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THE IMPACT OF REAL EXCHANGE RATE VOLATILITY ON THE EXPORT OF TURKISH ELECTRICAL APPLIANCES

This paper examines the impact of real exchange rate volatility on the demand for electrical exports, which is the second largest sub-sector of machinery in Turkey, by employing multivariate cointegration and error correction methods. The model was estimated for two-digit electrical exports (SITC 77), using quarterly data for the period 1995-2010. Our estimation results suggest that real exchange rate exerts a negative and significant impact on electrical exports both in the long and short term, while its volatility has only a positive and significant impact in the long run. In addition, the results of the long-term export model indicate that foreign income also has a positive and significant impact on Turkish electrical exports.

Keywords: real exchange rate volatility, electrical exports, cointegration, Turkey

1. INTRODUCTION

Since the collapse of the Bretton-Woods system, both nominal and real exchange rates started to fluctuate significantly for countries that adopted the floating exchange regime. These fluctuations in exchange rates brought up the issue of exchange rate volatility and its impact on trade flows. As a result, researchers have conducted a large number of theoretical and empirical studies. The theory suggests that exchange rate volatility can have either negative or positive effects on trade flows. On the one hand, it is argued that exchange rate volatility may depress trade flows, as risk-averse exporters and importers face possible losses due to exchange rate fluctuations. On the other hand, it is hypothesized that exchange rate volatility can encourage trade flows, as exporters and importers choose to enchance the volume of trade to compensate for the decrease in unit price of traded goods.

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Empirical studies have also yielded conflicting evidence for the effect of exchange rate volatility on trade due to the sample period chosen, model specification, measure of volatility preferred, and countries selected. In the context of the Turkish economy, the studies investigated empirically the relationship between exchange rate volatility and exports. Özbay (1999), Buguk et al. (2001), Vergil (2002), Demirel and Erdem (2004) and Köse et al. (2008) found negative evidence for the relationship between volatility and exports, while Kasman and Kasman (2005), Öztürk and Kalyoncu (2009) and Altıntaş et al. (2011) established positive relationships between the two variables. The majority of these existing studies evaluates the impact of exchange rate volatility on aggregate trade flows and thus ignores the potential differences of this impact across sectors and commodities (see Bini-Smaghi, 1991 and Langley et al. 2000).

Electrical appliances have been one of the primary exporting sectors in Turkey and their export was growing fast at a rate of 15% annually during the period of 1995-2010. This sector alone accounted for about 7% of total manufacturing exports, with an export value of USD 7.5 billion in 2010. Turkey also became the eighth largest exporter to the world market in terms of domestic electrical appliances. With the recent availability of industry-level data and Turkey's shift to a flexible exchange rate policy in 2001, researchers turned their attention to the impact of exchange rate volatility on industry-level exports. Therefore, this paper aims to fill this gap in the literature by analyzing the impact of real exchange rate volatility on Turkish electrical exports and recommend accurate exchange rate policies for policy makers.

The objective of this paper is to analyze the long and short-term impact of real exchange rate volatility on Turkish electrical exports over the period 1995 to 2010 by applying both multivariate cointegration and error correction techniques. The rest of the paper is organized as follows: Section 2 presents the structure and export performance of the electrical goods sector during the studied period, Section 3 briefly reviews the theoretical and empirical literature, Section 4 specifies the export demand model for Turkey, describes data sources and explains the estimation techniques, Section 5 discusses the findings of the empirical analysis and finally, the last section offers some concluding remarks and policy implications.

2. A PROFILE OF THE ELECTRICAL APPLIANCE SECTOR

This section discusses the size, structure, and export performance of the Turkish electrical goods industry during the studied period. The electrical appliance sector has an important role for the Turkish economy since it leads to the innovation of advanced technologies and thus produces high value added goods. The sector produces a full range of products including insulated cables and wires, electric power generation and transmission machinery, domestic electrical appliances, electric motors, batteries, lighting materials etc. (SPO, 2001).

