

وزارة الزراعة و الإصلاح الزراعي
NAPC
المركز الوطني للسياسات الزراعية

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مشروع GCP/SYR/006/ITA - المرحلة الثانية



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GCP/SYR/OO6/ITA (NAPC)

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FAO - TCAS, *Agricultural Policy Analysis Exercises*, ID8, Roma 1992

Rivas L., J. A. García, C. Seré, L. S. Jarvis, L. R. Sanint, and D. Pachico *Economic surplus analysis model (modexc)* website

CIAT, 1999 <http://www.ciat.cgiar.org/impact/index.htm>

Conforti P. “The Common Agricultural Policy in Main Partial Equilibrium Models”, *working paper* n 7, Istituto Nazionale di Economia Agraria (INEA), Osservatorio sulle Politiche Agricole dell'UE, website <http://www.inea.it/opaue/wp7.pdf>, Roma, 2001

Magnani R. e Perali F. (a cura di) *Laboratorio di Politica Economica*, Dispensa n. 1, Università di Verona, Dipartimento di Scienze Economiche, 2002

De Muro P. e Salvatici L. “The Common Agricultural Policy in Multisectoral Models”, *working paper* n 11, Istituto Nazionale di Economia Agraria (INEA), Osservatorio sulle Politiche Agricole dell'UE, website <http://www.inea.it/opaue/wp11.pdf>, Roma, 2001

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Y

() D C

: (y=a+bx)

Y : Dy

) Y : Dy0

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Y : Ay

Y CPy

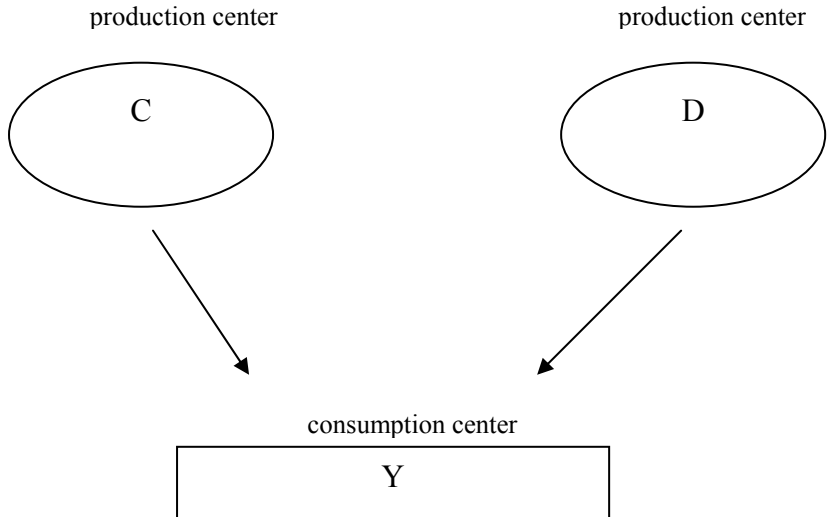
C Sc

Y Sc0

Y Ac

: 1

Y C Tcy



Y	C&D
(1) $Dy = Dy_0 + Ay \cdot CPy$	(2) $Sc = Sc_0 + Ac \cdot (CPy - Tcy)$ (3) $Sd = Sd_0 + Ad \cdot (CPy - Tdy)$
$Dy_0 = 3000$ $Ay = -4$	$Sc_0 = -500$ $Ac = 6$ $Tcy = 19$ $Sd_0 = -500$ $Ad = 4$ $Tdy = 25$

p q Tdy Tcy :

1a. $CPy(D) = -Dy_0/Ay + Dy/Ay$

C -2

2a. $CPy = -S_{co}/Ac + S_c/Ac$ (بدون تكاليف نقل)

2b. $Cpy = (T_{cy} * Ac - S_{co}) / Ac + S_c / Ac$ (مع تكاليف نقل)

D C -٣

CPy

3 $CPy = [(T_{cy} * Ac + T_{dy} * Ad) - (S_{co} + S_{do})] / (Ac + Ad) + (S_c + S_d) / (Ac + Ad)$

(1a) ()

(2b) (2a) C

. D C

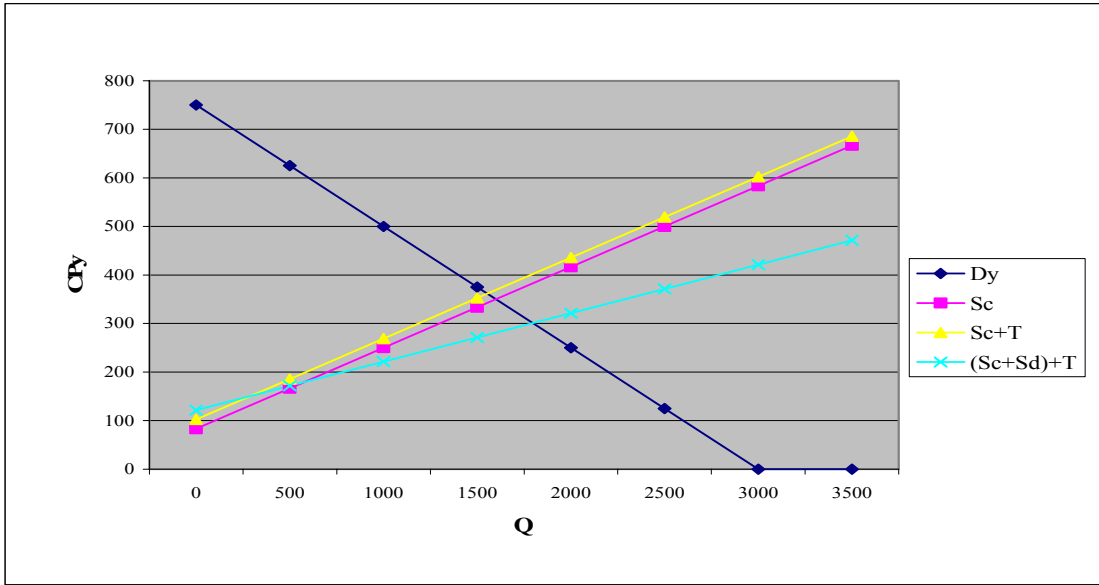
:

C

D C

	CPy	CPy	CPy	Cpy
	1a	2a	2b	3a
	Dy	Sc	Sc+T	(Sc+Sd)+T
0	750	83	102	121
500	625	167	186	171
1000	500	250	269	221
1500	375	333	352	271
2000	250	417	436	321
2500	125	500	519	371
3000		583	602	421
3500		667	686	471

(D C) -



Y

:

C

C

=

$$-Dy_0/Ay + Dy/Ay = (Tcy*Ac - Sco)/Ac + Sc/Ac$$

$$\text{since } Dy = Sc = q$$

$$q = [(Tcy*Ac - Sco)/Ac] + (Dy_0/Ay) / (1/Ay - 1/Ac)$$

$$q = 1554$$

$$p = 361$$

: D C

D C

=

$$Dy = (Sc + Sd) = q$$

$$-Dy_0/Ay + q/Ay = [(Tcy*Ac + Tdy*Ad) - (Sco + Sdo)] / (Ac + Ad) + (Sc + Sd) / (Ac + Ad)$$

:

$$q = \{Dy_0/Ay + [(Tcy*Ac + Tdy*Ad) - (Sco + Sdo)] / (Ac + Ad)\} / [(1/Ay) - 1 / (Ac + Ad)]$$

$$q = 1796$$

2a

$$p = 301$$

$$qc = 1192$$

$$qd = 604$$

$$pc = 282$$

$$pd = 276$$

C

D

D C

Z	B A
(4) $Dz = Dzo + Az*CPz$	(5) $Sb = Sbo + Ab*(CPz - Tbz)$ (6) $Sa = Sao + Aa *(CPz - Taz)$

