R OLS and Instrumental Variable Regression M Outcomes and N RHS Alternatives

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2020-04-01

Contents

IV Loop over RHS

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Regression with a Variety of Outcome Variables and Right Hand Side Variables. There are M outcome variables, and there are N alternative right hand side variables. Regress each M outcome variable and each N alternative right hand side variable, with some common sets of controls and perhaps shared instruments. The output file is a M by N matrix of coefficients, with proper variable names and row names. The matrix stores coefficients for this key endogenous variable.

• Dependency: R4Econ/linreg/ivreg/ivregdfrow.R

Construct Program The program relies on double lapply. lapply is used for convenience, not speed.

```
ff_reg_mbyn <- function(list.vars.y, list.vars.x,</pre>
                         vars.c, vars.z, df,
                         return_all = FALSE,
                         stats ends = 'value', time = FALSE) {
  \# reqf.iv() function is from C:\Users\fan\R\LEcon\lineg\ivreq\ivreq\finou.
  if (time) {
    start_time <- Sys.time()</pre>
  }
  if (return_all) {
    df.reg.out.all <-
      bind_rows(lapply(list.vars.x,
                        function(x) (
                          bind_rows(
                            lapply(list.vars.y, regf.iv,
                                   vars.x=x, vars.c=vars.c, vars.z=vars.z, df=df))
                        )))
  } else {
    df.reg.out.all <-
      (lapply(list.vars.x,
              function(x) (
```

```
# Library
library(tidyverse)
library(AER)

# Load Sample Data
setwd('C:/Users/fan/R4Econ/_data/')
df <- read_csv('height_weight.csv')

# Source Dependency
source('C:/Users/fan/R4Econ/linreg/ivreg/ivregdfrow.R')

# Setting
options(repr.matrix.max.rows=50, repr.matrix.max.cols=50)</pre>
```

Prepare Data Parameters.

```
var.y1 <- c('hgt')
var.y2 <- c('wgt')
var.y3 <- c('vil.id')
list.vars.y <- c(var.y1, var.y2, var.y3)

var.x1 <- c('prot')
var.x2 <- c('cal')
var.x3 <- c('wealthIdx')
var.x4 <- c('p.A.prot')
var.x5 <- c('p.A.nProt')
list.vars.x <- c(var.x1, var.x2, var.x3, var.x4, var.x5)

vars.z <- c('indi.id')
vars.c <- c('sex', 'wgt0', 'hgt0', 'svymthRound')</pre>
```

Program Testing

vars_var.y	prot_tvalue	cal_tvalue	wealthIdx_tvalue	p.A.prot_tvalue	p.A.nProt_tvalue
hgt	18.8756010031786	23.4421863484661	13.508899618216	3.83682180045518	32.5448257554855
wgt	16.3591125056062	17.3686031309332	14.1390521528113	1.36958319982295	12.0961557911467
vil.id	-14.9385580468907	-19.6150110809452	34.0972558327347	8.45943342783186	17.7801422421419

Test Program OLS Z-Stat

vars_var.y	prot_zvalue	cal_zvalue	wealthIdx_zvalue	p.A.prot_zvalue	p.A.nProt_zvalue
hgt	8.87674929300964	12.0739764947235	4.62589553677969	26.6373587567312	32.1162192385744
wgt	5.60385871756365	6.1225187008946	5.17869536991717	11.9295584469998	12.3509307017263
vil.id	-9.22106223347162	-13.0586007975839	-51.5866689219593	-29.9627476577329	-38.3528894620707

Test Program IV T-stat

vars_var.y	prot_Estimate	cal_Estimate	wealthIdx_Estimate	p.A.prot_Estimate	p.A.nProt_Estimate
hgt	0.049431093806755	0.00243408846205622	0.21045655488185	3.86952250259526e-05	0.00542428867316449
wgt	16.5557424523585	0.699072500364623	106.678721085969	0.00521731297924587	0.779514232050632
vil.id	-0.0758835879205584	-0.00395676177098486	0.451733304543324	0.000149388430455142	0.00526237555581024

