. In the November 1992 graph, we clearly observe the implications of the policy change in New Jersey: wages that were previously below the new minimum have effectively vanished and are now concentrated at the new rate of \$5.05. This shows high compliance with the new legislation introduced. Meanwhile, the Pennsylvania distribution remains largely unchanged. Note the change in the y-axis scale between the two plots, which is necessary to accommodate the massive spike in New Jersey's density.

1.2 Effect on Employment

To investigate whether the minimum wage policy affected employment, we estimate the following model:

$$\Delta E_i = \alpha_0 + \beta X_i + \gamma NJ_i + \epsilon_i \tag{1}$$

where ΔE_i is the change in employment for restaurant i (defined as $ft - 0.5pt$, where ft are the full-time employees, and pt are the part-time employees), X_i includes control variables (chain type and company ownership), and NJ_i is an indicator equal to 1 for restaurants in New Jersey and 0 for Pennsylvania.

Table 1: Effect of Minimum Wage on Employment

	Δ Employment	Δ Employment without controls
New Jersey (Treatment)	2.9356***	2.9425***
	(1.1240)	(1.1230)
Chain (1-4)	-0.3896	–
	(0.4180)	–
Company Owned	-0.4768	–
	(0.9590)	–
Constant	-1.5017	-2.4901**
	(1.3330)	(1.0080)
Observations	391	391
R-squared	0.021	0.017

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10. The dependent variable is the change in employment. The New Jersey dummy equals 1 for restaurants in NJ, 0 for PA.

Results: The estimated coefficient tied to the treatment variable is positive, equaling 2.9356. Moreover, it is statistically significant at every α. Therefore, fast-food restaurants in NJ increased their employment in nearly 3 full-time-equivalent employees relative to those in PA after the minimum wage was raised ($p = 0.009$).

Interpretation: Clearly, the value of the estimate suggests that the increase in the minimum wage not only did not reduce the levels of employment in fast-food establishments, but it is associated with a relative increase in full-time employment. This idea goes in line with Card and Krueger's reasoning: a minimum wage hike does not necessarily increase employment, however, in this specific environment, such policy change did not reduce it either, and may even have increased it.

Even though their suggestions and findings contradict the conception of a labor market that is perfectly competitive, where higher wages lead to lower levels of employment, Card and Krueger always refer to an industry, the fast-food one, in which companies systematically hire fewer workers than the competitive level. However, in this kind of market, paying a slightly higher wage can actually make it easier for firms to attract and keep workers, so forcing those firms to pay their workers just a bit more can end up with them hiring more people rather than cutting back.

1.3 Effect on Full Meal Prices

To investigate whether the minimum wage policy affected meal prices, we estimate the following model:

$$\Delta P_i = \alpha_0 + \beta X_i + \gamma NJ_i + \epsilon_i \tag{2}$$

where ΔP_i is the change in full meal price for restaurant i (defined as the sum of an entrée, medium soda, and small fries), X_i includes control variables (chain type and company ownership), and NJ_i is an indicator equal to 1 for restaurants in New Jersey and 0 for Pennsylvania.

Table 2: Effect of Minimum Wage on Full Meal Prices

	Δ Price ($)	Δ Price ($) without controls
New Jersey (Treatment)	0.1009**	0.1001***
	(0.0436)	(0.0490)
Chain (1-4)	0.0528**	–
	(0.0247)	–
Company Owned	-0.0374	–
	(0.0441)	–
Constant	-0.1330**	-0.0340
	(0.0513)	(0.0440)
Observations	356	356
R-squared	0.036	0.012

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10. The dependent variable is the change in the price of a full meal (entrée + medium soda + small fries) in dollars. The New Jersey dummy equals 1 for restaurants in NJ, 0 for PA.

Results: The coefficient on the New Jersey indicator is positive and statistically significant at the 5% level. NJ restaurants increased full meal prices by approximately $0.10 more than PA restaurants following the minimum wage increase (p = 0.021). This represents an increase of roughly 3% relative to the average meal price of approximately $3.

Interpretation: This finding provides evidence supporting the product market power hypothesis. The ability of NJ restaurants to raise prices significantly in response to the minimum wage increase indicates that fast-food establishments possess some degree of market power.

The positive and significant price effect, combined with the employment results, supports Card and Krueger's broader theoretical framework that imperfect competition in both labor and product markets can explain why minimum wage increases do not necessarily reduce employment as predicted by the standard competitive model. Firms with product market power can absorb cost increases through a combination of higher prices and maintained employment levels, rather than being forced to cut employment to preserve profit margins.