Taz Tbz :

$$Cpz = (Dzo - Sbo - Sao + Ab*Tbz + Aa*Taz) / (Ab + Aa - Az) = 146$$

$$Dz = 1562 \quad Sb = 667 \quad \text{العرض في B}$$

$$Sa = 895 \quad \text{العرض في A}$$

$$PPb = 139 \quad \text{أسعار المنتج في B}$$

$$PPa = 131 \quad \text{أسعار المنتج في A}$$

X	E
(7) $Dx = Dx_0 + Ax \cdot CPx$	(8) $Se = Se_0 + Ae \cdot (CPx - Tex)$
with: $Dx_0 = 5000$ $Ax = -5$	with: $Se_0 = -1000$ $Ae = 5$ $Tex = 7$

:

X

$$Cpx = (Dx_0 - Se_0 + Ae \cdot Tex) / (Ae - Ax) = 604$$

$$Dx = 1983$$

$$Se = 1983$$

E العرض في المركز

$$PPE = 597$$

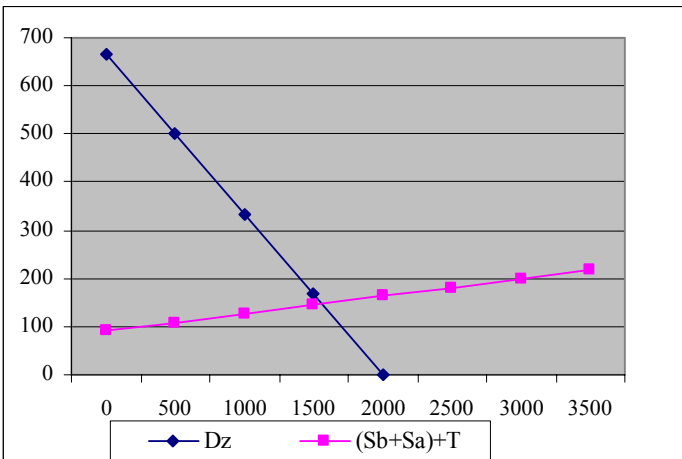
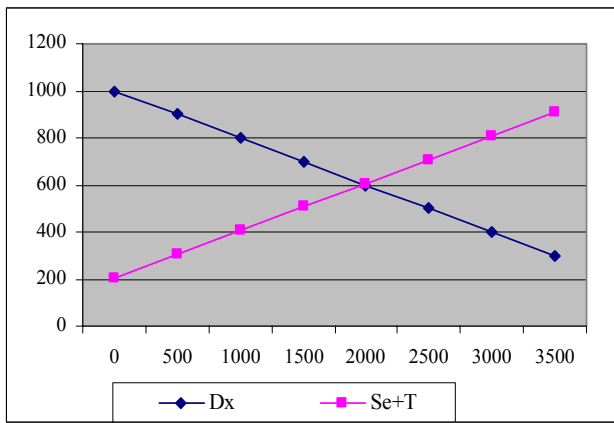
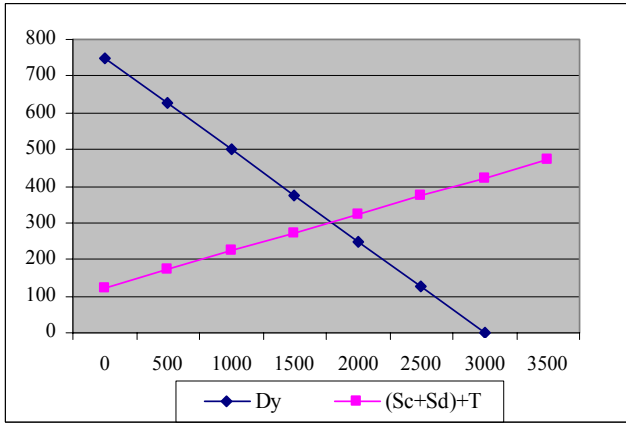
E سعر المنتج في المركز

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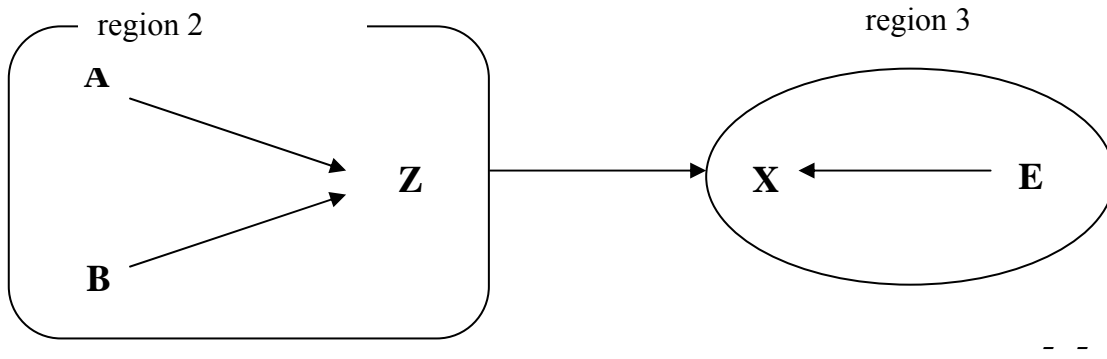
Y Reg 1	السعر الكمية	301 1796	C D	282 1192 276 604
Z Reg 2	السعر الكمية	146 1562	B A	139 667 131 895
X Reg 3	السعر الكمية	604 1983	E	597 1983



()

(= -)

$Dz = Dzo + Az \cdot CPz$	$Sb = Sbo + Ab \cdot (CPz - Tbz)$ $Sa = Sao + Aa \cdot (CPz - Taz)$	$Dx = Dxo + Ax \cdot CPx$	$Se = Seo + Ae \cdot (CPx - Tex)$
with: $Dzo = 2000$ $Az = -3$	with: $Sbo = -1000$ $Ab = 12$ $Tbz = 7$ $Sao = -1200$ $Aa = 16$ $Taz = 15$	with: $Dxo = 5000$ $Ax = -5$	with: $Seo = -1000$ $Ae = 5$ $Tex = 7$
$Txz = 65$ Z X		$Tzx = 65$ X Z	



PP

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T

CP

$$CPz = CPx - Tzx$$

$$PPa = CPx - Tzx - Taz$$

$$PPb = CPx - Tzx - Tbz$$

$$PPE = CPx - Tex$$

=

:

:

$$Dx + Dz = Se + Sa + Sb$$

:

$$Dx = Dx0 + Ax * CPx$$

$$Dz = Dzo + Az * (CPx - Tzx)$$

$$Sa = Sao + Aa * (CPx - Taz - Tzx)$$

$$Sb = Sbo + Ab * (CPx - Tbz - Tzx)$$

$$Se = Seo + Ae * (CPx - Tex)$$

CPx

:

$$CPx = \frac{[(Dx0 + Dzo - Seo - Sbo - Sao - AzTzx + AeTex + Ab(Tbz + Tzx) + Aa(Taz + Tzx)]}{(Ae + Ab + Aa - Ax - Az)}$$

$$CPx = 307$$

$$Se = 498$$

$$CPz = 242$$

$$Sb = 1816$$

$$Dx = 3467$$

$$Sa = 2427$$

$$Dz = 1275$$

Total = 4742

PPe = 300

PPb = 235

PPa = 227

:

(y X Z) -

Y reg 1		301.0	C	282.0
		1796.0		1192.0
			D	276.0
				604.0
Z reg 2		241.7	B	234.7
		1275.0		1816.2
			A	226.7
				2426.9
X reg 3		306.7	E	299.7
		3466.6		498.4

