

## Extended Example: Cabinet Government Example

**WEIBULL**

. streg invest polar numst format postelec caretakr, dist(weib) time nolog

failure \_d: censor  
analysis time \_t: durat

Weibull regression -- accelerated failure-time form

No. of subjects =	314	Number of obs =	314
No. of failures =	271	LR chi2(6) =	171.94
Time at risk =	5789.5	Prob > chi2 =	0.0000
Log likelihood =	-414.07496		

_t	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
invest	-.2958188	.1059024	-2.79	0.005	-.5033838	-.0882538
polar	-.017943	.0042784	-4.19	0.000	-.0263285	-.0095575
numst	.4648894	.1005815	4.62	0.000	.2677533	.6620255
format	-.1023747	.0335853	-3.05	0.002	-.1682006	-.0365487
postelec	.6796125	.104382	6.51	0.000	.4750276	.8841974
caretakr	-1.33401	.2017528	-6.61	0.000	-1.729438	-.9385818
_cons	2.985428	.1281146	23.30	0.000	2.734328	3.236528
/ln_p	.257624	.0500578	5.15	0.000	.1595126	.3557353
p	1.293852	.0647673			1.172939	1.42723
1/p	.7728858	.0386889			.700658	.8525593

**EXPONENTIAL**

. streg invest polar numst format postelec caretakr, dist(exp) time nolog

failure \_d: censor  
analysis time \_t: durat

Exponential regression -- accelerated failure-time form

No. of subjects =	314	Number of obs =	314
No. of failures =	271	LR chi2(6) =	148.53
Time at risk =	5789.5	Prob > chi2 =	0.0000
Log likelihood =	-425.90641		

_t	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
invest	-.3322088	.1376729	-2.41	0.016	-.6020426	-.0623749
polar	-.0193017	.0055465	-3.48	0.001	-.0301725	-.0084308
numst	.515435	.1291486	3.99	0.000	.2623084	.7685616
format	-.1079432	.0435233	-2.48	0.013	-.1932474	-.022639
postelec	.7403427	.134558	5.50	0.000	.4766138	1.004072
caretakr	-1.319272	.2595422	-5.08	0.000	-1.827965	-.8105783
_cons	2.944518	.1663401	17.70	0.000	2.618498	3.270539



**GOMPERTZ**

```
. streg invest polar numst format postelec caretakr, dist(gompertz) nolog
```

```
      failure _d: censor
analysis time _t: durat
```

```
Gompertz regression -- log relative-hazard form
```

```
No. of subjects =          314                Number of obs   =          314
No. of failures =          271
Time at risk    =          5789.5
Log likelihood  = -418.97771                LR chi2(6)         =          159.11
                                                Prob > chi2        =           0.0000
```

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
invest	1.442137	.1984577	2.66	0.008	1.101208	1.888615
polar	1.022888	.0057628	4.02	0.000	1.011655	1.034245
numst	.5446288	.0720488	-4.59	0.000	.420238	.7058394
format	1.135794	.04998	2.89	0.004	1.041941	1.238101
postelec	.4104204	.0583874	-6.26	0.000	.3105525	.542404
caretakr	4.382191	1.157914	5.59	0.000	2.610819	7.355392
gamma	.0225632	.005949	3.79	0.000	.0109032	.0342231

**GENERALIZED GAMMA**

```
. streg invest polar numst format postelec caretakr, dist(gamma) nolog
```

```
      failure _d: censor
analysis time _t: durat
```

```
Gamma regression -- accelerated failure-time form
```

```
No. of subjects =          314                Number of obs   =          314
No. of failures =          271
Time at risk    =          5789.5
Log likelihood  = -414.00944                LR chi2(6)         =          165.78
                                                Prob > chi2        =           0.0000
```

_t	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
invest	-.3005269	.108745	-2.76	0.006	-.5136633	-.0873906
polar	-.0182998	.0044674	-4.10	0.000	-.0270559	-.0095438
numst	.4692142	.1030895	4.55	0.000	.2671626	.6712659
format	-.1031368	.0342637	-3.01	0.003	-.1702925	-.0359811
postelec	.6807161	.1061356	6.41	0.000	.4726942	.888738
caretakr	-1.328476	.2066422	-6.43	0.000	-1.733487	-.9234647
_cons	2.963114	.1447075	20.48	0.000	2.679492	3.246735
/ln_sig	-.234325	.0802121	-2.92	0.003	-.3915378	-.0771122
/kappa	.9241712	.2065399	4.47	0.000	.5193605	1.328982
sigma	.7911047	.0634561			.6760165	.9257859

## Parametric Results

- **Lot's of Choices! (Too many?)**
- **Nested and Non-Nested Models**
- **AIC:  $-2(\log L) + 2(c + p + 1)$**
- **Criteria leads to Weibull as preferred model (Weibull AIC is 844.14)**
- **Encompassing Distribution: Generalized Gamma**
- **G.G. suggests Weibull is preferred model.**
- **Suggestions for Parametric Modeling**

