

APPENDIX A. CLASSICAL STATISTICAL COMPARISONS

summary(model_1, dispersion=1)

Call:

```
glm(formula = TimeBetween ~ as.factor(Year), family = Gamma,  
     data = LW_00)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-2.4383	-0.6774	-0.2990	0.4531	1.5846

Coefficients:

	<u>Estimate</u>	<u>Std. Error</u>	<u>z value</u>	<u>Pr(> z)</u>
(Intercept)	0.007576	0.004374	1.732	0.0833 .
as.factor(Year)2001	0.016562	0.010118	1.637	0.1016
as.factor(Year)2002	0.001770	0.006946	0.255	0.7989
as.factor(Year)2003	-0.002576	0.005624	-0.458	0.6470
as.factor(Year)2004	0.006154	0.007110	0.866	0.3867
as.factor(Year)2005	0.022959	0.011648	1.971	0.0487 *
as.factor(Year)2006	0.011614	0.007749	1.499	0.1339
as.factor(Year)2007	0.026907	0.014741	1.825	0.0680 .
as.factor(Year)2008	-0.001453	0.005624	-0.258	0.7961
as.factor(Year)2009	0.002424	0.006643	0.365	0.7152
as.factor(Year)2010	0.012626	0.011007	1.147	0.2513

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Gamma family taken to be 1)

Null deviance: 59.892 on 54 degrees of freedom
Residual deviance: 41.073 on 44 degrees of freedom
AIC: 577.83

Number of Fisher Scoring iterations: 6

summary(model_2, dispersion=1)

Call:

```
glm(formula = TimeBetween ~ as.factor(Rule), family = Gamma,  
     data = LW_00)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-2.5103	-0.9778	-0.2913	0.3310	2.0157

Coefficients:

	<u>Estimate</u>	<u>Std. Error</u>	<u>z value</u>	<u>Pr(> z)</u>
(Intercept)	0.016006	0.002413	6.633	3.28e-11 ***
as.factor(Rule)1	-0.005896	0.003888	-1.516	0.129

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Gamma family taken to be 1)

Null deviance: 59.892 on 54 degrees of freedom
Residual deviance: 57.864 on 53 degrees of freedom
AIC: 581.3

Number of Fisher Scoring iterations: 6

summary(model_3, dispersion=1)

Call:

glm(formula = TimeBetween ~ 1, family = Gamma, data = LW_00)

Deviance Residuals:

Min	1Q	Median	3Q	Max
-2.5532	-0.9853	-0.3895	0.2659	2.2856

Coefficients:

	<u>Estimate</u>	<u>Std. Error</u>	<u>z value</u>	<u>Pr(> z)</u>	
(Intercept)	0.014334	0.001933	7.416	1.20e-13	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Gamma family taken to be 1)

Null deviance: 59.892 on 54 degrees of freedom
Residual deviance: 59.892 on 54 degrees of freedom
AIC: 581.51
Number of Fisher Scoring iterations: 6

Confidence set for the best model

Method: raw sum of model probabilities

95% confidence set:

	<u>Model</u>	<u>K</u>	<u>AICc</u>	<u>Delta_AICc</u>	<u>AICcWt</u>
intercept only	3	2	581.74	0.00	0.46
Before and After Rule	2	3	581.77	0.04	0.46
All Years	1	12	585.26	3.52	0.08

Model probabilities sum to 1

Conclusion --- Note that the AICc for intercept only model and 2 rate model are the same even though 1 parameter was added: only one rate is supported

APPENDIX B. CLASSICAL CHANGE POINT ANALYSIS

summary(model.oneslope) (Model 4)

Call:

```
glm(formula = DaysSince2 ~ count, data = LW_00)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-328.93	-112.88	-15.83	98.70	299.95

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-3041.774	41.798	-72.77	<2e-16 ***
count	64.675	1.299	49.80	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Null deviance: 59213198 on 54 degrees of freedom
 Residual deviance: 1238754 on 53 degrees of freedom
 AIC: 713.31

summary(model.change) (Model 5)

Call:

```
glm(formula = DaysSince2 ~ 1 + count:as.factor(Rule), data = LW_00)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-258.13	-88.46	-29.35	72.82	306.03

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-2998.680	45.336	-66.14	<2e-16 ***
count:as.factor(Rule)0	62.087	1.756	35.36	<2e-16 ***
count:as.factor(Rule)1	65.025	1.269	51.24	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Null deviance: 59213198 on 54 degrees of freedom
 Residual deviance: 1140740 on 52 degrees of freedom
 AIC: 710.78

AICc Comparison --- Confidence set for the best model

Method: raw sum of model probabilities

95% confidence set:

	K	AICc	Delta_AICc	AICcWt
Change After Rule	4	711.58	0.0	0.75
One Slope	3	713.78	2.2	0.25

Conclusion - with an evidence ratio of 3:1, the change point is somewhat preferred, but the estimated difference in rates before and after the Rule (62 vs 65 days between) was small.

APPENDIX C. BAYESIAN CHANGE POINT ANALYSIS

(smaller DIC indicate BETTER fit)

<u>Model</u>	<u>DIC</u>
Free Change point	53.287
Fixed Change point	63.012
2 Regressions	63.170
1 Slope	64.706

Conclusion - Fixed change point is slightly preferred over a constant rate. Free change point is much preferred over the rest which indicates some unidentified heterogeneity is dominant over any rate change that might have occurred post-Rule.