

Economics 471
Midterm Review

Please answer all questions. Be concise and explicit as possible.

1. Based on auction data you have estimated the following CAPM model for recent rates of return on Persian carpets,

$$\begin{aligned} (r_i - r_0) &= 0.030 - .450 (r_m - r_0) \\ &\quad (0.009) \quad (0.21) \\ R^2 &= .41, \quad \hat{\sigma} = .08 \end{aligned}$$

- (a) Explain briefly the notation used to describe the model.
 (b) Test the hypothesis that the Persian Carpet $\beta = 0$ vs. the alternative that it is less than zero.
 (c) What conclusions can you draw from this regression about the desirability of investing in such carpets.
2. In Figures 3a-f we illustrate six scatterplots corresponding to estimated Engel Curves for six different commodities. Try to match each of the following estimated models with one of the figures and suggest an example of a commodity which might exhibit this behavior. If there isn't a match, explain why you think so.

$$y_i = 49.5 - 1.95 x_i \quad (3.1)$$

(.51) (.065)

$$y_i = 9.92 + 2.08 x_i \quad (3.2)$$

(1.03) (0.13)

$$y_i = 5.03 - 2.03 / \sqrt{x_i} \quad (3.3)$$

(.056) (.010)

$$\log y_i = -2.00 + 2.01 \log x_i \quad (3.4)$$

(0.04) (0.026)

$$y_i = 49.5 + .060 x_i - .003 x_i^2 \quad (3.5)$$

(.013) (.004) (.0002)

$$\log y_i = 0.498 - 0.496 \log x_i \quad (3.6)$$

(.014) (.008)

3. In the log linear gasoline demand model estimated in Problem Set 2 we obtained:

$$\log y_t = -5.27 + 1.76 \log x_t - .40 \log p_t$$

(.11) (0.04) (.020)

where as in the Problem Set, y_t is per capita demand in thousands of gallons per year for gasoline, x_t is per capita income in thousands of 1982 dollars, and p_t is price per gallons, again in 1982 dollars. Based on this estimated model, answer the following true-false questions, and briefly explain why, in each case:

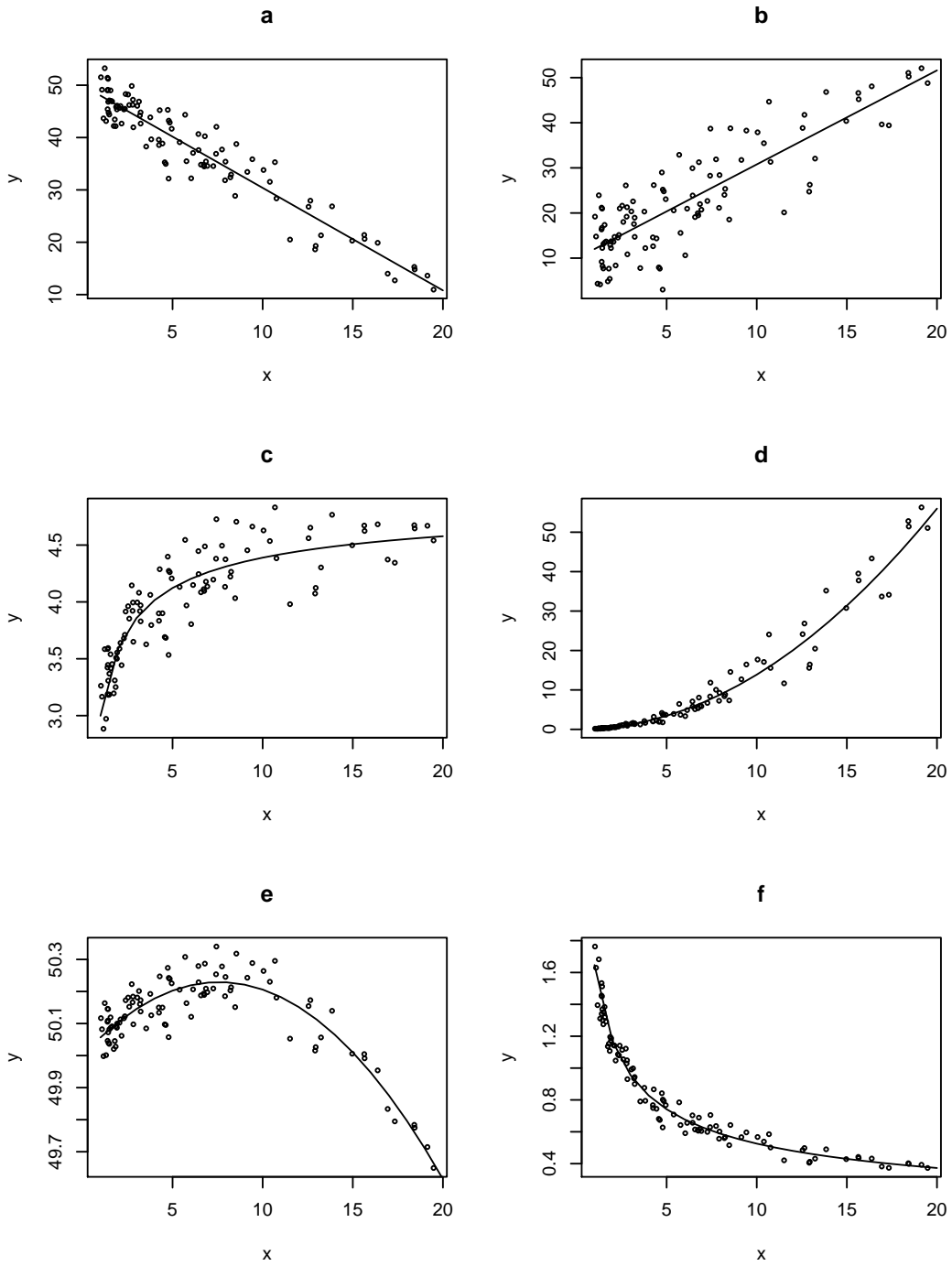


Figure 1: Six scatterplots and their fitted relationship.

- (a) As income rises the average American spends more of his income on gasoline.
- (b) As income rises the average American spends a larger proportion of his income on gasoline.
- (c) At the conventional $\alpha = .05$ level we can not reject the hypothesis that the price elasticity of gasoline is $-\frac{1}{2}$.
- (d) Raising the price of gasoline by 1% would be expected to increase the total amount spent on gasoline.
- (e) Doubling the price of gasoline would be expected to decrease the amount spent on gasoline. Now consider the alternative model also estimated in PS 2:

$$\log y_t = -7.39 + 2.57 \log x_t - 2.57 \log p_t - .271 (\log p_t)^2 + .717 (\log p_t \log z_t)$$

(.20)
(0.08)
(.19)
(.04)
(.06)

- (f) Describe briefly why this model is better than the first one emphasizing both statistical and economic criteria.