

(R)

Statistics/Data Analysis

User: Grant Aarons
Project: Assignment 3

```

name: Grant Aarons Assignment 3
log: C:\Users\gaarons\Git\Notes\Stata\2016F\Metrics\logs\stata_3.smcl
log type: smcl
opened on: 11 Jan 2017, 20:52:01

```

```

1 . * Use s or t to get smcl or text log file
2 . /*
   > Grant Aarons
   > gaarons@london.edu
   > Econometrics 1, London Business School
   > */
3 . global programdir C:\Users\gaarons\Git\Notes\Stata\2016F\Metrics\programs
4 . global datadir C:\Users\gaarons\Git\Notes\Stata\2016F\Metrics\data
5 . global outputdir C:\Users\gaarons\Git\Notes\Stata\2016F\Metrics\output
6 . /*
   > Program: stata_3l.do
   > Description: Introduction to econometrics in stata
   > */
7 .
8 . do $programdir/stata_3l.do
9 . /*
   > Grant Aarons
   > gaarons@london.edu
   > Econometrics 1, London Business School
   > Assignment 3
   > */
10 . * Load the data
11 . import excel "$datadir/schaller.xls", sheet("Sheet1") firstrow clear
12 . *pause Dataset has been loaded
13 .
14 .
15 . *** Part A
16 . * Tabulate the variables we were given as standard practice
17 . tabstat inv q, stat(min max mean sd)

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stats	inv	q
min	0	-1.966133
max	.7142991	45.44712
mean	.1686158	1.601154
sd	.0899994	3.803969

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18 . tabstat inv q, by(year) stat(min max mean sd)
```

Summary statistics: min, max, mean, sd
by categories of: year (year)

year	inv	q
1	.0205936	-1.748583
	.6704475	6.588722
	.1927996	.5728584
	.112118	1.648371
2	.0107318	-1.405087
	.5325488	6.588691
	.1718815	.597845
	.0927825	1.577901
3	.0113419	-1.508873
	.4278665	6.862064
	.1607248	.6349403
	.0906696	1.647415
4	.020651	-1.917622
	.5146071	9.03307
	.1472462	.4967591
	.0863553	1.78078
5	.0169944	-1.636174
	.4385091	16.39879
	.1687614	1.575704
	.0985533	2.936246

6	.0140286 -1.316996 .5664171 19.55134 .2085197 2.143651 .1088841 3.536015
7	.0214348 -1.514729 .5919886 15.757 .1891974 1.982852 .097126 3.214572
8	.0210933 -1.966133 .5523365 14.29717 .1445815 1.188414 .0933408 2.806896
9	.0088241 -1.738319 .6472303 25.06137 .1469142 2.615832 .0936516 4.240391
10	.011097 -1.219954 .6800648 41.90479 .1684816 3.291839 .104496 5.477325
11	0 -1.477367 .7142991 30.18523 .1494652 2.990903 .0990541 5.405804
12	.0182395 -1.211948 .5982081 45.44712 .1608216 3.946245 .0958416 6.795034
13	.0338612 -1.499547 .5844074 36.9486 .170258 2.496707 .092345 4.696228
14	.0159083 -1.326542 .6414233 33.9775 .1872097 2.878355 .0944825 5.152764
15	.0456929 -1.344155 .5690441 30.4778 .2180801 2.873494 .0922757 4.62583
16	.0360537 -.8103173 .655834 34.83765 .2338404 3.488654 .1016048 5.38048
17	.0221875 -1.069489 .6108891 26.40782 .2184982 2.396935 .1053458 4.369127
18	.0287359 -1.00933 .4589968 32.06573 .1938358 3.517091 .0837783 5.388207
19	.0264943 -.7960994 .6606368 27.86442 .1970291 3.4057 .0883814 4.786166
20	.0167316 -1.255464 .4899229 28.40281 .1765477 2.31209 .073611 4.739304
21	.005226 -1.066554 .4338658 19.17337 .1469716 1.841841 .0706017 3.489996

22	.0145928 -1.131676 .4037121 23.90062 .1444561 2.179387 .0679987 4.141808
23	.0329763 -1.542628 .4842557 27.49858 .179273 2.346174 .0853335 4.718412
24	.027034 -1.610933 .4426112 20.43754 .1931256 1.318847 .0856918 3.528182
25	.0077582 -1.955251 .4441033 13.70439 .151674 .2314248 .0673722 1.925192
26	.0190473 -1.428982 .3261356 11.73812 .1382109 .4759651 .0570254 1.95111
27	.0209634 -1.275176 .3595692 10.10888 .1506596 .618547 .0608719 1.754108
28	.0438521 -1.347831 .4033135 7.400327 .1579665 .2473247 .0649604 1.413838
29	.0144415 -1.547875 .6127569 9.157542 .1717787 .1102235 .0799605 1.391528
30	.0184241 -1.279086 .361407 9.488826 .1628513 .1234602 .0678179 1.305088
31	.0212685 -1.405766 .361128 10.21523 .1569981 .2477085 .0689526 1.521988
32	.0150045 -1.365615 .4270046 6.407879 .1365325 .0176893 .065645 1.335595
33	.0092279 -1.760928 .6422654 8.459704 .1219511 .1681494 .0767863 1.469953
34	.0138137 -1.722591 .5336629 7.986071 .1385301 .4142811 .0793025 1.433183
35	.012056 -1.870826 .4314426 6.277641 .1458804 .292498 .0779655 1.263107
Total	0 -1.966133 .7142991 45.44712 .1686158 1.601154 .0899994 3.803969

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19 . * Too long a printout by firm, but could be used
20 . *tabstat inv q, by(firm) stat(min max mean sd)
21 .
22 . * Run the required regression of inv = alpha + beta_1*q
23 . reg inv q

```

Source	SS	df	MS	Number of obs	=	5,740
Model	5.63683287	1	5.63683287	F(1, 5738)	=	791.81
Residual	40.8484783	5,738	.00711894	Prob > F	=	0.0000
				R-squared	=	0.1213
				Adj R-squared	=	0.1211
Total	46.4853111	5,739	.008099897	Root MSE	=	.08437

inv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
q	.0082388	.0002928	28.14	0.000	.0076648	.0088127
_cons	.1554243	.0012083	128.63	0.000	.1530555	.157793

