

## Contents

14.32 Lecture 13 Edited 04-16-20 from code for Extrapolating 2013

Data from [https://dataverse.harvard.edu/dataset.xhtml?persistentId=](https://dataverse.harvard.edu/dataset.xhtml?persistentId=hdl:1902.1/11288)  
hdl:1902.1/11288

(85 vars, 927,267 obs)

Recodes

```
(272,098 missing values generated)
(676,104 missing values generated)
(803,347 real changes made)
(2,458 real changes made)
(676,104 missing values generated)
(676,104 real changes made)
(927,267 missing values generated)
(927,267 real changes made)
(340,508 real changes made)
(586,759 real changes made)
replace illegit = 1 if ((dom_q - dolb_q)>0)
(108,294 real changes made)
(164,424 missing values generated)
(187,601 real changes made)
(164,424 missing values generated)
(164,424 missing values generated)
(164,424 missing values generated)
replace msample = 1 if ((aged!=.) & (timesmar==1) & (marital==0) & (illegit==
0) & (agefststd >=15) & (agefstm >= 15) & !mi(agefststd))
(596,315 real changes made)
(164,424 missing values generated)
(565,443 real changes made)
(905,599 real changes made)
(164,424 missing values generated)
keep if ((agem1>=21 & agem1<=35) & (kidcount>=2) & (ageq2nd1>4) & (agefstm>=1
5) & (asex==0) & (aage==0) & (aqtrbrth==0) & (asex2nd==0) & (aage2nd==0))
(532,427 observations deleted)

sum agem1 kidcount ageq2nd1 agefstm weeksm1 workedm morekids agem1 boy1st boy
2nd blackm hispm othracem multi2nd samesex msample
```

Variable	Obs	Mean	Std. Dev.	Min	Max
agem1	394,840	30.1248	3.509685	21	35
kidcount	394,840	2.552069	.8083876	2	12
ageq2nd1	394,840	26.36489	14.61527	5	70
agefstm	394,840	20.13956	2.949069	15	33
weeksm1	394,840	20.83419	22.28601	0	52
workedm	394,840	.5654873	.4956935	0	1
morekids	394,840	.4020641	.4903154	0	1
agem1	394,840	30.1248	3.509685	21	35
boy1st	394,840	.511088	.4998777	0	1
boy2nd	394,840	.5109614	.4998805	0	1
blackm	394,840	.1189343	.3237115	0	1
hispm	394,840	.03004	.1706976	0	1
othracem	394,840	.028685	.16692	0	1
multi2nd	394,840	.0085604	.0921258	0	1
samesex	394,840	.5053895	.4999716	0	1
msample	394,840	.6449499	.4785291	0	1

OLS

Linear regression	Number of obs	=	394,840
	F(8, 394831)	=	4589.07
	Prob > F	=	0.0000
	R-squared	=	0.0778
	Root MSE	=	21.402

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
morekids	-8.978191	.0705666	-127.23	0.000	-9.1165	-8.839883
agem1	1.466036	.0105266	139.27	0.000	1.445404	1.486668
agefstm	-1.423913	.0131709	-108.11	0.000	-1.449728	-1.398099
boy1st	-.1153498	.0681462	-1.69	0.091	-.2489143	.0182147
boy2nd	-.1773649	.0681483	-2.60	0.009	-.3109335	-.0437963

blackm		6.451669	.1103587	58.46	0.000	6.235369	6.667968
hispm		-.7810209	.1956389	-3.99	0.000	-1.164467	-.3975744
othracem		2.860371	.2109436	13.56	0.000	2.446928	3.273814
_cons		8.280615	.3199806	25.88	0.000	7.653463	8.907767

Linear regression

Number of obs	=	394,840
F(8, 394831)	=	3032.83
Prob > F	=	0.0000
R-squared	=	0.0537
Root MSE	=	.48222

		Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]
workedm						
morekids		-.1764489	.0016171	-109.11	0.000	-.1796184 - .1732793
agem1		.0241995	.0002424	99.84	0.000	.0237244 .0246745
agefstm		-.0291002	.0002967	-98.07	0.000	-.0296818 -.0285187
boy1st		-.0005312	.0015353	-0.35	0.729	-.0035404 .002478
boy2nd		-.0040863	.0015353	-2.66	0.008	-.0070955 -.0010771
blackm		.1060263	.0023474	45.17	0.000	.1014255 .110627
hispm		-.0309759	.0046057	-6.73	0.000	-.0400029 -.0219488
othracem		.0420805	.0046453	9.06	0.000	.0329759 .0511852
_cons		.4829654	.0075603	63.88	0.000	.4681474 .4977834

