

Elasticities of Turkish Trade

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Abstract

To gauge the effect of growth and exchange rate changes on the Turkish trade deficit we estimate income and price elasticities of Turkish imports and exports based on the Johansen cointegration method. Both total and disaggregated elasticities for consumer, intermediate and capital goods are computed using quarterly data between 1998 and 2008. We find negative exchange rate elasticity for both imports and exports indicating that an appreciating lira will increase imports and exports. The latter result is due to cheaper imported inputs associated with an appreciating lira that help the export of consumer goods. However, since this sector is not a large enough component of total exports, we conclude that an appreciating lira hurts the overall trade position. This problem is further exacerbated by growth. We find a significantly higher domestic income elasticity of imports compared with foreign income elasticity of exports. This result is driven by the high income elasticity of intermediate imports. Given the importance of intermediate imports in total imports, we conclude that growth leads to widening trade deficits.

Keywords: Cointegration, current account sustainability, price and income elasticity, Turkey

JEL Classification: F32 and F41

Introduction

The Turkish economy witnessed the worst economic crisis in its history in 2001 and subsequently embarked on a growth path that some hoped was sustainable. However, this growth was not without costs. It was accompanied with rising trade deficits which led to rising current account deficits of unseen proportions. At the same time, the Turkish lira continued to appreciate against major currencies. Many blamed the appreciating lira for rising trade deficits with the belief that the Turkish lira was overvalued. Consensus is elusive in academic studies on misalignment of the Turkish lira although the public at large as well as academics largely share the belief that the Turkish lira has been overvalued for the most part of 2000s.¹ In this paper, we estimate income and price elasticities for Turkish imports and exports. Through this we investigate the impact of growth and an appreciating lira on Turkish foreign trade.

Literature on trade elasticities is vast. In most cases price and income elasticities are estimated using standard export and import demand functions. In a large number of these studies import and export prices are used as the price variable. A significant number of studies use the exchange rate as a price variable and investigate the exchange rate elasticity. Some researchers have used import and export prices together with the exchange rate in the export and import demand functions to separate the effect of prices and the exchange rate. When the question of interest is to understand persistent trade deficits of a country or to understand the bilateral trade deficit between two countries or a group of countries, the latter has been the method of choice.

Bahmani-Oskoe and Niroomand (1998), Marquez (1990), Şimşek and Kadılar (2005), Öztürk and Acaravcı (2003) are but a few of some notable examples where trade elasticities are estimated using export or import prices. When Cushman (1987, 1990) investigates persistent US trade deficits or Thorbecke (2006) looks into persistent US-China trade deficit, the exchange rate is used instead of prices of exports or imports. Hooper et al. (1998) estimate trade elasticities using export and import prices as well as the real effective exchange rate index. They find that as the dollar depreciates imports increase and that the income elasticity for imports is greater than exports.

Our work follows Thorbecke (2006) and Cushman (1987, 1990) as well as Bahmani-Oskoe and Goswami (2004) and Haynes et al. (1996). Import and export demand functions are estimated using the exchange rate as the price variable. The paper is organized as follows. The next section describes the methodology employed in the paper followed by a description of the data and a discussion of results. The last section concludes.

¹ Alper and Saglam (1999) and Saxena and Atasoy (2006) agree that the Turkish lira was overvalued prior to the 1994 crisis. Saxena and Atasoy (2006) and Dağdeviren, Oğuş Binatlı and Sohrabji (2009) find that the Turkish lira was overvalued prior to the 2001 crisis but Ozlale and Yeldan (2004) disagree. The only study that investigates misalignment in the Turkish lira for the more recent past is Dağdeviren, Oğuş Binatlı and Sohrabji (2009) and they do not find that the Turkish lira is overvalued.