```

24 .
25 . *pause Part A completed
26 .
27 .
28 . *** Part B
29 . * Create dummy variables corresponding to each firm using ``xi'' command
30 . xi firm
31 . reg inv q i.firm

```

Source	SS	df	MS	Number of obs	=	5,740
Model	18.0371613	164	.109982691	F(164, 5575)	=	21.55
Residual	28.4481498	5,575	.005102807	Prob > F	=	0.0000
				R-squared	=	0.3880
				Adj R-squared	=	0.3700
Total	46.4853111	5,739	.008099897	Root MSE	=	.07143

inv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
q	.007249	.0003543	20.46	0.000	.0065544	.0079437
firm						
2	-.0110881	.0171628	-0.65	0.518	-.0447339	.0225577
3	.1144593	.0171091	6.69	0.000	.0809188	.1479999
4	-.0299033	.0171512	-1.74	0.081	-.0635263	.0037196
5	-.0131718	.017159	-0.77	0.443	-.0468102	.0204666
6	.0295458	.0171438	1.72	0.085	-.0040628	.0631544
7	-.0179783	.0171701	-1.05	0.295	-.0516385	.0156819
8	-.0288828	.017146	-1.68	0.092	-.0624955	.0047299
9	-.0102863	.0171597	-0.60	0.549	-.043926	.0233535
10	.0012063	.0171321	0.07	0.944	-.0323793	.0347918
11	-.0333366	.017152	-1.94	0.052	-.0669612	.0002879
12	.0018204	.0171088	0.11	0.915	-.0317196	.0353604
13	-.0626703	.0172465	-3.63	0.000	-.0964802	-.0288605
14	.0299757	.017154	1.75	0.081	-.0036528	.0636042
15	.0299541	.0171049	1.75	0.080	-.0035781	.0634864
16	-.0105629	.017164	-0.62	0.538	-.0442109	.0230852
17	.0073799	.0171342	0.43	0.667	-.0262099	.0409697
18	-.0479316	.0171712	-2.79	0.005	-.0815939	-.0142694
19	.0637984	.0171457	3.72	0.000	.0301863	.0974106
20	.037534	.0171446	2.19	0.029	.003924	.071144
21	.0033487	.0171188	0.20	0.845	-.0302108	.0369082
22	.0302641	.017113	1.77	0.077	-.0032841	.0638123
23	-.0303263	.0171771	-1.77	0.078	-.064	.0033474
24	.0416049	.0170807	2.44	0.015	.00812	.0750897
25	.0983835	.0171279	5.74	0.000	.0648062	.1319608
26	-.0093883	.0171363	-0.55	0.584	-.0429821	.0242056
27	.0475203	.0171412	2.77	0.006	.0139168	.0811237
28	-.0567045	.0170798	-3.32	0.001	-.0901876	-.0232214
29	-.0106659	.0171139	-0.62	0.533	-.0442157	.022884
30	.0435252	.0171216	2.54	0.011	.0099602	.0770903
31	.0755715	.0171089	4.42	0.000	.0420314	.1091115
32	.0205752	.0171604	1.20	0.231	-.0130659	.0542164
33	.0620965	.017091	3.63	0.000	.0285915	.0956015
34	.0030676	.0171605	0.18	0.858	-.0305736	.0367088
35	.0632206	.0171094	3.70	0.000	.0296795	.0967617
36	.0552266	.0171313	3.22	0.001	.0216426	.0888107
37	-.0210293	.0171333	-1.23	0.220	-.0546173	.0125587
38	.0675202	.0171455	3.94	0.000	.0339083	.1011321

39	.0023553	.0171479	0.14	0.891	-.0312612	.0359719
40	.0053389	.0171174	0.31	0.755	-.028218	.0388957
41	-.0111797	.0170966	-0.65	0.513	-.0446957	.0223363
42	.003941	.0171214	0.23	0.818	-.0296235	.0375056
43	.009515	.0171506	0.55	0.579	-.0241068	.0431369
44	.0487956	.0171345	2.85	0.004	.0152054	.0823859
45	.0431771	.0171268	2.52	0.012	.009602	.0767523
46	.0745948	.0171477	4.35	0.000	.0409785	.1082111
47	-.0113431	.0171585	-0.66	0.509	-.0449804	.0222943
48	.0060311	.017105	0.35	0.724	-.0275013	.0395635
49	-.0075513	.0171799	-0.44	0.660	-.0412306	.026128
50	-.0351712	.0171655	-2.05	0.041	-.0688223	-.00152
51	-.014578	.0171518	-0.85	0.395	-.0482021	.0190461
52	-.0170216	.0171304	-0.99	0.320	-.0506038	.0165606
53	-.0350846	.0171745	-2.04	0.041	-.0687533	-.0014159
54	.021855	.0171225	1.28	0.202	-.0117117	.0554218
55	.0219519	.0171542	1.28	0.201	-.011677	.0555808
56	.0318367	.0171471	1.86	0.063	-.0017783	.0654517
57	.0461108	.0171369	2.69	0.007	.0125157	.0797059
58	-.0164856	.0170781	-0.97	0.334	-.0499654	.0169941
59	.0258278	.0171496	1.51	0.132	-.007792	.0594476
60	.0461384	.0170906	2.70	0.007	.0126342	.0796425
61	.0948239	.0171271	5.54	0.000	.061248	.1283997
62	.0181437	.0170817	1.06	0.288	-.0153432	.0516306
63	-.0138999	.0171558	-0.81	0.418	-.047532	.0197321
64	-.0218311	.0171141	-1.28	0.202	-.0553815	.0117193
65	.0429222	.0171283	2.51	0.012	.009344	.0765003
66	.0747595	.017076	4.38	0.000	.0412839	.1082351
67	.0701564	.0171259	4.10	0.000	.0365831	.1037298
68	.0002675	.0171323	0.02	0.988	-.0333185	.0338534
69	.0460002	.0171216	2.69	0.007	.0124352	.0795652
70	.0683109	.0171055	3.99	0.000	.0347775	.1018444
71	.0279947	.0171355	1.63	0.102	-.0055975	.061587
72	.0685164	.017128	4.00	0.000	.0349388	.102094
73	.0334759	.017076	1.96	0.050	2.71e-07	.0669515
74	.1187479	.0171123	6.94	0.000	.0852011	.1522947
75	.000034	.0171192	0.00	0.998	-.0335264	.0335943
76	-.0218521	.017176	-1.27	0.203	-.0555238	.0118196
77	.0353268	.0171035	2.07	0.039	.0017974	.0688563
78	.0150356	.0170872	0.88	0.379	-.0184619	.048533
79	.0102299	.0171945	0.59	0.552	-.023478	.0439379
80	.0039382	.0171484	0.23	0.818	-.0296793	.0375558
81	.0184951	.0171391	1.08	0.281	-.0151041	.0520943
82	-.0116276	.01716	-0.68	0.498	-.0452678	.0220127
83	.0826889	.0171298	4.83	0.000	.0491079	.1162699
84	.0102795	.017157	0.60	0.549	-.0233549	.043914
85	-.0076072	.0171474	-0.44	0.657	-.0412227	.0260084
86	.0313087	.0170968	1.83	0.067	-.0022077	.0648251
87	-.0275372	.017099	-1.61	0.107	-.0610578	.0059834
88	-.0599936	.0171762	-3.49	0.000	-.0936656	-.0263217
89	.1633283	.017079	9.56	0.000	.1298468	.1968097
90	.0081582	.0171509	0.48	0.634	-.0254643	.0417807
91	-.030904	.0171306	-1.80	0.071	-.0644867	.0026787
92	-.0180802	.0171059	-1.06	0.291	-.0516145	.0154541
93	.061324	.0170765	3.59	0.000	.0278473	.0948006
94	-.000042	.0171425	-0.00	0.998	-.0336479	.0335639
95	-.0093794	.0171398	-0.55	0.584	-.0429802	.0242213
96	-.0172457	.0171775	-1.00	0.315	-.0509202	.0164288
97	.133017	.0171655	7.75	0.000	.0993659	.166668
98	-.0031429	.0171327	-0.18	0.854	-.0367296	.0304438
99	.0409969	.0171073	2.40	0.017	.0074599	.0745338
100	.0317446	.0171282	1.85	0.064	-.0018333	.0653225
101	-.0117057	.0171386	-0.68	0.495	-.0453041	.0218927
102	-.0047098	.0170769	-0.28	0.783	-.0381872	.0287675
103	.0809494	.0171046	4.73	0.000	.0474178	.1144811
104	-.04242	.0171655	-2.47	0.013	-.0760711	-.0087689
105	-.0092774	.0171248	-0.54	0.588	-.0428487	.0242939
106	.0096833	.0171703	0.56	0.573	-.0239773	.0433439
107	.0668296	.0171257	3.90	0.000	.0332566	.1004026
108	-.0319637	.0171538	-1.86	0.062	-.0655919	.0016645
109	-.0208587	.0171625	-1.22	0.224	-.054504	.0127865
110	.0406201	.0171572	2.37	0.018	.0069853	.0742549
111	.0033588	.0171546	0.20	0.845	-.0302708	.0369884
112	-.0346632	.0172433	-2.01	0.044	-.0684668	-.0008596
113	.0231535	.0171585	1.35	0.177	-.0104839	.056791
114	.0125792	.0172291	0.73	0.465	-.0211966	.0463549
115	-.0169208	.0171619	-0.99	0.324	-.0505649	.0167232
116	.0422971	.0171135	2.47	0.013	.0087479	.0758463
117	.118987	.0170846	6.96	0.000	.0854945	.1524796
118	-.0081228	.017153	-0.47	0.636	-.0417494	.0255038

119	-.0221458	.0170959	-1.30	0.195	-.0556604	.0113688
120	.0237715	.0171219	1.39	0.165	-.0097942	.0573371
121	-.0102183	.0171641	-0.60	0.552	-.0438667	.0234301
122	-.0261932	.017147	-1.53	0.127	-.0598079	.0074216
123	.114001	.0171271	6.66	0.000	.0804252	.1475767
124	.0278888	.0171065	1.63	0.103	-.0056467	.0614242
125	-.0029403	.0171321	-0.17	0.864	-.0365259	.0306453
126	-.0069179	.0171391	-0.40	0.686	-.0405172	.0266814
127	.0136327	.0171308	0.80	0.426	-.0199503	.0472158
128	.0681524	.017084	3.99	0.000	.0346612	.1016436
129	.0146445	.017076	0.86	0.391	-.0188312	.0481202
130	-.0654175	.0171515	-3.81	0.000	-.0990411	-.0317938
131	.0228469	.0171368	1.33	0.183	-.0107479	.0564417
132	-.0359411	.0171453	-2.10	0.036	-.0695527	-.0023296
133	.0962414	.0171039	5.63	0.000	.0627111	.1297718
134	.154328	.0171078	9.02	0.000	.1207901	.1878659
135	-.0470046	.0171615	-2.74	0.006	-.0806477	-.0133614
136	.0097354	.01714	0.57	0.570	-.0238656	.0433364
137	-.021706	.0171425	-1.27	0.205	-.055312	.0118999
138	.0481099	.0171488	2.81	0.005	.0144915	.0817282
139	.1480501	.0171195	8.65	0.000	.1144893	.181611
140	.034904	.0170849	2.04	0.041	.001411	.068397
141	.0460388	.0171494	2.68	0.007	.0124193	.0796582
142	.0125785	.0170974	0.74	0.462	-.020939	.046096
143	-.0526768	.0174231	-3.02	0.003	-.0868328	-.0185207
144	.0085849	.0170765	0.50	0.615	-.0248917	.0420615
145	.026235	.017142	1.53	0.126	-.0073701	.0598401
146	.0101592	.0171455	0.59	0.554	-.0234527	.0437711
147	-.0571875	.0170837	-3.35	0.001	-.0906781	-.0236968
148	-.0134221	.0171724	-0.78	0.434	-.0470867	.0202426
149	-.031901	.0171313	-1.86	0.063	-.0654849	.0016829
150	.0948328	.0171226	5.54	0.000	.0612658	.1283997
151	.0718996	.0171187	4.20	0.000	.0383402	.105459
152	.0511302	.0170784	2.99	0.003	.0176498	.0846106
153	.0137322	.0171189	0.80	0.422	-.0198274	.0472919
154	.0102959	.0171328	0.60	0.548	-.023291	.0438828
155	.0079635	.0171219	0.47	0.642	-.0256021	.0415292
156	-.0071696	.0171092	-0.42	0.675	-.0407102	.026371
157	-.0306744	.0171116	-1.79	0.073	-.0642197	.0028709
158	-.0000973	.0171537	-0.01	0.995	-.0337252	.0335306
159	.0100507	.0171292	0.59	0.557	-.0235291	.0436306
160	-.003881	.0171547	-0.23	0.821	-.0375109	.0297488
161	-.0054513	.0170979	-0.32	0.750	-.0389697	.0280672
162	-.0424006	.0171917	-2.47	0.014	-.076103	-.0086983
163	-.0316199	.0170922	-1.85	0.064	-.0651272	.0018874
164	.2038804	.0172066	11.85	0.000	.1701489	.237612
_cons	.1394105	.0121809	11.45	0.000	.1155313	.1632898