Test Program OLS Coefficient

```
vars.z <- c('indi.id')
suppressWarnings(suppressMessages(
  ff_reg_mbyn(list.vars.y, list.vars.x,</pre>
```

```
vars.c, vars.z, df,
    return_all = FALSE,
    stats_ends = 'Estimate'))) %>%
kable() %>%
kable_styling_fc_wide()
```

vars_var.y	prot_Estimate	cal_Estimate	wealthIdx_Estimate	$p.A.prot_Estimate$	p.A.nProt_Estimate
hgt	0.859205733632614	0.0238724384575419	0.144503490136948	0.00148073028434642	0.0141317656200726
wgt	98.9428234201406	2.71948246216953	69.1816142883022	0.221916473012486	2.11856940494335
vil.id	-6.02451379136132	-0.168054407187466	-1.91414470908345	-0.00520794333267238	-0.0494468877742109

Test Program IV coefficient

X.Intercept. Estimate	27.3029514189609	99.973884728925	31.46466602210029	27.9038445914729	219.626765179299	30.5103967998551	35.790038860306	-2662.74797734003	29.2380039651127	23.9945007729744	-547.959546430029	22.3367814226238	21.0904444950927	-476.703973630552	22.7780909464511
Introcept. Pr. t.	5.682171822149G3+231	0.75529005553805	6.780646553403994-84	8.24252673999353=242	0.493216914827181	1.62688785535218-79	2.26726906489443-145	7.13318962990131e-65	1.535790352679736-124	2.11912340053336e-165	0.0941551350855875	3.66337296226599e-49	2.34941965806765e-181	0.143944033032383	9.580294507112114-52
Introcept. Std.Error	0.831272666092284	329.450650379964	1.61328519718754	0.828072565159449	220.522532223672	1.60831190651104	1.38461348429899	670.301542938561	1.22902177264147	0.86658166219672	227.343126852912	1.3099937309759	0.543371070630828	325.1328.0308906	1.5004026559967
intercept, typine	32.90g789696777%	0.31166697965244	19.569474977155	23.6973421962119	0.685214557790078	18.9704485063256	25.840029368106	-3.97246270039407	23.8479483950102	27.6890900532576	-1.6729907509002	14.7939130971335	29.0397533397398	-1.06069652604567	15.1909794232527
i respected v	0.412229996159741	0.60716996506993	0.0979347513690973	n shonggraph(45)	0.6879636795112007	-0-045349907116090449	0.97501.89319990565	0.90093693733695	0.058543179819776	0.90.00000001459616	0.6273000977783.44	0.0003190074190696	0.924547953656956	0.690950790454794	0.0995497955117917
O v	6	6	6	6	6	4	4	6	9	6	6	6	6	6	6
12 v		18962	19999	18907	18962	18999	25092		30913	16567	18391	18845	1897	18591	18845
D v		6	6	6	6	6	6	6	6	6	6	6	6	6	6
uri) Estimate	0.60391517349617	56.3852927199184	0.296844389234445	0.589847843438394	52,9797041896704	-0.272219230757999	0.439074453256029	47.170969664749	0.35909363992046	0.087209209111965	72.100360623359	-0.109789161111504	9.62226G398399299	62.7336229299257	-0.157911627494093
162) PtL.	1.14533314566771e-183	1.52417506966835e-12	1.00290396203743-13	7.7917g9G1119325e-177	3.05720143843295e-11	8.89189153865126e-12	2.71000179219152-36	0.00520296567000071	2.41120063623865e-31		4.7961302424896e-19		1.11511327162935e-190	8.38506282719209-15	2.13721119929676e-66
gt) Std.Error	0.020667538632713	7.967(5224000553	0.0401060912799595	0.0205836398279421	7.96822145797115	0.0399777363543633	0.0346701896616764	16.8823488375743	0.000799463553359		8.07740906400683		0.02089.05437579215	3.07589092979212	0.0071223237183417