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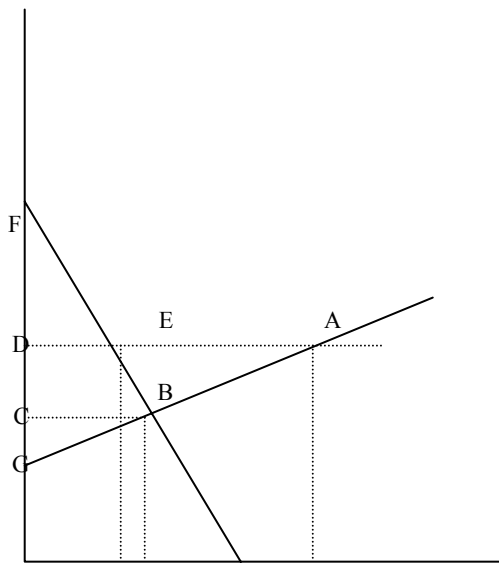
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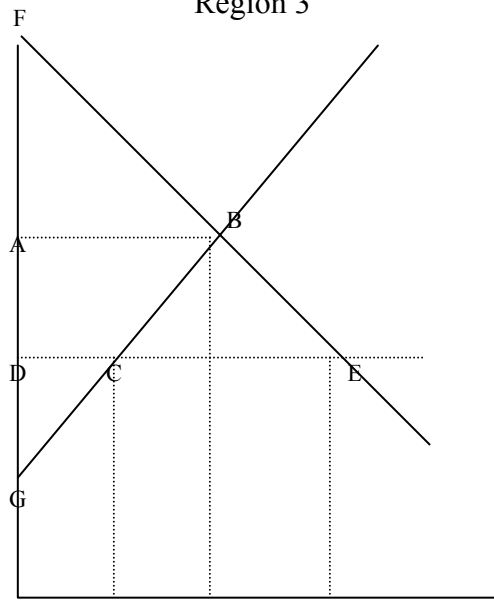
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أثر تكامل أسواق منطقتين على المنتجين والمستهلكين والتجار فيهما

Region 2



Region 3



:

$$\begin{aligned} (p_0 - p_1) * (d_0 + d_1) / 2 & \quad (\quad) \\ (p_0 - p_1) * (s_0 + s_1) / 2 & \quad (\quad) \\ & \quad (\quad) \end{aligned}$$

:

$$(p_0 - p_1) * [(d_0 + d_1) - (s_0 + s_1)] / 2 \quad (\quad)$$

FDE FCB

CBED

GAD GCB

GAD GCB ()

CBAD

CBDE

. BEA

:

-

	CBED	$(D-C)*(DE + CB)/2 =$	$(242-136,176$
		$140)*(1275 + 1562)/2$	
	CBAD	$(D-C)*(DA+CB)/2 =$	$278,640$
		$(242-146)*(1816+2427+1502)/2$	
	BAE	$(D-C)*(A-E)/2 =$	$(242-142,464$
		$146)*(1816 + 2427-1275)/2$	

:

= D

=C

=DE

=CB

=DA

()

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		%
	-135,825	59.6
	277,922	121.9
	142,097	62.3
	227,979	100.0

: _____

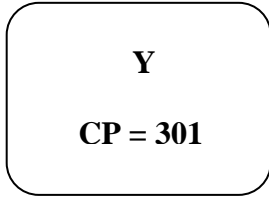
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		%
	-135,825	59.6
	277,922	121.9
	142,097	62.3
	227,979	100.0
		%
	808,691	76.1
	-368,189	34.6
	440,502	41.4
	1,063,143	100.0
		%
	672,866	47.2
	-90,267	6.3
	582,599	40.9
	1,424,418	100.0

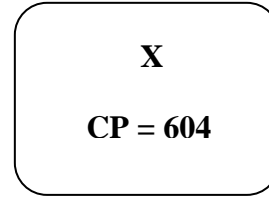
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region 1

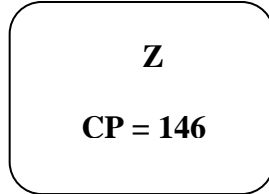


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region 3



region 2

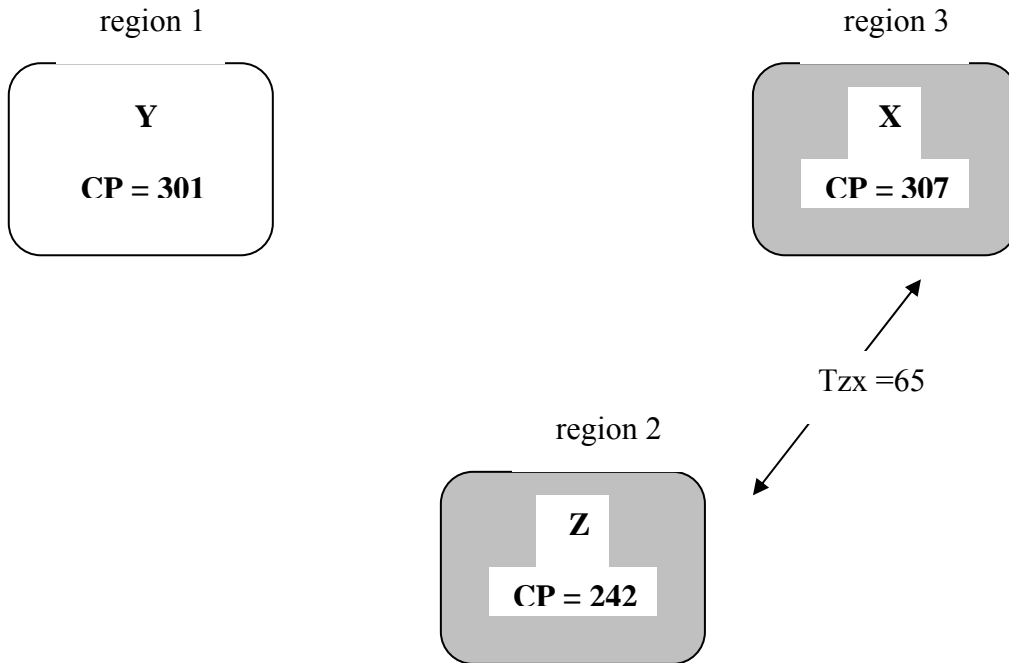


()

Z

B A

A B



()

:

$$S_c = S_{c0} + A_c CP_y - A_c T_{cy}$$

$$S_d = S_{d0} + A_d CP_y - A_d T_{dy}$$

$$S_b = S_{b0} + A_b CP_z - A_b T_{bz}$$

$$S_a = S_{a0} + A_a CP_z - A_a T_{az}$$

$$S_e = S_{e0} + A_e CP_x - A_e T_{ex}$$

: Z

$$\begin{aligned} C_{py} &= CPz + T_{yz} \\ C_{px} &= CPz + T_{xz} \end{aligned}$$

:

$$\begin{aligned} S_c &= S_{co} + A_c CPz + A_c T_{yz} - A_c T_{cy} \\ S_d &= S_{do} + A_d CPz + A_d T_{yz} - A_d T_{dy} \\ S_b &= S_{bo} + A_b CPz - A_b T_{bz} \\ S_a &= S_{ao} + A_a CPz - A_a T_{az} \\ S_e &= S_{eo} + A_e CPz + A_e T_{xz} - A_e T_{ex} \end{aligned}$$

:

$$\begin{aligned} D_y &= D_{yo} + A_y CP_y \\ D_z &= D_{zo} + A_z CP_z \\ D_x &= D_{xo} + A_x CP_x \end{aligned}$$

:

$$\begin{aligned} D_y &= D_{yo} + A_y CP_z + A_y T_{yz} \\ D_z &= D_{zo} + A_z CP_z \\ D_x &= D_{xo} + A_x CP_z + A_x T_{xz} \end{aligned}$$