```

32 .
33 . *pause Part B completed
34 .
35 . *** Part C
36 . * regress inv on firm dummies alone and obtain the residual
37 . reg inv i.firm

```

Source	SS	df	MS	Number of obs	=	5,740
Model	15.9015861	163	.097555743	F(163, 5576)	=	17.79
Residual	30.583725	5,576	.005484886	Prob > F	=	0.0000
				R-squared	=	0.3421
				Adj R-squared	=	0.3228
Total	46.4853111	5,739	.008099897	Root MSE	=	.07406

inv	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
firm						
2	-.0463644	.0177037	-2.62	0.009	-.0810706	-.0116582
3	.0926863	.0177037	5.24	0.000	.0579801	.1273925
4	-.0627225	.0177037	-3.54	0.000	-.0974287	-.0280163
5	-.0476682	.0177037	-2.69	0.007	-.0823744	-.012962
6	-.0016269	.0177037	-0.09	0.927	-.0363331	.0330794
7	-.0547145	.0177037	-3.09	0.002	-.0894207	-.0200083
8	-.0605399	.0177037	-3.42	0.001	-.0952461	-.0258337
9	-.0449276	.0177037	-2.54	0.011	-.0796338	-.0102214
10	-.0271394	.0177037	-1.53	0.125	-.0618456	.0075668
11	-.0663346	.0177037	-3.75	0.000	-.1010409	-.0316284
12	-.0198649	.0177037	-1.12	0.262	-.0545711	.0148413
13	-.0131799	.0177037	-0.74	0.457	-.0478861	.0215264

14	-.0034511	.0177037	-0.19	0.845	-.0381573	.0312551
15	.0096168	.0177037	0.54	0.587	-.0250894	.044323
16	-.0460741	.0177037	-2.60	0.009	-.0807804	-.0113679
17	-.0215037	.0177037	-1.21	0.225	-.0562099	.0132025
18	-.0848731	.0177037	-4.79	0.000	-.1195793	-.0501669
19	.0322069	.0177037	1.82	0.069	-.0024993	.0669131
20	.0061922	.0177037	0.35	0.727	-.028514	.0408984
21	-.0214032	.0177037	-1.21	0.227	-.0561095	.013303
22	.0072421	.0177037	0.41	0.683	-.0274641	.0419484
23	-.0683914	.0177037	-3.86	0.000	-.1030976	-.0336852
24	.0333578	.0177037	1.88	0.060	-.0013484	.068064
25	.0711326	.0177037	4.02	0.000	.0364264	.1058388
26	-.0387809	.0177037	-2.19	0.029	-.0734871	-.0040746
27	.0169559	.0177037	0.96	0.338	-.0177503	.0516621
28	-.0492857	.0177037	-2.78	0.005	-.0839919	-.0145795
29	-.0339525	.0177037	-1.92	0.055	-.0686587	.0007537
30	.0179631	.0177037	1.01	0.310	-.0167431	.0526693
31	.0538777	.0177037	3.04	0.002	.0191715	.0885839
32	-.0142134	.0177037	-0.80	0.422	-.0489196	.0204928
33	.0474473	.0177037	2.68	0.007	.012741	.0821535
34	-.0317294	.0177037	-1.79	0.073	-.0664357	.0029768
35	.0413572	.0177037	2.34	0.020	.006651	.0760634
36	.0270809	.0177037	1.53	0.126	-.0076253	.0617871
37	-.049687	.0177037	-2.81	0.005	-.0843932	-.0149808
38	.0359605	.0177037	2.03	0.042	.0012543	.0706667
39	-.0297369	.0177037	-1.68	0.093	-.0644431	.0049694
40	-.0190212	.0177037	-1.07	0.283	-.0537274	.015685
41	.0059927	.0177037	0.34	0.735	-.0287135	.0406989
42	-.0215471	.0177037	-1.22	0.224	-.0562533	.0131591
43	-.0231805	.0177037	-1.31	0.190	-.0578867	.0115257
44	.0198575	.0177037	1.12	0.262	-.0148487	.0545637
45	.0162103	.0177037	0.92	0.360	-.0184959	.0509165
46	.0425333	.0177037	2.40	0.016	.0078271	.0772395
47	-.0457316	.0177037	-2.58	0.010	-.0804378	-.0110254
48	.0263947	.0177037	1.49	0.136	-.0083115	.0611009
49	-.0461492	.0177037	-2.61	0.009	-.0808554	-.011443
50	-.0709933	.0177037	-4.01	0.000	-.1056995	-.0362871
51	-.047524	.0177037	-2.68	0.007	-.0822302	-.0128178
52	-.0449302	.0177037	-2.54	0.011	-.0796364	-.0102239
53	-.0726629	.0177037	-4.10	0.000	-.1073691	-.0379566
54	-.0039451	.0177037	-0.22	0.824	-.0386513	.0307611
55	-.0115221	.0177037	-0.65	0.515	-.0462283	.0231841
56	-.0000788	.0177037	-0.00	0.996	-.034785	.0346274
57	.0165654	.0177037	0.94	0.349	-.0181408	.0512716
58	-.0220309	.0177037	-1.24	0.213	-.0567371	.0126753
59	-.0066356	.0177037	-0.37	0.708	-.0413418	.0280706
60	.0316898	.0177037	1.79	0.074	-.0030165	.066396
61	.0677658	.0177037	3.83	0.000	.0330596	.102472
62	.0272186	.0177037	1.54	0.124	-.0074876	.0619248
63	-.0477142	.0177037	-2.70	0.007	-.0824204	-.013008
64	.0015401	.0177037	0.09	0.931	-.0331661	.0362463
65	.0155501	.0177037	0.88	0.380	-.0191561	.0502563
66	.0752376	.0177037	4.25	0.000	.0405314	.1099438
67	.0434331	.0177037	2.45	0.014	.0087269	.0781393
68	-.0281283	.0177037	-1.59	0.112	-.0628345	.006578
69	.0204488	.0177037	1.16	0.248	-.0142574	.055155
70	.0477585	.0177037	2.70	0.007	.0130522	.0824647
71	-.0011984	.0177037	-0.07	0.946	-.0359046	.0335078
72	.0412188	.0177037	2.33	0.020	.0065126	.075925
73	.0328962	.0177037	1.86	0.063	-.00181	.0676024
74	.0959444	.0177037	5.42	0.000	.0612382	.1306506
75	-.0248425	.0177037	-1.40	0.161	-.0595487	.0098637
76	-.0597242	.0177037	-3.37	0.001	-.0944304	-.025018
77	.0155004	.0177037	0.88	0.381	-.0192058	.0502066
78	.0023913	.0177037	0.14	0.893	-.0323149	.0370975
79	.051463	.0177037	2.91	0.004	.0167568	.0861692
80	-.0282713	.0177037	-1.60	0.110	-.0629775	.0064349
81	-.0115589	.0177037	-0.65	0.514	-.0462651	.0231473
82	-.0463194	.0177037	-2.62	0.009	-.0810256	-.0116132
83	.0549381	.0177037	3.10	0.002	.0202319	.0896443
84	-.0237981	.0177037	-1.34	0.179	-.0585043	.0109081
85	-.0395869	.0177037	-2.24	0.025	-.0742931	-.0048807
86	.0140537	.0177037	0.79	0.427	-.0206525	.0487599
87	-.0456679	.0177037	-2.58	0.010	-.0803741	-.0109617
