

11.28 Supply and demand curves as traditionally drawn in economics principles classes have price (P) on the vertical axis and quantity (Q) on the horizontal axis.

428

- Rewrite the truffle demand and supply equations in (11.11) and (11.12) with price P on the left-hand side. What are the anticipated signs of the parameters in this rewritten system of equations?
- Using the data in the file *truffles*, estimate the supply and demand equations that you have formulated in (a) using two-stage least squares. Are the signs correct? Are the estimated coefficients significantly different from zero?
- Estimate the price elasticity of demand “at the means” using the results from (b).
- Accurately sketch the supply and demand equations, with P on the vertical axis and Q on the horizontal axis, using the estimates from part (b). For these sketches set the values of the exogenous variables DI , PS , and PF to be $DI^* = 3.5$, $PF^* = 23$, and $PS^* = 22$.
- What are the equilibrium values of P and Q obtained in part (d)? Calculate the predicted equilibrium values of P and Q using the estimated reduced-form equations from Table 11.2, using the same values of the exogenous variables. How well do they agree?
- Estimate the supply and demand equations that you have formulated in (a) using OLS. Are the signs correct? Are the estimated coefficients significantly different from zero? Compare the results to those in part (b).

a.

- 需求: $P = \frac{a-Q}{b}$
- 供給: $P = \frac{Q-c}{d}$

預期參數的符號:

- 需求方程式: b 應為正 (價格上升, 需求量下降, 斜率負, $\frac{1}{b}$ 為負)。
- 供給方程式: d 應為正 (價格上升, 供給量增加, 斜率正, $\frac{1}{d}$ 為正)。
- a 通常為正 (需求截距), c 可為正或負 (供給截距取決於生產成本)。

b.

Coefficients:

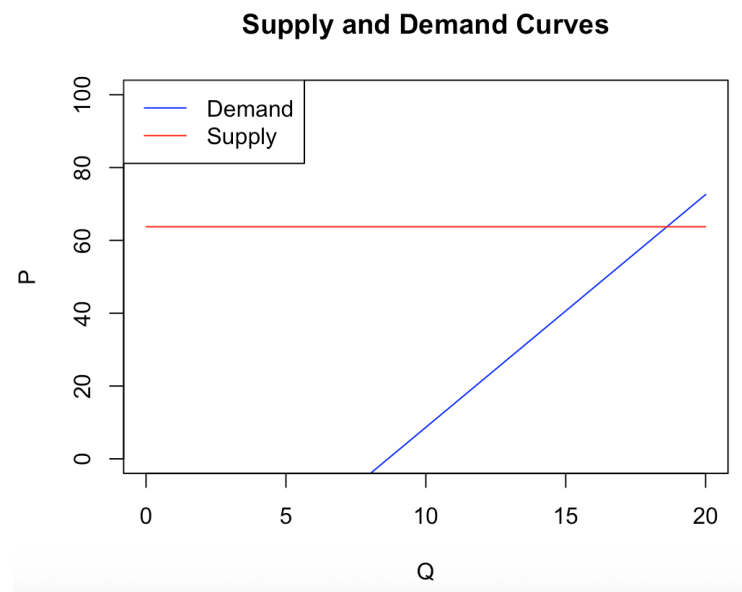
	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-13.5021	8.9250	-1.513	0.14194
ps	1.4733	0.4558	3.232	0.00323 **
di	12.4135	1.7855	6.953	1.8e-07 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

c.

```
> mean_q <- mean(truffles$q)
> cat("Mean p:", mean_p, "\nMean q:", mean_q, "\n")
Mean p: 62.724
Mean q: 18.45833
> elasticity <- 0.1564 * (mean_p / mean_q)
> cat("Price elasticity of demand at the means:", elasticity, "\n")
Price elasticity of demand at the means: 0.5314691
```

d.



e.

Equilibrium P: 63.745
Equilibrium Q: 18.61522

f.

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	10.31076	2.58633	3.987	0.000436 ***
p	0.12990	0.03956	3.283	0.002757 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 3.989 on 28 degrees of freedom
Multiple R-squared: 0.278, Adjusted R-squared: 0.2522
F-statistic: 10.78 on 1 and 28 DF, p-value: 0.002757

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-13.5021	8.9250	-1.513	0.14194
ps	1.4733	0.4558	3.232	0.00323 **
di	12.4135	1.7855	6.953	1.8e-07 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 8.665 on 27 degrees of freedom
Multiple R-squared: 0.8006, Adjusted R-squared: 0.7858
F-statistic: 54.21 on 2 and 27 DF, p-value: 3.516e-10