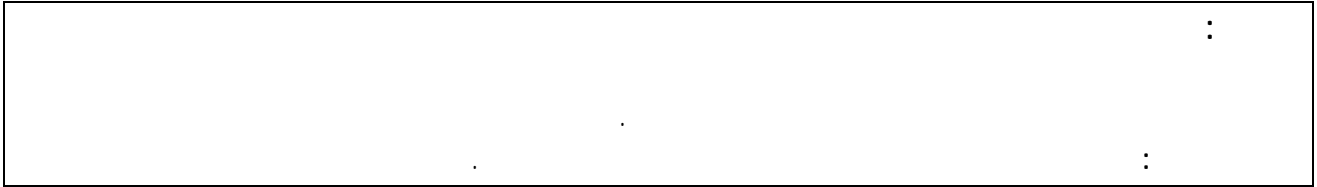


Gravity Model –

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.Linnemann

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(GNP. GDP)

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*mlahcene80@yahoo.com

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.4: (Mathur) : -1-1-I

Si (GDPj)j Si

$$X_{jt} = S_i Y_i = S_i S_j y_w = \frac{y_i y_j}{y_w}$$

$$GDP_{y_w} = \sum_{i=1}^n y_i, \quad st = \frac{y_i}{y_w}, \quad GDP \quad j \quad i \quad y_j, y_i$$

$$\log x_{jt} = b_0 + b_1 \cdot \log y_j + b_2 \log y_i$$

$$b_0 = -\log y_w \quad b_1 = b_2 = 1$$

-2-1-I

$$x_{ij} = \alpha_0 y_i^{\alpha_1} \cdot y_j^{\alpha_2} \cdot L_i^{\alpha_3} \cdot L_j^{\alpha_4} \cdot D_{ij}^{\alpha_5} \cdot P_{ij}^{\alpha_6} \cdot e^{u_{ij}} \dots \dots (1)$$

j i : D_{ij} : y_i, y_j j i : x_{ij} : U_{ij} : P_{ij}

$$X_{ij} = \alpha_0 y_i^{\alpha_1} \cdot y_j^{\alpha_2} \cdot L_i^{\alpha_3} \cdot L_j^{\alpha_4} \cdot D_{ij}^{\alpha_5} \cdot P_{ij}^{\alpha_6} \cdot e^{u_{ij}} \dots \dots (2)$$

$$Y = \frac{y}{L}, \quad \alpha_3^* = \alpha_1 + \alpha_3, \quad \alpha_4^* = \alpha_2 + \alpha_4$$

$$X_{ij} = \alpha_0 y_i^{\alpha_1^*} \cdot y_j^{\alpha_2^*} \cdot Y_i^{\alpha_3^*} \cdot Y_j^{\alpha_4^*} \cdot D_{ij}^{\alpha_5} \cdot P_{ij}^{\alpha_6} \cdot e^{u_{ij}}$$

$$\alpha_1^* = -\alpha_3, \quad \alpha_2^* = -\alpha_4, \quad \alpha_3^* = \alpha_1 + \alpha_3, \quad \alpha_4^* = \alpha_2 + \alpha_4$$

$$\log X_{ij} = \alpha_0^* + \alpha_1^* \log y_i + \alpha_2^* \log y_j + \alpha_3^* \log Y_i + \alpha_4^* \log Y_j + \alpha_5 \log D_{ij} + \alpha_6 P_{ij} + U_{ij}$$

$$\alpha_0^* = \log \alpha_0, \quad P_{ij} = (1,0)$$

(p.p.p)

	:	-2-I
6.	:	
j i	: Cost of border	-1-2-I
	j i	
	: Explaining Trade patterns	-2-2-I
		Intra-Industrial Trade
	: Trade creation versus trade diversion	-3-2-I
	j i	
"both in"		"Both in" :
		"in out" :
"in out"		
	: Calculation of Trade potentials	-1-2-I