After the liberalization programme in 1980, fast and radical changes have been observed in the Turkish electrical appliance sector. Consequently, the sector achieved a high level of growth rate after the late 1990s and this momentum is expected to continue, with government support and a positive investment environment. It can be noted from Table 1 that, even though the share of electrical appliances production in manufacturing was around 4%, the share of electrical appliance export in total manufacturing was significantly high, with an average of 6.9% in 2009. This highlights the importance and advantegous points of this fast developing industry. According to the trade figures, the sector ranks fifth in terms of export and third in terms of import across various sectors in the Turkish economy.

Table 1

General overview of the electrical appliance industry (percentage)

Share of assets in total manufacturing, 2008	**3.61**
Share of production in total manufacturing, 2006	**3.61**
Share of export in total manufacturing, 2009	**6.90**
Share of R&D expenditure in total manufacturing, 2008	**13.13**

Source: Ministry of Industry and Trade (MIT) 2010. Turkish Industrial Strategy Document: 2011-2014 (Towards EU Membership).

Exports of electrical appliances from Turkey have registered continuous growth, especially after 1999. The value of electrical appliances export increased from USD 1.6 billion in 1999 to USD 7.5 billion in 2010, accounting for a share of 7.1% of total manufacturing exports (Turkish Statistical Institute, 2011). However, this continuous growth was interrupted

by the global crisis in 2008 and the value of exports shrank by 14.6% in 2009. Insulated cables and wires make up the largest share in the exports of this sector, followed by domestic electrical appliances, electric transformers and electrical apparatus for switching not exceeding 1000 volts. According to the UN Comtrade data for domestic appliances, Turkey ranked eighth in 2010 with a market share of 3.5% among the major exporting countries. The main customers of Turkish electrical appliances are the EU countries (such as the UK, Germany, Belgium, the Netherlands, Italy, and France) and Middle East countries (Qatar, Irak, Saudi Arabia, United Arab Emirates, Libya, and Israel).

Turkey has a number of advantages in the production of electrical appliances. Apart from a large and fast growing domestic market, it has also an advantage of a customs union agreement with a large and developed EU market, availability of skilled and cheap labour, and improvements in capability and technology of domestic players. On the other hand, the main drawbacks of the sector are the lack of information sharing, design, access to financial markets, R&D activities, training and guiding human resources, sufficiency of legal infrastructure and institutionalization (MIT, 2010). According to a TEPAV study, the sector improved its international ranking from 13th place during the 2000-2005 period to 6th place during the 2005-2009 period (Özlale and Cunedioğlu, 2011).

3. A BRIEF REVIEW OF THEORY AND EVIDENCE

Early literature claimed that an increase in exchange rate volatility lowers the expected gains from exports and thus reduces the volume of trade (Hooper and Kohlhagen, 1978; Cushman, 1983). The reason for this is that the exchange rate is set at the time of trade contract, but payment is not made until the delivery takes place. The exchange rate risk that arises from this timing lag would be eliminated if there was a hedging opportunity for all traders in the forward market. Even if hedging is possible, there are still limitations and costs (Ethier, 1973 and Baron, 1976). For a trading firm with long lags between the time of trade contract and delivery, hedging exchange risk may be particulary more difficult and expensive.

On the other hand, recent theoretical developments suggest that there are situations in which the volatility of exchange rates may create or inhibit trade flows (De Grauwe, 1988; Franke, 1991; Sercu and Van Hulle, 1992; and Broll, 1994). De Grauwe (1988) assumes that exports are invoiced in

home currency and the effect of exchange rate volatility on exports depends on the degree of risk aversion. If firms are very risk averse, then an increase in the exchange rate volatility raises the expected marginal utility of exports and induces them to export more (income effect). However, if firms are less risk averse, they will produce less for export since exporting becomes relatively less attractive (substitution effect). It follows that the dominance of income effect over substitution effect can lead to a positive relationship between exchange rate volatility and trade and vice versa.

