Perfect Competition in the Short Run
Handout

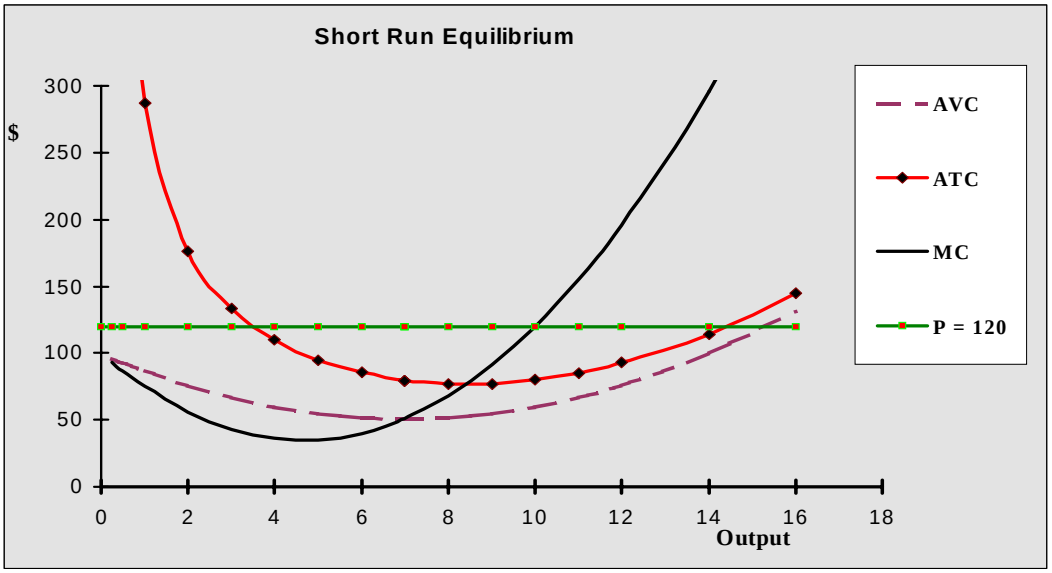
The firm's short-run supply curve

Let price be \$120. Let the cost function by given by $cost(y) = 200 + 100y - 14y^2 + y^3$. Let marginal cost be given by $MC(y) = 100 - 28y + 3y^2$ rather than being computed as a discrete change.

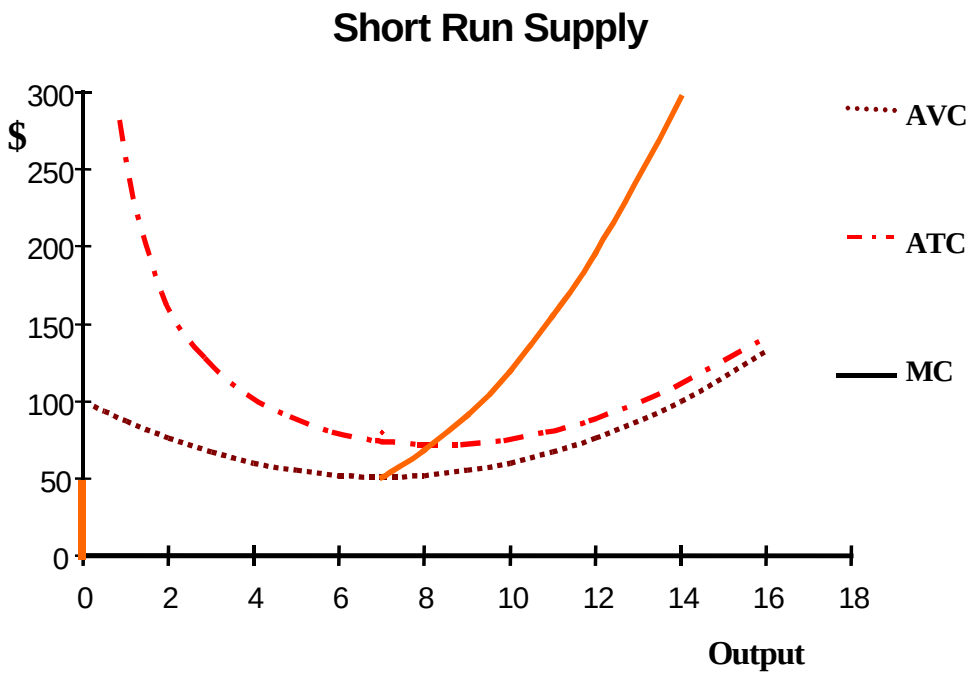
Data for this firm is as follows.

y	Price	TR	MR	FC	VC	C	AFC	AVC	ATC	MC	Profit
0.00	120	0	120	200	0.00	200.00					-200.00
0.25	120	30	120	200	24.14	224.14	800.00	96.56	896.56	93.19	-194.14
0.50	120	60	120	200	46.63	246.63	400.00	93.25	493.25	86.75	-186.63
1.00	120	120	120	200	87.00	287.00	200.00	87.00	287.00	75.00	-167.00
2.00	120	240	120	200	152.00	352.00	100.00	76.00	176.00	56.00	-112.00
3.00	120	360	120	200	201.00	401.00	66.67	67.00	133.67	43.00	-41.00
4.00	120	480	120	200	240.00	440.00	50.00	60.00	110.00	36.00	40.00
5.00	120	600	120	200	275.00	475.00	40.00	55.00	95.00	35.00	125.00
6.00	120	720	120	200	312.00	512.00	33.33	52.00	85.33	40.00	208.00
7.00	120	840	120	200	357.00	557.00	28.57	51.00	79.57	51.00	283.00
8.00	120	960	120	200	416.00	616.00	25.00	52.00	77.00	68.00	344.00
9.00	120	1080	120	200	495.00	695.00	22.22	55.00	77.22	91.00	385.00
10.00	**120**	**1200**	**120**	**200**	**600.00**	**800.00**	**20.00**	**60.00**	**80.00**	**120.00**	**400.00**
11.00	120	1320	120	200	737.00	937.00	18.18	67.00	85.18	155.00	383.00
12.00	120	1440	120	200	912.00	1112.00	16.67	76.00	92.67	196.00	328.00
14.00	120	1680	120	200	1400.00	1600.00	14.29	100.00	114.29	296.00	80.00
16.00	120	1920	120	200	2112.00	2312.00	12.50	132.00	144.50	420.00	-392.00

The figure below shows AVC, ATC and MC for this firm along with a price line at P = \$120.



The competitive firm's supply curve has two parts. For all prices above the minimum point on its average variable cost (AVC) curve, the supply curve coincides with the marginal cost curve (MC). For prices below the minimum point on the average variable cost curve (AVC), the firm will shut down, so its supply curve becomes a vertical line at zero units of output.



We write the individual supply curve as

$$y_i = y_i(p, w_1, w_2, \cdots, w_n, z)$$

where p denotes the price of the output, w_j is the price of the jth input, and z represents the levels of various fixed inputs. Note that z might well be written $z = (z_1, z_2, z_3, \ldots)$.

The market or industry supply curve Q is the horizontal summation of the individual firm supply curves $y_i = y_i(p, w_1, w_2, \cdots, w_n, z)$ accounting for the fact that $y_i = y_i(p, w, z)$ will be zero at some price levels. Specifically, if the industry has L firms,

$$Q = \sum_{i=1}^{L} y_i(p, w_1, w_2, \cdots, z)$$

The market supply curve is then a curve indicating the quantity of output that all sellers in a market will produce at different prices.

If there are L identical firms, each with supply, $y_i = y(p, w, z)$, market supply is given by

$$Q = L * y(p, w_1, w_2, \cdots, z)$$