gtt Makerus gtt tudge	29.2231179249683	7.90730222000333	-7.4014799000965	28.6561.96975977	6.64774497796099	-6.83428417151858	12.6002985423502	2.79445531182964	-11.6590740C325	22.1393351494544	8.8077429884388833 8.926773298555983		29.80550020495	7.76901157994423	-4.25112420677158
						-6.83E28E11151858									
eut_Estimate	0.049430093806755	16.5557424523585	-0.0058935979295584	NA	NA NA	NA	NA	NA	NA		NA		NA	NA	NA.
est_Prt.		9.6120337322218360	3.56296093562335e-50	NA.		NA			NA		NA		NA	NA	NA
eut_Std.Error		1.01201959743751	0.00507971392734022	NA.	NA.	NA	NA	NA .	NA		NA.	NA	NA	NA	NA
est_trader	18.8756010001786	16.3591125056062	-14.9385580468907	NA.	NA.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
.aquand_v	0.814299000954592	0.607272921412925	0.0075790335372957	0.806117722817266	0.60796705182314	0.0456030419476623	0.93202797977066	0.920952383432395	0.0599997716363463	0.804740609090486	0.617403296088206		0.824589538985803	0.629352935549793	0.0397997530096596
suMale Estimate	0.935177192149406	415.163616765357	-0.254089999175318	0.893454962955608	405.534891838028	-0.191389499600951	1.60682463132073	999.926979716707	-0.33436777751525		397.141949675354		0.96490990500711	400.59054369002	-0.423929627917592
exhiate Ptt.	2.39482111724900+51	2.0925290029000.50-67	0.0020709259907025	2.097659053359779-47	2.513656756967529-64	0.1290000754000748	1.3002730202354-06	2.6463089114000g-86	0.00031174554787706		6.194407 D677962i-59		1.245566152365604-52	1.18409030741204+60	0.00015614000636154
architale Stat France	0.0678492294097367	22 6516343,439675	0.120092045309633	0.0616029355633535	23 6567517563516	0.11679990545455	0.1044752927957902	50 5470476511796	0.09771922234229799	0.0617309019973967	24.4479730996481	@ 119292WG992WG9	0.0029977077360307	24.95/9999077297	0.119069536545845
exhibit today	12 1200306 P0068	17.4059409514302	2.11577613841484	14.5027763743537	16.9997478990157	-1.51508010885176	17.2902770900016	19,76600(0)507596	-3.69622577771614	11.1108867823929	16.2147/08/223453	-3.96717228218682	15.316409812052	16.4893316350029	-3.79137329093902
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contlibound Estimate		189.0429688392	-0.0054758585998997	0.951999939799917	185.308286001897	0.0200471227905442	0.432815253441721	189.877991796084	0.0021514£302529796	0.90903.002000.130	205.597385664745	-0.0399071490702906	0.921892091790082	205.945141306000	-0.0557201455206461
wenthRound Pr., t.	A	0	0.0397964033067173	1.0	0	0.0117151165196433	4	0	0.000447277200067272	0		1.97139399992395-19	4	0	7 760.40.49775376693
cynthRound Std Error		1.4955473831309	0.00052730297891217	0.0041123488213290	1.59260919679221	0.00799017907322279	1.00C2S32373332898	0.8270030998222	0.0006(27920956823)	0.00331109017586007	1.22083496490832		9.000171135.0002635	1.228/8979019071	0.0000000000000000000000000000000000000
	221 500692230022	196.403923139396	-2.0559D000161154	297.16832490006	116 957095671967	2.50065522351666	594 962299361197	596 959999679556	3.5309922277002	977 796573 3 99766	164 3007 29796095	-e sossoscii taacii	290 71/19/7971/49	167 926734460200	-0.000000000000000000000000000000000000
