God help me) Deadline: 11:59 ~~Столяров БЭК193~~ Stolyarov BEC193

1. Model 1 (unrestricted):

$Metrics_i = \beta_0 + \beta_1 Maths_i + \beta_2 LinearAlgebra_i + \beta_3 ProbabilityTheory_i + \beta_4 Statistics_i + \varepsilon_i$

Model 2 (restricted: 1) $\beta_1 = 2\beta_4$; 2) $\beta_2 = \beta_3$):

$Metrics_i = \beta_0 + 2\beta_4 Maths_i + \beta_2 LinearAlgebra_i + \beta_2 PT_i + \beta_4 Stats_i + \varepsilon_i = \beta_0 + \beta_4(2 Maths_i + Stats_i) + \beta_2(LA_i + PT_i) + \varepsilon_i$

We will ~~esti~~ run both models and calculate their RSS. The null hyp.: $\beta_1 = 2\beta_4$; $\beta_2 = \beta_3$ but researcher wants ~~to reject it~~

$$F(2; N-5) = \frac{(RSS_R - RSS_u)/2}{RSS_u / (N-5)}$$ ← F-test for linear restriction

num of restr; num coefs in unrestr model.

2.

$COFFEE = \beta_0 + \beta_1 \cdot Income + \beta_2 \cdot Winter + \beta_3 \cdot Spring + \beta_4 \cdot SUMMER$ (*)

Income is Income; Winter is a dummy variable when Season = 1; Spring dummy = 1 when season = 2, Summer - dummy and 1 when season = 3, when spring + winter + summer = 0 then it is autumn (we do it to avoid multicollinearity)

(1

" ~~if~~ It ~~linear~~ we want to make the model more flexible, then we can do: ~~COFFEE = $\beta_0 + \beta_1 \cdot$ SPRIN~~ add Income · Spring etc but it has non-sense I guess

2) So to test linear relationship we can run Ramsey's RESET TEST however, I guess ~~we can~~, it means that we should provide a Chow Test (or dummy variable group) < Dummy var. group test

So, we can run ~~four~~ our (*) model, or our pooled model and calculate next stat: run four diff models for four seasons

$$F(2; N-4\cdot 2) = \frac{\left(RSS_P - \left[\sum RSS_i\right]\right)/2}{\sum_{i=1}^{4} RSS_i \,/\, (N-4\cdot 2)}$$

in pooled model

4 seasons we have four restr models with 2 coefs

H_0: There is no joint explan. power of 3 dummies (so the same model for all seasons)

~~H_1: there's a joint explan. power~~

H_1: there's a signif. joint explan power of dummies (should run separate regressions)

2)

3. 1) We omit important variable, so our estimators will be biased and ~~the~~ s.e. will be invalid. All tests (t, F) are invalid too.

2) Our friend included ~~an~~ ~~excessive~~ ~~the~~ unnecessary variable, so his estimators will be unbiased but less efficient (comparing to the right specific) s.e. will be valid, but larger

~~Our friend~~ Our mistake is more dangerous cause our estim. are biased and their s.e. invalid, our friend has bad s.e. too, but his ests are unbiased (it is better than biased :-))

4. Group 12 „Crime Scars: Recession and the Making of career criminals."

~~Q~~ research quest: Влияет ли состояние рынка труда на уровень преступности (среди (при выходе на работу) несов.) когда не выход

Используются данные (панельные) о мужчинах в возрасте до 39 лет data США и ~~Ф~~ UK

Аресты – ~~про~~ прокси для уровня преступности (берутся из ~~FB~~ FBI). Также использовались данные для The UK с судимости что я придумал

Проблемы: Из-за того, что данные только о мужчинах может возникнуть bias и выводы могут оказаться неверными. (omit. var)

Из-за конкр. стран выводы могут оказаться неверными для других стран