Methodology

We estimate price and income elasticities for Turkish imports and exports. We use the Johansen cointegration method to find the long and short run determinants following Thorbecke (2006) for US-China bilateral trade and Bahmani-Oskooee and Goswami (2004) for Japanese trade. The specification used is given in equations (1) and (2) below.

$$X_t = \beta_{10} + \beta_{11}rer_t + \beta_{12}y_t^* + \varepsilon_{1t} \quad (1)$$

$$M_t = \beta_{20} + \beta_{21}rer_t + \beta_{22}y_t + \varepsilon_{2t} \quad (2)$$

In the above equations, X denotes real exports, M denotes real imports, *rer* is the real exchange rate, *y* and *y** are domestic and foreign real income respectively. ε s denotes the shocks to the system and β s are the long run parameters to be estimated.

We estimate the following vector error correction system for exports and imports to determine the short run dynamics. ϕ is the adjustment coefficient that measures how the adjustment in the short run takes place. γ s are the short run parameters and *v* is the error term. *p* is the number of lags included in the error correction equation.

$$\begin{aligned} \Delta X_t &= \gamma_{10} + \phi_1(X_{t-1} - \beta_{10} - \beta_{11}rer_{t-1} - \beta_{12}y_{t-1}^*) + \sum_{i=1}^p \gamma_{11}^i \Delta rer_{t-i} + \sum_{i=1}^p \gamma_{12}^i \Delta y_{t-i}^* + v_{1t} \\ \Delta rer_t &= \gamma_{20} + \phi_2(X_{t-1} - \beta_{10} - \beta_{11}rer_{t-1} - \beta_{12}y_{t-1}^*) + \sum_{i=1}^p \gamma_{21}^i \Delta rer_{t-i} + \sum_{i=1}^p \gamma_{22}^i \Delta y_{t-i}^* + v_{2t} \\ \Delta y_t^* &= \gamma_{30} + \phi_3(X_{t-1} - \beta_{10} - \beta_{11}rer_{t-1} - \beta_{12}y_{t-1}^*) + \sum_{i=1}^p \gamma_{31}^i \Delta rer_{t-i} + \sum_{i=1}^p \gamma_{32}^i \Delta y_{t-i}^* + v_{3t} \end{aligned} \quad (3)$$

$$\begin{aligned} \Delta M_t &= \gamma_{40} + \phi_4(M_{t-1} - \beta_{20} - \beta_{21}rer_{t-1} - \beta_{22}y_{t-1}) + \sum_{i=1}^p \gamma_{41}^i \Delta rer_{t-i} + \sum_{i=1}^p \gamma_{42}^i \Delta y_{t-i} + v_{4t} \\ \Delta rer_t &= \gamma_{50} + \phi_5(M_{t-1} - \beta_{20} - \beta_{21}rer_{t-1} - \beta_{22}y_{t-1}) + \sum_{i=1}^p \gamma_{51}^i \Delta rer_{t-i} + \sum_{i=1}^p \gamma_{52}^i \Delta y_{t-i} + v_{5t} \\ \Delta y_t &= \gamma_{60} + \phi_6(M_{t-1} - \beta_{20} - \beta_{21}rer_{t-1} - \beta_{22}y_{t-1}) + \sum_{i=1}^p \gamma_{61}^i \Delta rer_{t-i} + \sum_{i=1}^p \gamma_{62}^i \Delta y_{t-i} + v_{6t} \end{aligned} \quad (4)$$

To estimate the vector error correction systems in equations (3) and (4) the following steps should be followed. In order for the existence of a cointegrating relationship between the series in question, it must be established that the series are integrated of the same order. Then a cointegration test should be performed to identify the existence of co-integration. If the Johansen co-integration test is going to be used, as we do, it must be based on an equation which is not misspecified. This requires the selection of the number of lags to be used as well as establishing that the error term is well behaved with the lags chosen. If the Johansen co-integration test reveals that co-integration exists, then the system in (3) and (4) can be estimated.