First stage and reduced form: twins

Linear regression

Number of obs	=	394,840
F(0, 394838)	=	.
Prob > F	=	.
R-squared	=	0.0128
Root MSE	=	.48716

morekids		Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]
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multi2nd		.6030987	.000782	771.25	0.000	.601566	.6046313
_cons		.3969013	.000782	507.56	0.000	.3953687	.398434

Linear regression	Number of obs	=	394,840
	F(1, 394838)	=	27.19
	Prob > F	=	0.0000
	R-squared	=	0.0001
	Root MSE	=	22.285

		Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]
weeksm1						
multi2nd		-1.975956	.3789719	-5.21	0.000	-2.718729 -1.233182
_cons		20.8511	.0356232	585.32	0.000	20.78128 20.92092

Linear regression	Number of obs	=	394,840
	F(1, 394838)	=	28.12
	Prob > F	=	0.0000
	R-squared	=	0.0001
	Root MSE	=	.49568

		Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]
workedm						
multi2nd		-.0457607	.0086298	-5.30	0.000	-.0626747 -.0288466
_cons		.565879	.0007922	714.33	0.000	.5643264 .5674317

Wald for twins

Instrumental variables (2SLS) regression	Number of obs	=	394,840
	Wald chi2(1)	=	26.71
	Prob > chi2	=	0.0000
	R-squared	=	0.0138
	Root MSE	=	22.132

weeksm1	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
morekids	-3.276339	.6339241	-5.17	0.000	-4.518807	-2.033871
_cons	22.15149	.2573002	86.09	0.000	21.64719	22.65579

Instrumented: morekids

Instruments: multi2nd

First stage and reduced form: samesex

Linear regression	Number of obs	=	394,840
	F(1, 394838)	=	1461.73
	Prob > F	=	0.0000
	R-squared	=	0.0037
	Root MSE	=	.48941

morekids	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
samesex	.059544	.0015574	38.23	0.000	.0564915	.0625965
_cons	.3719712	.0010937	340.10	0.000	.3698276	.3741148

Linear regression	Number of obs	=	394,840
	F(1, 394838)	=	28.50
	Prob > F	=	0.0000
	R-squared	=	0.0001
	Root MSE	=	22.285

weeksm1	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
samesex	-.3786749	.0709378	-5.34	0.000	-.5177109	-.2396389
_cons	21.02557	.0505151	416.22	0.000	20.92656	21.12457

Linear regression	Number of obs	=	394,840
	F(1, 394838)	=	24.76
	Prob > F	=	0.0000
	R-squared	=	0.0001
	Root MSE	=	.49568

		Robust				
	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
workedm						
samesex	-.0078507	.0015777	-4.98	0.000	-.0109431	-.0047584
_cons	.569455	.0011205	508.23	0.000	.5672589	.571651

Wald for samesex

Instrumental variables (2SLS) regression	Number of obs	=	394,840
	Wald chi2(1)	=	29.00
	Prob > chi2	=	0.0000
	R-squared	=	0.0173
	Root MSE	=	22.093

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
weeksm1					
morekids	-6.359578	1.181014	-5.38	0.000	-8.674324
_cons	23.39115	.4761434	49.13	0.000	22.45792

Instrumented: morekids  
Instruments: samesex

Check for balance

Linear regression	Number of obs	=	394,840
	F(7, 394832)	=	16568.12
	Prob > F	=	0.0000
	R-squared	=	0.1941

Root MSE = 2.6475

		Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
agefstm							
multi2nd		.1752039	.0457188	3.83	0.000	.0855964	.2648115
agem1		.3290559	.0010836	303.66	0.000	.326932	.3311798
boy1st		.0094222	.0084286	1.12	0.264	-.0070976	.025942
boy2nd		.0193927	.0084301	2.30	0.021	.00287	.0359155
blackm		-1.427554	.0120888	-118.09	0.000	-1.451248	-1.40386
hispm		-.5792559	.0234584	-24.69	0.000	-.6252337	-.5332781
othracem		.6226536	.0280525	22.20	0.000	.5676715	.6776357
_cons		10.37992	.0320333	324.04	0.000	10.31713	10.4427