	221.NBH002.BH022	125-033823119395		207.168822400006	116.357(030)1267	2.52085021254888	394.362330361190	338.332339919308		277.728011133796	164.30812X3809G		290.114194780148	167.9267.31468268	-9.82988630236028
OM_OMY	No.	vg.	V0.50	165	wg:	12.30	1g	wg	V0.56	163	wg:	VE34	16	wgt	VILIG
THE THESE	sex+wgt0+kgt0+wywthRound	acs+sgt0+kgt0+synthRound		sex+wgt0+hgt0+ssymthRound	ex+vgti+lgti+eynthRoad	$400 + 800 + \log 10 + erynthikund$	sex+wg0+lg0+eynthRoad		sex+wgt0+lgt0+scynstlRound		soc-wgth-light-orysoliflouid			ssx+ugt0+kgt0+eyutkRound	
	peut		prot	rad	risk.	cal	weighting	wealthlik	wealthkix		p.A.peut		p.A.aProt	p.A.sProt	p.A.aPox
				-0.000116898230009949	0.649394003614758	-0.000941127072743919	0.00122231975126209	1.32970922160235	-0.000845838526704796	-0.000489534836079617	0.560023505722658	-0.00056290911156061	3.23596354259100+05	0.65551206304675	-0.00115432723977403
ugt0_Estimate															2.754727817284486-11
ugt0 Estimate ugt0 Prt.	0.130011583497549	2.96480083692757v-63	2.05763549729273+-06	0.230228828649018	7.43034302413852=66	6.6690119623173307	1.22269348658816e-13	6.75397939223977v-62							
ugt0_Ps_t_	0.130011583497549	2.96490083092757v-63 0.0028027271614794	2.057635497292736-06	0.230228628629018 9.74307633896921+-05	7.130313021138520-66	6.669012902317333-07		0.0798131859496002	0.0001440403082619518	9.90430500454333+05	0.0374185042114355	0.000072365145002826	9.75296521392969-05	0.0277292854835204	0.000173241059789276
ugt0_Ps_t_	0.130011583497549										0.0374185042114255 15.5088615428128		9.75208521200966-05 9.33182531275641		0.000173241656789276 -6.66312722777158
ogt0_Pr_t. ogt0_St4.Error ogt0_tralar	0.130011583497549 9.79994437486573+05 -1.49987260496811	0.0078027371614794 16.8512547316329	0.000290221500067133	9.74307633896921+-05 -1.29690821393398	0.037739975283113	0.000039270503626621	0.0001647475346907989 7.41843614592224	0.0798131856486002 16.6477281392748	0.000143040392619518 -5.872926128913	-4.94270692926991		-9.0629777654973		0.6977292854835204 17.3782378582956	
ogt0 Prt. ogt0 Std.Ever ogt0 tudae ad Estimate	0.13001E553297529 9.790941372865726-05 -1.09087200096911 NA	0.0078027371614794 16.8512547316329 NA	0.000190221503067433 -4.74915073475531 NA	9.7±307633896921+05 -1.3986821393398 0.00243488846305622	0.027739975283113 17.2071651836606 0.699072500364623	0.000089270543029621 -1.972111109029309 -0.00395674177096196	0.0001647475346907989 7.41843614592224	0.0798131856486002 16.6477281392748	0.0001140403082619G18 -5.872926128913 NA	-1.94274682926991 NA	15.5000805428128 NA	-9.0609777654873 NA	0.331822524275644 NA	0.0277292854835204 17.3782278584956 NA	-6.66312722777158
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opti Ptt. opti Std Erus opti Italia al Estimate al Pt.L. ul Std Error al Volte	8 190011583297549 8 20001437 885734-05 -1.000720000011 NA NA NA	0.0078007371614794 16.8512547316329 NA NA NA	0.0001902215031671331 -4.72915073475531 NA NA NA	9.71307033866021±-05 -1.7996031793398 0.00213398830305622 9.00672788677960±120	0.037739675283113 17.2071651836606 0.099072500363623 4.71331900865298a-67	0.00008070500036021 -1.97211108028308 -0.0025676177096486 7.906481280250276-85	0.0006679784097989 7.4180814592224 NA NA NA	0.0798111859286002 16.6477281390748 NA NA	0.00014204039319518 -5.972906128013 NA NA NA	-4.927468293691 NA NA NA NA	15.5000005128128 NA NA	- NA NA NA NA	0.33182252225644 NA NA	0.02772035482004 17.378227658206 NA NA NA NA	6.66312722777158 NA NA NA
