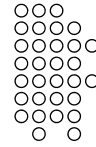


EKONOMI PRODUKSI

Kode PTE-4103

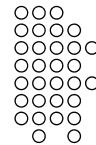


PERTEMUAN KEEMPAT:
BIAYA, PENERIMAAN & PENDAPATAN
PADA SISI OUTPUT



Rini Dwiastuti
2007

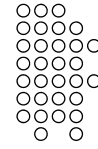
Outline:



1. Some Basic Definition
2. Simple Profit Maximization from the Output Side
3. The Duality of Cost and Production
4. The Inverse of a Production Function
5. Supply Function for the Firm

1. Some Basic Definition

Biaya produksi { Terminologi input (v^0x)
Terminologi output



Variable Cost (VC)

Are the cost of production that vary with the level of output product by farmer

Example:

Dlm satu musim tanam produksi jagung yg terkait dengan pembelian: benih, pupuk, herbisida. Insektisida, dsb

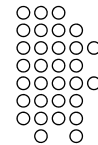
Fixed Cost (FC)

Are the cost that must be incurred by the farmer wheter or not production take place.

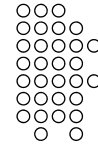
Example:

Pembayaran pembelian lahan, penyusutan nilai mesin, bangunan dan peralatan

Bgm dg biaya tenaga kerja?



Over very long periods → all costs are normally treated as variable



Why?

The categorization of each input as a fixed or variable-cost item cannot be made without explicit reference to the particular period involved.

The **proportion** of fixed to variable costs increases as the length of time is shortened, and declines as the length of time increases.

Beberapa ahli ekonomi mendefinisikan jangka panjang sbg suatu periode waktu yg cukup panjang untuk mengubah ukuran usaha (*size of plant*)

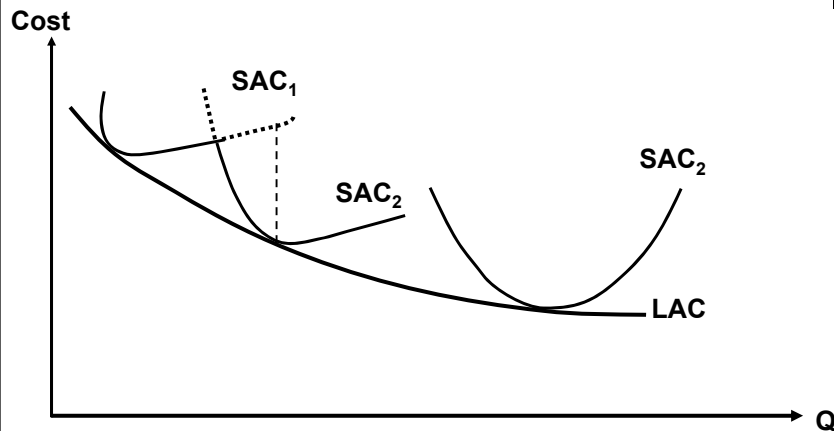


Kurva biaya rata-rata jk pendek → berbentuk huruf U

Perilaku Produsen (pd PPS) → $MR = SRMC$
(short run marginal cost)

SRAC & SRMC terkait dg ukuran usaha → pd waktu tertentu yg cukup, produsen dpt mengubah ukuran usaha dg menambah mesin, menjual atau membeli lahan, dan peralatan

Long-run average cost (LRAC) can be derived by drawing an envelope curve which is tangent to each short-run average cost curve



In long-run equilibrium → produsen menemukan & memilih suatu ukuran usaha pd titik minimum LRAC



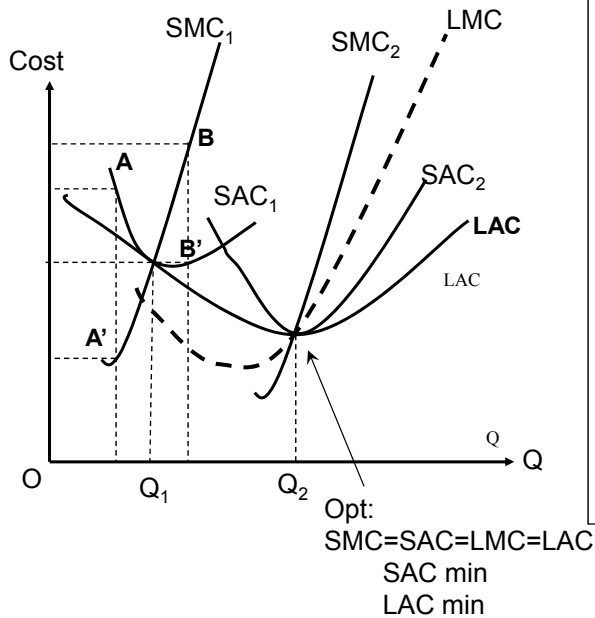
Selama $MR = LRMC \rightarrow$ no profit