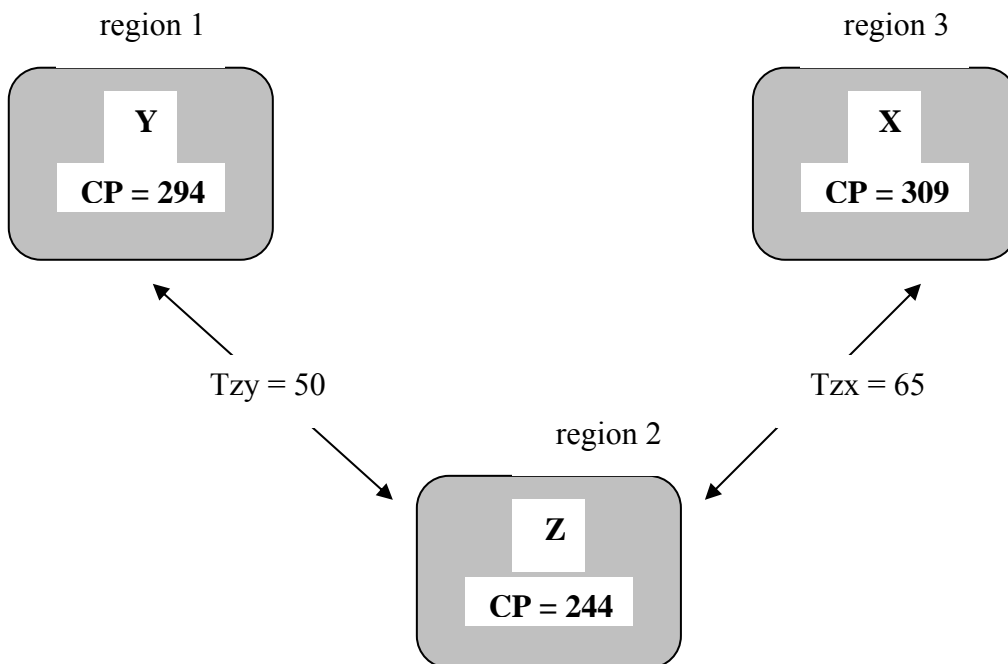
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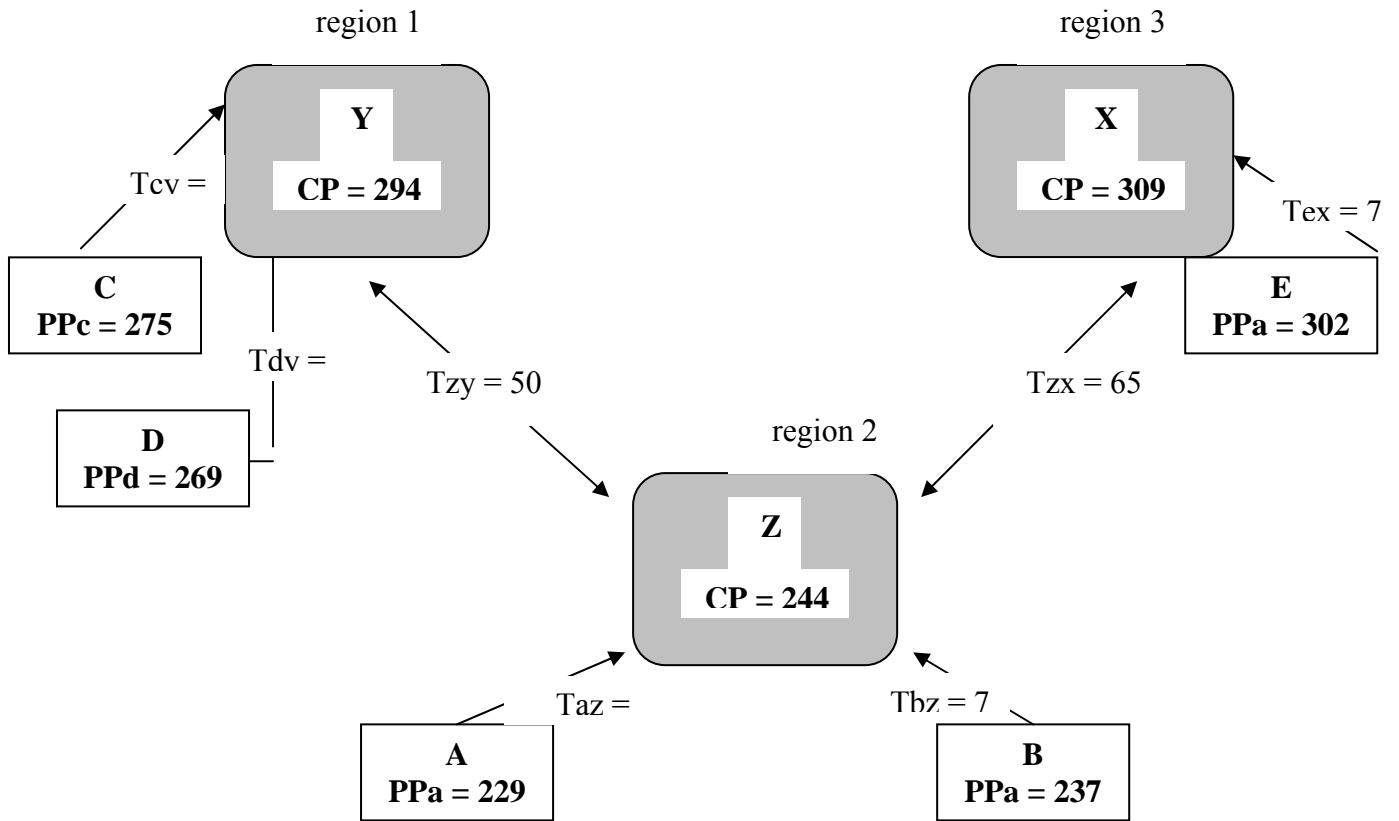
$$CPz = \frac{-(S_{co} + S_{do} + S_{eo} + S_{bo} + S_{ao}) + (D_{yo} + D_{xo} + D_{zo}) + (A_y T_{yz} + A_x T_{xz}) + (A_c (T_{cy} - T_{yz}) + A_d (T_{dy} - T_{yz}) + A_e (T_{ex} - T_{xz}) + A_b T_{bz} + A_a T_{az})}{(A_c + A_d + A_e + A_b + A_a - A_y - A_x - A_z)}$$

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	:		:
C	$S_c = -500 + 6(Pz + 50 - 19)$	Y	$D_y = 3000 - 4(Pz + 50)$
D	$S_d = -500 + 4(Pz + 50 - 25)$		
B	$S_b = -1000 + 12(Pz - 7)$	Z	$D_z = 2000 - 3 Pz$
A	$S_a = -1200 + 16(Pz - 15)$		
E	$S_e = -1000 + 5(Pz + 65 - 7)$	X	$D_x = 5000 - 5(Pz + 65)$

Y	294	1824			
Z	244	1268			
X	309	3455			
C	275	1,150	21,856	316,403	
D	269	576	14,405	155,034	
B	237	1,845	12,913	437,284	
A	229	2,465	36,973	564,590	
E	302	510	3,572	154,130	
		6,546	89,719	1,627,441	
Y	1,727	-97	4,862	0	536,291
Z	4,310	3,042	0	0	309,421
X	510	-2,944	191,390	0	1,067,699
	6,546	0	196,251		1,913,412