Data and Results

We use quarterly data from 1999 first quarter to 2008 third quarter. Our sample is restricted by the fact that GDP figures for Turkey computed by the current method are only available going back to 1998 first quarter. We use the GDP of the Euro zone as a proxy for foreign income in the export demand function which restricts our sample another year. We estimate export and import demand functions according to equations (1) and (2) for total exports, total imports, consumer goods exports and imports, capital goods exports and imports and intermediate goods export and imports. All data are in logs hence all estimated parameters are elasticities. The data on total exports and imports as well as exports and imports of consumer, capital and intermediate goods is from the electronic database of the Central Bank of Turkey. All other data are from the International Financial Statistics database. The trade data is in millions of current US dollars which are multiplied by the real exchange rate to calculate real exports and imports in Turkish liras. The real exchange rate is computed by multiplying the nominal exchange rate (Turkish lira to U.S. dollar) with prices for Turkey and for the U.S. We use the indicator buying rate for the nominal exchange rate and consumer price index (CPI) for price levels of both countries as in equation (5) below.

$$\ln\left(E \frac{P^{U.S.}}{P^{Tur}}\right) \quad (5)$$

E is the nominal exchange rate for Turkish lira to one U.S. dollar, $P^{U.S.}$ is the U.S. CPI and P^{Tur} is the CPI for Turkey both indices with 2003 as the base year. We use real GDP of Turkey as a proxy for real income in the import demand function and real GDP of the Euro zone as a proxy of real foreign income in the export demand function. It would be more appropriate to use a trade weighted GDP for foreign income and a trade weighted exchange rate in the export demand functions but we opt to refrain from computing a GDP and exchange rate which are not readily observable. We also opt to compute elasticities with respect to the US dollar exchange rate as Turkish import and export data are quoted in US dollars. We argue that this choice does not jeopardize the validity of our results. The European Union has been a major destination for Turkish exports for the entire sample period, accounting for 60 percent of exports at the end of the nineties and about fifty percent of exports currently and thus is the right choice for foreign income. Also, the correlation between the real Turkish lira/euro exchange rate and the real Turkish lira/US dollar exchange rate is 0.88 in the sample period.

Estimation steps are as follows. First, the order of integration of variables is determined by unit root tests. We report the ADF, Phillips-Perron and KPSS unit root test statistics on each variable. Then lag length is chosen by considering several information criteria in an unrestricted VAR where maximum lag length is set at five given the size of the sample. In addition to Likelihood Ratio Tests and Final Prediction Error, Akaike, Schwartz, and

Hannan Quinn information criteria are considered. Lag length is chosen based on the outcome of majority of the tests. Diagnostic tests are performed to ensure the model cointegration tests are performed on a correctly specified model. The Johansen (1991) VAR-based cointegration tests are implemented to test for the existence of a cointegrating relationship and to identify the cointegrating equation. Finally, vector error correction model results based on the identified cointegrating equation are estimated.

Unit root test results are presented in Tables 1 and 2, indicate that all variables are integrated of order 1. In general diagnostic tests in table 3 confirm that models are correctly specified and the Johansen test results in table 4 show cointegration between the variables. Error correction results of income and exchange rate elasticities are presented in table 5. We find that exchange rate elasticities of both exports and imports are negative indicating that an appreciating lira will have a positive impact on both imports and exports. The point estimate for the income elasticity for imports and exports are 1.106 and 0.886 respectively. A one-sided test where the null hypothesis is income elasticity for imports is equal to that of exports ($\beta_{22}-\beta_{12}=0$) is rejected at 1 percent level of significance (critical value is 3.7). This significant gap between income elasticities of imports and exports points to a threat of growing trade deficits as noted by Houthakker and Magee (1969).

We estimate elasticities for components of trade as well (table 5). All income elasticities are positive and significant. The income elasticity of imports and exports of intermediate goods are 1.17 and 0.52 respectively. The equality of income elasticities is rejected against the alternative hypothesis of greater income elasticity of intermediate imports at 1 percent level of significance (critical value is 3.41). For consumer goods and capital goods, the difference between income elasticity of imports and exports is not statistically significant.

