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Asian Financial Crisis and Korean Trade Dynamics

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By

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Abstract

Since the Asian financial crisis in 1997, Korean international trade has gone up substantially in both volume and trade balances. The improvement is largely due to an expansion of international markets through various bilateral trade agreements and the structural changes in Korean exchange rates. This paper investigates the exchange rate – trade balance dynamics, popularly known as the J-curve phenomenon. Employing the Bounds-Testing approach to cointegration and error-correction modeling on Korean bilateral trade for the pre- and post-Asian crisis periods, the study finds that support for the strict version of the J-curves has been fading after the crisis. The weaker version of J-curve is generally supported in both pre- and post-crisis sample periods. There exists a long-run relationship among the Korean exchange rates, domestic income, foreign income, and Korean trading balances.

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I. Introduction

South Korean international trading has been expanding quite rapidly since the Asian financial crisis during 1997-98. According to the Korea International Trade Association, Korean international trade has nearly tripled in total volume since 1998, mainly due to her rapid expansion into new markets opened up by WTO and various bilateral agreements. The total number of Korean bilateral agreements is currently reaching 329 compared with 50 in 1998. Korean trade balances have also improved dramatically from a $5 billion average deficit during 1988-97 to a $20 billion average surplus in 2012 (Figure 1a, 1b and 1c). The turn-around can be largely explained by an improvement of global economic environment but also by a significant structural change in the Korean real exchange rates since the crisis.

Until the crash in 1997, the Korean currency, won, was getting stronger against the US dollar. Tantamount to a structural change, this trend, reversed after the crisis (Fig. 2) and the Korean trade balance improved substantially. However, the structural change in Korean exchange rates and its impact on her bilateral trade balances has not been clear. In this context, this paper investigates the dynamic nature of Korean bilateral trading by investigating the *J-curve* under the changing environment of Korean currency exchange rates.

According to the Marshall-Lerner condition, as long as the import and export demand elasticities add up to more than one, real depreciation of a currency improves the trade balance of a country. However, there have been circumstances under which this condition was met yet the trade balance continued to deteriorate (Bahmani-Oskooee,

1985) following a currency devaluation/depreciation.[1] The focus, thus, shifted to the short-run dynamics that traced the post-depreciation time-path of trade balance to the *J-Curve*. Junz and Rhomberg (1973), Magee (1973), and Meade (1988) show that while exchange rates adjust instantaneously, it takes some time for consumers and producers to adjust to changes in relative prices. Moreover, since currency depreciations make the exports cheaper and the imports dearer, trade balance may actually decline for a while before showing any signs of improvement. Thus, short-run deteriorations followed by long run improvements seem to characterize the post-depreciation time-path of trade balance. However, there is no consensus as such and it remains an empirically open issue. This paper adds to the literature by investigating the J-Curve effect for South Korea.

Most of the papers investigating the J-Curve have employed aggregate trade data. See, for example, Bahmani-Oskooee and Ratha (2004) for an extensive review of the empirical literature investigating the J-Curve effect. A problem with using aggregate data is that the regressions potentially suffer from an aggregation bias – a country's trade balance (and/or terms of trade) could be deteriorating with one trading partner while at the same time improving with another. In order to overcome this problem, Rose and Yellen (1989), Marwah and Klein (1996), Bahmani-Oskooee and Brooks (1999), and Bahmani-Oskooee and Ratha (2004) amongst others, have employed US bilateral data.

Despite the Asian currency crisis and the subsequent trend reversal in Korean trade balance, the Korean trade dynamics, it seems, has not received a lot of attention, especially when it comes to the J-curve literature. The few Korea-specific empirical studies that we came across have sparse evidence of the J-curve, if any. For example,

[1] *Depreciation* means decline in the value of a currency relative to other currencies; *devaluation* means a policy-driven depreciation of a currency. Countries may devalue their currency in response to a declining trade balance. The terms "devaluation" and "depreciation" are used interchangeably in this paper.