# COX MODEL

. stcox invest polar numst format postelec caretakr, efron nolog nohr

failure \_d: censor  
analysis time \_t: durat

Cox regression -- Efron method for ties

No. of subjects =	314	Number of obs =	314
No. of failures =	271		
Time at risk =	5789.5		
Log likelihood =	-1287.7389	LR chi2(6) =	163.85
		Prob > chi2 =	0.0000

_t	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
invest	.3871388	.1371298	2.82	0.005	.1183693 .6559083
polar	.0233392	.0056193	4.15	0.000	.0123255 .0343528
numst	-.5826222	.1322266	-4.41	0.000	-.8417816 -.3234628
format	.130011	.0438699	2.96	0.003	.0440275 .2159945
postelec	-.8611202	.1406178	-6.12	0.000	-1.136726 -.5855144
caretakr	1.710397	.2828184	6.05	0.000	1.156084 2.264711

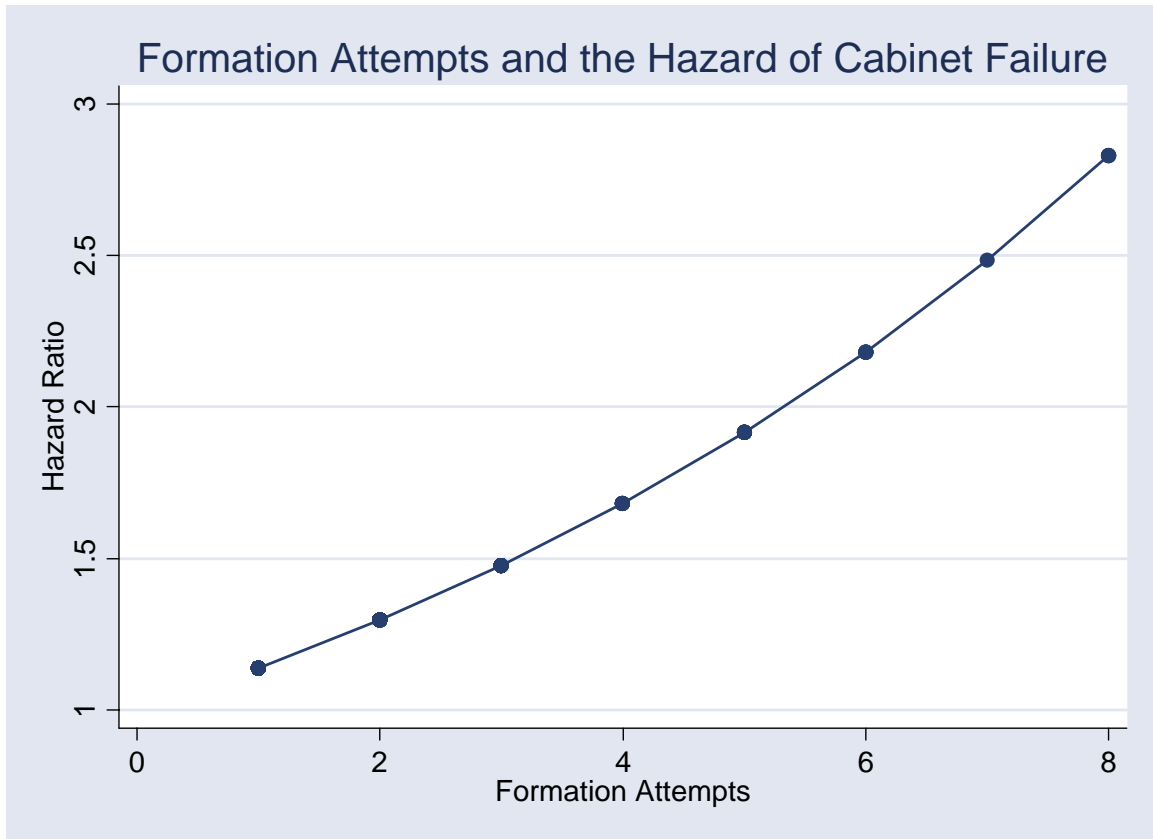
. stcox invest polar numst format postelec caretakr, efron nolog

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Cox regression -- Efron method for ties

No. of subjects =	314	Number of obs =	314
No. of failures =	271		
Time at risk =	5789.5		
Log likelihood =	-1287.7389	LR chi2(6) =	163.85
		Prob > chi2 =	0.0000

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
invest	1.472761	.2019595	2.82	0.005	1.12566 1.926892
polar	1.023614	.005752	4.15	0.000	1.012402 1.03495
numst	.5584321	.0738396	-4.41	0.000	.4309421 .7236389
format	1.138841	.0499609	2.96	0.003	1.045011 1.241096
postelec	.4226883	.0594375	-6.12	0.000	.3208678 .5568194
caretakr	5.53116	1.564314	6.05	0.000	3.177464 9.628346



```
twoway (scatter format_ratio format, sort c(1)), ytitle(Hazard Ratio)  
xtitle(Formation Attempts) title(Formation Attempts and the Hazard of Cabinet  
Failure)
```