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Import and Economic Growth in Turkey: Evidence from Multivariate VAR Analysis

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Abstract

This study made an attempt to analyze empirically the relationship between imports and economic growth in Turkey. In order to make an elaborate examine of the import-economic growth relationship, import is decomposed to its categories and then a multivariate VAR analysis is used to determine the relationship. Empirical results derived from IRFs and VDCs show that while there is a bidirectional relationship between GDP and investment goods import and raw materials import, there is a unidirectional relationship between GDP and consumption goods import and other goods import.

Key Words: Import, Economic growth, Multivariate VAR analysis

JEL Code: C32, O11

Introduction

In theory, it is widely argued that there is a two-way causal relationship between export and economic growth. Consequently, an extensive empirical literature exists on the relationship between exports and growth. Yet, relative to the empirical literature on exports and economic growth, the number of empirical studies on the relationship between imports and growth is quite limited, because the theoretical relationship between imports and economic growth tends to be more complicated than that between exports and growth.

The demand for imports is determined by both economic and non-economic factors. These generally include exchange rates and/or relative prices, economic activity, domestic and external economic conditions, production and/or labour costs, and political circumstances. However, relative prices and real income are the major factors significantly affecting the demand for imports. Rivera-Batiz (1985) argues that a rise in economic activity would induce an increase in imports, the reason being that high real income promotes consumption. In that regard, there is a direct connection between economic growth and the import.

Recent endogenous growth models have emphasized the importance of imports as an important channel for foreign technology and knowledge to flow into the domestic economy (Grossman and Helpman, 1991; Lee, 1995:91-110; Mazumdar, 2001:209-224). New technologies could be embodied in imports of intermediate goods such as machines and equipments and labour productivity could increase over time as workers acquire the knowledge to 'unbundle' the new embodied technology (Thangavelu and Rajaguru, 2004:1083-1094). Moreover, it is widely acknowledged that imports play a central role in the countries whose manufacturing base is built on export oriented industries (Esfahani, 1991:93-116; Serletis, 1992:135-145; Riezman et. al, 1996:77-110; Liu et. al., 1997:1679-1686). If foreign exchange accumulation is sufficient, the economic growth is promoted by importing of high quality goods and services, which in turn expand the production possibilities (Baharumshah, 1999:389-406).

The purpose of this paper is to provide an emprical test of the causal relationship between economic growth and imports, especially categories of imports, which are investment goods imports, raw material imports, consumption goods imports and other goods imports. Import categories are formed according to the classification of Broad Economic Categories (BEC). The focus is Turkey because recently Turkey has lived an economic growth with a large current deficit. So, it is wondered if an economic growth causes an increase in imports or import expansion causes the economic growth. Moreover, which category of imports may affect economic growth or be affected by the economic growth is another question wondered. This paper differs from the previous studies in that way, import is decomposed to determine the dynamic relationship between import categories and economic growth, comparing with the relationship between total import and economic growth.

The rest of the study is organized as follows: Section 2 contains a selective review of the literature on the relationship between import and economic growth, Section 3 describes data and methodology, Section 4 presents the emprical results and finally Section 5 concludes the discussion.

Literature Review

Kotan and Saygılı (1999) incoporated two different model specifications to estimate an import demand function for Turkey. It is found that in the long run, income level affects imports considerably. Gulati (1978:519-522) examined the effect of the capital imports on savings and growth for less developed countries. He found that the effect of capital imports on economic growth would depend on the degree to which the growth is constrained by the lack of capital.

Dutta and Ahmed (2004:607-613) investigated the behaviour of Indian aggregate imports during the period 1971-1995. According to his econometric estimates of the import-demand function for India, import-demand is largely explained by real GDP. Humpage (2000), in his study claimed that there is a positive relationship between imports and economic growth. However, the direction of influence between imports and economic growth is less certain. According to his study, the direction of causality seems to run predominantly from income to imports at quarterly frequencies, not the other way around. Hooper et. al. (1998) estimated that a 1 percent increase in real GDP in the U.S. would lead to a 2 percent rise in U.S.