88	-.0978886	.0177037	-5.53	0.000	-.1325948	-.0631824
89	.1567992	.0177037	8.86	0.000	.122093	.1915054
90	-.0246092	.0177037	-1.39	0.165	-.0593154	.010097
91	-.0588708	.0177037	-3.33	0.001	-.093577	-.0241646
92	-.0387872	.0177037	-2.19	0.028	-.0734934	-.004081
93	.0641024	.0177037	3.62	0.000	.0293962	.0988086

94	-.0308961	.0177037	-1.75	0.081	-.0656023	.0038101
95	-.0396196	.0177037	-2.24	0.025	-.0743258	-.0049134
96	-.055389	.0177037	-3.13	0.002	-.0900952	-.0206828
97	.168835	.0177037	9.54	0.000	.1341288	.2035412
98	-.031635	.0177037	-1.79	0.074	-.0663412	.0030712
99	.0621631	.0177037	3.51	0.000	.0274569	.0968693
100	.0044086	.0177037	0.25	0.803	-.0302976	.0391148
101	-.0416618	.0177037	-2.35	0.019	-.076368	-.0069556
102	-.001127	.0177037	-0.06	0.949	-.0358332	.0335792
103	.060717	.0177037	3.43	0.001	.0260108	.0954232
104	-.0782415	.0177037	-4.42	0.000	-.1129477	-.0435352
105	-.0357128	.0177037	-2.02	0.044	-.070419	-.0010066
106	-.0270939	.0177037	-1.53	0.126	-.0618001	.0076123
107	.0401573	.0177037	2.27	0.023	.0054511	.0748635
108	-.0653616	.0177037	-3.69	0.000	-.1000678	-.0306554
109	-.0560756	.0177037	-3.17	0.002	-.0907818	-.0213694
110	.0065055	.0177037	0.37	0.713	-.0282007	.0412117
111	-.0301916	.0177037	-1.71	0.088	-.0648978	.0045146
112	.0143614	.0177037	0.81	0.417	-.0203448	.0490677
113	-.0112408	.0177037	-0.63	0.525	-.045947	.0234654
114	.0594683	.0177037	3.36	0.001	.0247621	.0941745
115	-.0520106	.0177037	-2.94	0.003	-.0867168	-.0173044
116	.0191136	.0177037	1.08	0.280	-.0155926	.0538198
117	.1078621	.0177037	6.09	0.000	.0731559	.1425683
118	-.0413463	.0177037	-2.34	0.020	-.0760525	-.0066401
119	-.0390276	.0177037	-2.20	0.028	-.0737338	-.0043214
120	.0494182	.0177037	2.79	0.005	.014712	.0841244
121	-.0457608	.0177037	-2.58	0.010	-.080467	-.0110546
122	-.0580835	.0177037	-3.28	0.001	-.0927897	-.0233773
123	.0869552	.0177037	4.91	0.000	.052249	.1216614
124	.006985	.0177037	0.39	0.693	-.0277212	.0416912
125	-.0312861	.0177037	-1.77	0.077	-.0659923	.0034201
126	-.0369805	.0177037	-2.09	0.037	-.0716867	-.0022743
127	-.0143831	.0177037	-0.81	0.417	-.0490894	.0203231
128	.0574712	.0177037	3.25	0.001	.022765	.0921774
129	.013773	.0177037	0.78	0.437	-.0209332	.0484792
130	-.0983107	.0177037	-5.55	0.000	-.1330169	-.0636044
131	-.0066625	.0177037	-0.38	0.707	-.0413687	.0280437
132	-.0674566	.0177037	-3.81	0.000	-.1021628	-.0327504
133	.0762481	.0177037	4.31	0.000	.0415419	.1109543
134	.1330009	.0177037	7.51	0.000	.0982946	.1677071
135	-.082001	.0177037	-4.63	0.000	-.1167072	-.0472948
136	-.0205373	.0177037	-1.16	0.246	-.0552435	.0141689
137	-.0525667	.0177037	-2.97	0.003	-.0872729	-.0178605
138	.0158057	.0177037	0.89	0.372	-.0189005	.0505119
139	.1230968	.0177037	6.95	0.000	.0883906	.157803
140	.023623	.0177037	1.33	0.182	-.0110832	.0583292
141	.0136152	.0177037	0.77	0.442	-.021091	.0483214
142	-.0049101	.0177037	-0.28	0.782	-.0396163	.0297961
143	.0181167	.0177037	1.02	0.306	-.0165895	.0528229
144	.0112982	.0177037	0.64	0.523	-.023408	.0460044
145	-.0045251	.0177037	-0.26	0.798	-.0392313	.0301811
146	-.0214016	.0177037	-1.21	0.227	-.0561078	.0133046
147	-.0467027	.0177037	-2.64	0.008	-.0814089	-.0119965
148	-.0506048	.0177037	-2.86	0.004	-.085311	-.0158986
149	-.0600311	.0177037	-3.39	0.001	-.0947373	-.0253249
150	.069006	.0177037	3.90	0.000	.0342998	.1037122
151	.0471642	.0177037	2.66	0.008	.012458	.0818705
152	.0452041	.0177037	2.55	0.011	.0104979	.0799103
153	-.0110455	.0177037	-0.62	0.533	-.0457517	.0236608
154	-.0182215	.0177037	-1.03	0.303	-.0529277	.0164847
155	-.0176781	.0177037	-1.00	0.318	-.0523843	.0170281
156	-.0289575	.0177037	-1.64	0.102	-.0636637	.0057487
157	-.0532392	.0177037	-3.01	0.003	-.0879454	-.018533
158	-.0334624	.0177037	-1.89	0.059	-.0681686	.0012438
159	-.017543	.0177037	-0.99	0.322	-.0522492	.0171632
160	-.037459	.0177037	-2.12	0.034	-.0721652	-.0027528
161	-.0231408	.0177037	-1.31	0.191	-.0578471	.0115654
162	-.0831324	.0177037	-4.70	0.000	-.1178386	-.0484262
163	-.0468346	.0177037	-2.65	0.008	-.0815408	-.0121284
164	.2471651	.0177037	13.96	0.000	.2124589	.2818713
_cons	.1722653	.0125184	13.76	0.000	.1477243	.1968063


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38 . predict einv, residuals
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39 .
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40 . * regress q on firm dummies alone and obtain the residual
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41 . reg q i.firm
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Source	SS	df	MS	Number of obs	=	5,740
Model	42404.191	163	260.148411	F(163, 5576)	=	35.69
Residual	40640.1674	5,576	7.28840879	Prob > F	=	0.0000
				R-squared	=	0.5106
				Adj R-squared	=	0.4963
Total	83044.3584	5,739	14.4701792	Root MSE	=	2.6997

q	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
firm						
2	-4.866352	.645353	-7.54	0.000	-6.131495	-3.601208
