

Modelos de Selección

Prestigio del Primer Trabajo Académico

- **Muestra:** 408 bioquímicos con PhD
- **Objetivo:** características personales vs. educacionales.
- **Variable explicada:** job (prestigio del primer trabajo. Va de 1 a 5, de peor a mejor. 1 si no hace investigación o "poco adecuado").
- **Variables explicativas:** fem (1 si mujer), phd (prestigio del PhD department, 1 a 5), ment (citas del mentor, 0 a 532), fel (1 si tuvo fellowship), art (artículos publicados), cit (citas recibidas).
- **Característica:** muchos ceros.
- **Fuente:** J. Scott Long (1997).

Estimacion Tobit

```
Tobit estimates
Log likelihood = -560.25209
Number of obs   =      408
LR chi2(6)      =      89.20
Prob > chi2     =      0.0000
Pseudo R2      =      0.0737
```

jobcen1	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
fem	-.2368486	.1165795	-2.03	0.043	-.4660302	-.0076669
phd	.3225846	.0639198	5.05	0.000	.1969258	.4482435
ment	.0013436	.0008875	1.51	0.131	-.0004011	.0030884
fel	.3252657	.1224516	2.66	0.008	.0845403	.5659911
art	.0339053	.0365	0.93	0.353	-.0378493	.10566
cit	.00509	.0024751	2.06	0.040	.0002243	.0099557
_cons	.6854061	.218261	3.14	0.002	.2563307	1.114482
_se	1.087237	.046533	(Ancillary parameter)			

```
Obs. summary:      99 left-censored observations at jobcen1<=1
                  309 uncensored observations
```

Selection. MV. Todas las variables

Heckman selection model
(regression model with sample selection)

```
Number of obs      =      408
Censored obs       =       99
Uncensored obs     =      309
```

Log likelihood = -523.4458

```
Wald chi2(6)      =      90.55
Prob > chi2       =      0.0000
```

		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
jobcend							
	fem	-.0811249	.1029406	-0.79	0.431	-.2828848	.120635
	phd	.3260626	.0526973	6.19	0.000	.2227778	.4293473
	ment	.0011605	.0007189	1.61	0.107	-.0002486	.0025696
	fel	.2757632	.1040316	2.65	0.008	.071865	.4796614
	art	.0236048	.0295391	0.80	0.424	-.0342908	.0815004
	cit	.0038159	.0020003	1.91	0.056	-.0001046	.0077364
	_cons	.88623	.1951974	4.54	0.000	.5036502	1.26881
select							
	fem	-.3544893	.1441717	-2.46	0.014	-.6370608	-.0719179
	phd	.2172759	.0738104	2.94	0.003	.0726102	.3619416
	ment	.0010932	.0011782	0.93	0.353	-.0012161	.0034025
	fel	.1881959	.1415461	1.33	0.184	-.0892294	.4656212
	art	.0195506	.0526815	0.37	0.711	-.0837033	.1228044
	cit	.0095298	.0045525	2.09	0.036	.0006071	.0184526
	_cons	-.1586437	.2462426	-0.64	0.519	-.6412703	.3239829
/athrho		1.585809	.449295	3.53	0.000	.7052065	2.466411
/lnsigma		-.1490127	.0699519	-2.13	0.033	-.2861159	-.0119096
rho		.9195042	.0694215			.6076622	.9856908
sigma		.8615581	.0602676			.7511755	.9881611
lambda		.7922063	.1094032			.5777801	1.006633
LR test of indep. eqns. (rho = 0):				chi2(1) =	5.97	Prob > chi2 = 0.0145	

Selection. MV. Con exclusiones.

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
-----+-----						
jobcend						
phd	.3242935	.0517376	6.27	0.000	.2228896	.4256973
ment	.0011499	.0007057	1.63	0.103	-.0002333	.0025332
fel	.273655	.1024768	2.67	0.008	.0728042	.4745059
cit	.0048215	.0014609	3.30	0.001	.0019582	.0076848
_cons	.9170047	.1914301	4.79	0.000	.5418086	1.292201
-----+-----						
select						
fem	-.3177589	.1399869	-2.27	0.023	-.5921283	-.0433896
phd	.2111998	.0763155	2.77	0.006	.0616242	.3607754
ment	.0011196	.0012147	0.92	0.357	-.0012611	.0035004
fel	.2013087	.1439856	1.40	0.162	-.0808979	.4835152
art	.002471	.0496642	0.05	0.960	-.0948691	.099811
cit	.0109349	.0045044	2.43	0.015	.0021065	.0197634
_cons	-.1525532	.2475969	-0.62	0.538	-.6378342	.3327277
-----+-----						
/athrho	1.412668	.4238976	3.33	0.001	.5818441	2.243492
/lnsigma	-.1723133	.0730282	-2.36	0.018	-.3154461	-.0291806
-----+-----						
rho	.8880594	.089591			.5240045	.9777414
sigma	.8417154	.061469			.7294634	.971241
lambda	.7474932	.1242682			.503932	.9910544
-----+-----						
LR test of indep. eqns. (rho = 0): chi2(1) = 5.97 Prob > chi2 = 0.0146						
-----+-----						

Heckman 2 Step. Todas las variables

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
jobcend						
fem	.0914314	.1481765	0.62	0.537	-.1989891	.3818519
phd	.2985985	.0570769	5.23	0.000	.1867299	.4104672
ment	.0007974	.0006701	1.19	0.234	-.000516	.0021108
fel	.1488889	.1302948	1.14	0.253	-.1064842	.4042619
cit	.002487	.0021624	1.15	0.250	-.0017512	.0067253
_cons	1.397864	.4451156	3.14	0.002	.5254535	2.270275
select						
fem	-.4534282	.1472404	-3.08	0.002	-.742014	-.1648423
phd	.1282671	.0805519	1.59	0.111	-.0296118	.286146
ment	.0010347	.0013323	0.78	0.437	-.0015766	.003646
fel	.2597756	.155315	1.67	0.094	-.0446362	.5641875
art	.0526686	.0614043	0.86	0.391	-.0676816	.1730187
cit	.010287	.0053732	1.91	0.056	-.0002443	.0208184
_cons	.0395207	.2666023	0.15	0.882	-.4830103	.5620516
mills						
lambda	.0354413	.6079183	0.06	0.954	-1.156057	1.226939
rho	0.05096					
sigma	.69550223					
lambda	.03544127	.6079183				

Heckman 2 Step. Excluyo fem.

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
jobcend						
phd	.3151096	.0518482	6.08	0.000	.213489	.4167302
ment	.0009416	.0006504	1.45	0.148	-.0003331	.0022163
fel	.1985839	.1051493	1.89	0.059	-.007505	.4046727
cit	.0034034	.0016302	2.09	0.037	.0002083	.0065984
_cons	1.197328	.3120702	3.84	0.000	.5856819	1.808974
select						
fem	-.4534282	.1472404	-3.08	0.002	-.742014	-.1648423
phd	.1282671	.0805519	1.59	0.111	-.0296118	.286146
ment	.0010347	.0013323	0.78	0.437	-.0015766	.003646
fel	.2597756	.155315	1.67	0.094	-.0446362	.5641875
art	.0526686	.0614043	0.86	0.391	-.0676816	.1730187
cit	.010287	.0053732	1.91	0.056	-.0002443	.0208184
_cons	.0395207	.2666023	0.15	0.882	-.4830103	.5620516
mills						
lambda	.3450247	.3511426	0.98	0.326	-.3432022	1.033252

Correlacion entre lambda y x_1 : $R^2 = 0.7015$

Correlacion entre z y x_1 : $R^2 = 0.83$