Under monopolistic market conditions, Franke (1991) also modelled the export strategy of a risk neutral firm. The export strategy is determined by the transaction (entry and exit) costs. Accordingly, a firm starts exporting if the present value of the transaction costs is outweighed by the present value of the expected cash flows from exports. When the expected cash flow is a convex function of the exchange rate, the present value of cash flows grows faster than that of the entry and exit costs and the firm benefits from the increased exchange rate risk. Under this setting, the model predicts that firms will enter a market sooner and exit later when the exchange rate volatility increases and so the number of trading firms will increase (Franke, 1991).

Unlike the previous models, Broll (1994) focused on the decision of a risk averse multinational firm, which produces in a foreign country and sells that output abroad. It was assumed that the multinational firm has a monopoly power in the foreign market and faces exchange rate risk. Where that exchange rate risk is not diversifiable, both production and trade tends to decline in the foreign country. However, where there is an accessible forward exchange market, then the volatility of the exchange rates bears no negative impact on the decision of the multinational enterprise with respect to investment.

It is obvious from the recent literature that the impact of exchange rate volatility on trade can be either negative or positive depending on the restrictive assumptions made relative to attidutes towards exchange rate risk, type of trader, market structure, flexibility of production capacity, and the availability of forward exchange market. Côte (1994) and McKenzie (1999), who surveyed the literature on the topic, concluded that there has been no unambiguous relationship between exchange rate volatility and trade flows.

Similar to the theoretical discussions, the available empirical studies which use aggregate trade data (multilateral or bilateral) have found mixed and sometimes ambiguous results. Only a handful of these studies were able to establish either negative or positive relationships between exchange rate volatility and trade; while Kenen and Rodrik, (1986), De Grauwe (1988),

Lastrapes and Koray (1990), Caballero and Corbo, (1989), Chowdhury (1993), Vita and Abbot (2004), Aurangzeb et al. (2005), Arize et al. (2000, 2008) have established a negative relationship, Asseery and Peel (1991), McKenzie and Brooks (1997), Doyle (2001), Bredin et al. (2003), Kasman and Kasman (2005), and Zhang et al. (2006) have found a positive relationship. The conflicting evidence obtained by these studies arise partly from the fact that the models with aggregate trade data implicitly assume that elasticities of income, exchange rate and its volatility are equal across sectors, both in terms of direction and magnitude (Bini-Smaghi, 1991). Given the different characteristics of the market in which trade occurs, it is more likely to assume that the impact of exchange rate volatility on trade will differ across sectors or commodities.

Belanger et al. (1992) examined the impact of nominal exchange rate volatility on U.S. exports to Canada in five sectors. The instrumental variables approach is used to estimate single and multiple equation models over the period 1976-1987. Exports are specified as a function of capacity utilization, output, relative prices and exchange rate risk. The results of this procedure suggest that volatility has had a negative and significant effect on the industrial supplies and automobile sectors, whilst for food and consumer goods a positive result is derived.

The impact of exchange rate volatility on Turkish agricultural exports was examined by Buguk et al. (2001) using the error-correction model. The results of their model indicate that, except for a few countries, the exchange rate and its variability do not have a significant impact on the export of dried figs, grapes and tobacco. Thus, policies designed to increase the export level of Turkish agricultural products by incorporating the weak Turkish lira against other currencies are not likely to be effective.

By using cointegration and error correction techniques, Bredin et al (2003) analyzed the relationship between export volume and its main determinants. The model was estimated for aggregate and sectoral Irish exports to the EU over the quarterly data for the period 1978-1998. The results showed that exchange volatility has no significant effect in the short-term, but has a positive and significant effect in the long run on aggregate and sectoral exports. It can be concluded that a decline in exchange volatility associated with a single currency (euro) will lead to a long-term fall in Irish exports to the market.