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: -3-I

: Problem of multicollinearity

-1-3-I

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-2-3-I

GNP Per Capita GNP

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Atlas

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$$\Delta = \tau_j - \tau_i$$

$$\Delta_{ij} = \text{Arc cos}[\sin Q_i \cdot \sin Q_j + \cos Q_i \cdot \cos Q_j \cdot \cos \Delta_{ij}]z$$

τ

Q

τ_j

τ_i

Δ_{ij}

z :

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-3-3-I

(1)

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-II

GAFTA

: 2009-2005

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2008

%8.7

2009

%10.3

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11.9

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(2009-2005)

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-2-2-II

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() ((4)) ()
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-III

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-1-III

. R²= 42.6 ¹² 1996-1990

Limam, Imed and Adil Abdallah

¹³.1995-1988

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(2009)

2007-1990

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-2000

-2-III

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19

2009

Log (X_{ij})=-6.212423+0.523833 log (GNI)_i + 0.271779 log (GNI)_j+0.459105 log (GNI per Capit)_i
 + 0.074271 log (GNI per Capit)_j -0.819303 log (dist)_{ij}+0.703015 log (adj)+0.230766 log (lang)_{ij} -
 0.181796 (ECR)_j
 A_{dj}.R² = 99.9959.

: log level

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: SBL ()

: CRL

: CLL

j i

: (dist)_{ij} j i

: (GNI)_{ij}

: Bo

: (ECR)_j j i

: (lang)_{ij} : j i

: (adj)_{ij}

: Ue j

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Gravity Model -

(2009-2005)

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2009	2008	2007	2006	2005	
10.3	8.7	8.8	8.5	8.5	
11.2	11.9	12.01	13.4	12.6	

173 :

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2009 2005

: (2)

2009		2005		()				
(%)	(%)	(%)	(%)					
2009	2005	2009	2005	2009	2005	2009	2005	
11.2	11.1	10.3	7.9	66.898	38.487	74.355	44.812	
6.2	8.3	6.0	5.0	21.046	15.751	31.036	20.012	
2.6	2.7	2.9	2.0	2.972	1.816	3.298	2.154	
1.8	1.3	3.9	1.3	1.951	924	2.225	642	
17.2	19.7	14.9	12.9	45	22	42	21	Mercosur
24.5	24.3	25.5	24.9	229	144	252	162	ASEAN

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2010

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(2009-2005)

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2009	2008	2007	2006	2005	/	2009	2008	2007	2006	2005	/
0,287/182	0,284/180	0,295/180	0,316/174	0,303/170		-----	0,867/101	0,883/93	0,887/99	0,0887/80	
0,863/153	0,858/165	0,807/169	0,70/165	0,821/152		0,855/101	0,849/80	-----	-----	-----	
0,905/46		0,856/43	0,778/37	-----		0,46/173	0,654/161	0,426/172	0,352/198	0,492/170	
0,933/195	0,935/186	0,903/196	0,872/194	-----		0,993/0	0,996/0	0,994/0	0,98/0	0,984/0	
-----	0,842/33	-----	0,357/27	0,549/22		0,359/143	0,23/148	0,395/147	0,469/132	0,407/128	
-----	0,763/90	-----	-----	0,555/108		-----	-----	0,856/178	0,846/144	0,896/161	
0,371/195	0,354/190	0,38/194	0,403/187	0,932/186		0,168/177	0,218/172	0,172/178	0,184/175	0,176/181	
0,9178/170	0,939/151	0,9127/126	0,913/0	0,923/0		0,9478/29	0,9478/29	0,9478/29	0,9478/29	0,9478/29	
0,6329	0,662	0,678	0,762	0,67		0,9711/0	0,9753/0	0,96/0	0,960/0	0,9671/0	