Baharumshch and Rashid (1999:389-406) detected the presence of a stationary long-run relationship between exports, imports and GDP. The emprical findings of their study indicated that an important determinant of long-run growth in the fast growing Malaysian economy is imports of foreign technology. Awokuse (2007:389-395) investigated the contribution of both exports and imports to economic growth in Bulgaria, Czech Republic, and Poland by using a neoclassical growth modeling framework and multivariate cointegrated VAR methods. His study's findings indicate that the exclusion of imports and the singular focus of many past studies on just the role of exports as the engine of growth may be misleading or at best incomplete.

Ramos (2001:613-623) investigated the Granger-causality between exports, imports and economic growth in Portugal over the period 1865-1998. The empirical results of the study didn’t confirm a unidirectional causality between the variables considered. There is a feedback effect between exports-output growth and import-output growth. Riezman et al. (1995:77-110) provided an investigation on export led growth that took account of import explicitly in the model. Using the forecast error variance decomposition, they found that the export-led growth would work both directly (import›export›growth) and indirectly through import (export›import›growth) in these countries.

Similarly, Asafu-Adjaye and Chakraborty (1999:164-175), also found the evidence that real output, export and imports were co-integrated in inward oriented countries. Using the error correction models, they found causality running indirectly, namely, from exports to imports and then real output. In summary, taken together all findings, it is clear that import is an important channel to economic growth.

Data and Methodology

The analysis is based on the quarterly time series data on real GDP, real export, real aggregate imports, real investment goods import, real raw material import, real consumption goods import and real other goods import. All variables are diflated by producer price index (PPI) and are in logarithm form. The sample period is from 1994:1 to 2005:4. The data are obtained from the website of TUIK. In the empirical analysis, the first model includes the variables GDP (real gdp), EXP (real export) and IMP real import; the second model includes GDP, EXP, IIMP (real invenstment goods import), RIMP (real raw material import), CIMP (real consumption goods import) and OIMP (other goods import).

It is standart to begin the analysis by examining the time-series properties of the data. Firstly, the order of integration is determined by the unit root tests. In order to detect unit roots in data, Augmented Dickey-Fuller (ADF), Phillip and peron (PP) and Kwiatkowski, Phillips, Schmidt and Shin (KPSS) tests are employed. While the ADF test corrects for higher order serial correlation by adding lagged di.erenced terms to the righthand-side variables, the PP test makes the correction to the t-statistic of the coe.cient of the lagged variable from the AR(1) regression to account for the serial correlation. Newey–West heteroscedasticity autocorrelation consistent estimate is used for this purpose.

Granger (1969) developed a test to check whether or not the inclusion of past values of a variable X improves the prediction of present values of variable Y. If the prediction of Y is improved by including past values of X relative to only using the past values of Y, then X is said to Granger-cause Y. In the same manner, if the past values of Y improve the prediction of X relative to using only the past values of X, then Y is said to Granger-cause X. If both X is found to Granger-cause Y and Y is found to Granger-cause X, then there is said a feedback relationship. In order to determine the relationships between imports and economic growth, the Granger Causality test is employed. To implement the Granger test, a particular autoregressive lag length p is assumed and Equation 1 and Equation 2 are estimated by OLS:

$$X_t = \lambda_1 + \sum_{i=1}^{k} a_{1i} X_{t-i} + \sum_{j=1}^{k} b_{1j} Y_{t-j} + \mu_{1t} \quad (1)$$

$$Y_t = \lambda_2 + \sum_{i=1}^{p} a_{2i} X_{t-i} + \sum_{j=1}^{p} b_{2j} Y_{t-j} + \mu_{2t} \quad (2)$$