As expected the exchange rate elasticities are negative for total as well as disaggregated imports. This indicates that an appreciating lira increases imports and vice versa. The exchange rate elasticity for exports of capital and intermediate goods are positive but are not statistically significant. Total exports and most importantly, exports of consumer goods have negative exchange rate elasticities which implies that an appreciating lira increases exports as well. Moreover, the exchange rate elasticity of consumer goods imports is -0.711 compared to exchange rate elasticity of consumer goods exports of -1.44. The difference between the two exchange rate elasticities is statistically significant. This indicates that an appreciating lira would lead to a greater increase in consumer goods exports than consumer goods imports. To make sense of these findings, the structure of Turkish exports and imports needs to be scrutinized and this task will be undertaken in the next section.

The adjustment coefficients are presented in Table 5 as well. These coefficients measure the speed of adjustment for imports or exports to the deviations from the long run equilibrium. Most of the adjustment coefficients are significant and negative as expected. For total exports and imports the value of the speed of adjustment coefficients are -0.32 and -0.29 respectively which are not significantly different. Following Mathisen (2003) and others

we can compute how quickly adjustment to equilibrium takes place based on these estimates. We find that it takes about three quarters to eliminate 50% of the deviation of exports and imports from equilibrium. Intermediate imports have the smallest adjustment coefficient (-0.14) and capital imports has the largest (-0.54). Thus, it takes about two years to eliminate 50% deviation in the former while capital imports only require two quarters for the same level of adjustment.

Discussion

The sample period of this study covers the most important economic crisis in the history of Turkey in February 2001 which resulted in a switch from a fixed to a floating exchange rate regime. The exchange rate policy of the Central Bank that was announced at the start of 1998 was to conduct exchange rate policy consistent with the inflation target.² This meant that the exchange rate basket which consisted of 1 US dollar and 1.5 Deutsche marks would be increased steadily and parallel with the inflation rate. Starting in January 2000 Turkey had employed an exchange rate regime in which the change in the exchange rate was effectively fixed for 12 months. At the end of every quarter, the Central Bank would announce the rate of increase in the exchange rate basket which now consisted of 1 US dollar and 0.77 euro that would be compatible with the targeted inflation rate for the additional three months period while keeping the pre-announced rates for the previous 9 months unchanged. After the February 2001 crisis a floating exchange rate regime was adopted and the government intervened very little in the exchange rate market. At the same time there were structural changes implemented in the banking system. After the disruptive effects of the crisis wore off the Turkish lira appreciated against the dollar in line with a falling dollar across the world.

An appreciating lira by making imports cheaper and exports more expensive is expected to hurt the trade position of a country. Our results show that this is not a straightforward conclusion. We find a statistically significant negative exchange rate elasticity for imports as well as exports, with the latter being higher. This indicates that an exchange rate appreciation is associated with an increase in both imports and exports. Thus, an exchange rate appreciation has an ambiguous impact on trade. Disaggregating the results sheds more light on this issue.

While exchange rate elasticities for all the different imported goods are negative and statistically significant, the highest elasticity is for intermediate imports. For exports, the key result is the elasticity of exports of consumer goods which is negative, large and statistically significant. Exchange rate elasticity for intermediate and capital goods are actually positive, of much smaller magnitude and not statistically significant. Our results suggest that export of consumer goods benefit from cheap intermediate imports due to an appreciating Turkish lira. Thus, the effect of exchange rate elasticities on

² The target that was announced at the start of 1998 was an annual inflation rate in the neighbourhood of 70 percent during the first half of 1998.

Turkish trade is not clear-cut and the appreciation of the lira experienced in our sample period has not been disadvantageous for all export sectors.