Linear regression

Number of obs = 394,840  
F(8, 394831) = 9264.86  
Prob > F = 0.0000  
R-squared = 0.2109  
Root MSE = 2.1325

		Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
educm							
multi2nd		-.0074761	.0373593	-0.20	0.841	-.0806992	.0657471
agem1		.0221166	.0010089	21.92	0.000	.0201392	.024094
agefstm		.3330336	.0014574	228.51	0.000	.3301771	.3358902
boy1st		.0036823	.0067884	0.54	0.588	-.0096229	.0169874
boy2nd		.0075476	.0067899	1.11	0.266	-.0057603	.0208555
blackm		.2191673	.0101611	21.57	0.000	.1992517	.2390828
hispm		-2.374502	.0326049	-72.83	0.000	-2.438406	-2.310597
othracem		-.531052	.0321654	-16.51	0.000	-.5940952	-.4680088
_cons		4.80712	.0341787	140.65	0.000	4.740131	4.874109

Linear regression

Number of obs = 394,840  
F(7, 394832) = 16567.41  
Prob > F = 0.0000

R-squared = 0.1941  
Root MSE = 2.6475

		Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
agefstm							
samesex		.0217124	.0084313	2.58	0.010	.0051874	.0382375
agem1		.3290979	.0010836	303.71	0.000	.3269741	.3312217
boy1st		.0089868	.0084313	1.07	0.286	-.0075383	.025512
boy2nd		.0188476	.0084318	2.24	0.025	.0023216	.0353737
blackm		-1.427105	.012089	-118.05	0.000	-1.450799	-1.403411
hispm		-.5793764	.0234604	-24.70	0.000	-.625358	-.5333947
othracem		.6225523	.0280511	22.19	0.000	.567573	.6775316
_cons		10.36963	.0323018	321.02	0.000	10.30632	10.43294

Linear regression

Number of obs = 394,840  
F(8, 394831) = 9264.95  
Prob > F = 0.0000  
R-squared = 0.2109  
Root MSE = 2.1325

		Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
educm							
samesex		-.0087736	.0067908	-1.29	0.196	-.0220833	.0045362
agem1		.0221105	.0010089	21.92	0.000	.0201332	.0240878
agefstm		.3330388	.0014574	228.51	0.000	.3301823	.3358953
boy1st		.0038694	.0067906	0.57	0.569	-.0094399	.0171787
boy2nd		.0077413	.0067907	1.14	0.254	-.0055683	.0210509
blackm		.2191597	.0101598	21.57	0.000	.1992469	.2390726
hispm		-2.374498	.0326047	-72.83	0.000	-2.438402	-2.310594
othracem		-.5310898	.0321659	-16.51	0.000	-.594134	-.4680457
_cons		4.811376	.0343194	140.19	0.000	4.744112	4.878641

2SLS (twins, w/covs)

ivregress 2sls weeksm1 (morekids = multi2nd) agem1 agefstm boy1st boy2nd blac



km hispm othracem, r

Instrumental variables (2SLS) regression	Number of obs	=	394,840
	Wald chi2(8)	=	18168.92
	Prob > chi2	=	0.0000
	R-squared	=	0.0654
	Root MSE	=	21.545

		Robust				
weeksm1	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
morekids	-3.712292	.6036268	-6.15	0.000	-4.895379	-2.529205
agem1	1.307164	.0209401	62.42	0.000	1.266122	1.348205
agefstm	-1.186511	.0300822	-39.44	0.000	-1.245471	-1.127551
boy1st	-.0804947	.0687157	-1.17	0.241	-.2151751	.0541857
boy2nd	-.1385996	.0687455	-2.02	0.044	-.2733383	-.0038609
blackm	6.075055	.1192318	50.95	0.000	5.841365	6.308745
hisp	-1.603621	.2187741	-7.33	0.000	-2.032411	-1.174832
othracem	2.482386	.216284	11.48	0.000	2.058477	2.906295
_cons	6.210914	.398797	15.57	0.000	5.429286	6.992542

Instrumented: morekids

Instruments: agem1 agefstm boy1st boy2nd blackm hispm othracem multi2nd

ivregress 2sls workedm (morekids = multi2nd) agem1 agefstm boy1st boy2nd blackm hispm othracem, r

