CHAPTER-7

INTERVENTION ANALYSIS THROUGH THE STUDY OF IMPULSE RESPONSE FUNCTIONS FOR EXPORT GROWTH AND ECONOMIC GROWTH IN SRI LANKA

7.1 Introduction:

VAR model represents a 'Simultaneous Equation System' where for each endogenous variable one equation is specified. Again each equation contains the autoregressive structure of the endogenous variable along with distributed lag structures of other endogenous variables. Consequently, a shock to the 'i th' variable not only directly affects the 'i th' variable itself but the shock is also transmitted to all other endogenous variables through the dynamic (lag) structure of the VAR.

An *Impulse Response Function* traces the effects of a one time shock to one of the innovations on current and future values of the endogenous variables. In other words, *Impulse Response Function* traces the response of a variable through time to an unanticipated change in 'itself' or other interrelated variables. Therefore, the *Impulse Response Function* can be used in any VAR system to describe the dynamic behaviors of the whole system with respect to shocks in the residuals of the time series.

The VAR model estimated in chapter-6 contains two endogenous variables, namely, the economic growth (Y_t) and export growth (X_t). We, therefore, seek to study in this chapter the dynamic response of Y_t and X_t across different time periods in response to shocks transmitted through channels of different endogenous variables concerned.

7.2 Graphical Presentation of Impulse Response Functions For Economic Growth:

The relevant *Impulse Response Functions* of economic growth in response to impulses, transmitted through the channels of economic growth and export growth, are being presented through the Figures 7.1.1 and 7.2. The numerical values of these responses across different periods are given by the Table-7.1