In addition to the elasticities, the structure of trade also sheds light on the Turkish trade position. From figure 2, we find that intermediate imports, which are most responsive to an exchange rate appreciation, are a large and increasing component of total imports. Imports of intermediate goods increased from 64 percent of total imports in 1998 to 75 percent in 2008 (figure 2). Thus, an exchange rate appreciation has a big impact on imports. Moreover, we find that export of consumer goods which increase significantly due to an appreciation are now a declining share of total exports. Exports of consumer goods declined from 53 percent in 1998 to 36 percent in 2008 (figure 1). This implies that while an exchange rate appreciation helps this sector it is unlikely to improve the overall trade position. Thus, despite some benefits, we conclude that the exchange rate appreciation observed in the sample period has exacerbated the overall trade position.

Income elasticity results also show problems for the trade position. Domestic income elasticity of imports is greater than foreign income elasticity of exports. This indicates that for equal increases in income for Turkey and its trading partners, imports will outpace exports. In addition, we find that the high domestic income elasticity of imports is driven by intermediate imports which as noted earlier make up a large and growing share of total imports. Foreign income elasticity of exports on the other hand is high for consumer and capital goods but much more modest for intermediate goods. As noted earlier, consumer goods are a declining component of total exports and while capital goods are increasing in importance they remained a minor 10 percent by the end of the sample period. Thus, the structure of trade reinforces and magnifies the conclusion that equal growth for Turkey and its trading partners will exacerbate the trade position.

Conclusion

We estimated exchange rate and income elasticities for Turkish imports and exports and investigate the effect of an appreciating lira and growth on Turkish foreign trade. We estimated elasticities for total exports and imports as well as exports and imports of capital, intermediate and consumer goods. We find exchange rate elasticities of both exports and imports to be negative indicating that appreciation of the Turkish lira will lead to an increase of both imports and exports. Thus, it appears that an exchange rate appreciation has an ambiguous impact on the trade position. Disaggregating these elasticities shows the key results are for intermediate imports and consumer exports. By reducing the price of imported inputs, an appreciation benefits the export of consumer goods. Thus, an appreciation helps certain export sectors. Despite this, the overall trade position is still hurt by an appreciation because consumer goods are a declining component of total exports while intermediate imports are a large and increasing share of imports.

We also find that income elasticity for imports is significantly greater than exports which implies that as income increases for Turkey and its trading partners, imports will outpace exports. The high income elasticity of imports is driven by the high income elasticity of intermediate imports which as noted earlier is a significant component of total imports. Thus, we conclude that growth further exacerbates the Turkish trade deficit.

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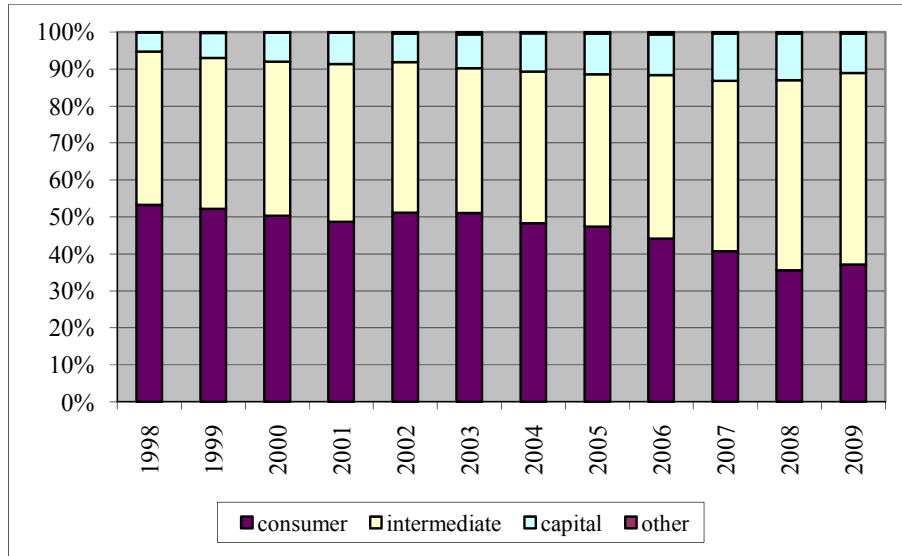
Figure 1 *Export Shares (%)*