Awokuse and Yuan (2006) examine the relationship between exchange rate volatility and U.S. poultry exports using a panel data for 49 importing nations over two subperiods: 1976-1985 and 1986-2000. The analysis uses a

country specific fixed-effect in the panel regression. Exports are specified as a function of foreign income, export price, exchange rate, trade openness, and exchange rate volatility. The empirical results suggested that there is a positive relationship between exchange rate uncertainty and poultry exports in 5 of the 6 estimations.

Wong and Tang (2008) used the ARDL cointegration approach to examine the influence of exchange rate variability on the demand for Malaysia's top five electrical exports, as classified by Standard International Trade Classification (SITC) product groups, over quarterly periods in 1990-2001. The empirical results supported the view that exchange rate variability had an adverse effect on Malaysia's electrical exports.

Ekanayake et al. (2010) used GARCH-type exchange rate volatility to investigate the effects of exchange rate volatility on sectoral U.S. exports to its major trading partners. They used monthly trade data for the period from January 1990 through December 2007. Estimating sectoral export models allows one to detect whether the direction or magnitude of the impact of volatility differs depending on the types of goods that are traded. The results found that an increase in the volatility of exchange rate exerts a negative effect on export demand in six out of ten export products and significant positive effects in four products.

Serenis (2010) looked at the impact of exchange rate volatility on sectoral exports for eleven EU countries for the time period 1973-2004. They examined the sectoral export of leather and rubber, using the standard deviation of the moving average of the log of real exchange rate as a measure of exchange rate volatility. Since the variables contained at least one unit root, the first difference model and error correction technique were utilized. Overall, the results suggested that exchange rate volatility had a mixed effect on sectoral exports for the EU countries.

Overall, these results suggest that the use of disaggregated sectoral trade data in estimating the impact of exchange rate volatility on trade flows is potentially beneficial. Whilst multilateral and bilateral trade flows do not appear to provide any significant additional insights, studies which have adopted this sectoral perspective found evidence to suggest that volatility does differ, both in magnitude and direction, between sectors.

4. ECONOMETRIC METHODS

Based on the early empirical studies of exchange rate volatility and exports and following Bredin et al. (2003) and Bahmani-Oskooee and Mitra (2008), the long-term electrical export demand equation takes the following form:

$$X_t = \beta_0 + \beta_1 Y_t^* + \beta_2 R_t + \beta_3 V_t + \beta_4 D + u_t \quad (1)$$

where X_t denotes the real export of electrical appliances from Turkey; Y_t^* is a measure of foreign economic activity, which is proxied by the real GDP of OECD countries; R_t represents the real effective exchange rate (REER); V_t is the volatility of the REER; D is a dummy variable that takes the value of one during the 2008 global financial crisis and the value of zero otherwise (two more dummies were also tested in the long-running model; one is for the adoption of a flexible exchange regime in 2001, and one is for the financial crisis that took place in 2000 and 2001, but, since their effects were not significant, they were dropped from the model) and u_t is the error term. Electrical exports are assumed to depend positively on the GDP of OECD countries, while it is assumed to be negatively related to the REER. As discussed in the previous section, the effect of exchange rate volatility on exports is ambiguous.

The study covers quarterly observations from 1995:2 to 2010:2. The data on electrical appliances exports is collected from the Turkish Statistical Institute and is divided by the export price index to obtain real export figures. The GDP series is is obtained from the online sources of the OECD website, while the data on real effective exchange rate is taken from Eurostatistics. REER is calculated by using consumer prices of both Turkey and its 36 trade partners. A fall (rise) in the REER means depreciation (appreciation) of the Turkish lira. The REER volatility is obtained by using the moving average standard deviation (MASD) model. All real values are measured in the base of year 2000 and all the series are expressed in US dollars. All variables are then expressed in a logarithmic form, so that their estimates are interpreted as elasticities.