Figure-7.1

Response to Cholesky One SD Innovations ± 2SE

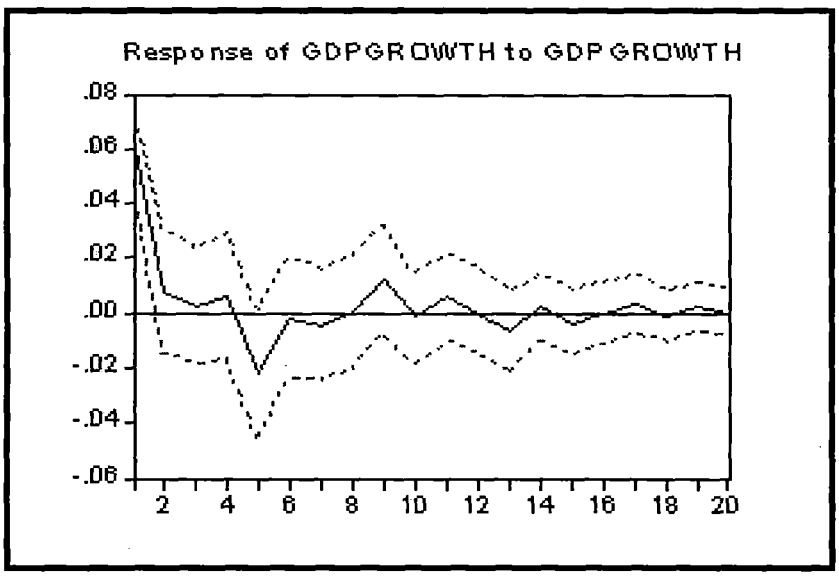

Figure-7.2
Response to Cholesky One SD Innovations ± 2SE

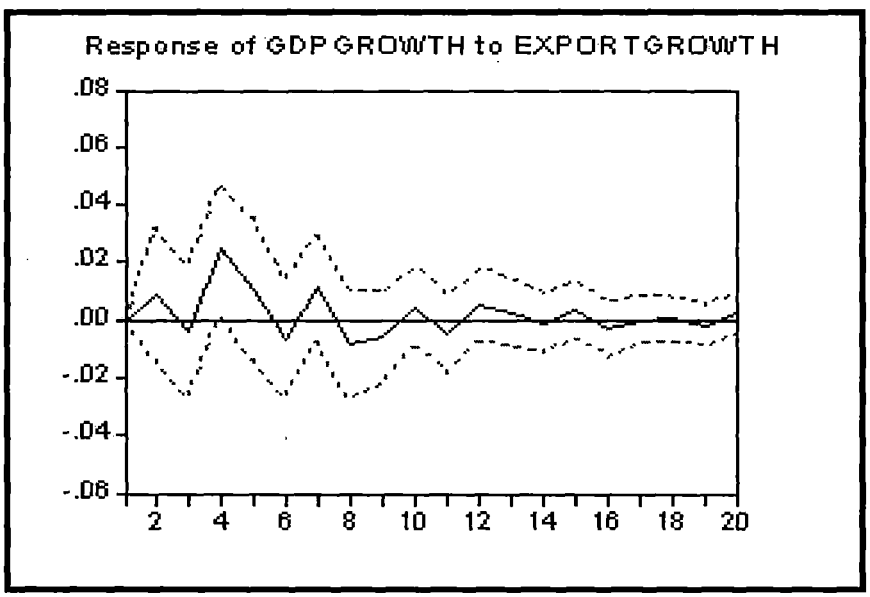

Figure-7.3

Response to Cholesky One SD Innovations ± 2SE

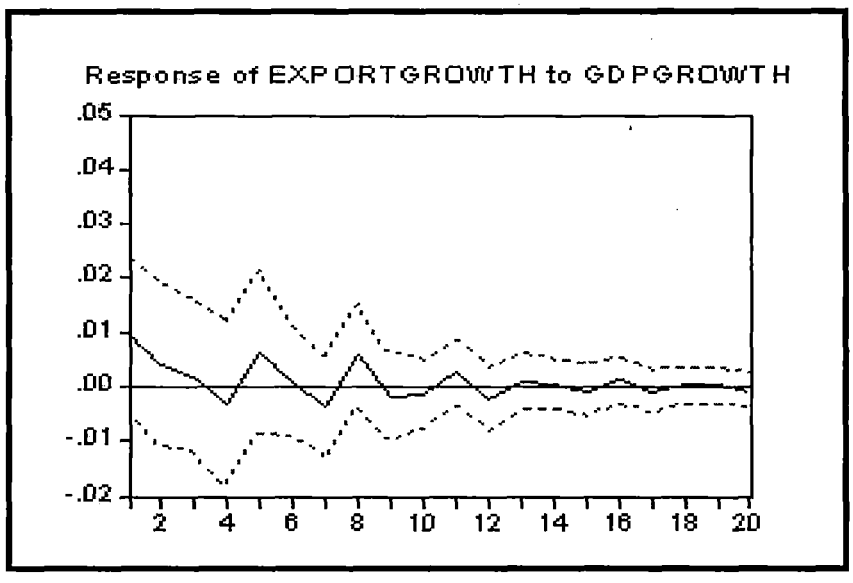

Figure-7.4
Response to Cholesky One SD Innovations ± 2SE

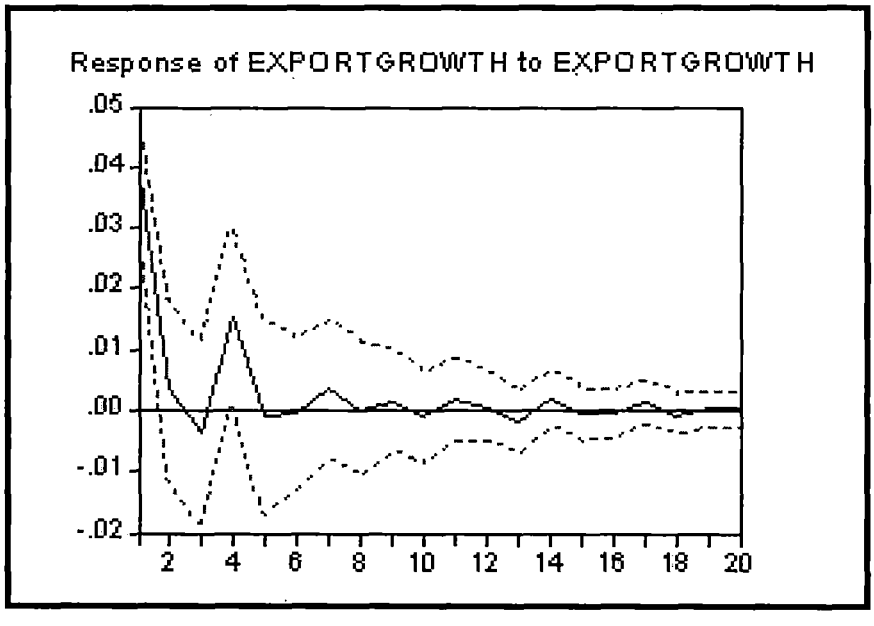

Table-7.1
Response of Economic Growth

Response of Economic Growth		
Period	Economic Growth	Export Growth
1	0.059764	0.000000
	(0.00759)	(0.00000)
2	0.007939	0.009071
	(0.01135)	(0.01147)
3	0.002009	-0.003528
	(0.01062)	(0.01151)
4	0.006075	0.024406
	(0.01148)	(0.01164)
5	-0.022138	0.010859
	(0.01196)	(0.01218)
6	-0.001825	-0.006469
	(0.01077)	(0.01005)
7	-0.004388	0.010965
	(0.01005)	(0.00918)
8	0.000401	-0.008313
	(0.01019)	(0.00935)
9	0.012077	-0.005912
	(0.00977)	(0.00782)
10	-0.001587	0.004397
	(0.00815)	(0.00692)
11	0.005556	-0.004420
	(0.00786)	(0.00672)
12	8.56E-05	0.004782
	(0.00771)	(0.00632)
13	-0.006814	0.002021
	(0.00738)	(0.00588)
14	0.002162	-0.000908
	(0.00611)	(0.00506)
15	-0.003674	0.002951
	(0.00602)	(0.00487)
16	5.05E-06	-0.003407
	(0.00564)	(0.00482)
17	0.003422	2.59E-05
	(0.00542)	(0.00429)

