

CHAPTER – X

INTERVENTION ANALYSIS THROUGH THE STUDY OF VARIANCE DECOMPOSITION

10.1 Meaning and Relevance

We have seen how shocks to one endogenous variable may affect the other endogenous variables in the VAR model through *Impulse Response Functions*. In this section, with the help of *Variance Decomposition* we seek to separate the variations in an endogenous variable into some component shocks.

The *Forecast Error Variance Decomposition* reflects the proportion of the forecast error variance of a variable which is explained by an unanticipated change in itself as opposed to that proportion attributable to change in other interrelated variables. In other words, the *Forecast Error Variance Decomposition* tells us the proportion of the movement in a sequence due to its own shocks versus shocks of other variables.

10.2 Variance Decomposition for Trade Deficit

Variations in Trade Deficit over the period of study were basically the effects of responses of trade deficit to shocks transmitted through both trade deficit and budget deficit channels. So a part of total variances in trade deficit was due to trade deficit shocks and another part of the variation was due to the budgetary deficit shocks. The break-up of the total variations in trade deficit into the two deficit parts across different periods ($t = 1, 2, \dots, 20$) constitute the '*Variance Decomposition*' of trade

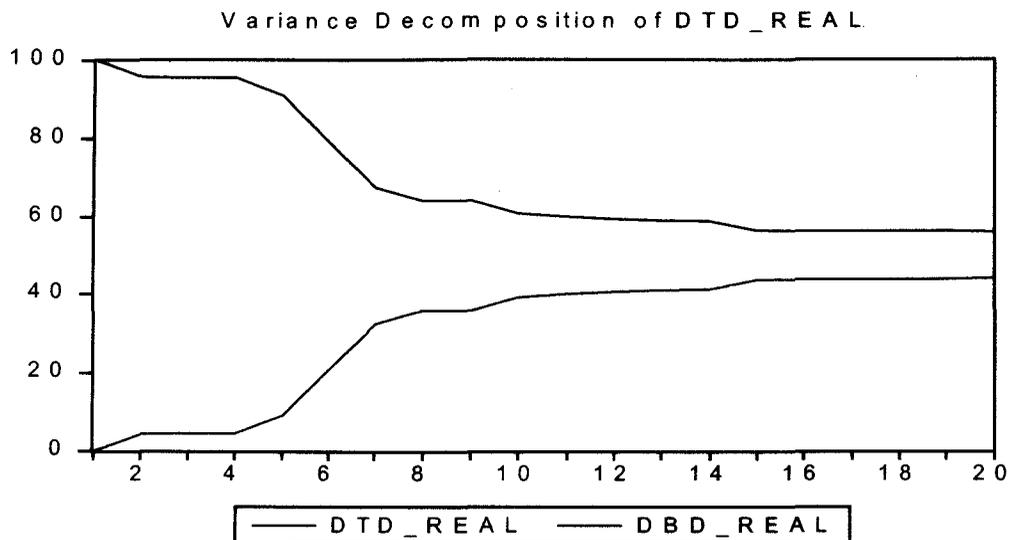
deficit. Such *Variance Decomposition* of trade deficit (TD_t) is given by the Table-10.1.

The graphical presentation of Variance Decomposition for TD_t is being presented the Figure 10.1.

Table 10.1
Variance Decomposition of Trade Deficit (TD_t)

Periods	S.E.	TD_t	BD_t
1	865.1375	100.0000	0.000000
2	895.0773	95.62824	4.371758
3	899.2978	95.61352	4.386481
4	916.9793	95.47282	4.527184
5	946.8167	90.86401	9.135991
6	950.0875	79.01070	20.98930
7	976.6063	67.57134	32.42866
8	992.1744	64.10422	35.89578
9	999.5758	64.15113	35.84887
10	1003.936	60.71300	39.28700
11	1013.290	59.86616	40.13384
12	1013.977	59.30670	40.69330
13	1016.373	58.84937	41.15063
14	1025.900	58.75670	41.24330
15	1036.946	56.38812	43.61188
16	1037.604	56.13048	43.86952
17	1040.931	56.16586	43.83414
18	1042.397	56.12102	43.87898
19	1044.576	56.20171	43.79829
20	1046.111	55.86769	44.13231
Cholesky Ordering: DTD_REAL DBD_REAL			

Figure 10.1



10.3 Findings from the Table 10-1 and Figure 10.1

The Table 10.1 and Figure 10.1 show that

- (i) variations in trade deficit were mainly due to trade deficit shocks in the very early part of projections periods ($t \leq 4$).
- (ii) shocks, transmitted through budgetary deficit, assumed grater role in explaining variations in Trade Deficit since $t > 4$ periods.
- (iii) budgetary shocks became the dominant (important) factor behind short-run variations in Trade Deficit since $t > 6$ periods.
- (iv) for $t \rightarrow \infty$, the contribution of budgetary deficits shocks to total variations in Trade Deficit was about 44% while that of trade deficit was at about 56%.

