

Full Model:	Value	Std. Error	z	p
(Intercept)	8.55480	3.3749	2.535	0.01125
treat	0.42521	0.4591	0.926	0.35434
size	-0.00708	0.0231	-0.306	0.75937
index	-0.05051	0.1488	-0.339	0.73432
age	-0.03688	0.0170	-2.169	0.03009
serum	-0.27506	0.1198	-2.295	0.02173
Log(scale)	-1.00628	0.3494	-2.880	0.00398

Weibull distribution

Loglik(model) = -31.3 Loglik(intercept only) = ~~-39.1~~ ^{-39.3}
 Chisq = ~~15.59~~ ^{15.82} on 5 degrees of freedom, p = ~~0.0081~~ ^{0.0074} _{3 tips}

Reduced Model: Loglik(model) = -31.4 Loglik(intercept only) = -39.3
 Chisq = 15.64 on 3 degrees of freedom, p = 0.0013

1) The prostate cancer data is from Collett (2003, p. 10). The full model has 5 predictors, *treat* (placebo or DES), *size* of tumor, Gleason *index* for tumor, *age* and *serum*. The reduced model uses the predictors *treat*, *size*, and *index*. Output is from a Weibull regression. a) For the full model, test whether $\beta = 0$. $H_1: \beta \neq 0$

$\chi^2(NIF) = \frac{15.82}{0.0074}$ $\frac{15.82}{0.0074} = 2137.97$ ^{handway}
 $\chi^2(3) = 6.25$ $\frac{15.82}{0.0074} > 6.25$
 $\left[-2(-39.3) \right] - \left[-2(-31.3) \right] = 16$

reject H_0 there is a WPH survival relationship between Y and the predictors (*treat*, *size*, *index*, *age*, *serum*)

b) For the full model, test whether $\beta_1 = 0$. $H_1: \beta_1 \neq 0$

$Z_{01} = 0.926$
 $p_{val} = 0.35434$

fail to reject H_0 , *treat* is not needed in

the WPH survival model given the other predictors (*size*, *index*, *age*, and *serum*) are in the model

c) Test whether H_0 : the reduced model is good. H_1 : use the full model

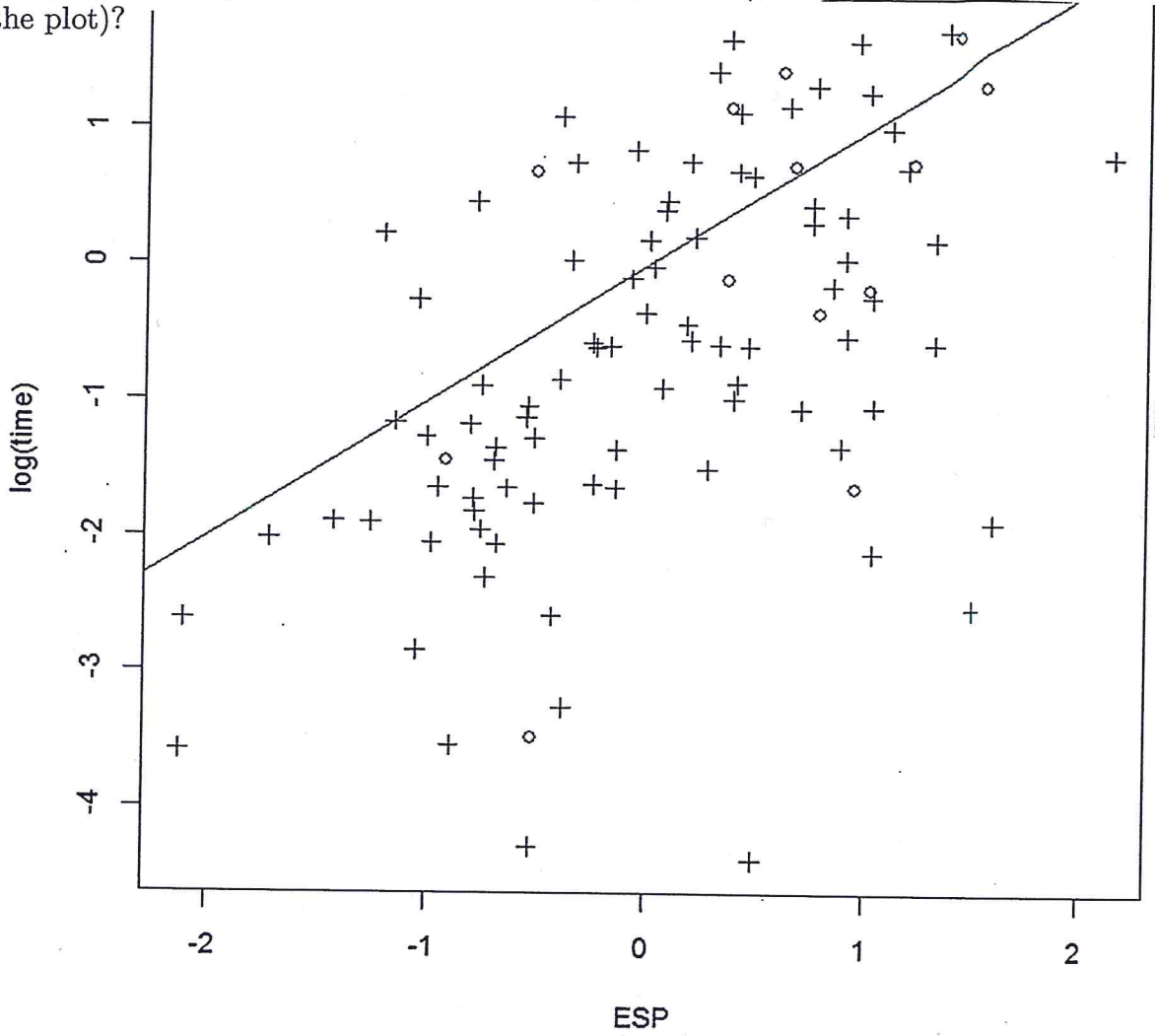
$\chi^2(RIF) = \chi^2(NIF) - \chi^2(NIR) = 15.82 - 15.64 = 0.18$ ¹¹⁷
 $\chi^2(1) = 2.71$ _{positive}

$p_{val} = P(\chi^2_1 > 0.18) > 0.25$ $\frac{\chi}{2} \mid \frac{0.25}{2.77}$

fail to reject H_0 the reduced model is good

$\chi^2(RIF) = \left[-2(-31.4) \right] - \left[-2(-31.3) \right] = 62.8 - 62.6 = 0.20$ _{either}

e 2) Is the log censored response plot shown below roughly linear (possibly ignoring the bottom of the plot)?

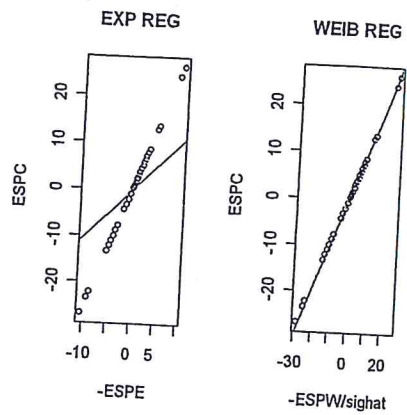


yes

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e 3) Consider the EE plots shown below. Can the Exponential regression be used or should the Weibull regression be used?

Weibull regression



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