

ECO220Y: Homework, Lecture 3

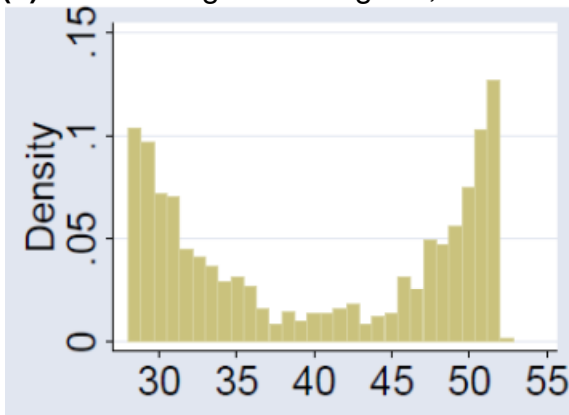
Readings: Chapter 7

Exercises: Chapter 7: 7, 9, 10, 13

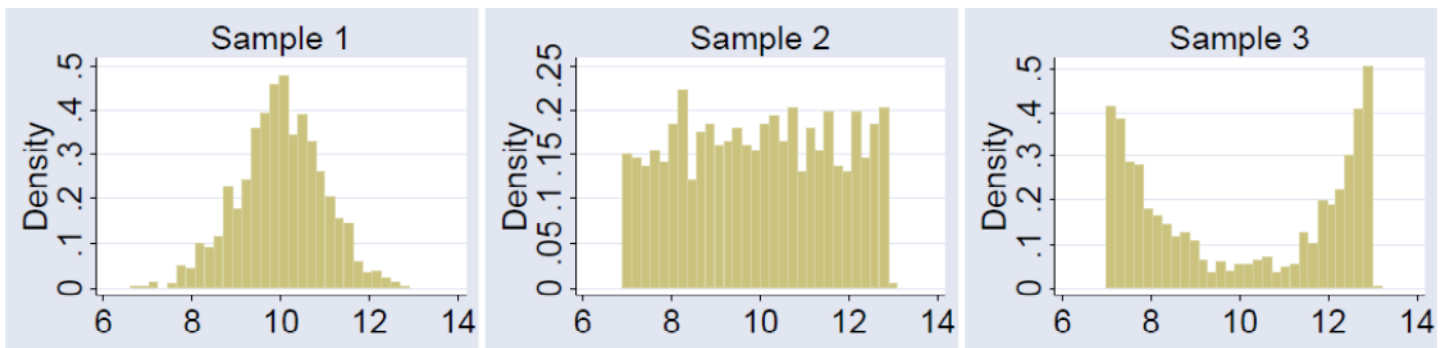
Problems:

(1) If you add up the heights of the bars what is total for a frequency histogram? If you add up the heights of the bars what is total for a relative frequency histogram? If you add up the area of the bars what is the total for a density histogram?

(2) Considering this histogram, could the variance of these data be 5? Explain.



(3) Which histogram shows the sample with the largest s.d.? Smallest? Explain the intuition.



(4) Three telecommunication companies reported their average monthly profit and standard deviation for a year. The results are presented below:

	Company A	Company B	Company C
Mean	\$ 10,930	\$ 13,000	\$ 34,450
Standard Deviation	\$ 4,196	\$ 9,300	\$4,116

(a) For each company, find an interval within which you would expect 95.44 percent of all monthly profit values to fall (assuming that profits are normally distributed).

(b) In the context of the situations like the stock fund comparison, the coefficient of variation is often used as *a measure of risk* because it measures the variation of the returns (standard deviation) relative to the size of the mean return. Calculate the coefficient of variation for each company, and use the result to compare profits. Which company is more risky?

(5) Suppose that a large international corporation wishes to obtain its own benchmark for one-day travel expenses in Moscow. To do this it records the one-day travel expenses for a random sample of 35 executives visiting Moscow. The mean and the standard deviation of these expenses are calculated to be \$ 538 (mean) and \$41 (standard deviation). Furthermore, a histogram shows that expenses are approximately normally distributed.

(a) Find an interval that you estimate contains about 99.7 percent of all one-day travel expenses in Moscow.

(b) If an executive submits an expense of \$720 for a one-day stay in Moscow, should this expense be considered unusually high? Why or why not?

(6) An old joke is that a certain economics professor left Yale to go to Harvard and thereby improved the average quality of both departments. Is this possible?

(7) Suppose, $s_{xy}=10$ and $s_{wz} = -20$. Based on this information is it reasonable to conclude that W and Z are more strongly related than X and Y? Explain.

(8) Suppose you calculated the following statistics from the sample: $\bar{x} =12$, $\bar{y} =10$, $s_x=4$, $s_y=2$ and $s_{xy}=12$. How do you know that you must have made a mistake computing these statistics?