In measuring exchange rate volatility, various approaches have been used in the literature. Three of these measures commonly used by the empirical studies are the standard deviation, the conditional variance (GARCH), and the MASD. Following the literature by Chowdhury (1993) and Wong and

Tang (2008), the MASD for the volatility measure is used in this study and this proxy is defined as follows:

$$V_t = \left[\frac{1}{m} \sum_{i=1}^{m} (LR_{t+i-1} - LR_{t+i-2})^2 \right]^{\frac{1}{2}} \quad (2)$$

where V is the exchange rate volatility; LR represents the logarithm of real effective exchange rate and $m = 4$ is the order of moving average.

Cointegration methodology developed by Johansen (1988) and Johansen and Juselius (1990) is applied in this paper due to its advantages over Engle-Granger's (1987) two-step cointegration approach. Since there are more than two I(1) variables in the current analysis, we preferred the Johansen test and the procedure is based on a vector autoregressive model of y_t

$$y_t = \mu + \Gamma_1 y_{t-1} + \Gamma_2 y_{t-2} + ... + \Gamma_p y_{t-p} + \varepsilon_{t-p} \quad (3)$$

where y_t and ε_t are nx1 vectors of variables and innovations respectively.

In the Johansen testing, there are two statistics for cointegration; the trace statistics and the maximum eigenvalue statistics. The trace statistic tests the null hypothesis of r cointegrating vectors against the alternative of n cointegrating vectors. The maximum eigenvalue statistic, on the other hand, tests the null hypothesis of r cointegrating vectors against the alternative of r+1 cointegrating vectors.

If the set of variables in the model (equation 1) is said to be cointegrated, it is then possible to construct short-run dynamic error correction model (ECM). The ECM used in this paper is obtained from the cointegrating regression (equation 1) as follows:

$$\Delta X_t = \sum_{i=1}^{m1} c_{1i} \Delta X_{t-i} + \sum_{i=0}^{m2} c_{2i} \Delta Y^*_{t-i} + \sum_{i=0}^{m3} c_{3i} \Delta R_{t-i} + \sum_{i=0}^{m4} c_{4i} \Delta V_{t-i} + c_5 D + c_6 EC_{t-1} + e_t \quad (4)$$

where Δ is the first difference operator; m stands for the lag length; e_t is the error term; EC_{t-1} represents the lagged error-correction term generated from equation (1) and c_6 is the speed of adjustment towards the long-term equilibrium. A negative and significant coefficient of EC_{t-1} term will be an indication of cointegration.

5. EMPIRICAL RESULTS

Before we estimate equation (1), all the variables in the system must be tested for the presence of unit roots. To this end, we used the augmented Dickey-Fuller (ADF) test suggested by Dickey and Fuller (1981). The ADF test was conducted for the series of X, Y^*, R and V in levels and first differences and the test results are provided in Table 2. As Table 2 shows, all the variables in the system are integrated of order one (or stationary), I(1). The values in parentheses indicate the number of lags chosen by the Hannan-Quinn Information Criteria.

Table 2
Results of the Unit Root Tests

Variables	Level		First Difference		Results
	ADF_1	ADF_2	ADF_1	ADF_2	
X	-0.84 (4)	-2.99 (4)	-4.24 (6)***	-4.27 (6)***	I (1)
Y^*	0.19 (1)	-1.78 (1)	-4.35 (0)***	-4.33 (0)***	I (1)
R	-2.71 (1)*	-3.09 (1)	-6.57 (0)***	-6.51 (0)***	I (1)
V	-1.76 (4)	-1.61 (4)	-5.08 (3)***	-5.11 (2)***	I (1)

Notes: *** and * denote the rejection of null hypothesis (that variable is non-stationary) at 1% and 10% significance level, respectively. Critical values for the ADF tests with a constant are -3.55 and -2.59, while the critical values with a constant and time trend are -4.12 and -3.17 at the 1% and 10% significance level, respectively.