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SSD Ps. L. SSD Ps. L. SSD Table al Estimate al Estimate al Std Enve authlife, Sol Enve muthlife, Sol Enve muthlife, Sol Enve muthlife, Sol Enve authlife, Sol Enve Aport, Ps. L. Aport, Ps. L. Aport, Std Enve aport, Std Enve aport, Std Enve aport, Std Enve Aport, Ps. L. Aport, Std Enve Aport, Ps. L. Aport, Std Enve	8. EROLI ESCARO PEP P. DEGO SETE DESCRIPTION 1. ESCARD SERVICE NA NA NA NA NA NA NA NA NA N	0.0050007774417901 [In.SS12542346239] NA N	0.00000071500007001 -1.4787100730007001 -0.478710073007001 -0.4787100730070007001 -0.47871007300700070007000070000000000000000	9.7 EMPOREMENDO 1—65 - 1 PROMOSED (COLEGE 0.0002.3 SINO-5 (COLEGE 0.0002.3	0.007200072001113 7.320 (61.500000 0.00007200000.0022 0.00007200000.0022 1.712150000000000000000 NA	0.0000000798/0.0000001 	### ##################################	0.07983/118560986002 11.06477298.092749 NA	0.0001.pp.0200019518 - 5.572000.20013 - SA	1-4 9427 00429 00493 NA NA NA NA NA NA NA NA NA N	13. (2000/06/12/01/28/ XA	A 00009777054872 XA XA XA XA XA XA XA XA XA X	8.31182232325618 NA	0.0072000548400000 0.007200054840000 N.A. N.A. N.A. N.A. N.A. N.A. N.A.	-6.603177277118 NA NA NA NA NA NA NA NA
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ger Pr. L. ger Stal Erus ger Stal ger	B. ERGI LEG-GRAPLEP	0.025002177441790	0.0000 8071 50000 T 201 - 1.4 FELECO 12 FELEC 1 SAL	0.7 EMPOREMENDING 1-65 -1.2 DEMONET DECEMBE 0.000133888-90006022 8.00077388977886-220 0.000133888-90006022 8.00077388977886-220 0.0001088038778612131 8.X. 8.X. 8.X. 8.X. 8.X. 8.X. 8.X. 8.X	0.007200072001113 7.320 (61.500000 0.00007200000.0022 0.00007200000.0022 1.712150000000000000000 NA	0.0000.000706/0.0000011 1-072014 100000706/0.0000011 1-072014 100000706/0.00000706-66 2-00000120700000000000000000000000000000	# 000000170% approximate 1	0.0798.1115/Consecute [En.6477220.0207249 S.A. S.A. S.A. S.A. S.A. S.A. S.A. S.A	0.0001 (pagenesi 1951) S. S. SPERGEZ 2013 NA NA NA NA NA NA NA NA NA N	1-4 9427 (64290099) NA	13. Januari 54 201. 20 1	A SIGNET OF THE STATE OF THE ST	B. 3182329276648 NA	0. 017790845 48140000 11.12789229780.0 0260 NA	-6.6631272277138 NA

Test Program OLS Return All

Test Program IV Return All

Program Line by Line Set Up Parameters

```
vars.z <- c('indi.id')
vars.z <- NULL
vars.c <- c('sex', 'wgt0', 'hgt0', 'svymthRound')</pre>
```

```
| March | Marc
```

Lapply

Nested Lapply Test

```
# df.reg.out.all %>%
# kable() %>%
# kable_styling_fc_wide()
```

Nested Lapply All

$vars_var.y$	prot_tvalue	cal_tvalue	wealthIdx_tvalue	$p.A.prot_tvalue$	$p.A.nProt_tvalue$
hgt	18.8756010031786	23.4421863484661	13.508899618216	3.83682180045518	32.5448257554855
wgt	16.3591125056062	17.3686031309332	14.1390521528113	1.36958319982295	12.0961557911467
vil.id	-14.9385580468907	-19.6150110809452	34.0972558327347	8.45943342783186	17.7801422421419

Nested Lapply Select