Wilson (2001) examined Korean data over 1970Q1-1996Q4 and found some evidence of a J-Curve. Hsing (2005), however, could not come up with any such evidence over 1980:M1-2001:M12 time-period. Kim (2009) looked at Korea's bilateral trade with US and Japan over 1980Q1-2006Q2. Using the Johansen's cointegration and error-correction modeling on an augmented version of Rose and Yellen (1989) model, he finds some evidence of a bilateral J-curve between Korea and Japan.[2] This paper adds to this literature by examining Korea's bilateral trade with her 29 trading partners, perhaps the largest sample thus far. Together these countries accounted for more than two-third of Korea's trade in the fourth quarter of 2011 (Table 1).

Our sample includes quarterly data collected from the Korea International Trade Association (KITA) and the International Monetary Fund database for the period of 1988-2011, a time period that also included the Asian Currency Crisis in 1997. During the last two quarters of 1997, the Korean won, for example, fell by almost 50%, in real terms. Following such a rapid and steep fall in currency value, one would only expect to see a huge improvement in the trade balance. Indeed, Korea's trade balance moved from a deficit of $0.5 billion in 1997 to a staggering surplus of $39 billion in 1998. This was a huge improvement also in real terms, which was followed by a steady surplus in trade balances in Korea along with a gradual trend of currency depreciation for the next 15 years. Considering the magnitude of shock from the crisis to the Korean trading patterns and its implication for the J-curve phenomenon, this paper also looks into Korean bilateral trade dynamics both *pre-crisis* (currency appreciating regime) as well as *post-*

[2] Sun and Chiu (2010) used the same model and methodology as ours but his study was specific to Taiwan. They looked at Taiwan's bilateral trade over 1980:1-2004:12 and reported no evidence of a bilateral J-curve with Korea.

crisis (currency depreciating regime). To this end, we employ a relatively modern time-series technique known as the Bounds-Testing Approach to Cointegration for the empirical analysis.

The rest of the paper is organized as follows. The trade balance model is presented in section II, followed by a discussion of the methodology and empirical results in Section III. Section IV offers conclusions. Data, definitions, and sources are listed in the appendix.

Table 1 & Figure 1go about here

II. The Trade Balance Model

We estimate the reduced form trade balance model from Rose and Yellen (1989):

$$ln\ TB_{jt} = a + b\ ln\ Y_{k,t} + c\ ln\ Y_{jt} + d\ ln\ REX_{jt} + \varepsilon_t \qquad \ldots \qquad (1)$$

where TB_{jt} is Korean trade balance with trading partner j, $Y_{k,t}$ is the index of Korean real GDP, Y_{jt} is the index of country j's GDP (proxied by industrial production index when GDP data are unavailable), and REX_{jt} is the bilateral real exchange rate between the won and j's currency defined such that a decrease reflects a real depreciation of the won against trading partner j's currency. The trade balance is defined as the ratio of Korea's imports from trading partner j over her exports to the same trading partner such that a decrease implies a deterioration of trade balance. Note this ratio is unit free, and is the nominal as well as real trade balance. Moreover, it lets us use the regressions in log form so the coefficient estimates are also elasticities of the corresponding variables. While we have no *a priori* expectations about the signs of b and c, for real depreciation of the won

to have a favorable long run impact on the trade balance, we need the estimate of *d* to be positive and significant.[3]

III. Methodology and Empirical Results

Specification (1) outlines the long-run relation (cointegration) among the variables of interest. Testing the J-Curve phenomenon requires estimation of the short-run dynamics (the error-correction model) of the model. We employ the Autoregressive Distributed Lag (ARDL) approach to cointegration, also known as the Bounds-Testing Approach to cointegration and error-correction modeling, proposed by Pesaran, *et al.* (2001), and extensively used in recent works in similar context.[4]

The error-correction version of the ARDL model pertaining to variables in (1) is given by:

$$\begin{aligned}\Delta LnTBj_t &= a_i + \sum_{i=1}^{n} b_i \Delta LnTB_{t-i} + \sum_{i=1}^{n} c_i \Delta LnYus_{t-i} \\ &+ \sum_{i=1}^{n} d_i \Delta LnYj_{t-i} + \sum_{i=1}^{n} f_i \Delta LnREXj_{t-i} + \delta_1 LnTB_{t-1} \quad \cdots \quad (2) \\ &+ \delta_2 LnYus_{t-1} + \delta_3 LnYj_{t-1} + \delta_4 LnREXj_{t-1} + \varepsilon_t\end{aligned}$$