Source: own calculations

Having tested for the unit roots, we then performed the maximum eigenvalue and trace tests for the presence of cointegrating vectors among the variables in equation (1). The results of the Johansen cointegration test and normalized long-term cointegrating vector on real exports are reported in Table 3 and 4, respectively. The appropriate lag length in an unrestricted VAR approach was determined on the basis of the Schwarz and the Hannan-Quinn Information Criteria. As Table 3 shows, both max-eigen and trace tests reject the null of zero cointegrating vector, but cannot reject the hypothesis of one cointegrating vector. Based on this evidence, we would conclude that there exists a cointegrating relationship between real exports

and their determinants. The partial correlation coefficient between the real exchange rate and its volatility is -0.20 with a probability of 11%, indicating that there is no correlation between these two variables.

Table 3

Johansen's Cointegration Test Results

Series: X, Y^*, R, and V
Lag-length: 1

Trace statistics		**Max-Eigen statistics**		**Hypothesized No. of Cointegrating Vectors**
Statistics	CV	Statistics	CV	
46.73	46.26	**26.42**	26.41	None*
20.31	28.49	12.33	20.06	At most 1

Notes: CV stands for critical values and they are obtained from MacKinnon-Houg-Michelis (1999). * denotes rejection of the hypothesis at the 7% significance level.

Source: own calculations

Table 4

Normalized Cointegrating Equation

$$\mathbf{X = 6.56\ Y^* - 0.87\ R + 0.10\ V + 18.45}$$
$$\mathbf{(23.8)^{***}\quad (-3.51)^{***}\quad (1.80)^{*}}$$

Notes: t-values are given in parenthesis. *** and * denote significance at the 1% and 10% level. The estimated coefficents of all the explanatory variables in equation (1) do not change much when the dummy variable is omitted. The long-term coefficients of all variables are normalized on the basis of export variable by setting its estimated coefficient at -1.

Source: own calculations

As can be noticed from Table 4, all the variables appear to have significant effects on the export of electrical appliances, and their coefficients have the expected signs. Our results can be interpreted in the following way. First of all, the estimated coefficient for foreign income is found to be statistically significant and has a value of 6.56, suggesting that a 1% increase in the level of OECD income will increase foreign demand for Turkish electrical appliances by about 6%. The size of income elasticity is comparable to the previous findings of Kasman and Kasman (2005), Rey,

(2006), Köse et al., (2008) and Öztürk and Kalyoncu, (2009) in the case of Turkey.

Secondly, the estimated coefficient for real exchange rate appears to be statistically significant at the 1% significance level and has a magnitude of -0.87, implying that a 1% increase in the level of real exchange rate will result in a decline in the export of electrical appliances by 0.9%. Given the significance of the real exchange rate term, Turkey can use effective exchange rate policy to boost its world export share rather than adopting alternative policies.

Finally and most importantly, real exchange rate volatility has a positive and statistically significant effect (at the 10% significance level) on the export of electrical appliances. This means that exporters of electrical appliances based in Turkey are responding to exchange rate volatility by increasing their exports. This impact is particularly true when the income effect is dominant over the substitution effect. This finding is consistent with the results of Kasman and Kasman (2005), Öztürk and Kalyoncu (2009), and Altıntaş et al. (2011), who used aggregate trade data in the case of Turkey. Moreover, a positive and significant trade-off between the exchange rate volatility and exports were also evidenced by international researchers, namely McKenzie and Brook (1997), Doyle (2001), Bredin et al. (2003), Awokuse and Yuan (2006), and Ekanayake et al. (2010).

Since the cointegration test established a long-run relationship between exports, foreign income, exchange rate and its volatility, the short-term dynamics of equation (1) can be examined by estimating the error correction model (ECM). The model structure is determined by Hendry's general to specific modeling strategy. This requires the elimination of insignificant lags from the estimation of equation (4). We tried to capture the impacts of the flexible exchange regime and the global financial crisis. Since their coefficients were not found statistically significant they were dropped from the short-term model. The regression results are reported in Table 5. Before discussing these results, we need to determine the consistency of the ECM. For this reason, we performed a number of diagnostic tests and reported their results at the bottom of Table 5. These tests indicate that the model has no serial correlation, heteroscadasticity, misspecification problems, and errors are normally distributed. The following remarks can be made from the ECM results.