3	-3.003586	.645353	-4.65	0.000	-4.268729	-1.738443
4	-4.527385	.645353	-7.02	0.000	-5.792528	-3.262242
5	-4.758758	.645353	-7.37	0.000	-6.023901	-3.493615
6	-4.300253	.645353	-6.66	0.000	-5.565397	-3.03511
7	-5.067738	.645353	-7.85	0.000	-6.332881	-3.802595
8	-4.367086	.645353	-6.77	0.000	-5.632229	-3.101943
9	-4.778749	.645353	-7.40	0.000	-6.043893	-3.513606
10	-3.910269	.645353	-6.06	0.000	-5.175412	-2.645126
11	-4.552061	.645353	-7.05	0.000	-5.817204	-3.286918
12	-2.99148	.645353	-4.64	0.000	-4.256624	-1.726337
13	6.827187	.645353	10.58	0.000	5.562044	8.092331
14	-4.61121	.645353	-7.15	0.000	-5.876354	-3.346067
15	-2.805525	.645353	-4.35	0.000	-4.070668	-1.540381
16	-4.898768	.645353	-7.59	0.000	-6.163911	-3.633625
17	-3.984481	.645353	-6.17	0.000	-5.249625	-2.719338
18	-5.096064	.645353	-7.90	0.000	-6.361207	-3.83092
19	-4.358045	.645353	-6.75	0.000	-5.623189	-3.092902
20	-4.323588	.645353	-6.70	0.000	-5.588732	-3.058445
21	-3.414516	.645353	-5.29	0.000	-4.67966	-2.149373
22	-3.175872	.645353	-4.92	0.000	-4.441016	-1.910729
23	-5.251062	.645353	-8.14	0.000	-6.516205	-3.985919
24	-1.137682	.645353	-1.76	0.078	-2.402825	.1274617
25	-3.759242	.645353	-5.83	0.000	-5.024385	-2.494099
26	-4.054692	.645353	-6.28	0.000	-5.319835	-2.789549
27	-4.216341	.645353	-6.53	0.000	-5.481485	-2.951198
28	1.023417	.645353	1.59	0.113	-.2417258	2.288561
29	-3.212386	.645353	-4.98	0.000	-4.47753	-1.947243
30	-3.526282	.645353	-5.46	0.000	-4.791425	-2.261138
31	-2.992644	.645353	-4.64	0.000	-4.257788	-1.727501
32	-4.799077	.645353	-7.44	0.000	-6.06422	-3.533934
33	-2.02086	.645353	-3.13	0.002	-3.286003	-.7557163
34	-4.800237	.645353	-7.44	0.000	-6.065381	-3.535094
35	-3.016051	.645353	-4.67	0.000	-4.281194	-1.750908
36	-3.882698	.645353	-6.02	0.000	-5.147841	-2.617554
37	-3.95331	.645353	-6.13	0.000	-5.218453	-2.688167
38	-4.353644	.645353	-6.75	0.000	-5.618787	-3.088501
39	-4.427102	.645353	-6.86	0.000	-5.692245	-3.161959
40	-3.360462	.645353	-5.21	0.000	-4.625605	-2.095318
41	2.368921	.645353	3.67	0.000	1.103778	3.634065
42	-3.516076	.645353	-5.45	0.000	-4.781219	-2.250933
43	-4.510337	.645353	-6.99	0.000	-5.77548	-3.245193
44	-3.992002	.645353	-6.19	0.000	-5.257146	-2.726859
45	-3.720063	.645353	-5.76	0.000	-4.985206	-2.45492
46	-4.422873	.645353	-6.85	0.000	-5.688017	-3.15773
47	-4.743883	.645353	-7.35	0.000	-6.009026	-3.47874
48	2.809145	.645353	4.35	0.000	1.544001	4.074288
49	-5.324561	.645353	-8.25	0.000	-6.589704	-4.059418
50	-4.941651	.645353	-7.66	0.000	-6.206794	-3.676507
51	-4.544886	.645353	-7.04	0.000	-5.81003	-3.279743
52	-3.849973	.645353	-5.97	0.000	-5.115116	-2.58483
53	-5.183904	.645353	-8.03	0.000	-6.449047	-3.918761
54	-3.559118	.645353	-5.51	0.000	-4.824262	-2.293975
55	-4.617728	.645353	-7.16	0.000	-5.882871	-3.352585
56	-4.402726	.645353	-6.82	0.000	-5.667869	-3.137582
57	-4.075778	.645353	-6.32	0.000	-5.340921	-2.810635
58	-.7649613	.645353	-1.19	0.236	-2.030105	.500182
59	-4.478312	.645353	-6.94	0.000	-5.743455	-3.213169
60	-1.993179	.645353	-3.09	0.002	-3.258322	-.7280354
61	-3.732652	.645353	-5.78	0.000	-4.997795	-2.467508
62	1.251882	.645353	1.94	0.052	-.0132611	2.517025
63	-4.664669	.645353	-7.23	0.000	-5.929812	-3.399526
64	3.224053	.645353	5.00	0.000	1.958909	4.489196

65	-3.775961	.645353	-5.85	0.000	-5.041104	-2.510818
66	.0659443	.645353	0.10	0.919	-1.199199	1.331088
67	-3.686471	.645353	-5.71	0.000	-4.951614	-2.421327
68	-3.917178	.645353	-6.07	0.000	-5.182321	-2.652034
69	-3.524795	.645353	-5.46	0.000	-4.789938	-2.259652
70	-2.835203	.645353	-4.39	0.000	-4.100346	-1.570006
71	-4.027183	.645353	-6.24	0.000	-5.292326	-2.762039
72	-3.765691	.645353	-5.84	0.000	-5.030834	-2.500547
73	-.0799685	.645353	-0.12	0.901	-1.345112	1.185175
74	-3.145733	.645353	-4.87	0.000	-4.410876	-1.88059
75	-3.431694	.645353	-5.32	0.000	-4.696837	-2.16655
76	-5.224431	.645353	-8.10	0.000	-6.489575	-3.959288
77	-2.735045	.645353	-4.24	0.000	-4.000188	-1.469901
78	-1.744269	.645353	-2.70	0.007	-3.009412	-.4791253
79	5.688083	.645353	8.81	0.000	4.422939	6.953226
80	-4.443287	.645353	-6.89	0.000	-5.708431	-3.178144
81	-4.14593	.645353	-6.42	0.000	-5.411073	-2.880786
82	-4.785723	.645353	-7.42	0.000	-6.050866	-3.520579
83	-3.828204	.645353	-5.93	0.000	-5.093348	-2.563061
84	-4.700998	.645353	-7.28	0.000	-5.966141	-3.435854
85	-4.411584	.645353	-6.84	0.000	-5.676728	-3.146441
86	-2.380325	.645353	-3.69	0.000	-3.645468	-1.115181
87	-2.501125	.645353	-3.88	0.000	-3.766268	-1.235982
88	-5.227596	.645353	-8.10	0.000	-6.49274	-3.962453
89	-.900681	.645353	-1.40	0.163	-2.165824	.3644622
90	-4.520257	.645353	-7.00	0.000	-5.785401	-3.255114
91	-3.858013	.645353	-5.98	0.000	-5.123156	-2.592869
92	-2.856521	.645353	-4.43	0.000	-4.121664	-1.591377
93	.3832855	.645353	0.59	0.553	-.8818578	1.648429
94	-4.256308	.645353	-6.60	0.000	-5.521452	-2.991165
95	-4.171619	.645353	-6.46	0.000	-5.436762	-2.906476
96	-5.261856	.645353	-8.15	0.000	-6.526999	-3.996713