As an attempt to examine the dynamic relationships between two (or more) variables Vector Autoregression Models (VARs) are widely used. Accordingly, in this paper a vector autoregression (VAR) methodology is utilized for two reasons. First, previous studies imply that the variables of interest are simultaneously related. We need to treat each variable symmetrically and allow feedback among them. Second, VAR analysis is superior to a single equation approach for capturing the long-run dynamics of variables. An n-equation VAR is an n-variable linear system in which each variable is in turn explained by its own lagged values and past values of the remaining n-1 variables (Enders, 1995). Given Y_t the vector of variables, the classical VAR model explains each variable by its own p past values and the p past values of all other variables by the relation:

$$Y_t = d_0 + \sum_{k=1}^{p} \Phi_k Y_{t-k} + \varepsilon_t \quad (3)$$

where the Φ_k are $n \times n$ matrices, d_0 the deterministic component which can include a constant and seasonal dummies and ε_t is a zero-mean vector of white noise processes with positive definite contemporaneous covariance matrix Σ and zero covariance matrices at all other lags.

In order to identify the impulse response functions for a VAR, one needs to impose some identification restrictions on the VAR errors. To this end, this study uses the Choleski decomposition. A Choleski decomposition isolates the structural errors by recursive orthogonalization. It requires that the concerned variables be placed on the basis of the speed at which the variables act in response to shocks. In particular, the variables placed higher in the ordering have contemporaneous impact on the variables lower in the ordering, but the variables placed lower in the ordering do not have contemporaneous impact on the variables higher in the ordering (Rahman, 2005).

Finally, variance decompositions (VDCs) and impulse response functions (IRFs) derived from VARs estimation have been used to look at the relative impact of imports on economic growth. Basically, the IRFs show the response of each concerned variable in the linear system to a shock from system variables and the VDCs show the portion of the variance in the forecast error for each variable due to innovations to all variables in the system (Enders, 1995).

Emprical Results

The variables used in the study are tested for their stationarity by ADF, PP and KPSS unit root tests. It is generally known that the results of these tests depend on the number of lags included, thus special attention must be paid to the lag-length selection. In this study, he lag length for ADF tests is selected on the basis of Schwartz's Information Criteria (SIC) and maximum bandwith for PP and KPSS is chosen on the basis of Newey-West (1994). The results of the unit root tests are presented in Table 1. According to PP and KPSS tests GDP is stationary on level, while the null hypothesis of unit root couldn't be rejected in ADF test. Nevertheless, GDP is taken as I(0). Except EXP, other variables are stationary on level. EXP is non-stationary and contain unit root I(1). Moreover, unit root test of first diffrence of EXP variable, not reported here, also suggest that EXP is I(1).

The second step is the Granger test to determine the causal relationship between the variables. It is conducted to the variables seperately for model 1 and model 2. The test results of model 1 is presented in Table 2. ıt is clear that both import and GDP affect each other. The test results of model 2 are presented in Table 3. It is interesting that there isn't any granger causality between the raw materials import and gross domestic product, since according to the import-led growth theory, imported raw materials should be used in the goods to be exported, which in turn promote the economic growth. In addition, there isn't any realtionship between the other goods import and GDP.

Table 1: *Results of the Unit Root Tests*

Variable	ADF		PP		KPSS	
	Without Trend	With Trend	Without Trend	With Trend	Without Trend	With Trend
GDP	-0.13	-1.73	-5.14***	-6.77***	0.13	0.11
EXP	-3.83***	-2.04	-7.23***	-2.03	0.89***	0.23***
IMP	-1,27	-4.98***	-1.9	-3.76**	0.82***	0.11
IIMP	-4.06***	-4.23***	-4.23***	-4.94***	0.45*	0.12
RIMP	-1.76	-3.58**	-1.49	-3.55**	0.82***	0.06
CIMP	-2.06	-4.63***	-1.33	-2.8	0.71**	0.14*
OIMP	-3.48**	-4.53***	-3.33**	-4.5***	0.65**	0.12*

(*) denotes rejection of the null hypothesis of unit root for the ADF test, rejection of the null hypothesis of unit root for the PP test and rejection of the null hypothesis of stationarity for the KPSS test at 10 percent level of significance.
(**)denotes rejection of the null hypothesis of unit root for the ADF test, rejection of the null hypothesis of unit root for the PP test and rejection of the null hypothesis of stationarity for the KPSS test at 5 percent level of significance.
(***)denotes rejection of the null hypothesis of unit root for the ADF test, rejection of the null hypothesis of unit root for the PP test and rejection of the null hypothesis of stationarity for the KPSS test at 1 percent level of significance

The next step is to formulate and estimate the appropriate VAR model. The variables in the VAR models are used on their stationary level. The initial task in estimating the VAR model is to determine the optimum order of lag length. This is important since under parametrization would tend to bias the results and over-parametrization would diminish the power of tests. In oder to select the lag length of the VAR model, Sequential Modified Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HQ) are used.

