

# Does Tax-Collection Invariance Hold? Evasion and the Pass-through of State Diesel Taxes Online Appendix

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## A Imperfect competition and incidence

**The independence result also holds with imperfect competition:** For example, maximization of profits given by  $p_r^p \cdot Q(p_r^p + t, X) - C(Q(p_r^p + t, X))$  where  $C(\cdot)$  is the cost function and  $X$  is the vector of characteristics influencing a particular firm's demand (including, potentially, prices set by competitors) is equivalent to maximizing profits given by  $(p_r - t) \cdot Q(p_r, X) - C(Q(p_r, X))$  with the solutions again linked as  $p_r^p + t_r = p_r$ . As the result, ceteris paribus, decisions of a standard firm with market power are not affected by where statutory incidence lies and, when this is so for all firms, the original equilibrium outcome remains an equilibrium when the statutory incidence shifts.

## B Further market power analysis (For Online Publication)

In a similar fashion to our other covariates, we test whether wholesale market concentration varies substantially over time and across regimes. Over the past two decades, industry consolidation increased concentration in the wholesale market approximately 20 percent, from a mean of .20 in 1994 to a mean of .24 in 2008. The most concentrated wholesale markets tend to be in the northeast - wholesale sales are most concentrated in Delaware (0.60), Vermont (0.54) and New Hampshire(0.46). Wholesale sales tend to be more concentrated in distributor-remitting states and less concentrated in supplier-remitting states (Table A1), but changes in regime and changes in diesel taxes are not strongly correlated with lagged, contemporaneous or leading changes in concentration (Table A2).

Table A1: Market Power and Point of Taxation

|                        | (1)<br>Wholesale HHI   | (2)<br>Wholesale 4-firm CR |
|------------------------|------------------------|----------------------------|
| Distributor Remittance | 0.0726**<br>(0.0300)   | 0.00763<br>(0.0347)        |
| Supplier Remittance    | -0.0423***<br>(0.0124) | -0.105***<br>(0.0334)      |
| Constant               | 0.188***<br>(0.00668)  | 0.764***<br>(0.0242)       |
| Observations           | 7951                   | 7951                       |
| R-Squared              | 0.103                  | 0.138                      |

Standard errors clustered by state are in parentheses. \*, \*\*, \*\*\* denote significance at the 10%, 5%, and 1% level, respectively. Specifications include year fixed effects.

Table A2: Market Power and Changes in Point of Taxation

|                                | (1)<br>$\Delta$ Distributor Remittance | (2)<br>$\Delta$ Retailer Remittance | (3)<br>$\Delta$ Supplier Remittance | (4)<br>$\Delta$ Tax Rate |
|--------------------------------|--|-------------------------------------|-------------------------------------|--------------------------|
| $\Delta$ Wholesale $HHI_{t-1}$ | 0.287<br>(0.189)                       | -0.0927<br>(0.0673)                 | -0.194<br>(0.185)                   | 0.591<br>(1.016)         |
| $\Delta$ Wholesale $HHI_t$     | -0.163<br>(0.251)                      | 0.0351<br>(0.0849)                  | 0.128<br>(0.237)                    | -1.543<br>(1.329)        |
| $\Delta$ Wholesale $HHI_{t+1}$ | 0.0823<br>(0.170)                      | 0.0680<br>(0.0784)                  | -0.150<br>(0.167)                   | 0.396<br>(1.071)         |
| Observations                   | 576                                    | 576                                 | 576                                 | 576                      |
| R-Squared                      | 0.345                                  | 0.0344                              | 0.272                               | 0.0281                   |

Standard errors clustered by state are in parentheses.

\*, \*\*, \*\*\* denote significance at the 10%, 5%, and 1% level, respectively. Specifications include year fixed effects. For reference, one standard deviation changes in  $\Delta$  Wholesale  $HHI_t$  is 0.033.