

## الملاحق

### ملحق رقم (1) بيانات الدراسة :

year	INF	GDP	ER	EX	POP	DOP	MS	I	T	R	F	FC
1980	26.09	397.2	0.005	39.46	18362	0.296601	123.211	37.9	2	0.367	20	8
1981	22.56	495.1	0.009	55.44	19079	0.313512	156.967	24.13	3	3.033	22	10
1982	27.69	704	0.013	68.48	19829	0.340085	216.104	160.6	4	3.2513	25	10
1983	31.13	959.2	0.013	96.75	20210	0.346049	277.45	153.03	3	2.2594	21	12
1984	32.45	1180.7	0.025	13.02	20530	0.19679	326.149	162.7	1	-	22	14
1985	46.33	1535.7	0.025	844.714	20882	1.657904	601.81	693.1	2	-3.625	34	16
1986	29.04	2021.8	0.025	833.205	21085	1.600278	775.61	240.3	2	-	56	16
1987	24.98	3647.1	0.045	1497.081	21290	1.12692	1040.74	472.83	3	31.563	67	19
1988	49.14	4679.2	0.045	2290.88	21724	1.509618	1420.85	716.26	6	13.986	88	20
1989	74.08	8256.2	0.045	3023.1	22394	1.09454	2270.87	1100.04	8	-	78	22
1990	67.4	11011.1	0.045	374.1	23079	0.09017	3164.46	1026.6	8	-17.9	77	29
1991	123.7	19266	0.045	305	23780	0.062043	5269.55	2588.89	9	93.4	709	28
1992	117.6	42181.8	0.1	319.3	24495	0.027031	14159.45	7306.23	14	29.3	524	32.9
1993	101.3	94844.8	0.1328	417.267	25222	0.014123	26858.34	18796	11	-41.8	3140	27.2
1994	115.4	188129	0.216	523.9	25961	0.009081	40535.29	42643.9	203	30.5	30816	27
1995	68.4	404973.9	0.4	555.7	26688	0.005087	70586.6	89404.59	243	-23.6	82049	28
1996	132.7	1047814	1.2464	620.186	27875	0.0021	116598.6	140908.2	401	-2	134020	30
1997	47.7	1613737	1.5765	594.182	28627	0.001561	159713.7	284293.7	2102	24	137176	41.7
1998	17.1	2193591	1.9945	595.741	29496	0.000917	206951.3	575137.7	4041	24	196770	36.3
1999	16	2705881	2.516	780.058	30326	0.000448	257918	442450.8	2347	-110	463230	28
2000	8	3366271	2.5714	1806.708	31081	0.000994	346671	388761.7	1345	-108	731028	25.7
2001	4.9	3769274	2.587	1698.703	31913	0.001061	432213	678747.2	218	127.6	412494	15.2
2002	8.3	4283554	2.6334	1949.115	32769	0.001026	563266	1042641	107	-300	1197690	14.9
2003	7.7	4971336	2.6082	2542.176	33648	0.001091	742356	1025156	177	-422.6	1370780	16.2
2004	8.5	4910662	2.5826	3777.764	34512	0.001599	969779.4	1306843	266	-730.2	3317990	11.3
2005	8.5	6432876	2.4358	4824.278	36198	0.0018	1403138	1258520	128	-530.5	6645836	11
2006	7.2	8001578	2.1715	5656.568	37158	0.001716	1787178	2079352	125	208.6	4529749	11.3
2007	8.1	9329965	2.0159	8879.25	38143	0.001892	1971462	2216531	173	282	5684838	11.8
2008	14.3	942697	2.0913	11670.5	39154	0.0223	2293316	2580700	124	-21.12	4412643	11.8
2009	11.2	141010	2.2359	19119.5	40522	0.318977	16,106.3	7702	140.67	119.88	11224218	10.2
2010	13	162203.9	2.2373	20758	42247	0.29092	19908.3	25158	145.89	-	12126166	9.7
2011	18	214503.8	2.4851	21448	42246	0.234305	41853	40831	136.85	174.2	3161989	9.9

المصدر: بنك السودان المركزي، الجهاز المركزي للإحصاء، دراسات سابقه

## ملحق رقم (2) اختبار التكامل المشترك

Date: 06/28/15

Time: 13:12

Sample: 1980

2011

Included  
observations:  
30

Test  
assumption:

Linear  
deterministic  
trend in the  
data

Series: EX ER  
I MS DOP

Lags interval:  
1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.999929	351.2323	68.52	76.07	None **
0.640523	64.79143	47.21	54.46	At most 1 **
0.508372	34.09828	29.68	35.65	At most 2 *
0.346540	12.79732	15.41	20.04	At most 3
0.001103	0.033099	3.76	6.65	At most 4

## ملحق رقم (3) تقدير النموذج اللوغريثمي

Dependent Variable: LOG(EX)

Method: Least Squares

Date: 08/10/15 Time: 21:09

Sample: 1980 2011

Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.298027	4.034677	-0.073866	0.9417
LOG(MS)	0.547143	0.185114	2.955702	0.0064
LOG(I)	-0.008596	0.180308	-0.047673	0.9623
LOG(DOP)	0.345548	0.158517	2.179885	0.0382
LOG(ER)	-0.289746	0.495420	-0.584849	0.5635
R-squared	0.673179	Mean dependent var		6.919223
Adjusted R-squared	0.624761	S.D. dependent var		1.847186
S.E. of regression	1.131526	Akaike info criterion		3.227613
Sum squared resid	34.56950	Schwarz criterion		3.456634
Log likelihood	-46.64181	F-statistic		13.90349
Durbin-Watson stat	0.785238	Prob(F-statistic)		0.000003