Table 4 and Table 5 show the selected lag length by criteria for model 1 and model 2, respectively. For model 1, except for LR criterion all other criteria select 10 lag so lag length of VAR for model 1 is selected 10. Model 2 is based on VAR order (5), since that is chosen by all of the selection criteria. In general, the explanatory power of all the equations of the VAR model as reflected in their adjusted R^2 and F statistic is fairly well. The Joint JB statistic rejects the null hypothesis of normal distribution of the residuals and the LM test indicates that the residuals are not serially correlated.

Table 2: *Granger Causality Results of Model 1*

Null Hypothesis:	F-Statistic	Probability
IMP does not Granger Cause GDP	7.62227	0.00016
GDP does not Granger Cause IMP	13.6395	8.4E-07

Table 3: *Granger Causality Results of Model 2*

Null Hypothesis:	F-Statistic	Probability
IIMP does not Granger Cause GDP	13.3281	1.1E-06
GDP does not Granger Cause IIMP	19.6333	1.5E-08
RIMP does not Granger Cause GDP	0.90713	0.47080
GDP does not Granger Cause RIMP	1.63210	0.18876
CIMP does not Granger Cause GDP	14.6246	4.1E-07
GDP does not Granger Cause CIMP	14.7724	3.7E-07
OIMP does not Granger Cause GDP	1.20116	0.32767
GDP does not Granger Cause OIMP	1.10840	0.36807

Table 4: *Lag Length Order Selection Criteria Results of Model 1*

Lag	LR	FPE	AIC	SC	HQ
0	NA	9.81E-09	-9.926304	-9.795689	-9.880256
1	50.77576	3.43E-09	-10.97848	-10.45602	-10.79428
2	66.60185	6.13E-10	-12.71205	-11.79775	-12.38972
3	43.29454	2.06E-10	-13.82907	-12.52292	-13.36859
4	22.43439	1.39E-10	-14.27735	-12.57935	-13.67872
5	26.41368	7.02E-11	-15.04865	-12.95882	-14.31189
6	14.72622	5.80E-11	-15.38029	-12.89861	-14.50538
7	7.676997	7.03E-11	-15.40560	-12.53208	-14.39255
8	20.82463*	2.81E-11	-16.65450	-13.38913	-15.50331
9	12.24373	1.97E-11	-17.52843	-13.87121	-16.23909
10	10.76936	1.26E-11*	-18.83684*	-14.78778*	-17.40936*

* indicates lag order selected by the criterion

Table 5: *Lag Length Order Criteria Results of Model 2*

Lag	LR	FPE	AIC	SC	HQ
0	NA	2.22E-12	-9.804549	-9.553782	-9.713233
1	133.5391	2.59E-13	-11.97607	-10.22071	-11.33686
2	158.0475	5.95E-15	-15.86453	-12.60456	-14.67743
3	68.03651	2.16E-15	-17.20100	-12.43643	-15.46601
4	54.86156	8.38E-16	-18.87375	-12.60458	-16.59086
5	56.46412*	8.36E-17*	-22.76406*	-14.99030*	-19.93329*