Dlm jk pendek: MR bisa $> MC$

Setiap produsen akan menyamakan MR dg $SRMC$ & berusaha s/d pd kondisi $SRAC$ min.

Save the firms in long-run equilibrium:
min. $SRAC$ & $LRAC$

How are a firm's long-run and short-run cost curves related?



Jika produsen berpandangan bahwa tingkat Q yang memberikan \bar{u} max adalah:

• $OQ_1 \rightarrow SAC > LAC$

↓
STC < LTC

↓
SMC < LMC

• $OQ_2 \rightarrow SAC = LAC$

SMC = LMC

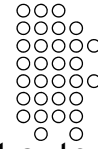
Total Cost are the sum of fixed plus variable cost

$$TC = FC + VC$$

$$TC = g(y) + k$$

- FC is the total cost to a firm of its short-run fixed inputs. FC, the firm's fixed cost, does not vary with the firm's output level.
- VC is the total cost to a firm of its variable inputs when producing y output units. VC or $g(y)$ is the firm's variable cost function.
- $g(y)$ depends upon the levels of the fixed inputs.

Average Cost



- Average variable cost is the variable cost per unit output

$$AVC = VC/y = g(y)/y$$

- Average fixed cost is equal to fixed cost per unit output

$$AFC = FC/y = ky$$

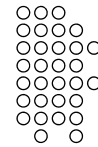
- Total average cost

$$AC = ATC = TC/y$$

$$AC = AVC + AFC$$

$$\Rightarrow TC/y = VC/y + FC/y$$

Marginal Cost



Definisi:

Perubahan biaya total atau biaya variabel yang dihasilkan dr perubahan satu tambahan output

$$MC = \Delta TC/\Delta y = \Delta TC/\Delta y$$

MC pd titik tertentu adalah slopedr fungsi biaya total → dlm bentuk turunan sbb:

$$MC = dTC/dy = dTC/dy$$

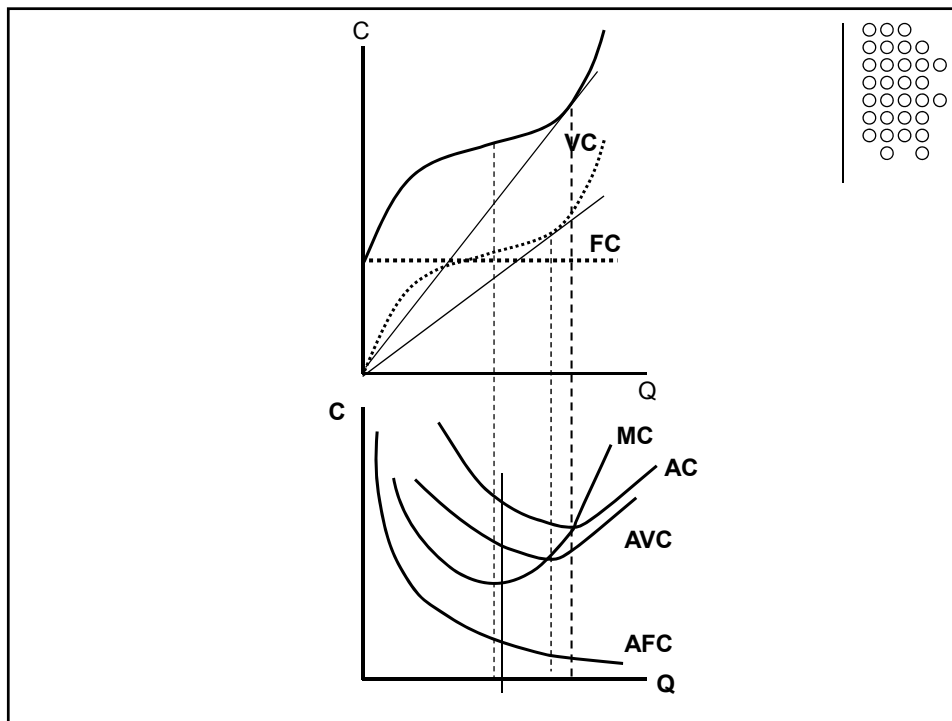
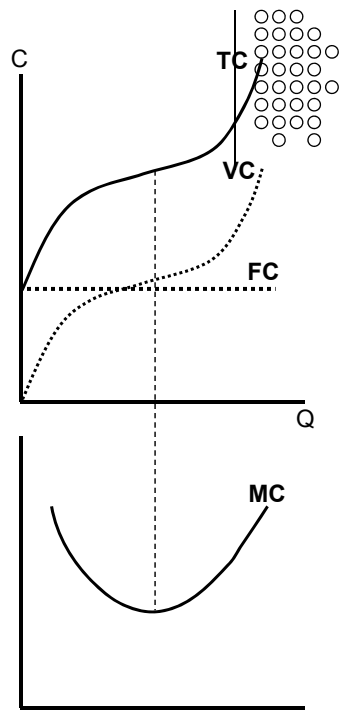
⇒ Fs MC adalah fs yg menjelaskan slope dr fungsi biaya total