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2009-2005

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	ALG	BAH	EGY	IRQ	JOR	KUW	LEB	LYB	MUR	MOR	QAT	OMA	SAU	SOM	SUD	SYR	TUN	EMI	YEM
ALG	1,000000	0,845109	0,845025	0,703107	-0,189925	0,952364	0,187098	0,895467	-0,653753	-0,426106	0,773983	0,941459	0,964392	-0,598903	0,909069	0,764782	-0,514680	0,888271	0,859464
BAH	0,845409	1,000000	0,573354	0,701799	0,169783	0,719604	0,151983	0,664096	-0,778886	-0,639866	0,772652	0,747915	0,819321	-0,655838	0,797137	0,517848	-0,813674	0,576804	0,650005
EGY	0,84525	0,573354	1,000000	0,295719	-0,647674	0,890691	-0,202123	0,776388	-0,338839	-0,055417	0,405209	0,859392	0,928057	-0,214233	0,704598	0,443599	-0,304390	0,880496	0,850257
IRQ	0,703107	0,701799	0,295719	1,000000	0,440624	0,594735	0,57593	0,50021	-0,882975	-0,902445	0,981472	0,723598	0,540264	-0,945890	0,868508	0,768372	-0,443583	0,587688	0,623313
JOR	-0,189925	0,169783	0,647674	0,440624	1,000000	-0,40148	0,373343	-0,363231	-0,457654	-0,714477	0,320932	0,268556	-0,376834	-0,553116	-0,270050	0,135974	-0,371713	-0,462857	-0,391659
KUW	0,952384	0,719604	0,890891	0,594735	-0,40148	1,000000	0,250017	0,939927	-0,474275	-0,296697	0,701339	0,952668	0,962100	-0,420918	0,885915	0,671212	-0,275801	0,970477	0,938135
LEB	0,187098	0,151983	-0,202123	0,57593	0,372243	0,250017	1,000000	0,359903	-0,162563	-0,632133	0,572064	0,203464	0,038722	-0,347546	0,362444	0,488643	0,281626	0,258817	0,225102
LYB	0,895467	0,664096	0,776388	0,50021	-0,363231	0,939927	0,359903	1,000000	-0,29511	-0,231423	0,597916	0,804977	0,880214	-0,285125	0,741739	0,724900	-0,194990	0,866609	0,775346
MUR	-0,653753	0,778885	-0,338839	-0,882975	-0,457654	-0,474275	-0,162563	-0,29511	1,000000	0,820429	-0,862838	-0,673837	-0,543425	-0,957116	-0,795412	-0,544599	0,746014	-0,444439	-0,547248
MOR	-0,425106	-0,639866	0,055417	-0,902445	-0,714477	-0,296697	-0,532133	-0,231423	0,820439	1,000000	-0,875845	-0,347059	-0,267676	0,869519	-0,651160	-0,502659	0,474517	-0,253369	-0,353310
QAT	0,773983	0,772652	0,405209	0,981472	0,320932	0,701339	0,572064	0,597916	-0,862838	-0,875845	1,000000	0,80751	0,650325	-0,889346	0,930310	0,729415	-0,447511	0,683754	0,735206
OMA	0,941459	0,747915	0,859392	0,723598	-0,268556	0,952668	0,203464	0,804977	-0,673837	-0,437059	0,80751	1,000000	0,933511	-0,612476	0,966815	0,656984	-0,377748	0,956212	0,971935
SAU	0,964392	0,819321	0,928057	0,540264	-0,376834	0,962100	0,038722	0,880214	-0,543425	-0,267676	0,650325	0,933511	1,000000	-0,427561	0,855358	0,580028	-0,489540	0,896491	0,894323
SOM	-0,598903	-0,655838	-0,214233	-0,94589	-0,553116	-0,420918	-0,347546	-0,285125	-0,957116	0,865419	-0,889346	-0,612476	-0,427561	1,000000	-0,763081	-0,679978	0,586755	-0,417865	-0,473013
SUD	0,909069	0,797137	0,704598	0,868508	-0,027005	0,885915	0,362422	0,741739	-0,795412	-0,65116	0,39031	0,966815	0,855358	-0,763081	1,000000	0,700845	-0,432569	0,882116	0,921618
SYR	0,764782	0,517848	0,443599	0,768372	0,135274	0,671212	0,484643	0,7249	-0,544599	-0,502659	0,729415	0,656984	0,580028	-0,679978	0,700545	1,000000	-0,232668	0,651697	0,516995
TUN	-0,51468	-0,813674	-0,30439	-0,443583	-0,371713	-0,275801	0,281626	-0,17499	0,746014	0,474517	-0,447511	-0,377748	-0,489540	0,586755	-0,432569	-0,232668	1,000000	-0,121902	-0,222912
EMI	0,858271	0,576804	0,88046	0,587688	-0,462857	0,970477	0,258817	0,866609	-0,444439	-0,253369	0,683754	0,956212	0,896491	-0,417865	0,882116	0,651697	-0,121902	1,000000	0,965402
YEM	0,859464	0,650005	0,850257	0,623313	-0,391659	0,938135	0,225102	0,775346	-0,547248	-0,35331	0,735206	0,951935	0,89423	-0,473013	0,921618	0,516995	-0,222912	9,965402	1,000000