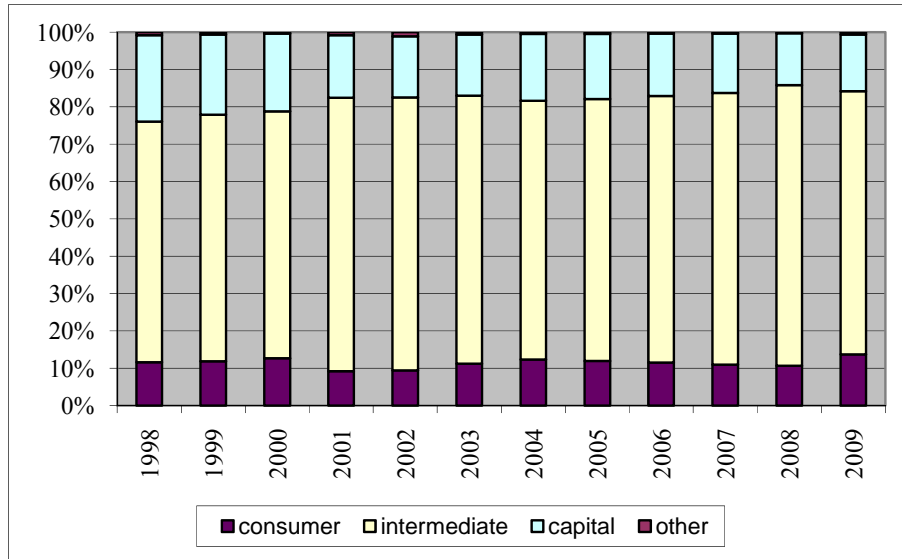
Figure 2 *Import Shares (%)*

Table 1 Unit Root Tests

	ADF ^a			Phillips-Perron ^b			KPSS ^c	
	No Intercept No Trend	Intercept	Intercept and Trend	No Intercept No Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend
<i>rer</i>	-1.251 [0]	-0.139 [0]	-2.534 [1]	-1.286 [8]	-0.086 [7]	-2.107 [8]	0.644** [5]	0.138 [4]
Δrer	-4.771*** [0]	-4.929*** [1]	-5.106*** [1]	-4.689*** [9]	-4.975*** [15]	-6.340*** [26]	0.218 [8]	
<i>Imports</i>	2.248 [0]	-1.069 [0]	-3.007 [1]	4.005 [11]	-0.990 [7]	-3.215* [2]	0.758*** [5]	0.118 [3]
$\Delta Imports$	-5.946*** [0]	-6.500*** [0]	-6.410*** [0]	-5.974*** [4]	-11.002*** [23]	-12.295*** [25]	0.129 [11]	
<i>Exports</i>	2.952 [4]	-0.879 [0]	-4.719*** [1]	4.574 [22]	-0.236 [34]	-3.289* [14]	0.746*** [5]	0.075 [5]
$\Delta Exports$	-5.498*** [0]	-5.056*** [3]		-5.551*** [26]	-9.530*** [19]	-8.881*** [18]	0.348* [21]	
<i>GDP</i>	1.443 [0]	-0.445 [0]	-1.904 [0]	1.565 [6]	-0.422 [5]	-1.880 [4]	0.655** [5]	0.157** [5]
ΔGDP	-5.058*** [0]	-5.181*** [0]	-5.151 [0]	-5.032*** [5]	-5.066*** [7]	-4.981*** [10]	0.153 [6]	0.119 [8]
<i>GDP-EU</i>	0.228 [0]	-3.306** [1]	-3.736** [1]	0.872 [34]	-2.384 [7]	-2.681 [6]	0.578** [1]	0.148** [1]
$\Delta GDP - EU$	-5.102*** [3]			-7.934*** [35]	-9.223*** [36]	-9.705*** [36]	0.050 [3]	0.045 [3]

Notes:

*** and ** indicates rejection of the null hypothesis at 1 percent and 5 percent respectively.

a Lag length is presented in square brackets. Lag length is selected based on Schwartz information criteria when maximum lag length is 9.

b Bandwidth is in square brackets and was chosen by Newey-West algorithm using Bartlett kernel.

c Bandwidth is in square brackets .