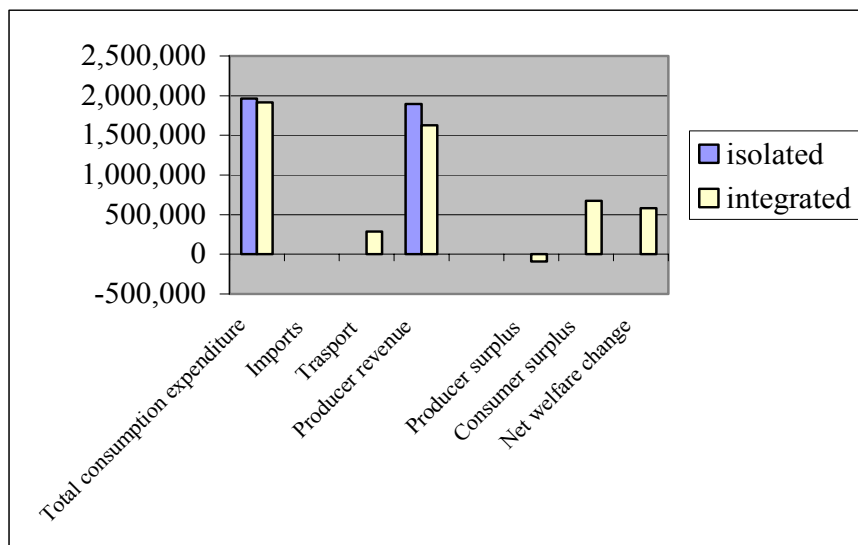
C	282	275	1,192	1,150	-8,134	336,144	316,403
D	276	269	604	576	-4,099	166,704	155,034
B	139	237	667	1,845	123,232	92,701	437,284
A	131	229	895	2,465	164,832	117,183	564,590
E	597	302	1,983	510	-366,993	1,182,561	154,130
			5,341	6,546	-91,162	1,895,294	1,627,441

	()		()			()	
Y	301	294	1,796	1,824	12,571	540,596	536,291
Z	146	244	1,562	1,268	-138,840	227,979	309,421
X	604	309	1,983	3,455	800,483	1,196,439	1,067,699
			5,341	6,546	674,214	1,965,014	1,913,412

:

							%
				1,965,014	1,913,412		-2.6
				0	0		0.0
					285,971		0.0
				1,895,294	1,627,441		-14.1
					-91,162		-5.6
					674,214		35.2
					583,052		30.5

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X

X

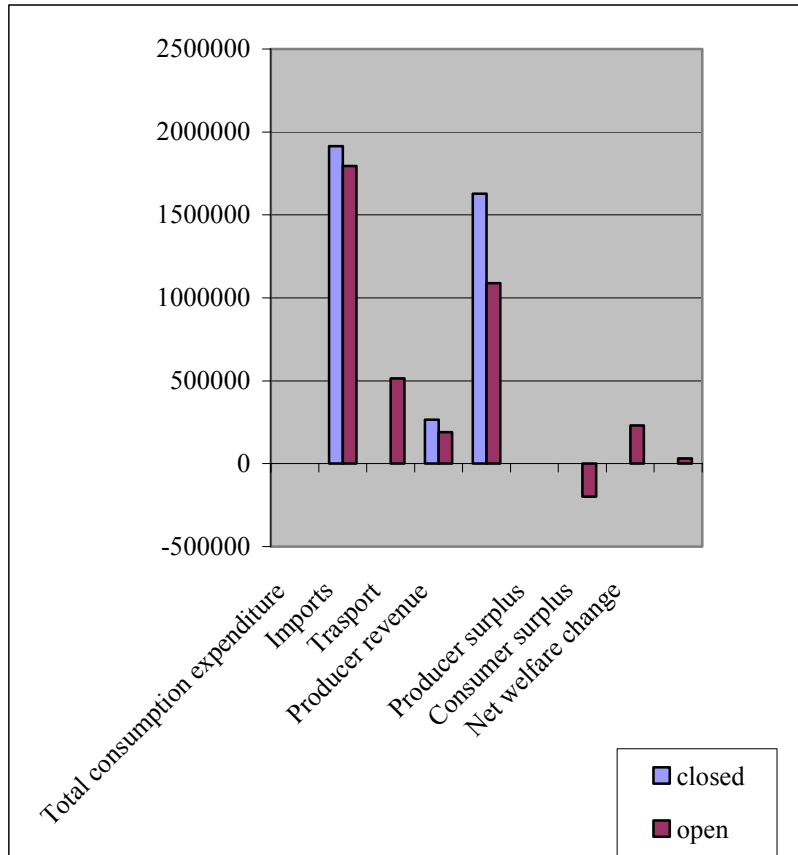
X () Z () X
Z

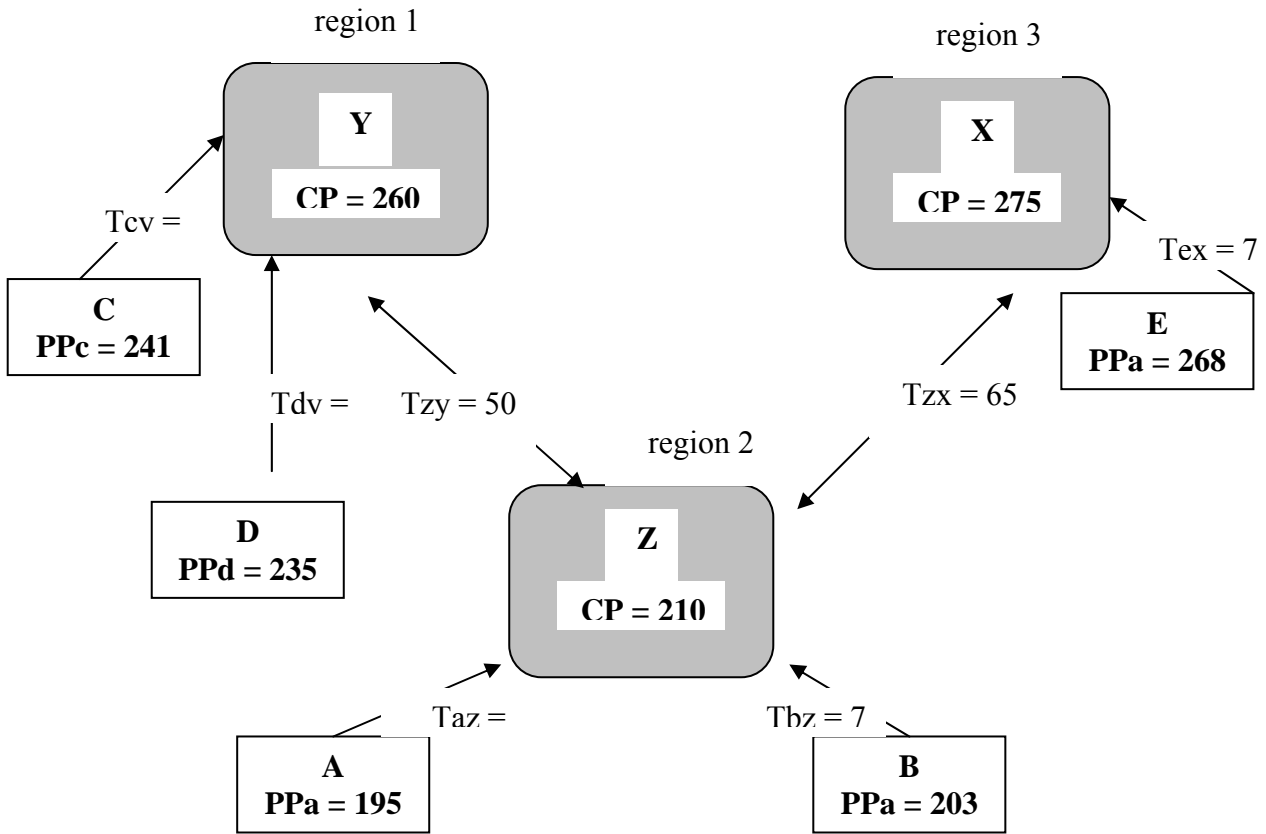
Y	260		1960		
Z	210		1370		
X	275		3625		
C	241	946	17,974	227,986	
D	235	440	11,000	103,400	
A	203	1436	10,052	291,508	
B	195	1920	28,800	374,400	
E	268	340	35,574	91,120	
	214	5082		1,088,414	
Y	1,386	-574	28,700	0	509,600
Z	3,356	1,986	0	0	287,700
X	340	-1,412	91,780	1873	996,875
	5,082	0	120,480	1873	1,794,175