97	4.941089	.645353	7.66	0.000	3.675946	6.206233
98	-3.930475	.645353	-6.09	0.000	-5.195618	-2.665331
99	2.91987	.645353	4.52	0.000	1.654727	4.185013
100	-3.770992	.645353	-5.84	0.000	-5.036135	-2.505848
101	-4.13243	.645353	-6.40	0.000	-5.397574	-2.867287
102	.4942529	.645353	0.77	0.444	-.7708903	1.759396
103	-2.791056	.645353	-4.32	0.000	-4.056199	-1.525912
104	-4.941557	.645353	-7.66	0.000	-6.2067	-3.676414
105	-3.646751	.645353	-5.65	0.000	-4.911895	-2.381608
106	-5.073405	.645353	-7.86	0.000	-6.338548	-3.808262
107	-3.679438	.645353	-5.70	0.000	-4.944582	-2.414295
108	-4.607226	.645353	-7.14	0.000	-5.872369	-3.342082
109	-4.858157	.645353	-7.53	0.000	-6.1233	-3.593014
110	-4.706094	.645353	-7.29	0.000	-5.971237	-3.440951
111	-4.628273	.645353	-7.17	0.000	-5.893416	-3.36313
112	6.76293	.645353	10.48	0.000	5.497787	8.028073
113	-4.744689	.645353	-7.35	0.000	-6.009832	-3.479546
114	6.468334	.645353	10.02	0.000	5.203191	7.733478
115	-4.840617	.645353	-7.50	0.000	-6.10576	-3.575474
116	-3.198145	.645353	-4.96	0.000	-4.463288	-1.933002
117	-1.53468	.645353	-2.38	0.017	-2.799824	-.269537
118	-4.583168	.645353	-7.10	0.000	-5.848311	-3.318024
119	-2.328837	.645353	-3.61	0.000	-3.59398	-1.063694
120	3.537956	.645353	5.48	0.000	2.272813	4.803099
121	-4.903066	.645353	-7.60	0.000	-6.168209	-3.637923
122	-4.399257	.645353	-6.82	0.000	-5.664401	-3.134114
123	-3.730955	.645353	-5.78	0.000	-4.996098	-2.465812
124	-2.883669	.645353	-4.47	0.000	-4.148812	-1.618525
125	-3.91029	.645353	-6.06	0.000	-5.175434	-2.645147
126	-4.147117	.645353	-6.43	0.000	-5.41226	-2.881973
127	-3.864778	.645353	-5.99	0.000	-5.129921	-2.599635
128	-1.473463	.645353	-2.28	0.022	-2.738606	-.2083193
129	-.1202265	.645353	-0.19	0.852	-1.38537	1.144917
130	-4.537601	.645353	-7.03	0.000	-5.802744	-3.272458
131	-4.070799	.645353	-6.31	0.000	-5.335942	-2.805656
132	-4.347549	.645353	-6.74	0.000	-5.612693	-3.082406
133	-2.758069	.645353	-4.27	0.000	-4.023212	-1.492926
134	-2.942074	.645353	-4.56	0.000	-4.207217	-1.67693
135	-4.827747	.645353	-7.48	0.000	-6.09289	-3.562603
136	-4.176109	.645353	-6.47	0.000	-5.441253	-2.910966
137	-4.257219	.645353	-6.60	0.000	-5.522362	-2.992075
138	-4.456349	.645353	-6.91	0.000	-5.721493	-3.191206
139	-3.442303	.645353	-5.33	0.000	-4.707446	-2.17716
140	-1.556216	.645353	-2.41	0.016	-2.821359	-.2910723
141	-4.472818	.645353	-6.93	0.000	-5.737962	-3.207675
142	-2.412541	.645353	-3.74	0.000	-3.677684	-1.147398
143	9.765928	.645353	15.13	0.000	8.500785	11.03107
144	.3742963	.645353	0.58	0.562	-.890847	1.63944

145	-4.243346	.645353	-6.58	0.000	-5.508489	-2.978203
146	-4.353792	.645353	-6.75	0.000	-5.618935	-3.088649
147	1.446372	.645353	2.24	0.025	.1812283	2.711515
148	-5.129339	.645353	-7.95	0.000	-6.394483	-3.864196
149	-3.880535	.645353	-6.01	0.000	-5.145679	-2.615392
150	-3.562787	.645353	-5.52	0.000	-4.827931	-2.297644
151	-3.412235	.645353	-5.29	0.000	-4.677378	-2.147092
152	-.8175055	.645353	-1.27	0.205	-2.082649	.4476378
153	-3.418071	.645353	-5.30	0.000	-4.683214	-2.152928
154	-3.933964	.645353	-6.10	0.000	-5.199108	-2.668821
155	-3.53725	.645353	-5.48	0.000	-4.802393	-2.272106
156	-3.005625	.645353	-4.66	0.000	-4.270768	-1.740481
157	-3.112807	.645353	-4.82	0.000	-4.37795	-1.847663
158	-4.602697	.645353	-7.13	0.000	-5.867841	-3.337554
159	-3.806547	.645353	-5.90	0.000	-5.071691	-2.541404
160	-4.632064	.645353	-7.18	0.000	-5.897208	-3.366921
161	-2.440271	.645353	-3.78	0.000	-3.705414	-1.175128
162	-5.618929	.645353	-8.71	0.000	-6.884072	-4.353786
163	-2.098864	.645353	-3.25	0.001	-3.364007	-.8337206
164	5.9711	.645353	9.25	0.000	4.705957	7.236243
_cons	4.532296	.4563335	9.93	0.000	3.637705	5.426888

42 . predict eq, residuals

43 .

44 . * regress einv on eq, the partitioned regression, partialing out result

45 . reg einv eq

Source	SS	df	MS	Number of obs	=	5,740
Model	2.13557517	1	2.13557517	F(1, 5738)	=	430.75
Residual	28.4481498	5,738	.004957851	Prob > F	=	0.0000
				R-squared	=	0.0698
				Adj R-squared	=	0.0697
Total	30.583725	5,739	.005329104	Root MSE	=	.07041

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
eq	.007249	.0003493	20.75	0.000	.0065643	.0079337
_cons	1.59e-12	.0009294	0.00	1.000	-.0018219	.0018219

46 .

47 . * Follow up questions addressed in the LaTeX write-up

48 .

49 . *pause Part C completed

50 .

51 .

52 . *** Part D

53 . * Purely analytical and addressed in the LaTeX write-up

54 . * Not asked to compute anything in Stata

55 .

56 .

57 . *** Part E

58 . * Regress inv on eq

59 . reg inv eq

Source	SS	df	MS	Number of obs	=	5,740
Model	2.13557518	1	2.13557518	F(1, 5738)	=	276.30
Residual	44.349736	5,738	.007729128	Prob > F	=	0.0000
				R-squared	=	0.0459
				Adj R-squared	=	0.0458
Total	46.4853111	5,739	.008099897	Root MSE	=	.08792

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
eq	.007249	.0004361	16.62	0.000	.0063941	.0081039
_cons	.1686158	.0011604	145.31	0.000	.166341	.1708906