Table 2 Unit root tests continued

	ADF ^a			Phillips-Perron ^b			KPSS ^c	
	No Intercept No Trend	Intercept	Intercept and Trend	No Intercept No Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend
<i>Imports-consumer</i>	1.290 [0]	-1.416 [0]	-2.438 [0]	1.735 [7]	-1.375 [5]	-2.637 [2]	0.702** [5]	0.078 [4]
Δ <i>Imports-consumer</i>	-6.705*** [0]	-6.923*** [0]	-6.833*** [0]	-6.669*** [3]	-7.025*** [5]	-6.919*** [5]	0.112 [8]	
<i>Imports-intermediate</i>	2.859 [0]	-1.413 [0]	-4.057** [1]	5.766 [23]	-1.549 [19]	-4.921*** [23]	0.776*** [5]	0.067 [3]
Δ <i>Imports-intermediate</i>	-5.547*** [0]	-5.131*** [2]		-5.549*** [5]	-13.868*** [34]		0.374 [25]	
<i>Imports-capital</i>	1.064 [0]	-1.560 [0]	-2.088 [0]	1.658 [13]	-1.559 [8]	-2.236 [5]	0.661** [5]	0.095 [4]
Δ <i>Imports-capital</i>	-5.067*** [0]	-5.094*** [0]	-5.035*** [0]	-5.029*** [26]	-7.124*** [36]	-7.045*** [36]	0.202 [13]	
<i>Exports-consumer</i>	1.166 [0]	-2.298 [4]	-2.0285 [0]	2.510 [37]	-1.683 [37]	-1.871 [9]	0.688** [5]	0.190** [4]
Δ <i>Exports-consumer</i>	-5.207*** [0]	-4.802*** [3]	-5.539*** [3]	-5.204*** [14]	-5.918*** [36]	-9.713*** [24]	0.500** [37]	0.500** [37]
<i>Exports-intermediate</i>	3.409 [4]	0.350 [4]	-2.672 [0]	5.033 [24]	1.325 [23]	-2.485 [6]	0.747*** [5]	0.113 [1]
Δ <i>Exports-intermediate</i>	-5.024*** [0]	-5.156*** [3]	-5.140*** [3]	-4.961*** [5]	-7.859*** [27]	-9.186*** [30]	0.362 [22]	
<i>Exports-capital</i>	4.526 [4]	-0.996 [4]	-5.325*** [2]	6.775 [37]	-1.479 [37]	-3.462 [18]	0.763*** [5]	0.104 [6]
Δ <i>Exports-capital</i>	-5.470*** [0]	-6.843*** [3]		-5.470*** [3]	-10.712*** [36]	-13.617*** [36]	0.500** [37]	

See notes in above table.