C	275	241	1,150	946	-35,695	316,403	227,986
D	269	235	576	440	-17,303	155,034	103,400
B	237	203	1,845	1,436	-55,861	437,284	291,508
A	229	195	2,465	1,920	-74,662	564,590	374,400
E	302	268	510	340	-14,478	154,130	91,120
			6,546	5,082	-197,999	1,627,441	1,088,414
Y	294	260	1,824	1,960	64,427	536,291	509,600
Z	244	210	1,268	1,370	44,915	309,421	287,700
X	309	275	3,455	3,625	120,548	1,067,699	996,875
			6,546	6,955	229,891	1,913,412	1,794,175

:

						%
				1,913,412	1,794,175	-6.2
				0	515,075	0.0
				266,000	190,686	-28.3
				1,627,441	1,088,414	-33.1
					-197,999	-18.2
					229,891	12.8
					31,892	1.8





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Y	258	1968			
Z	258	1226			
X	258	3710			
C	214	784	14,896	167,776	
D	214	356	8,900	76,184	
B	214	1,568	10,976	335,552	
A	214	2,224	33,360	475,936	
E	214	70	490	14,980	
		5,002	68,622	1,070,428	
Y	1,140	-828	41,400	0	507,744
Z	3,792	2,566	0	0	316,308
X	70	-1,738	112,970	1902	957,180
	5,002	0	154,370		1,781,232

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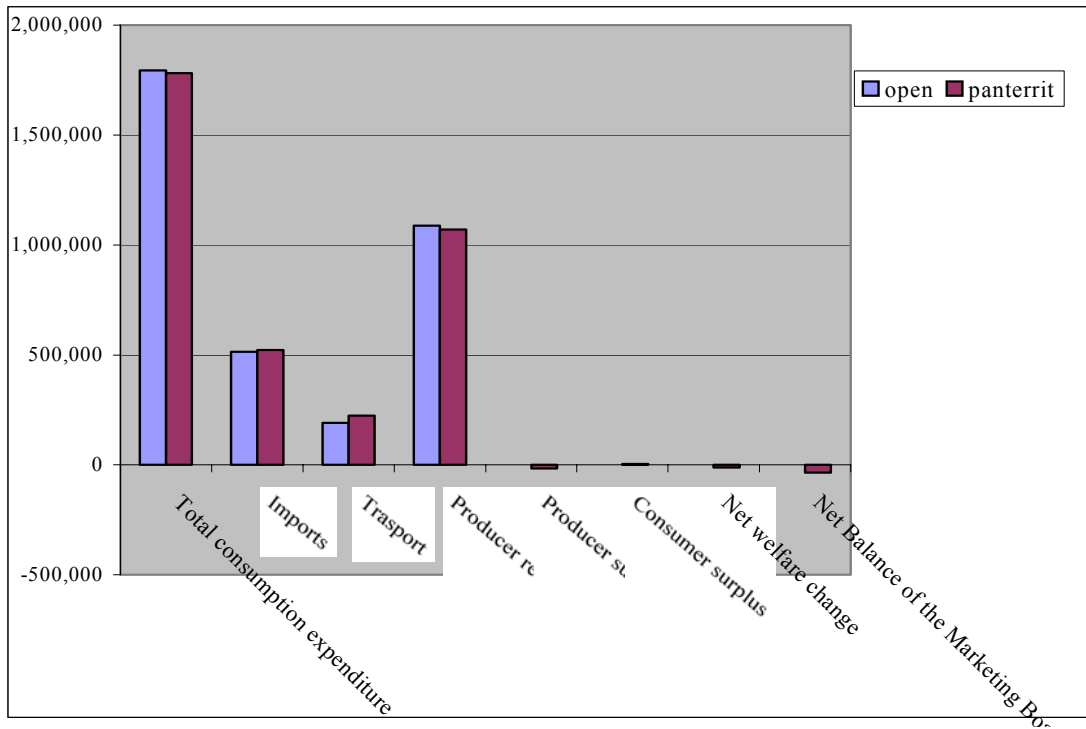
	open	panterrit	open	panterrit		open	panterrit
C	241	214	946	784	-52,812	227,986	167,776
D	235	214	440	356	-8,358	103,400	76,184
B	203	214	1,436	1,568	16,522	291,508	335,552
A	195	214	1,920	2,224	39,368	374,400	475,936
E	268	214	340	70	-11,070	91,120	14,980
			5,082	5,002	-16,350	1,088,414	1,070,428

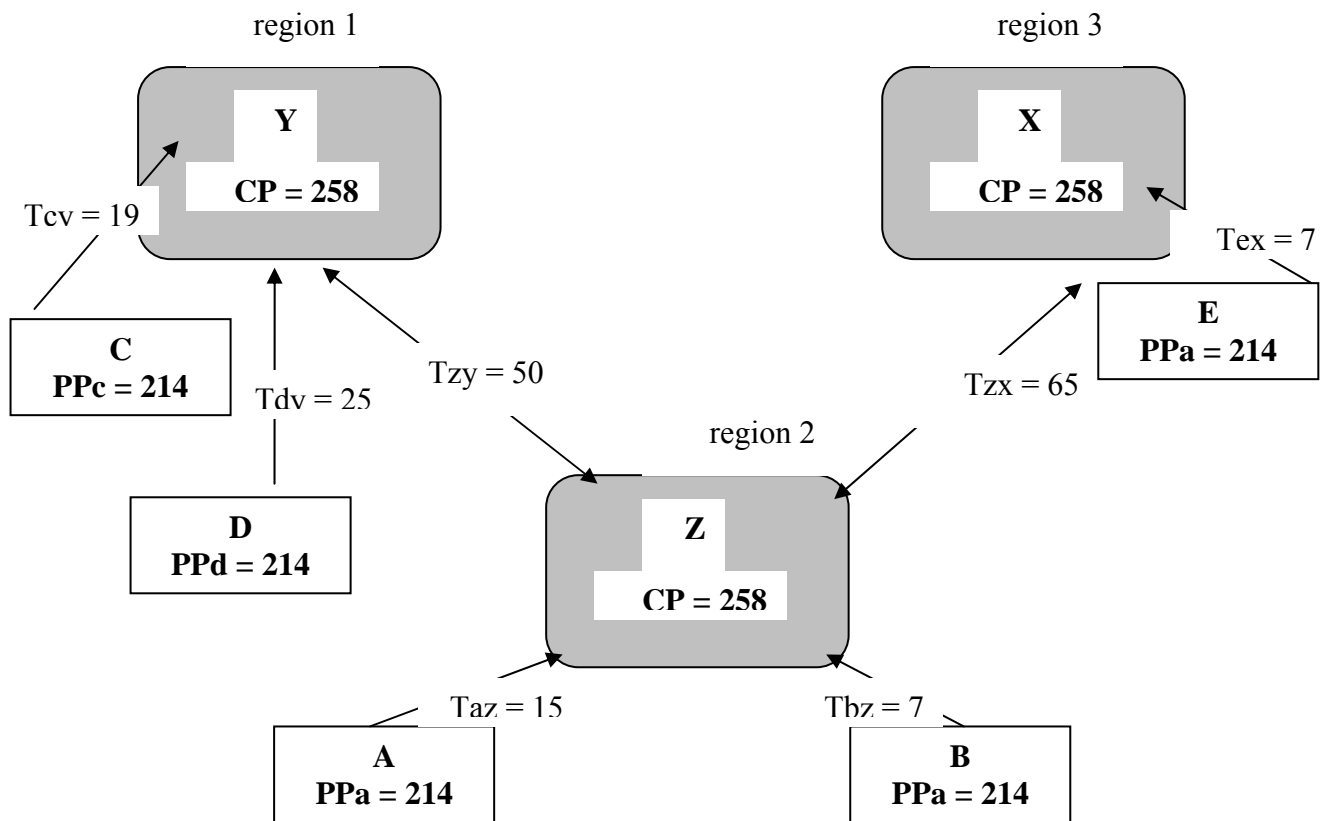
	open	panterrit	open	panterrit		open	panterrit
Y	260	258	1,960	1,968	3,928	509,600	507,744
Z	210	258	1,370	1,226	-62,304	287,700	316,308
X	275	258	3,625	3,710	62,348	996,875	957,180
			6,955	6,904	3,972	1,794,175	1,781,232