* indicates lag order selected by the criterion

Based on the estimated VAR models, impulse responses function (IRF) and variance decomposition analyses (VDC) are computed in order to address the question of causality between import and economic growth. Impulse response is the time paths of one or more variables as a function of a one-time shock to a given variable or set of variables. An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables through the dynamic lag structure of the VAR (Aziakpono, 2005). Impulse responses for model 1 are presented in Figure 1. They are shown for 1 to 16 lags/quarters. A shock in IMP has no significant impact on GDP. On the other hand, a shock in GDP has a positive impact on IMP up to fourth quarter. For model 2, which is presented in Figure 2, IRF shows that the shock in IIMP affects GDP positively up to third quarter, after that lag it affects negatively. It appears that a shock in investment goods import has a positive effect on GDP, however this positive effects turno ut negative beginning with end of third quarter. Namely, in the short-run it affects positively but in the long-run it affects negatively. The shocks in CIMP and OIMP has no statistically significant effect on GDP: RIMP begins to affect GDP positively at nineth quarter. That is, raw materials import shows its impact on GDP in the long-run. This is natural since the production process takes a certain time.

On the other hand, the GDP shock has a positive and significant impact on IIMP, RIMP and CIMP. But these positive impacts dissipate after a certain quarter (about eigth qarter) and then they begin to affect positively again. These positive impacts are also compatible with the economic theory, because consumption depends on income and more consumption promotes more investment. Overall, the results derived from the impulse responses of model 2 sugget that although a shock in total import has no significant effect on GDP, categories of import may have an effect on GDP.

The results of variance decomposition analysis for model 1 are presented in Table 6. A shock in GDP is largely explained by its own innovations. However, error variances in IMP is largely explained by EXP both inth short and long run, which is a sign of export oriented growth since according to thisa theory goods are imported to make export. VDC results of model 2, presented in Table 7, show that a shock in GDP is explained only by its own innovations at first quarter. But its explanatory power declines over time. On the other hand, IIMP have a partially significant explanatory power and in the long-run the explanatory of RIMP increases, which is in line with the outcome of IRF. GDP explains most of the error variances of IIMP both in short and log run. Moreover, EXP has nearly the same explanatory power as IIMP itself. This indicates that investment goods import mainly depends on GDP and export. EXP accounts for 55% error variances of RIMP at first year, which suggests that raw materials imported are mainly used for export. However, inth long-run while the explanatory power of EXP declines, the explanatory power of GDP increases, which indicates that total output determines raw materials import. The error variances of CIMP is primarily explained by GDP and IIMP, which is consistent to economic theory of consumption. Finally, the shock in OIMP is largely explained by EXP, IIMp and RIMP.

Conclusion

Although there are a lot of studies about import and economic growth in the literature, there exits no studies about the effect of import categories on economic growth. Therefore, this study decomposed the imports and then tried to examine the relationship between import and economic growth. Moreover, the study employed econometric tools such as Granger Causality test, multivariate VAR analysis, impulse response funtion and varinace decomposition analysis.

While Granger Causality test results indicates a bidirectional relationship between GDP and IIMP, and unidirectional relationship between GDP and RIMP, IRFs and VDCs show a bidirectional relationship between GDP and both IIMP and RIMP. Moreover, there is only a unidirectional relationship between GDP and CIMP and OIMP, which flows from GDP to CIMP and OIMP.