First, the coefficient of the error correction term (denoted by EC_{t-1}), is negative and significant at the 1% level. The highly significant EC term

suggests that following a shock, about 52% of the adjustment back to the long-term equilibrium is completed after one quarter. Second, the ECM results show that all variables in the system have the expected signs and all the variables have a significant effect on electrical exports, except for the volatility. The foreign income appears to have a positive effect, while the real exchange rate tends to have a negative effect on the level of electrical exports. The negative effect of the 2008 financial crisis on exports arose because of a significant fall in international demand, especially from the European Union market. Finally, in contrast with the long-term exchange rate volatility, short-term volatility has a negative, but statistically insignificant, impact on the export of electrical appliances.

Table 5

Error Correction Model Estimates

Variable	Coefficient	t -statistic	Variable	Coefficient	t -statistic
ΔX_{t-2}	-0.19	-1.62	ΔR_{t-4}	-0.25	-1.42
ΔX_{t-3}	-0.24	-2.17**	ΔV_t	-0.06	-1.46
ΔY^*_{t-1}	10.03	4.78***	D	-0.17	-2.58**
ΔR_t	-0.34	-1.91*	EC_{t-1}	**-0.52**	**-4.08*** **

Diagnostic Test Results

Adjusted R^2 = 0.46	ARCH F(1, 53) = 0.65 (0.42)
AIC = - 1.91	RESET F(1, 47) = 1.49 (0.23)
$\chi^2_{BG}(2)$ = 0.83 (0.44)	χ^2_{JE} = 1.94 (0.38)

Notes: The optimal lag order is determined by AIC. Numbers in parentheses show t-values. ***, **, and * denote significance at the %1, 5%, and 10% level, respectively. χ^2_{BG} ARCH, RESET, and χ^2_{JE} show Breusch-Godfrey test statistics for autocorrelation, heteroscedasticity, and Ramsey test for misspecification, Jarque-Bera normality statistics, respectively.

Source: own calculations

6. CONCLUSION AND POLICY IMPLICATIONS

This paper investigated both the long and short-term impact of real exchange rate volatility on Turkish electrical appliances exports at two-digit SITC level over the quarterly period of 1995:2 to 2010:2 by employing cointegration and error correction techniques. Unlike the majority of past studies that are based on aggregate trade data, this paper works with industry-level trade data in its analysis of the matter. The volatility term here is defined as the MASD of the real effective exchange rates. The estimated cointegration vectors suggest that there is a unique long-term relationship between real exports and foreign income, real effective exchange rates and its volatility.

The estimation results show that foreign income has a positive and significant impact on Turkish electrical appliances exports both in the long and short term. The results further indicate that real exchange rate has a negative and significant effect on electrical exports both in the long and short term, while its volatility affects the export of electrical appliances positively and significantly only in the long run. This suggests that instability in the exchange rate would improve the export performance of the sector in the long run.

The results of this paper have some implications for producers of electrical appliances, macro policy makers and stock market investors. As the recent financial crisis is still negatively affecting Turkey's major exporting market (the EU), we can expect a considerable drop in the export of electrical appliances. Therefore, it is suggested that domestic producers should expand into new export markets in order to maintain the growth rate of electrical exports at their pre-crisis level. As was found through our results, increases in real exchange rate hindered Turkey's export performance, and therefore it is important for macro policy makers to allow the depreciation of the Turkish Lira *vis a vis* foreign currencies. Finally, stock market investors who buy shares of the firms in this sector and hold them for a longer period, could earn more profit when the exchange rate volatility increases in the long run.

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