Marginal Cost

$$MC = \frac{\partial TC}{\partial y} = \frac{\partial FC}{\partial y} + \frac{\partial VC}{\partial y}$$

A marginal cost curve is the graph of a firm's marginal cost function.

Marginal cost minimum pd saat inflection point (MPP maximum)



How are these cost curves related to each other?

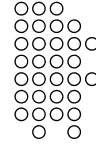
$$\begin{aligned} AVC &= \frac{VC}{Q} = \frac{v^0 \cdot X}{Q} \\ &= v^0 \cdot \frac{X}{Q} \\ &= v^0 \cdot \frac{1}{AP} \end{aligned}$$

$$\begin{aligned} MC &= \frac{\partial VC}{\partial Q} = \frac{\partial (v^0 \cdot X)}{\partial Q} \\ &= v^0 \cdot \frac{\partial X}{\partial Q} \\ &= v^0 \cdot \frac{1}{MP} \end{aligned}$$

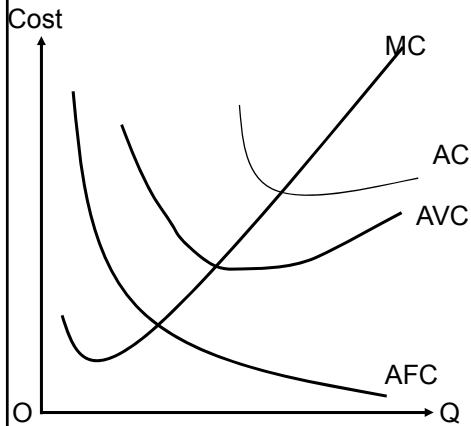
$$\begin{aligned} AVC &= v^0 \cdot \frac{1}{AP} \\ MC &= v^0 \cdot \frac{1}{MP} \end{aligned}$$

$$\begin{aligned} e &= \frac{MP}{AP} \Rightarrow AP = \frac{MP}{e} \\ MP &= e \cdot AP \end{aligned}$$

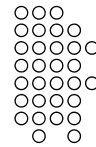
$$\begin{aligned} AVC &= v^0 \cdot \frac{e}{MP} \\ MC &= v^0 \cdot \frac{1}{e \cdot AP} \end{aligned}$$



AVC dan AC Memot MC pada saat AVC da AC_{min}



$$\begin{aligned} TC &= (AC)y \\ dTC/dy &= AC(1) + y(dAC/dy) \\ MC &= AC + y(\text{the slope of } AC) \end{aligned}$$