Figure 1: Impulse Responses of Model

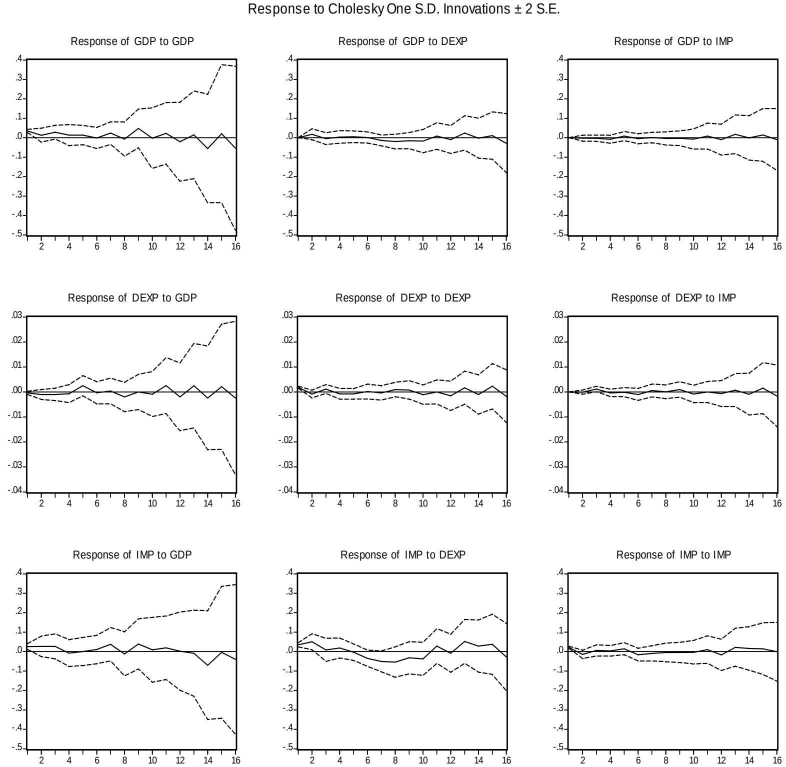

Figure 2: Impulse Responses of Model 2

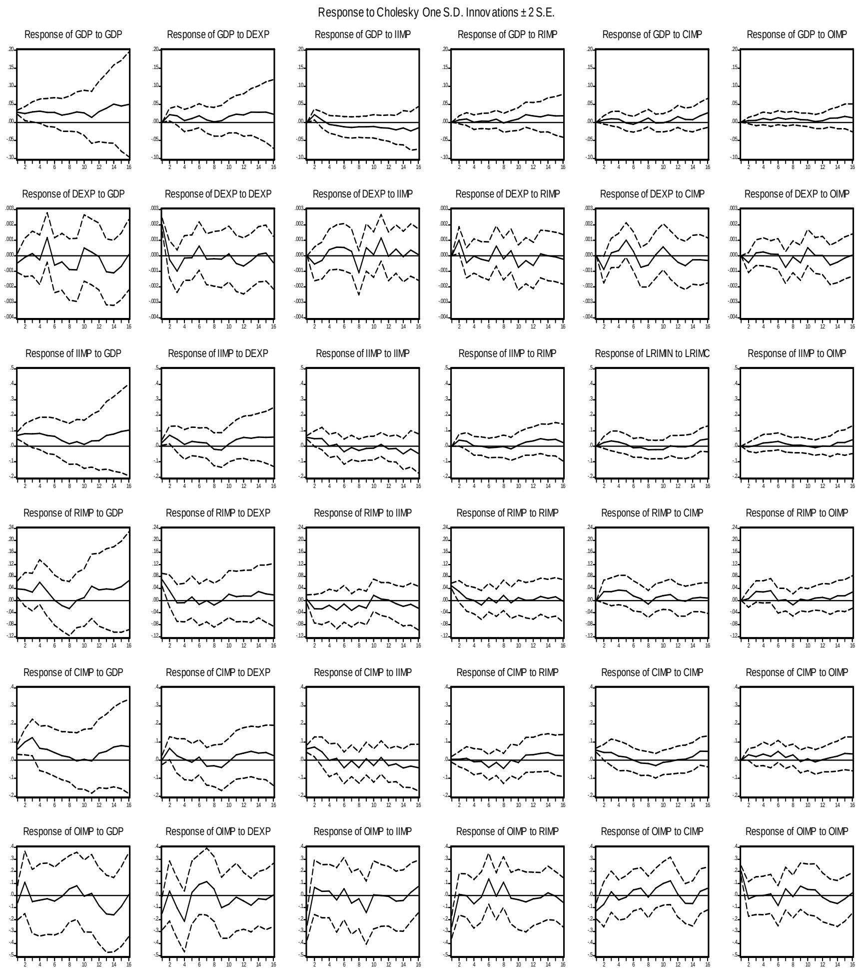

Table 6: *Variance Decompositions of Model 1*

	Variance Decomposition of GDP			Variance Decomposition of IMP		
Period	GDP	DEXP	IMP	GDP	DEXP	IMP
1	100.0000	0.000000	0.000000	28.38629	51.10394	20.50977
2	80.93687	18.65136	0.411770	23.70629	64.38451	11.90921
3	85.85367	13.57711	0.569225	31.38151	57.66607	10.95242
4	84.28827	12.74756	2.964173	30.49705	59.00923	10.49373
5	82.75025	12.41594	4.833810	29.56695	57.36353	13.06951
6	82.07888	12.33734	5.583782	25.48246	60.83069	13.68685
7	80.47112	15.04531	4.483574	28.32244	61.62149	10.05607
8	73.10318	22.49251	4.404305	23.68823	68.07365	8.238123
9	79.51158	17.54933	2.939092	28.67177	64.11353	7.214701
10	75.65919	20.79938	3.541429	26.89498	66.36802	6.736999
11	75.85512	20.02689	4.117995	27.02048	66.17275	6.806780
12	75.39106	19.65776	4.951174	26.56614	65.38170	8.052153
13	68.76679	23.60814	7.625070	23.41129	67.67330	8.915408
14	76.37946	17.86188	5.758664	34.81515	57.17768	8.007172
15	75.30650	17.70240	6.991097	33.15111	58.58490	8.263989
16	75.59671	18.39837	6.004927	35.50103	56.79861	7.700359

Table 7: *Variance Decompositions of Model 2*

Variance Decomposition of GDP:						
Period	GDP	DEXP	IIMP	RIMP	CIMP	OIMP
1	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	57.94669	18.46718	18.83754	1.792523	2.011370	0.944700
3	58.22292	20.38320	12.90127	3.337614	3.807390	1.347607
4	63.45426	15.93554	10.50880	2.526586	4.358346	3.216461
5	65.40143	15.08142	10.07821	2.314914	3.712308	3.411718