```

60 .
61 . * Follow up questions addressed in the LaTeX write-up
62 .
63 . *pause Part E completed
64 .
    end of do-file

65 .
66 . do $programdir/stata_32.do

67 . /*
    > Grant Aarons
    > gaarons@london.edu
    > Econometrics 1, London Business School
    > Assignment 3
    > */
68 . * Load the data
69 . import excel "$datadir/ps3.xls", sheet("Sheet1") firstrow clear

70 . *pause Dataset has been loaded
71 .
72 . * Need to identify panelists/firms
73 . gen individual = _n

74 .
75 . * Reshape the data from wide to long
76 . reshape long w ed a, i(individual) j(year)
    (note: j = 0 1 2)

Data                                wide  ->   long
-----
Number of obs.                     1500  ->   4500
Number of variables                  10  ->     5
j variable (3 values)                ->   year
xij variables:
      w0 w1 w2  ->   w
    ed0 ed1 ed2  ->   ed
      a0 a1 a2  ->   a

77 . replace w = log(w)
    variable w was long now double
    (4,500 real changes made)

78 . gen xp = a-ed-6

79 . gen xp_p2 = xp^2

80 .
81 . * Create necessary variables
82 . by individual: egen luwe=mean(w)

83 . by individual: egen educ=mean(ed)

84 . by individual: egen exp=mean(xp)

85 . by individual: egen exp_p2=mean(xp_p2)

86 .
87 . *pause Check the means calculated above by individual
88 .
89 . *** Part A
90 . * For the 1990 portion of the data, regress log(wage) on constant, educ, exp, exp2
91 . * NOT SURE THAT THE PSET is written correctly, want the means of the individual over each variable..
    > .?
92 .
93 . * should we regress the average over all individuals or just 1990
94 . * (average by individual used later) NOT THIS: reg luwe educ exp exp_p2

```

```
95 . reg w ed xp xp_p2 if year==0
```

Source	SS	df	MS	Number of obs	=	1,500
Model	91.6141861	3	30.538062	F(3, 1496)	=	46.28
Residual	987.209592	1,496	.65989946	Prob > F	=	0.0000
				R-squared	=	0.0849
				Adj R-squared	=	0.0831
Total	1078.82378	1,499	.719695649	Root MSE	=	.81234

w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ed	.1440517	.0131358	10.97	0.000	.1182852	.1698182
xp	.026499	.0284373	0.93	0.352	-.0292823	.0822802
xp_p2	.0009687	.0013386	0.72	0.469	-.0016571	.0035945
_cons	7.384689	.2795876	26.41	0.000	6.836263	7.933114

```
96 .
97 . * Pooled Regression (1990-1992)
98 . reg w ed xp xp_p2
```

Source	SS	df	MS	Number of obs	=	4,500
Model	318.441207	3	106.147069	F(3, 4496)	=	164.80
Residual	2895.83354	4,496	.64409109	Prob > F	=	0.0000
				R-squared	=	0.0991
				Adj R-squared	=	0.0985
Total	3214.27475	4,499	.714442043	Root MSE	=	.80255

w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ed	.1479199	.0072281	20.46	0.000	.1337493	.1620905
xp	.0273553	.0165968	1.65	0.099	-.0051826	.0598931
xp_p2	.0005749	.0007205	0.80	0.425	-.0008377	.0019874
_cons	7.385116	.1622288	45.52	0.000	7.067067	7.703164

```
99 .
100 . *pause Part A completed
101 .
102 .
103 . *** Part B
104 . * Discussed in the LaTeX write-up
105 . * Not asked to compute anything in Stata, but helpful to do so
106 .
107 . *Combined for all IV
108 . rvfplot

109 . graph export "..\output\fittedResid_hettest.pdf", replace
(file ..\output\fittedResid_hettest.pdf written in PDF format)