2. Simple Profit Maximization from the Output Side

$$TR = p \cdot y$$

$$\pi = TR - TC$$

Min (or max) profit \rightarrow mencapai titik dimana slope fs profit = 0

$$\pi/dy = TR/dy - TC/dy = 0$$

Slope TR

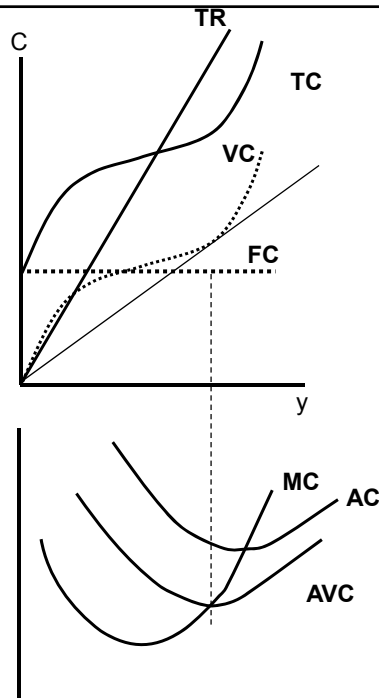
Slope TC

Diacu sbg MR

Didefinisikan sbg MC

$$\Rightarrow MR - MC = 0$$

$$\Rightarrow MR = MC$$



y	TVC	FC	TC	AVC	AFC	AC	MC	MR
40	90	75	165	2.25	1.88	4.13		
50	110	75	185	2.20	1.50	3.70	2.00	4.00
60	130	75	205	2.17	1.25	3.42	2.00	4.00
70	140	75	215	2.00	1.07	3.07	1.00	4.00
80	155	75	230	1.94	0.94	2.88	1.50	4.00
90	175	75	250	1.94	0.83	2.78	2.00	4.00
100	200	75	275	2.00	0.75	2.75	2.50	4.00
110	230	75	305	2.09	0.68	2.77	3.00	4.00
120	270	75	345	2.25	0.63	2.88	4.00	4.00
130	320	75	395	2.46	0.58	3.04	5.00	4.00
140	380	75	455	2.71	0.54	3.25	6.00	4.00


3. The Duality of Cost and Production

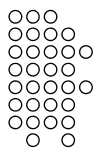
The law of diminishing return also can be interpreted from the output side

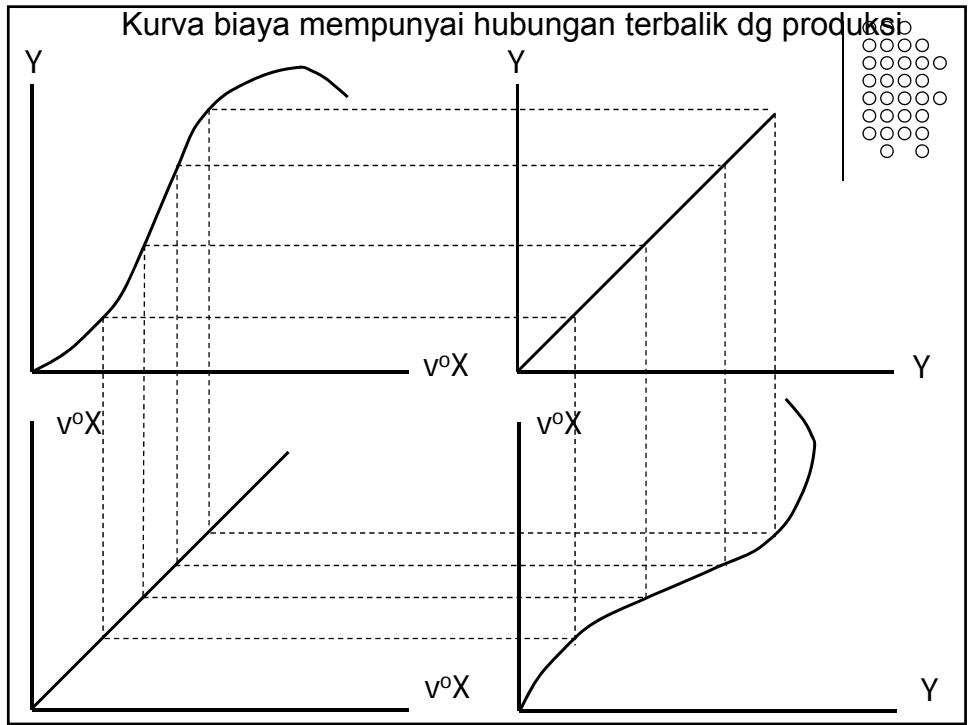
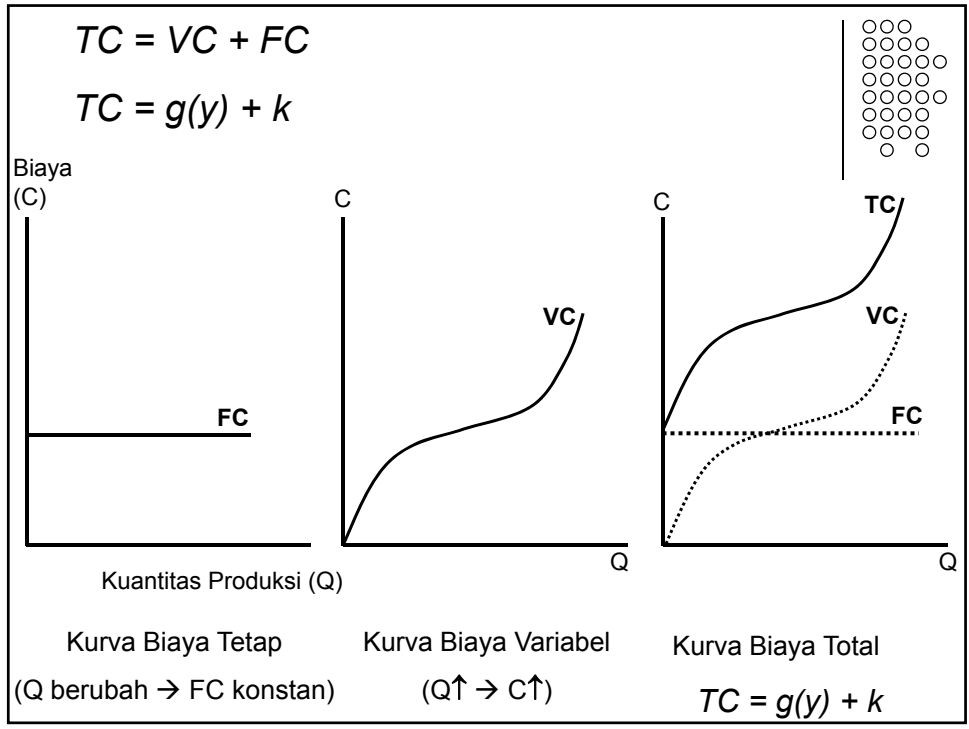
Output is increased by 1 unit at a time, after a point, each incremental or additional unit of output requires more and more additional unit of one or more variable input