6	62.69568	16.61686	10.31832	2.005431	3.403049	4.960650
7	61.46983	15.50399	11.86420	2.688744	3.120704	5.352533
8	60.82752	13.85164	12.37402	2.433391	4.301270	6.212157
9	62.47003	12.54945	12.64682	2.351082	3.870836	6.111781
10	61.76980	13.66730	12.41788	2.825492	3.482756	5.836769
11	56.66210	16.13805	12.79004	5.917808	3.243821	5.248181
12	54.50755	16.60173	12.66678	7.095057	4.510146	4.618739
13	53.31476	18.12448	12.88229	7.097620	4.060312	4.520535
14	54.69443	18.20433	11.51995	7.687579	3.560330	4.333379
15	53.48890	18.26106	11.74512	7.629134	4.233771	4.642019
16	53.90948	17.34330	10.87272	7.597637	5.796599	4.480263

Variance Decomposition of IIMP:						
Period	GDP	DEXP	IIMP	RIMP	CIMP	OIMP
1	56.19198	7.133948	36.67408	0.000000	0.000000	0.000000
2	46.35404	22.88489	22.34530	6.065010	2.275376	0.075383
3	47.14470	20.50853	20.98292	6.725165	4.513411	0.125272
4	53.54367	17.15412	17.27916	5.548365	5.385361	1.089333
5	55.92617	16.75269	15.39858	4.843374	5.028464	2.050722
6	56.01263	15.78316	15.68564	4.474950	4.622127	3.421497
7	56.22434	15.91106	15.24382	4.381992	4.557527	3.681258
8	54.94759	16.05261	15.91983	4.255011	5.188402	3.636555
9	54.17838	16.35384	15.65117	4.529246	5.679654	3.607708
10	53.55820	16.41694	15.63983	4.552198	6.280757	3.552075
11	52.15179	18.12442	14.94438	5.371807	5.945070	3.462537
12	49.78495	20.98747	14.17384	6.369743	5.489307	3.194692
13	49.55053	21.71347	12.76485	8.276600	4.870030	2.824520
14	48.69587	22.02490	13.40527	8.667548	4.216838	2.989571
15	49.42285	21.69765	11.76256	9.127017	4.953000	3.036916
16	49.69437	20.98013	11.48450	8.151143	5.819701	3.870156