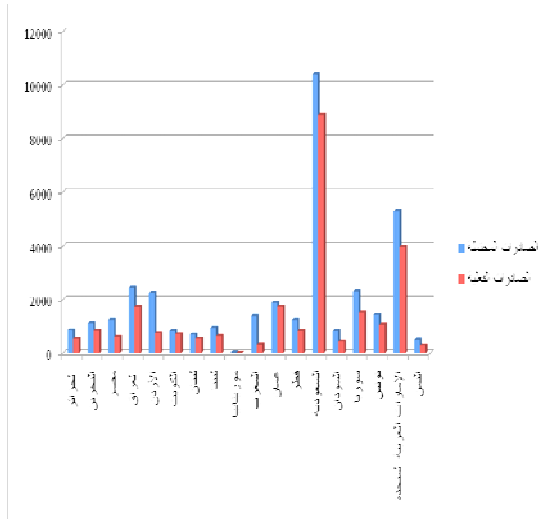
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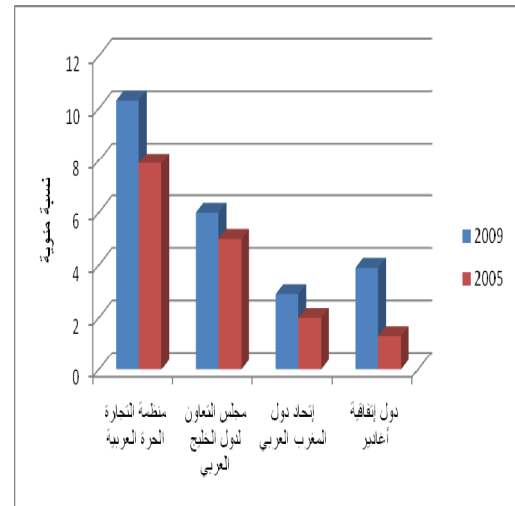
1.389.794.570	334.638.277		874.312.219	551.555.556	
1.886.453.155	1.733.400.822		1.108.839.477	858.850.575	
1.234.719.037	845.456.139		1.234.114.296	630.142.133	
10.405.876.114	8.898.102.406		2.461.217.331	1.732.492.300	
844.316.208	443.774.753		2261167690	760.655.276	
2313.947.110	1.521.284.162		844.682.118	731.888.911	
1.432.861.223	1.060.196.995		716.513.801	561.345.471	
5.308.212.479	3.981.787.467		962.318.444	657.626.450	
512.391.207	295.061.343		30.103.200	13.803.659	
33.721.839.679			26.028.869.054		

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