Table 3 Diagnostic test results

	Serial correlation LM statistic (p-value)	Heteroskedasticity χ^2 statistic (p-value)	Skewness χ^2 statistic (p-value)	Kurtosis χ^2 statistic (p-value)	Normality J-B statistic (p-value)
<i>All exports</i>	10.372 (0.321)	133.734 (0.185)	1.080 (0.465)	8.316** (0.040)	23.100 (0.572)
<i>All imports</i>	12.642 (0.180)	101.232* (0.097)	6.361* (0.095)	5.084 (0.166)	11.445* (0.076)
<i>Exports-consumer</i>	1.366 (0.998)	136.153 (0.149)	1.089 (0.780)	12.802*** (0.005)	27.084 (0.352)
<i>Exports-intermediate</i>	7.642 (0.571)	91.767 (0.263)	1.080 (0.782)	7.964** (0.047)	9.044 (0.171)
<i>Exports-capital</i>	5.174 (0.819)	157.963 (0.441)	0.741 (0.864)	24.110*** (0.000)	30.343 (0.212)
<i>Imports-consumer</i>	17.104** (0.047)	168.924 (0.339)	2.975 (0.396)	7.061* (0.070)	10.036 (0.123)
<i>Imports-intermediate</i>	5.607 (0.779)	69.170 (0.878)	3.815 (0.282)	16.867*** (0.001)	20.682** (0.002)
<i>Imports-capital</i>	13.657 (0.135)	95.251 (0.189)	8.647** (0.034)	5.822 (0.121)	14.469** (0.025)

Notes:

- The null hypothesis for all tests are that the residuals do not have serial correlation, are homoskedastic and normally distributed.
- Serial correlation test is conducted with two lags.
- We use the White heteroskedasticity test with cross terms.
- ***, ** and * indicates rejection of the null hypothesis at 1 percent, 5 percent and 10 percent level of significance respectively.

Table 4 *Johansen cointegration test results*

	No. of CE(s)	Adjusted trace value	Model	Lag length
<i>All exports</i>	None	43.202 ^{***}	Intercept, no trend	3
	At most 1	10.953		
<i>All imports</i>	None	24.963 ^{**}	Intercept, no trend	0
	At most 1	8.458		
<i>Imports-consumer</i>	None	39.964 ^{**}	No Intercept, no trend	3
	At most 1	13.264		
<i>Imports-intermediate</i>	None	29.988 ^{***}	Intercept, no trend	0
	At most 1	11.316		
<i>Imports-capital</i>	None	25.978 ^{**}	Intercept, no trend	1
	At most 1	3.849		
<i>Exports-consumer</i>	None	38.360 ^{***}	Intercept, no trend	3
	At most 1	7.484		
<i>Exports-intermediate</i>	None	48.179 ^{***}	Intercept, no trend	2
	At most 1	14.094 ^{**}		
<i>Exports-capital</i>	None	43.694 ^{***}	Intercept, no trend	2
	At most 1	15.170		

Notes:

^{***} and ^{**} denotes rejection of the null of no cointegration at 1 percent and 5 percent level of significance respectively.

Table 5 Error Correction Results

<i>Panel A: Imports</i>	All imports	Imports-consumer	Imports-intermediate	Imports-capital
<i>Exchange rate elasticity</i>	-0.596 ^{***} (0.116)	-0.711 ^{***} (0.069)	-0.797 ^{***} (0.298)	0.447 ^{***} (0.066)
<i>Income elasticity</i>	1.106 ^{***} (0.043)	0.927 ^{***} (0.026)	1.168 ^{***} (0.111)	0.870 ^{***} (0.025)
<i>Adjustment coefficient</i>	-0.296 ^{***} (0.070)	-0.352 (0.223)	-0.142 ^{***} (0.036)	-0.523 ^{***} (0.150)
<i>Lags</i>	0	3	0	1
<i>Panel B: Exports</i>	All exports	Exports-consumer	Exports-intermediate	Exports-capital
<i>Exchange rate elasticity</i>	-0.754 ^{***} (0.054)	-1.440 ^{***} (0.285)	0.018 (0.544)	0.131 (0.250)
<i>Income elasticity</i>	0.886 ^{***} (0.016)	0.951 ^{***} (0.081)	0.516 ^{***} (0.156)	0.978 ^{***} (0.363)
<i>Adjustment coefficient</i>	-0.324 ^{**} (0.177)	0.063 (0.039)	0.042 ^{**} (0.020)	-0.329 [*] (0.190)
<i>Lags</i>	3	3	0	0

Notes:

***, ** and * denotes rejection of the null of no cointegration at 1 percent, 5 percent and 10 percent level of significance respectively.