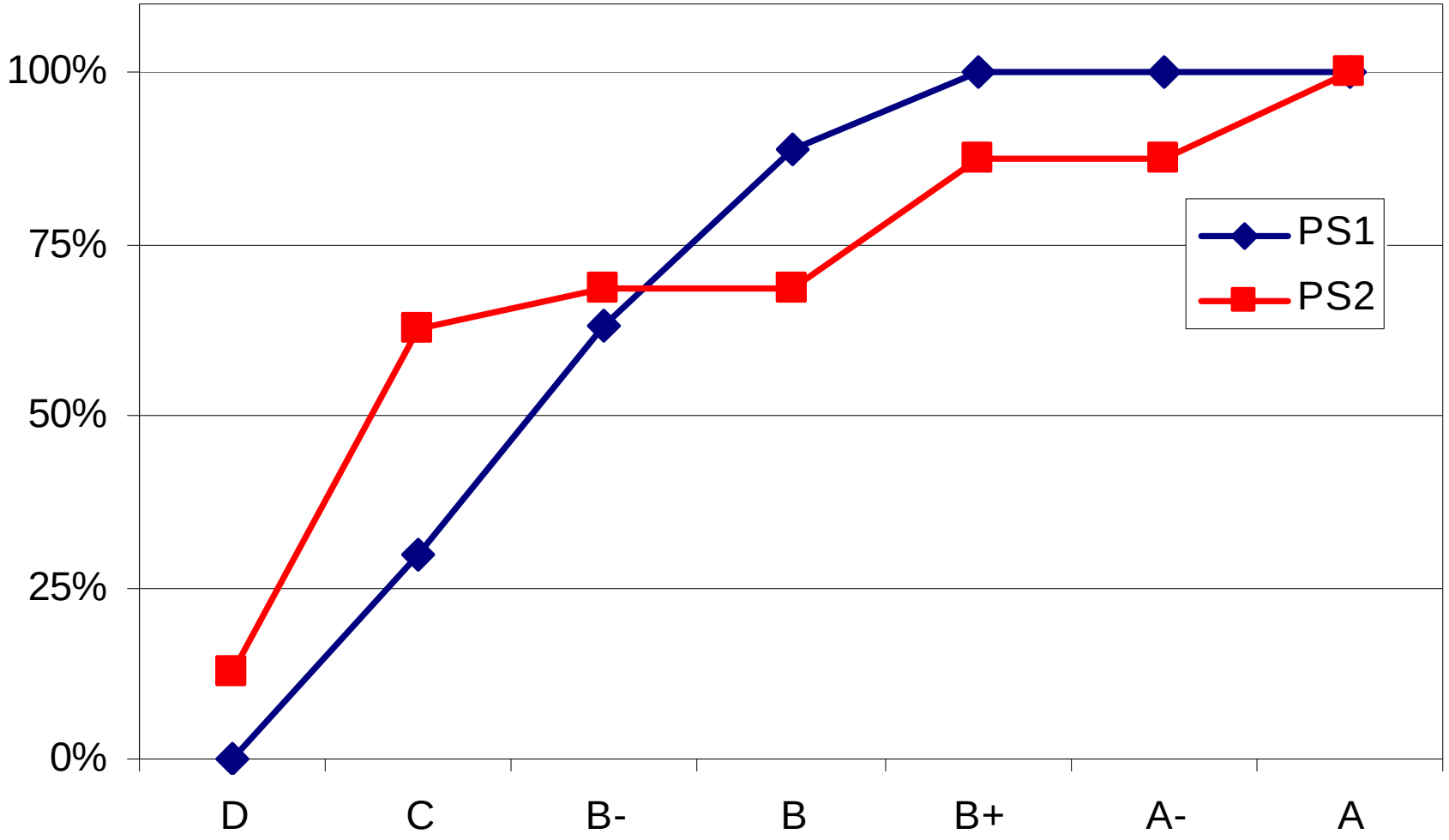
EC220-PS2

Antoine Goujard
a.j.goujard@lse.ac.uk

Office hour: on Monday in S684
from 17:30 to 18:30

PS2



PS2

- First 2 problems (1.3 and 1.4, textbook example p.56): same as PS1, but add the interpretation of the R2.
- 3rd problem (1.6), go back to the least squares (OLS) principles.
- 4th problem (2.3), our first proofs of the properties of the estimator.

Main mistakes for Exercises 1/2

I Econometric crimes

- Interpreting the regression results as the effect of S (dependent var) on ASVABC (expl. Var.) ! (**fail the exam**)

- Do not state the definitions of the dependent and the explanatory variables or the units of each of the variables. Sloppy statements as:

« S is positively correlated with ASVABC », …

II Mistakes

- You are expected to give a precise meaning of each estimates and to explain if the estimate makes sense or not. You can use your other economic courses, your common sense.

- Vague definition or intepretation of the R2.

R2 interpretation, goodness of fit

TSS=ESS+RSS Does this always hold (for any regression model fitted by OLS) ?

$$R^2 = \frac{ESS}{TSS} = \frac{\sum(\hat{Y}_i - \bar{Y})^2}{\sum(Y_i - \bar{Y})^2}$$

$$R^2 = \frac{TSS - RSS}{TSS} = 1 - \frac{\sum e_i^{\,2}}{\sum(Y_i - \bar{Y})^2}$$

The proportion of the variance of Y explained by the regression equation.

Square of the **coefficient of correlation** between the true values of Y and the fitted values.

$$r_{Y,\hat{Y}} = \frac{\sum(Y_i - \bar{Y})(\hat{Y}_i - \bar{Y})}{\sqrt{\sum(Y_i - \bar{Y})^2 \sum(\hat{Y}_i - \bar{Y})^2}}$$

Why can the R2 be low? It may be the case that S depends on ASVABC but also on other important variables. For example, parental education, parental income… The true relationship may also be non linear (why?).

Main mistakes for Exercise 4

Econometric crimes when you try to prove the unbiasedness of an estimator

- Take the expected value of the parameter to prove that the estimator is unbiased.
- Make a confusion between the disturbance term and the residuals.
- Writing a proof without stating the assumptions used to derive the main results (X non stochastic, E(ui)=0, …).
- Use « strange » rules to compute the expectation (E(x/y) is not equal to E(x)/E(y) in general).