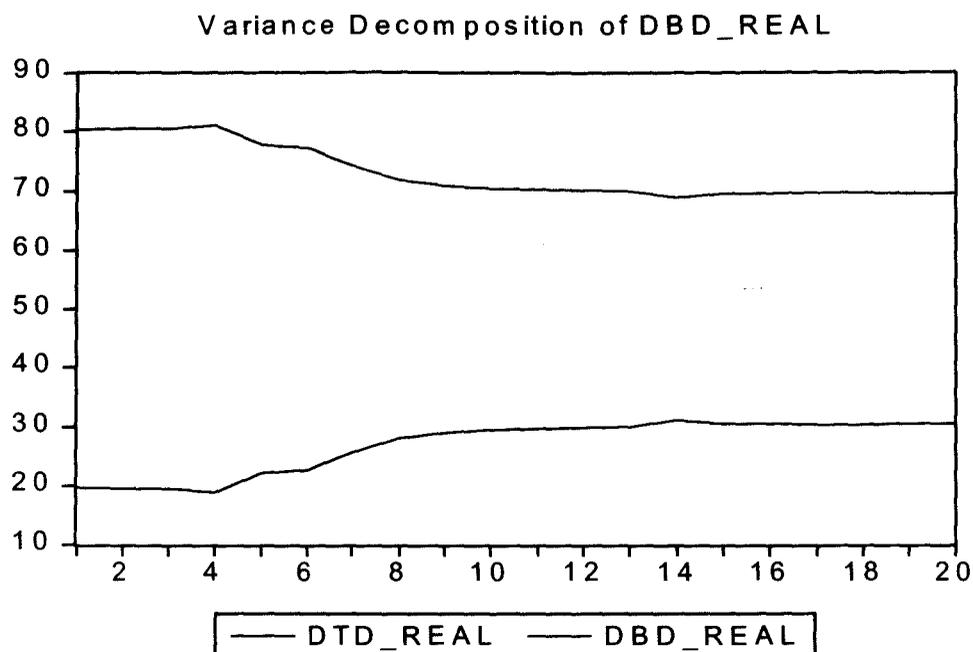
10.4 Variance Decomposition for the Budget Deficit

Variance in Budget Deficit over the periods of study were basically the results of budget deficit to the shocks transmitted through budget deficit and trade deficit. So a part of total variations in budget deficit was due to budget shocks and the other part of was due to trade deficit shocks. The break-up of variances in budget deficit into these two definite parts across different periods ($t = 1, 2, \dots, 20$) constituted the '*Variance Decomposition*' of budget deficit as given by the Table 10.2. The graphical presentation of the *Variance Decomposition* is being presented through the Figure 10.2.

Table – 10.2
Variance Decomposition of Budget Deficit (BD_t)

Period	S.E.	TD _t	BD _t
1	865.1375	19.57296	80.42704
2	895.0773	19.51808	80.48192
3	899.2978	19.42901	80.57099
4	916.9793	18.85850	81.14150
5	946.8167	22.12617	77.87383
6	950.0875	22.66100	77.33900
7	976.6063	25.72704	74.27296
8	992.1744	28.02646	71.97354
9	999.5758	28.97491	71.02509
10	1003.936	29.48246	70.51754
11	1013.290	29.75352	70.24648
12	1013.977	29.78438	70.21562
13	1016.373	30.01057	69.98943
14	1025.900	31.07589	68.92411
15	1036.946	30.49318	69.50682
16	1037.604	30.48517	69.51483
17	1040.931	30.38887	69.61113
18	1042.397	30.36970	69.63030
19	1044.576	30.45319	69.54681
20	1046.111	30.42907	69.57093
Cholesky Ordering: DTD_REAL DBD_REAL			

Figure 9.2



10.5 Findings from the Table 10.2

The Table 10.2 shows that

- (i) budget deficit shocks dominated over the trade deficit shocks in generating short-run variations in expenditure. For example, for $1 < t \leq 4$, at least 81% of the short-run variations were due to budgetary deficit shocks while trade deficit shocks accounted for at most 9% of such variations.
- (ii) budget deficit shocks took the dominant role in constituting the long-run equilibrium level for the budget deficit profile. For example, budget deficit shocks constituted about 70% of the long-run equilibrium level of the budget deficit profile. Trade deficit shocks, on the other hand, contributed at most 30% to their account.

10.6 Findings from the Figure 10.2

The findings are being confirmed by the Figure 10.2, which shows that

- (i) at $t = 1$, the total budget deficit variations was mainly due to budget deficit shocks. So,
- (ii) at $t \rightarrow \infty$, the contribution of budgetary shocks to total variations never fell short of 70% level. On the other hand, contributions of trade deficit shocks to this account never exceeded 30% level.

10.6 Summary and Conclusion on Variance Decomposition Study

All these observations in Sections 10.2 – 10.5 show that

- (i) *shocks transmitted through the budget deficit took a significant role in constituting the long-run equilibrium levels for both budget deficits and trade deficit profiles.*
- (ii) *shocks transmitted through the budget deficit channel dominated over the trade deficit channel in generating short-run variations in short-run in both budget deficit and trade deficit profiles.*

All these findings, therefore, confirm that Causality running from 'trade deficit' to 'budget deficit' is 'weak'. On the other hand, 'budget deficit' shocks contributed significantly to the constitution of trade deficit profile. Consequently, Causation running from 'budget deficit' to 'trade deficit' was 'stronger' and dominant.'

