HW7

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A

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. gen lnprice=ln(price)

. gen lnquantity=ln( quantity )

. regress lnquantity lnprice ice seas1 seas2 seas3 seas4 seas5 seas6 seas7 seas8 seas9 seas10 seas11, vce(robust)

Linear regression                               Number of obs     =        328
                                                F(13, 314)        =      12.34
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3085
                                                Root MSE          =     .39784

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             |               Robust
  lnquantity |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     lnprice |   -.649479    .073287    -8.86   0.000    -.7936747   -.5052833
         ice |   .3335133   .0782443     4.26   0.000     .1795639    .4874627
       seas1 |  -.1803444   .0920358    -1.96   0.051    -.3614292    .0007404
       seas2 |   .0203993   .0869861     0.23   0.815      -.15075    .1915485
       seas3 |   .0649648   .0937521     0.69   0.489    -.1194969    .2494265
       seas4 |   .0915228   .1181266     0.77   0.439    -.1408969    .3239426
       seas5 |  -.0055961   .0936158    -0.06   0.952    -.1897897    .1785974
       seas6 |  -.1163228   .1005575    -1.16   0.248    -.3141745    .0815289
       seas7 |  -.0410411   .1352003    -0.30   0.762    -.3070541    .2249718
       seas8 |  -.3984281   .0977151    -4.08   0.000    -.5906872    -.206169
       seas9 |   -.160015   .0930739    -1.72   0.087    -.3431423    .0231122
      seas10 |   .0046707   .0922216     0.05   0.960    -.1767797    .1861212
      seas11 |   .0515408   .0931051     0.55   0.580    -.1316479    .2347295
       _cons |   9.008542   .1189587    75.73   0.000     8.774485    9.242599
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The value of demand elasticity according to the model is -0.65 with robust standard error being 0.073.

B

The estimator of the elasticity could be biased as our observations are actually the equilibrium of demand curves over time. Regressing over these values is bound to yield biased results for the aforementioned reason.

C

Although the cartel has no influence over the demand of the grain, it can control the price of the grain plausibly satisfying the conditions for a valid instrument.

D

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. regress lnprice cartel ice seas1 seas2 seas3 seas4 seas5 seas6 seas7 seas8 seas9 seas10 seas11, vce(robust)

Linear regression                               Number of obs     =        328
                                                F(13, 314)        =      24.16
                                                Prob > F          =     0.0000
                                                R-squared         =     0.4881
                                                Root MSE          =     .21108
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lnprice	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
cartel	.3573672	.0261144	13.68	0.000	.3059859	.4087485
ice	.0288637	.0374718	0.77	0.442	-.0448638	.1025912
seas1	.0361852	.0628858	0.58	0.565	-.0875457	.1599161
seas2	.1337483	.0600381	2.23	0.027	.0156205	.2518762
seas3	.1864327	.0624571	2.98	0.003	.0635453	.30932
seas4	.0860296	.0533067	1.61	0.108	-.0188539	.1909131
seas5	.0116498	.041908	0.28	0.781	-.0708061	.0941057
seas6	-.0344678	.0449704	-0.77	0.444	-.1229493	.0540137
seas7	-.0758533	.0521024	-1.46	0.146	-.1783673	.0266607
seas8	-.0445862	.0445122	-1.00	0.317	-.132166	.0429936
seas9	-.0145912	.0471473	-0.31	0.757	-.1073558	.0781734
seas10	-.1090264	.0409344	-2.66	0.008	-.1895668	-.0284861
seas11	-.0954561	.0488723	-1.95	0.052	-.1916146	.0007024
_cons	-1.684682	.0355787	-47.35	0.000	-1.754685	-1.61468

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. test cartel

 ( 1)  cartel = 0

       F(  1,   314) =  187.27
            Prob > F =    0.0000
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As the F-statistic is 187.27 (greater than 10), it is not a weak instrument.

E

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. db ivregress

. ivregress 2sls lnquantity seas1 seas2 seas3 seas4 seas5 seas6 seas7 seas8 seas9 seas10 seas11 ice (lnprice = cartel), vce(ro
> bust)

Instrumental variables (2SLS) regression          Number of obs   =        328
                                                  Wald chi2(13)   =     160.72
                                                  Prob > chi2     =     0.0000
                                                  R-squared       =     0.2897
                                                  Root MSE        =     .39451
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lnquantity	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnprice	-.8892966	.1286809	-6.91	0.000	-1.141507	-.6370866
seas1	-.1689605	.0979539	-1.72	0.085	-.3609466	.0230257
seas2	.0551806	.0905057	0.61	0.542	-.1222074	.2325685
seas3	.1001375	.0948922	1.06	0.291	-.0858478	.2861227
seas4	.1010961	.1174149	0.86	0.389	-.1290328	.331225
seas5	-.0211007	.0902921	-0.23	0.815	-.19807	.1558686
seas6	-.1401813	.0980401	-1.43	0.153	-.3323365	.0519738
seas7	-.0748247	.1342048	-0.56	0.577	-.3378613	.188212
seas8	-.4282842	.0967265	-4.43	0.000	-.6178646	-.2387038
seas9	-.1933907	.0969866	-1.99	0.046	-.3834809	-.0033004
seas10	-.0513521	.0970697	-0.53	0.597	-.2416052	.1389009
seas11	.0166271	.0971939	0.17	0.864	-.1738695	.2071237
ice	.3297887	.0791537	4.17	0.000	.1746503	.4849271
_cons	8.673682	.1861821	46.59	0.000	8.308772	9.038593

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Instrumented:  lnprice
Instruments:   seas1 seas2 seas3 seas4 seas5 seas6 seas7 seas8 seas9 seas10
               seas11 ice cartel

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Demand elasticity is -0.89 whereas the robust standard error is 0.128.

F

The monopolist should increase the price when the price elasticity is less than 1. The elasticity being less than 1 suggests that the monopolist wasn't charging the optimal price in order to maximize profit.