Instrumental variables (2SLS) regression	Number of obs	=	394,840
	Wald chi2(8)	=	10971.93
	Prob > chi2	=	0.0000
	R-squared	=	0.0455
	Root MSE	=	.48428

		Robust				
workedm	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
morekids	-.0812696	.0139393	-5.83	0.000	-.1085901	-.0539491
agem1	.0213279	.0004839	44.08	0.000	.0203795	.0222763
agefstm	-.0248092	.000692	-35.85	0.000	-.0261656	-.0234529

boy1st		.0000988	.0015446	0.06	0.949	-.0029285	.0031262
boy2nd		-.0033856	.0015453	-2.19	0.028	-.0064144	-.0003568
blackm		.0992191	.0025567	38.81	0.000	.0942081	.1042302
hisp		-.0458441	.0051133	-8.97	0.000	-.055866	-.0358221
othracem		.0352486	.0047645	7.40	0.000	.0259103	.0445869
_cons		.4455563	.009336	47.72	0.000	.4272581	.4638545

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Instrumented: morekids

Instruments: agem1 agefstm boy1st boy2nd blackm hispm othracem multi2nd

2SLS (samesex, w/covs)

ivregress 2sls weeksm1 (morekids = samesex) agem1 agefstm boy1st boy2nd black  
m hispm othracem, r

Instrumental variables (2SLS) regression	Number of obs	=	394,840
	Wald chi2(8)	=	18252.28
	Prob > chi2	=	0.0000
	R-squared	=	0.0726
	Root MSE	=	21.462

		Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
weeksm1							
morekids		-5.55877	1.117829	-4.97	0.000	-7.749673	-3.367866
agem1		1.362872	.0352894	38.62	0.000	1.293706	1.432038
agefstm		-1.269755	.0520245	-24.41	0.000	-1.371722	-1.167789
boy1st		-.0927166	.0687273	-1.35	0.177	-.2274196	.0419864
boy2nd		-.1521926	.0688292	-2.21	0.027	-.2870953	-.0172899
blackm		6.207114	.1364545	45.49	0.000	5.939668	6.47456
hisp		-1.315178	.2625227	-5.01	0.000	-1.829713	-.8006428
othracem		2.614926	.2260306	11.57	0.000	2.171914	3.057938
_cons		6.936651	.5431087	12.77	0.000	5.872177	8.001124

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Instrumented: morekids

Instruments: agem1 agefstm boy1st boy2nd blackm hispm othracem samesex

ivregress 2sls workedm (morekids = samesex) agem1 agefstm boy1st boy2nd black  
m hispm othracem, r

Instrumental variables (2SLS) regression	Number of obs	=	394,840
	Wald chi2(8)	=	10996.53
	Prob > chi2	=	0.0000
	R-squared	=	0.0505
	Root MSE	=	.48301

		Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
workedm							
morekids		-.117295	.0251545	-4.66	0.000	-.166597	-.067993
agem1		.0224148	.0007955	28.18	0.000	.0208556	.0239739
agefstm		-.0264334	.00117	-22.59	0.000	-.0287266	-.0241401
boy1st		-.0001396	.0015469	-0.09	0.928	-.0031714	.0028922
boy2nd		-.0036508	.001549	-2.36	0.018	-.0066868	-.0006149
blackm		.1017956	.0029574	34.42	0.000	.0959992	.107592
hisp		-.0402164	.006057	-6.64	0.000	-.052088	-.0283449
othracem		.0378345	.0049857	7.59	0.000	.0280627	.0476063
_cons		.4597156	.0124318	36.98	0.000	.4353497	.4840816

Instrumented: morekids

Instruments: agem1 agefstm boy1st boy2nd blackm hisp othracem same-sex

2SLS (overid, w/covs)

ivregress 2sls weeksm1 (morekids = multi2nd same-sex) agem1 agefstm boy1st boy2nd blackm hisp othracem, r

Instrumental variables (2SLS) regression	Number of obs	=	394,840
	Wald chi2(8)	=	18224.63
	Prob > chi2	=	0.0000
	R-squared	=	0.0674
	Root MSE	=	21.522

		Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
weeksm1							
morekids		-4.141475	.5311981	-7.80	0.000	-5.182605	-3.100346
agem1		1.320112	.0190752	69.21	0.000	1.282725	1.357499

agefstm		-1.20586	.0271733	-44.38	0.000	-1.259118	-1.152601
boy1st		-.0833355	.0686168	-1.21	0.225	-.2178218	.0511509
boy2nd		-.1417591	.0686413	-2.07	0.039	-.2762936	-.0072245
blackm		6.10575	.1173185	52.04	0.000	5.87581	6.33569
hisp		-1.536577	.2138234	-7.19	0.000	-1.955663	-1.117491
othracem		2.513193	.2151399	11.68	0.000	2.091526	2.934859
_cons		6.379599	.3822657	16.69	0.000	5.630372	7.128826

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Instrumented: morekids

Instruments: agem1 agefstm boy1st boy2nd blackm hispm othracem multi2nd  
samesex

ivregress 2sls workedm (morekids = multi2nd samesex) agem1 agefstm boy1st boy  
2nd blackm hispm othracem, r

Instrumental variables (2SLS) regression	Number of obs	=	394,840
	Wald chi2(8)	=	11005.77
	Prob > chi2	=	0.0000
	R-squared	=	0.0469
	Root MSE	=	.48394

		Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
workedm						
morekids		-.0896431	.0121839	-7.36	0.000	-.1135231 - .0657631
agem1		.0215805	.0004385	49.22	0.000	.0207211 .0224399
agefstm		-.0251867	.0006208	-40.57	0.000	-.0264035 -.0239699
boy1st		.0000434	.0015429	0.03	0.978	-.0029806 .0030673
boy2nd		-.0034473	.0015434	-2.23	0.026	-.0064723 -.0004222
blackm		.099818	.0025086	39.79	0.000	.0949012 .1047348
hisp		-.044536	.0049987	-8.91	0.000	-.0543333 -.0347388
othracem		.0358496	.0047367	7.57	0.000	.0265659 .0451334
_cons		.4488474	.0089436	50.19	0.000	.4313183 .4663765

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Instrumented: morekids

Instruments: agem1 agefstm boy1st boy2nd blackm hispm othracem multi2nd  
samesex

manual 2SLS

reg morekids multi2nd samesex agem1 agefstm boy1st boy2nd blackm hispm othrac

em

Source	SS	df	MS	Number of obs	=	394,840
Model	9200.59068	9	1022.28785	F(9, 394830)	=	4708.57
Residual	85722.3271	394,830	.21711199	Prob > F	=	0.0000
				R-squared	=	0.0969
				Adj R-squared	=	0.0969
Total	94922.9177	394,839	.240409174	Root MSE	=	.46595

morekids	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
multi2nd	.6049071	.0080499	75.14	0.000	.5891295	.6206847
same-sex	.0614735	.0014839	41.43	0.000	.0585652	.0643819
agem1	.0301281	.0002318	129.97	0.000	.0296738	.0305825
agefstm	-.0452589	.0002801	-161.58	0.000	-.0458079	-.0447099
boy1st	-.0080449	.0014839	-5.42	0.000	-.0109533	-.0051366
boy2nd	-.0084413	.0014839	-5.69	0.000	-.0113497	-.0055329
blackm	.0696438	.0023467	29.68	0.000	.0650443	.0742433
hisp	.1565985	.004367	35.86	0.000	.1480392	.1651578
othracem	.0729161	.0044574	16.36	0.000	.0641797	.0816525
_cons	.3630539	.0072301	50.21	0.000	.3488831	.3772248

(option xb assumed; fitted values)

Linear regression	Number of obs	=	394,840
	F(8, 394831)	=	2227.06
	Prob > F	=	0.0000
	R-squared	=	0.0420
	Root MSE	=	21.813

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
more_hat	-4.141476	.5336062	-7.76	0.000	-5.187328	-3.095624
agem1	1.320112	.0192077	68.73	0.000	1.282466	1.357759
agefstm	-1.20586	.0273376	-44.11	0.000	-1.25944	-1.152279
boy1st	-.0833355	.0695413	-1.20	0.231	-.2196343	.0529634
boy2nd	-.1417591	.0695644	-2.04	0.042	-.2781032	-.0054149

blackm	6.10575	.118865	51.37	0.000	5.872778	6.338722
hispm	-1.536577	.2171298	-7.08	0.000	-1.962145	-1.111009
othracem	2.513193	.2175725	11.55	0.000	2.086757	2.939628
_cons	6.379599	.3862117	16.52	0.000	5.622636	7.136563
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