## ملحق رقم (4) تقدير النموذج نصف لوغريثمي

Dependent Variable: LOG(EX)

Method: Least Squares

Date: 08/10/15 Time: 21:11

Sample: 1980 2011

Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.664998	0.294359	19.24521	0.0000
MS	1.05E-07	3.04E-08	3.450612	0.0019
I	1.04E-06	4.11E-07	2.542247	0.0171
ER	0.376951	0.278079	1.355557	0.1865
DOP	1.50E-05	5.85E-06	2.557151	0.0165
R-squared	0.658341	Mean dependent var	6.919223	
Adjusted R-squared	0.607725	S.D. dependent var	1.847186	
S.E. of regression	1.156927	Akaike info criterion	3.272013	
Sum squared resid	36.13896	Schwarz criterion	3.501034	
Log likelihood	-47.35220	F-statistic	13.00654	
Durbin-Watson stat	0.821446	Prob(F-statistic)	0.000005	

## ملحق رقم ( 5 ) تقدير النموذج المصحح

Dependent Variable: EX

Method: Least Squares

Date: 06/28/15 Time: 13:00

Sample: 1980 2011

Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	719.3740	258.4159	2.783784	0.0097
MS	0.000647	2.67E-05	24.27390	0.0000
DOP	0.100732	0.005136	19.61126	0.0000
I	0.003583	0.000361	9.929551	0.0000
ER	-733.9676	244.1235	-3.006542	0.0057
R-squared	0.975640	Mean dependent var	3686.816	
Adjusted R-squared	0.972031	S.D. dependent var	6073.067	
S.E. of regression	1015.659	Akaike info criterion	16.82706	
Sum squared resid	27852207	Schwarz criterion	17.05609	
Log likelihood	-264.2330	F-statistic	270.3407	
Durbin-Watson stat	1.514569	Prob(F-statistic)	0.000000	

## ملحق رقم (6) اختبار مشكله اختلاف التباين

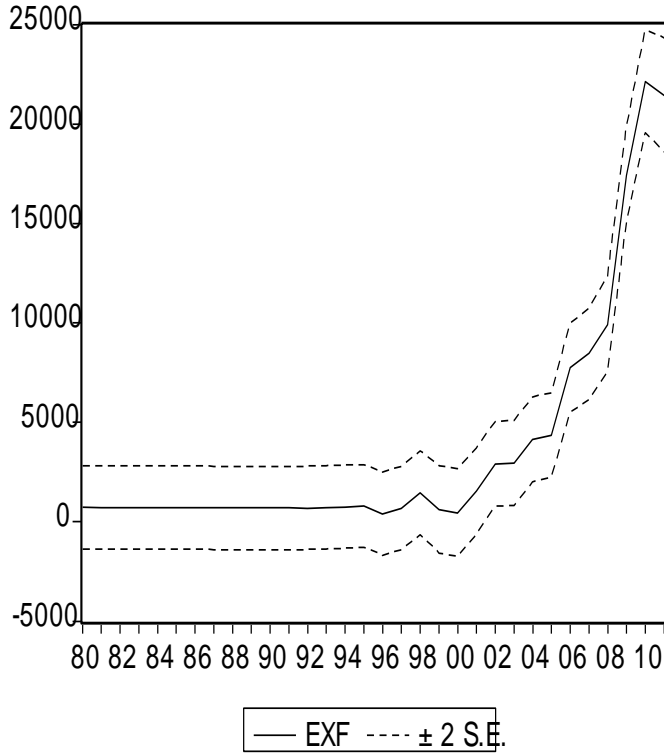
Dependent Variable: E\*E  
 Method: Least Squares  
 Date: 06/28/15 Time: 13:10  
 Sample: 1980 2011  
 Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	723337.9	352571.7	2.051605	0.0497
DOP	-2.765375	6.790861	-0.407220	0.6869
I	0.509428	0.453349	1.123699	0.2707
ER	-52240.50	292497.8	-0.178601	0.8595
R-squared	0.072409	Mean dependent var		870381.5
Adjusted R-squared	-0.026976	S.D. dependent var		1367423.
S.E. of regression	1385744.	Akaike info criterion		31.23784
Sum squared resid	5.38E+13	Schwarz criterion		31.42106
Log likelihood	-495.8055	F-statistic		0.728574
Durbin-Watson stat	1.717794	Prob(F-statistic)		0.543582

## ملحق رقم (7) مصفوفه الارتباطات لكشف مشكله الارتباط الخطى

	MS	DOP	I	ER
MS	1	-	-0.075788591062	0.291913663142
DOP	0.0537856880872	1	-0.101959845302	0.211707317946
I	-0.075788591062	-0.101959845302	1	0.607043012898
ER	0.291913663142	0.211707317946	0.607043012898	1

ملحق رقم (8)  
اختبار مقدره النموذج على التنبؤ



Forecast:	EXF
Actual:	EX
Forecast sample:	1980 2011
Included observations:	32
Root Mean Squared Error:	82.9424
Mean Absolute Error:	702.7376
Mean Abs. Percent Error:	43.1222
Theil Inequality Coefficient:	0.6716
Bias Proportion:	0.000000
Variance Proportion:	0.006165
Covariance Proportion:	0.93835