:

			open	panterrit	%
			1,794,175	1,781,232	-0.7
			515,075	523,050	1.5
			190,686	222,992	16.9
			1,088,414	1,070,428	-1.7
			0	35,238	
				-16,350	-1.5
				3,972	0.2
		التغير الصافي في مستوى الرفاه		-12,379	-0.7

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CIF

CIF

FOB

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MODEX

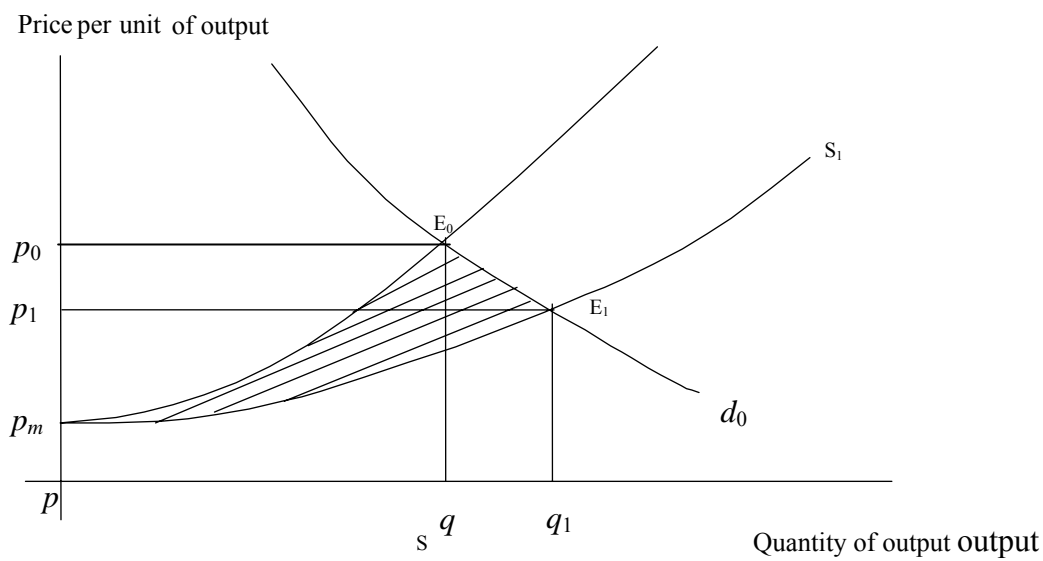
MODEX :

MODEX

MODEX

S1 S0

Rivas L., J. A. García, C. Seré, L. S. Jarvis, L. R. Sanint, and D. Pachico *Economic surplus analysis model (modexc)* website <http://www.ciat.cgiar.org/impact/index.htm> CIAT, 1999.



$$E_1(p_1, q_1)$$

$$E_0(p_0, q_0)$$

$$p_0 p_1 E_0 E_1$$

$$p_m F E_1 - \text{ (NPS)}$$

$$p_m F E_1 - p_0 E_0 F p_1$$

$$p_m E_0 E_1 - p_0 E_0 F p_1$$

(Alston et al. 1988)

(Alston et al. 1988)

MODEX

$(\eta=\infty)$

(k)

MODEX

(k)

(k)

(k_p)

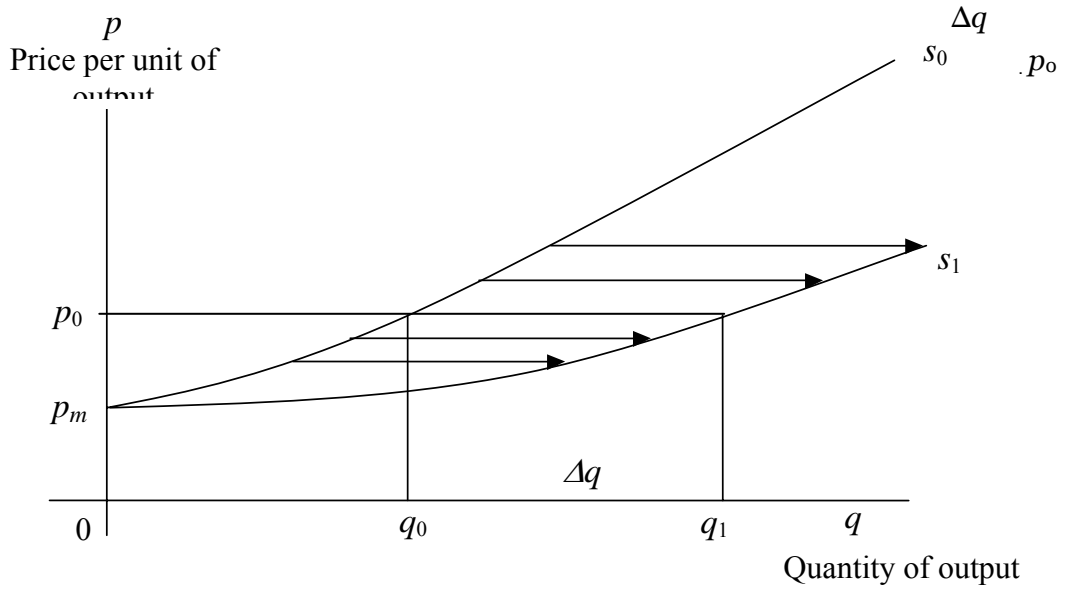
(k_c)

$$k_p = k_c \phi_p \quad (3)$$

Φ_p

: k

$$k = \frac{q_0 + (q_1 - q_0)}{q_0} = \frac{q_0 + \Delta q}{q_0}$$



() Pachio

:

:

$$s_0 = c(p - p_m)^g \quad (5)$$

:

= s_0

= c, g

= p

= p_m

:

E_0

(q_0, p_0)

-

ϕ_{p_i}

-

(p_m)

-

:

$$g_i = \frac{\phi_{p_i}(p_{0i} - p_{mi})}{p_{0i}} \quad (7)$$

"i"

ϕ_{p_i}

$$c_i = \frac{q_{0i}}{(p_{0i} - p_{mi})^{g_i}} \quad (8)$$

: (1908) Nerlove

$$p_t^* = \alpha_1 p_{t-1} + \alpha_2 p_{t-2} + \alpha_3 p_{t-3} + \alpha_4 p_{t-4} + \alpha_5 p_{t-5} \quad (10)$$

"t"

= p_t^{*}

"t-n"

"t-1"

= p_{t-1}...p_{t-n}

= α₁...α_n

:

k

:

k

:

-

$$s_1 = ck(p - p_m)^g \quad (11)$$

:

-2

$$s_1 = c(kp - p_m)^g \quad (12)$$

:

-3

$$s_1 = c\left(p_0 - \frac{p_m}{k}\right)^g \quad (13)$$

:

$$s_1 = k_1 c \left(k_2 p - \frac{p_m}{k_3} \right)^g \quad (14)$$

:

k_3 k_2 k_1
 k k_3 k_2 k_1
 : a :

$$d_{0a} = b_a p_a^{\eta_a} \quad (15)$$

a = d_{0a}
 a = p_a
 a = η_a
 = b_a

:

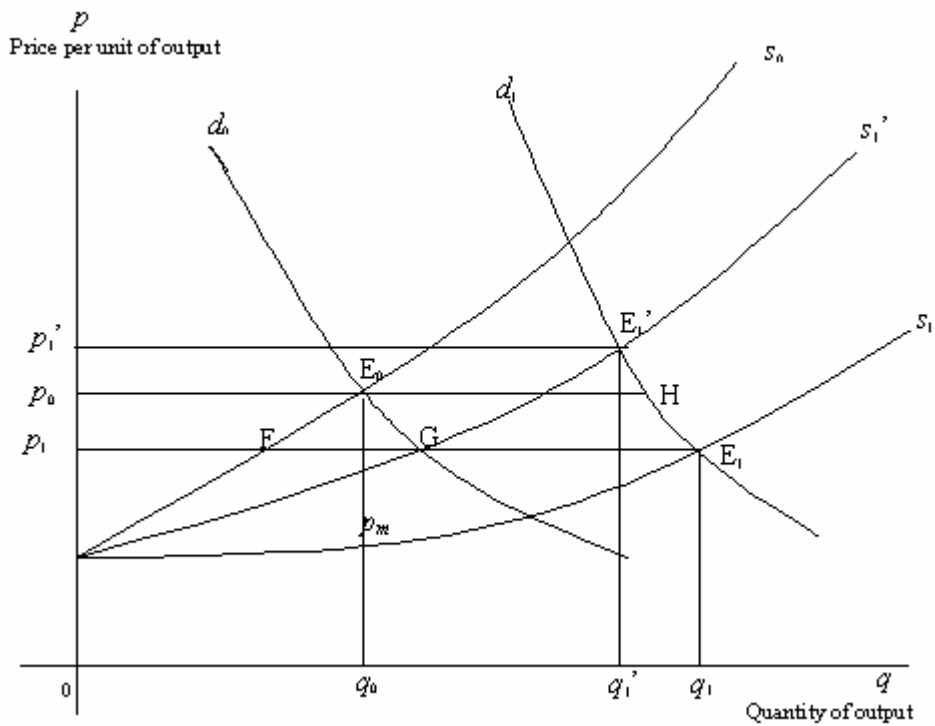
p_o, q_o -
 (η) -

MODEX

d0 S0

d1 s_1'

. (E1) "t" s1 s_1'



$$\begin{aligned}
 c(p-p_m)^g, &= s_0 \\
 c(1+\theta)^t (p-p_m)^g, &= s_1' \\
 c(1+\theta)^t k(p-p_m)^g, &= s_1 \\
 bp^{Np}, \text{ and} &= d_0 \\
 b(1+AGRD)^t p^{Np}. &= d_1
 \end{aligned}$$

: k_d

$$k_{d_t} = (1 + AGRD)^t \quad (18)$$

"t"

AGRD

MODEX

$$k_{0_t} = (1 + \theta)^t \quad (19) \quad = \theta$$

"t" = k_{ot}

$$s_0 = c(p - p_m)^g \quad (20)$$

$$s_1' = c(1 + \theta)^t (p - p_m)^g \quad (21)$$

$$s_1 = c_1(1 + \theta)^t k_1 \left(k_2 p - \frac{p_m}{k_3} \right)^g \quad (22)$$

$$d_0 = bp^N \quad (23)$$

$$d_1 = b(1 + AGRD)^t p^N \quad (24)$$

$$\theta \quad k \quad \theta$$

) k

$$p_1 p_0 H E_1 + (p_m E_1 F - p_1 p_0 E_0 F) \quad (25)$$

$$p_1 p_1' E_1' E_1 + (p_m E_1 G - p_1 p_1' E_1' G) \quad (26)$$

FAPRI AGLINK

(1) $s_{i,n} = s(p_{v,i,n}, p_{v,j,n}, Pol_s)$		(8) $c_{i,n} = c(p_{z,i,n}, p_{z,j,n}, Pol_c)$
(2) $r_{v,i,n} = r(p_{v,i,n}, PR)$		(9) $AL = al(p_{v,i,n}, p_{v,j,n})$
(3) $Qo_{v,i,n} = s_{i,n} r_{v,i,n}$		(10) $r_{z,i,n} = r(p_{z,i,n}, AL, PR)$
		(11) $Qo_{z,i,n} = c_{i,n} r_{z,i,n}$
(4) $Cu_{v,i,n} = cu(p_{v,i,n}, Y_n, POP_n)$		(12) $Qd_{z,i,n} = qd(p_{z,i,n}, Y_n, POP_n)$
(5) $AA_{v,i,n} = aa(Qo_{z,i,n})$		
(6) $SE_{v,i,n} = se(s_{v,i,n})$		
(7) $Qd_{v,i,n} = Cu_{v,i,n} + AA_{v,i,n} + SE_{v,i,n}$		
(13) $p_{i,n} = p(p_{i,w}, tc, Pol_p)$		
(14) $(E_{i,n} - I_{i,n}) = Qo_{i,n} - Qd_{i,n}$		
(15) $\Sigma (E_{i,n} - I_{i,n}) = 0$		
$i, j =$		$E =$
$v =$		$I =$
$z =$		$tc =$
$n =$		$PR =$
$s = (\quad)$		$\gamma =$
$c =$		$POP =$
$AL =$		
$r =$		
$Pol_p =$		
$Pol_s =$		

Conforti P. "The Common Agricultural Policy in Main Partial Equilibrium Models", *working paper* n 7, Istituto Nazionale di Economia Agraria (INEA), Osservatorio sulle Politiche Agricole dell'UE, website <http://www.inea.it/opaue/wp7.pdf>, Roma, 2001.

$Polc =$		
$Qo =$		
$p_n = n.$		
$p_w =$		
$Cu =$		
$AA =$		
$SE =$		
$Qd =$		

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 - () ()
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() () -

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CGE

-	
	$X_{agr}^S = f(L, K)$
	$X_{tex}^S = f(L, K)$

	$U_{rur} = f(X_{agr}, X_{tex})$
	$U_{urr} = f(X_{agr}, X_{tex})$

Magnani R. e Perali F. (a cura di) *Laboratorio di Politica Economica*, Dispensa n. 1, Università di Verona, Dipartimento di Scienze Economiche, 2002; and De Muro P. e Salvatici L. "The Common Agricultural Policy in Multisectoral Models", *working paper* n 11, Istituto Nazionale di Economia Agraria (INEA), Osservatorio sulle Politiche Agricole dell'UE, website <http://www.inea.it/opaue/wp11.pdf>, Roma, 2001

	$L = \mathbf{L}$
	$K = \mathbf{K}$

:

P_i	I	L^S_h	H
w		K^S_h	H
r		a_{hi}	
X^S_i	I		
${}_hX^D_i$	i h		
${}_D L_i$	I		
${}_D K_i$	I		
Y^h	H		

" "

.

$X^S_i = f(DL_i, DK_i)$	I	${}_hX^D_i = a_{hi} (Y^h / p_i)$	I
$w = (\partial X^S_i / \partial DL_i) p_i$			
$r = (\partial X^S_i / \partial DK_i) p_i$			
		$X^S_i = \sum_h {}_hX^D_i$	=
$Y^h = w L^S_h + r K^S_h$		$\sum_i DL_i = \sum_h L^S_h$	=
		$\sum_i DK_i = \sum_h K^S_h$	=
	$P_i X^S_i = DL_i w + DK_i r$		=
	$Y^h = \sum_i {}_hX^D_i p_i$		=

: (CGE)

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(SAM)

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Main references employed in the preparation of the teaching materials and of the handouts are listed below. These are meant to be also a starting point for the trainees that wish to expand their knowledge of the topic in the future

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