Table-7.2
Response of Export Growth

Response of Export Growth		
Period	Economic Growth	Export Growth
1	0.009432	0.038157
	(0.00696)	(0.00485)
2	0.003843	0.003531
	(0.00740)	(0.00752)
3	0.001832	-0.003407
	(0.00691)	(0.00747)
4	-0.003247	0.015218
	(0.00741)	(0.00748)
5	0.006426	-0.001088
	(0.00754)	(0.00793)
6	0.001073	-0.000682
	(0.00518)	(0.00610)
7	-0.003534	0.003412
	(0.00468)	(0.00565)
8	0.005703	7.20E-05
	(0.00475)	(0.00551)
9	-0.001873	0.001508
	(0.00403)	(0.00411)
10	-0.001446	-0.001061
	(0.00317)	(0.00370)
11	0.002615	0.001686
	(0.00301)	(0.00342)
12	-0.002222	0.000570
	(0.00292)	(0.00275)
13	0.000930	-0.001888
	(0.00258)	(0.00257)
14	0.000376	0.001902
	(0.00232)	(0.00233)
15	-0.000775	-0.000645
	(0.00229)	(0.00211)
16	0.001256	-0.000685
	(0.00214)	(0.00187)
17	-0.000939	0.001290
	(0.00198)	(0.00186)

18	-0.001431	0.000333	18	0.000283	-0.000872
	(0.00449)	(0.00376)		(0.00174)	(0.00167)
19	0.002482	-0.002043	19	0.000355	0.000345
	(0.00447)	(0.00370)		(0.00168)	(0.00149)
20	-0.000355	0.002262	20	-0.000872	0.000246
	(0.00405)	(0.00354)		(0.00162)	(0.00140)

7.3 Findings From the Figure-7.1:

It is observed from the Figure-7.1 that following shocks, transmitted through the economic growth channel, economic growth

(i) responded immediately by rising above the long run base at t=1

(ii) fell bellow the long run base at t=5 and remained so until t=8

(iii) registered a small rise above the equilibrium base at t=9

(iv) touched the base at t=4,8,12 periods

(v) exhibited very damped oscillations around the base level for $10 \leq t \leq 20$

(vi) almost collapsed on the long –run base for $20 \leq t \leq \infty$

7.4 Findings From the Figure-7.2:

The Figure 7.2 shows that, following shocks transmitted through export growth channel, economic growth

(i) exhibited delayed response by rising above the base level at t=2

(ii) fell bellow the base level at t=3

(iii) exhibited damped oscillations around the base level for $6 \leq t \leq 16$

(iv) did not collapse on the base line even at period 10.

7.5 Overall Findings on the Nature of Economic Growth Responses:

(A) The findings in Sec 7.3 indicate that the shocks, transmitted through the channels of economic growth
(i) were short –lived

(ii) failed to change the long-run equilibrium base of economic growth

(iii) produced very damped oscillations in the economic growth around the long run base.

(B) The findings in Sec. 7.4 indicate that the shocks, transmitted through the channel of export growth
(i) were long-lived

(ii) seemed to distort the equilibrium base of economic growth

(iii) accounted for most of the short-run variations in economic growth for $t \leq 17$ periods.

7.6 Graphical Presentations of Impulse Response Functions for Export Growth (X_t):

The Impulse Response Functions of export growth (X_t) corresponding to equation 6.4 in the VAR system and in response to impulses transmitted through the channels of economic growth and export growth are being presented through the Figures 7.3 and 7.4. The corresponding numerical values of these responses are given by the Table-7.2

7.7 Findings from the Figure-7.3:

The Figure- 7.3 shows that , following shocks transmitted through the channel of economic growth, export growth
(i) exhibited immediate small rise above the long –run base at t=1

(ii) fell below the base level at t=4

(iii) exhibited very damped oscillations around the base level $3 \leq t \leq \infty$

(iv) collapsed on the base on the base level for $14 \leq t \geq \infty$ periods.

(v) oscillations were convergent.

7.8 Findings from the Figure -7.4:

The Figure -7.4 shows that, following impulses transmitted through the export growth channel, export growth

(i) responded immediately by rising above the long-run base at t=1

(ii) fell below the long-run base at t=3

(iii) exhibited damped oscillations around the long run equilibrium level for $t \geq 5$

(iv) collapsed on the equilibrium base for $t \geq 19$

7.9 Findings From the Joint Study of the Figures 7.3 and 7.4:

The joint study of Figures 7.3 and 7.4 indicate that

(i) short-run variations in export growth were mainly due to impulses transmitted through the channel of export growth

(ii) both type of shocks were short-lived since these failed to change the long-run equilibrium bases of export growth.

7.10 Overall Findings from the Study with Impulse Response Functions:

It is, therefore, observed from the findings in Secs. 7.3- 7.9 that

(i) export shocks were the predominant cause behind the short-run variations in export growth.

(ii) export shocks generated significant short-run variations in income growth

(iii) the shocks, transmitted through export growth seemed to distort the equilibrium base of economic growth. Consequently, export shocks were long-lived for economic growth.

(iv) shocks transmitted through the channels of economic growth and export growth failed to change the equilibrium base of export growth. Consequently, for export growth both these shocks were short-lived.