Variance Decomposition of RIMP:						
Period	GDP	DEXP	IIMP	RIMP	CIMP	OIMP
1	17.60393	55.29881	0.189768	26.90749	0.000000	0.000000
2	21.26243	42.55387	5.632020	23.75949	6.476443	0.315750
3	21.60538	34.33969	9.038644	19.25870	10.19837	5.559207
4	32.23567	25.43681	7.757980	14.14555	12.79613	7.627858
5	30.52823	21.85012	10.07181	12.67714	14.53027	10.34243
6	29.85631	21.99402	10.26435	12.71568	15.05584	10.11380
7	29.32283	20.90552	13.40028	12.28083	14.44215	9.648387
8	29.87256	20.41132	13.44993	12.48399	14.00895	9.773249
9	29.12546	19.90195	15.07487	12.36640	13.93849	9.592832
10	28.33710	20.55559	15.42435	12.18538	14.25584	9.241735
11	32.22761	19.40855	14.26180	11.21647	14.18368	8.701890
12	34.19519	19.18288	13.66199	10.74232	13.58587	8.631746
13	36.17876	18.73124	13.23293	10.70055	12.91801	8.238509
14	36.84786	19.52687	13.15213	10.06484	12.15801	8.250292
15	38.80252	19.21818	12.55377	9.673094	11.53081	8.221624
16	42.47076	17.66255	12.27401	8.529097	10.29215	8.771431

Variance Decomposition of CIMP:						
Period	GDP	DEXP	IIMP	RIMP	CIMP	OIMP
1	33.86690	0.025730	37.58842	0.124527	28.39442	0.000000
2	41.13004	12.93016	28.29545	0.106872	14.72656	2.810934
3	54.69966	8.963308	21.31722	0.249260	12.39154	2.379014
4	56.34326	8.106432	19.17962	0.363915	11.97161	4.035164
5	57.97471	7.768131	17.97868	0.425934	11.52379	4.328763
6	53.98931	7.282922	18.63851	2.766297	10.27157	7.051393
7	52.96117	8.693075	18.03890	2.921827	10.30067	7.084351
8	48.94737	9.272544	18.81653	5.461523	9.948005	7.554025
9	47.30168	11.01222	18.24798	5.275184	10.79172	7.371206
10	46.52388	10.89533	19.05326	5.414953	10.82065	7.291913
11	45.49443	11.58322	18.84738	6.184248	10.63800	7.252724
12	44.64880	12.67767	18.87513	6.833118	10.08616	6.879124
13	44.02454	14.13636	18.06184	7.774772	9.429550	6.572927
14	44.28956	14.03866	18.01269	8.540346	8.792974	6.325767
15	44.57872	13.92712	16.91023	8.138313	9.739588	6.706033
16	44.71368	13.18040	16.69855	7.875004	10.57214	6.960228

Variance Decomposition of OIMP:						
Period	GDP	DEXP	IIMP	RIMP	CIMP	OIMP
1	1.754199	10.34264	29.08354	31.88358	7.633163	19.30288
2	6.685508	9.841140	28.00031	28.62943	9.174237	17.66937
3	7.284927	13.44615	26.76380	26.89537	9.011206	16.59854
4	6.442047	26.27608	22.31313	23.54649	7.847116	13.57513
5	6.614108	26.19185	22.53103	23.34232	7.828414	13.49227
6	6.453317	25.41210	20.75902	25.95576	7.475337	13.94446
7	6.056810	27.26974	20.53071	24.29114	7.976672	13.87492
8	6.501746	26.69029	19.73507	26.18694	7.646966	13.23899
9	7.252469	26.17888	22.24648	23.50287	7.649254	13.17005
10	6.962730	26.24614	21.34302	22.80899	9.469799	13.16933
11	6.729243	25.19028	20.45178	22.46154	12.11510	13.05206
12	8.071202	25.07275	20.01764	22.14411	11.87141	12.82289
13	11.88328	24.43668	18.93785	20.55572	11.82202	12.36444
14	15.66408	22.93014	17.98363	19.26016	11.82873	12.33326
15	16.82892	22.63009	17.70075	18.85154	11.76893	12.21977
16	16.48050	22.15489	18.23633	18.97965	12.11719	12.03143

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