Jika output ditambah, stl satu titik, masing-masing tambahan unit output menjadi lebih mahal (*more costly*) terkait dg penggunaan inputnya.

Unit output yg lain diproduksi, ttp hanya pd pengeluaran biaya tambahan penggunaan input

$y = 0.75x + 0.0042x^2 - 0.000023x^3$ $dy/dx = 0.75 + 0.0084x - 0.000069x^2$								
x	y	MPP	1/MPP	v°	V°/MPP MC	APP	1/APP	V°/APP AVC
0	0	0.75	1.33	0.15	0.200			
20	16.496	0.8904	1.12	0.15	0.168	0.8248	1.21	0.182
40	35.248	0.9756	1.03	0.15	0.154	0.8812	1.13	0.170
60	55.152	1.0056	0.99	0.15	0.149	0.9192	1.09	0.163
80	75.104	0.9804	1.02	0.15	0.153	0.9388	1.07	0.160
100	94.000	0.9000	1.11	0.15	0.167	0.9400	1.06	0.160
120	110.736	0.7644	1.31	0.15	0.196	0.9228	1.08	0.163
140	124.208	0.5736	1.74	0.15	0.262	0.8872	1.13	0.169
160	133.312	0.3276	3.05	0.15	0.458	0.8332	1.20	0.180
180	136.944	0.0264	37.88	0.15	5.682	0.7608	1.31	0.197
200	134.000	-0.3300	-3.03	0.15	-0.454	0.6700	1.49	0.224
220	123.376	-0.7416	-1.35	0.15	-0.202	0.5608	1.78	0.267
240	103.968	-1.2084	-0.83	0.15	-0.124	0.4332	2.31	0.346

<h4>4. The Inverse of a Production Function</h4>		
<p>Fungsi biaya dihasilkan dari invers fungsi produksi</p>		
<p>Types of Cost Curves:</p> <ul style="list-style-type: none"> ▪ Fixed, Variable & Total Cost Functions ▪ Av. Fixed, Av. Variable & Av. Total Cost Curves ▪ Marginal and Variable Cost Functions 		



6. Supply Function for the Firm