110 . estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of w

      chi2(1)      =   114.87
      Prob > chi2   =   0.0000

111 .
112 . *For individual IV
113 . rvpplot ed

114 . graph export "..\output\edResid_hettest.pdf", replace
(file ..\output\edResid_hettest.pdf written in PDF format)
```

```

115 . rvppplot xp
116 . graph export "..\output\xpResid_hettest.pdf", replace
    (file ..\output\xpResid_hettest.pdf written in PDF format)
117 . rvppplot xp_p2
118 . graph export "..\output\xp_p2Resid_hettest.pdf", replace
    (file ..\output\xp_p2Resid_hettest.pdf written in PDF format)
119 .
120 . estat hettest ed

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: ed

        chi2(1)      =    76.42
        Prob > chi2   =    0.0000

121 . estat hettest xp

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: xp

        chi2(1)      =    1.19
        Prob > chi2   =    0.2760

122 . estat hettest xp_p2

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: xp_p2

        chi2(1)      =    0.00
        Prob > chi2   =    0.9587

123 .
124 . *** Part C
125 . * Purely analytical and addressed in the LaTeX write-up
126 . * Not asked to compute anything in Stata
127 . * The problem set should have asked us to compute the FE estimated coefficients
128 . xi year
129 . reg w ed xp xp_p2 i.year

```

Source	SS	df	MS	Number of obs	=	4,500
Model	319.315949	5	63.8631898	F(5, 4494)	=	99.14
Residual	2894.9588	4,494	.644183089	Prob > F	=	0.0000
				R-squared	=	0.0993
				Adj R-squared	=	0.0983
Total	3214.27475	4,499	.714442043	Root MSE	=	.80261

w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ed	.1464139	.0074734	19.59	0.000	.1317624	.1610655
xp	.0253395	.0167407	1.51	0.130	-.0074805	.0581595
xp_p2	.0006004	.0007209	0.83	0.405	-.0008129	.0020136
year						
1	.0340731	.0298066	1.14	0.253	-.0243624	.0925086
2	.0247063	.0312118	0.79	0.429	-.0364843	.0858968
_cons	7.403881	.1652676	44.80	0.000	7.079875	7.727887

```

130 .
131 . * To show the effect of different years on the coefficient estimates
132 . reg w ed xp xp_p2 if year==0

```

Source	SS	df	MS	Number of obs	=	1,500
Model	91.6141861	3	30.538062	F(3, 1496)	=	46.28
Residual	987.209592	1,496	.65989946	Prob > F	=	0.0000
				R-squared	=	0.0849
				Adj R-squared	=	0.0831
Total	1078.82378	1,499	.719695649	Root MSE	=	.81234

w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ed	.1440517	.0131358	10.97	0.000	.1182852	.1698182
xp	.026499	.0284373	0.93	0.352	-.0292823	.0822802
xp_p2	.0009687	.0013386	0.72	0.469	-.0016571	.0035945
_cons	7.384689	.2795876	26.41	0.000	6.836263	7.933114

```

133 . reg w ed xp xp_p2 if year==1

```

Source	SS	df	MS	Number of obs	=	1,500
Model	104.638302	3	34.8794341	F(3, 1496)	=	54.27
Residual	961.470297	1,496	.642694049	Prob > F	=	0.0000
				R-squared	=	0.0981
				Adj R-squared	=	0.0963
Total	1066.1086	1,499	.711213208	Root MSE	=	.80168

w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ed	.1440497	.0129141	11.15	0.000	.1187179	.1693814
xp	.0152927	.0300446	0.51	0.611	-.0436413	.0742267
xp_p2	.0008968	.0012998	0.69	0.490	-.0016529	.0034464
_cons	7.539949	.2956219	25.51	0.000	6.960071	8.119826

```

134 . reg w ed xp xp_p2 if year==2

```

Source	SS	df	MS	Number of obs	=	1,500
Model	116.20869	3	38.7362301	F(3, 1496)	=	61.41
Residual	943.702983	1,496	.630817502	Prob > F	=	0.0000
				R-squared	=	0.1096
				Adj R-squared	=	0.1079
Total	1059.91167	1,499	.707079168	Root MSE	=	.79424

w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ed	.1501405	.012801	11.73	0.000	.1250307	.1752503
xp	.0057006	.0322058	0.18	0.860	-.0574728	.0688741
xp_p2	.0012123	.0012884	0.94	0.347	-.0013151	.0037397
_cons	7.519055	.3162754	23.77	0.000	6.898665	8.139446

```

135 .
136 . *** Part D
137 . * Only MATLAB
138 .
139 . *** Part E
140 . * Estimate the within estimator \tilde{\beta}_W for the wage equation
141 .
142 . preserve
143 . * Need demeaned variables
144 . replace w = w - luwe
    (4,500 real changes made)

```

```

145 . replace ed = ed - educ
    variable ed was byte now float
    (4,500 real changes made)

146 . replace xp = xp - exp
    (4,500 real changes made)

147 . replace xp_p2 = xp_p2 - exp_p2
    (4,500 real changes made)

148 . * Need to do this to get the same coefficient names for Hausman test
149 .
150 . * Pooled Regression (1990-1992) but after demeaned/Within/FixedEffects
151 . *reg w_dm ed_dm xp_dm xp_p2_dm
152 . reg w ed xp xp_p2

```

Source	SS	df	MS	Number of obs	=	4,500
Model	10.5005623	3	3.50018743	F(3, 4496)	=	23.26
Residual	676.6235	4,496	.150494551	Prob > F	=	0.0000
				R-squared	=	0.0153
				Adj R-squared	=	0.0146
Total	687.124063	4,499	.152728176	Root MSE	=	.38794

w	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ed	.0637628	.0264373	2.41	0.016	.0119326	.1155929
xp	.1301495	.0250195	5.20	0.000	.081099	.1791999
xp_p2	-.0035098	.0011127	-3.15	0.002	-.0056913	-.0013284
_cons	-1.05e-08	.005783	-0.00	1.000	-.0113376	.0113375

```

153 . estimates store fixedEffects

154 . restore

155 . * Firm fixed effect
156 . * FOR within each individual demean the average over time, firm fixed effect
157 .
158 . * Follow up questions addressed in the LaTeX write-up
159 .
160 . *pause Part E completed
161 .
162 . *** Part F
163 . * Only MATLAB
164 .
165 . *** Part G
166 . * Only Stata - WE CANNOT DO THIS PROBLEM WITH THE STATA IC license that we are
167 . * given. Max matsize=800 on IC and we need 1500.
168 .
169 . * Check if the results match with Stata by using the command xtgls on the
170 . * variable from the original wage equation.
171 .
172 . /* xtset individual year
    > set matsize 2000
    > xtgls w ed xp xp_p2
    > estimates store gls
    > */

173 .
174 . * Follow up questions addressed in the LaTeX write-up
175 .
176 . *pause Part G completed
177 .
178 .
179 . *** Part H
180 . * Are the FGLS (MATLAB should match) results different than the FE ones? Perform a Hausman test.
181 .
182 . /* hausman fixedEffects gls
    > */

```



```
183 .
184 . * Follow up questions addressed in the LaTeX write-up
185 .
186 . *pause Part H completed
187 .
188 .
    end of do-file

189 .
190 . log close _all
      name: Grant Aarons Assignment 3
      log:  C:\Users\gaarons\Git\Notes\Stata\2016F\Metrics\logs\stata_3.smcl
      log type: smcl
      closed on: 11 Jan 2017, 20:52:03
```