The procedure then comprises of (1) *selection of optimal lag structure* for (2), based on a criterion such as the *Akaike Information Criterion* (AIC), followed by an (2) an F-test (variable addition test) where the null hypothesis of "*non-existence of cointegration*" (i.e., H_0: $\delta_1=\delta_2=\delta_3=\delta_4$) is tested against its alternative. Since the F-test results depend on the number of lags imposed on each first differenced variable, we only report the value of the F-statistic for lag-structure chosen by AIC in step 1.

[3] Normally, imports increase as a country's income rises. However, if this rise in income is due to increased production of import-substitutes, then the country would import less, and experience an improvement in her trade balance.

[4] The earlier ones include Engle-Granger cointegration Method (1987), and Johansen-cointegration technique (1990). Unlike its predecessors, the ARDL-approach does not require unit-root testing. Bahmani-Oskoee and Brooks (1999) has a good account of the details on using the ARDL approach in the present context.

Tables 2a, 2b, and 2c go about here.

The lower and upper bounds critical values for the F-test are obtained from Narayan (2005). If the calculated F-Statistic exceeds the upper bound then the null hypothesis if cointegration is rejected, validating the presence of a long-run relation among the variables of the trade balance model. If it falls below the lower bound, then the null cannot be rejected, and if it falls between the lower and upper bounds, the results are inconclusive. Given the 90% critical value of 3.57, there is evidence of cointegration in almost all cases (i.e., the variables are all cointegrated). Since our focus is mainly on the dynamics of devaluation, we collect the coefficients of the real exchange rate and (2) look for evidence of the J-Curve. We also retain the coefficient of the error correction terms, as its sign and significance help determine presence of cointegration amongst the variables of the trade balance model.[5]

Tables 3a, 3b, 3c go about here.

The J-Curve hypothesis, strictly speaking, calls for a J-shaped post-depreciation path of the trade balance. More precisely, following a real depreciation of the won, there should be an initial deterioration followed by an improvement in the Korean trade balance, *both in the short-run*.[6] While the J-pattern was observed in some cases, patterns like *M* and *W* were seen as well. See Table 5 for example. The strict version of J-Curve is supported in cases of Korea's trade with Japan for the whole sample; Austria, Belgium, France, Hong Kong, Japan, Mexico, Netherland, Philippines, Portugal, Singapore during the pre-crisis era; Germany and Hong Kong during the post-crisis era. As mentioned

[5] See for example, Kremers et al. (1992).

[6] Note that a negative coefficient of REX implies a deterioration of the trade balance in our model.

already, some other short-run patterns were seen as well, so the strict version of the J-curve may not necessarily hold good (Bahmani-Oskooee and Ratha, 2004a and 2004c). Accordingly, Bahmani-Oskooee and Brooks (1999) redefined the J-Curve hypothesis *as short-run deteriorations and long-run **improvements** of the trade balance*. If we subscribe to this weaker version, then there is considerable support for the J-Curve effect.

Tables 4a, 4b, and 4c go about here.

Korea has a bilateral J-Curve with Belgium, Brazil, China, Germany, Greece, India, Italy, Portugal, Singapore, Spain, and Switzerland during the whole sample period; with Australia, Belgium, Germany, Hong Kong, Indonesia, Italy, Malaysia, Mexico, New Zealand, Norway, Switzerland, and the UK during the pre-crisis era; Belgium, Brazil, China, Denmark, India, Indonesia, Italy, New Zealand, Norway, Portugal, Singapore, Spain, and the US during the post-crisis era[7].

Table 5 goes about here

Interestingly, the long-run coefficient of the real bilateral exchange rate carries the expected sign (i.e., positive) in most cases, regardless of the time period - depreciation of the Korean won has a favorable impact on Korean trade balance in the long run. Actually most of the positive coefficients are recorded for the sample spanning over the entire time period, followed by the post-crisis era.[8] This indicates currency devaluation works better in the long-run, and the effect varies positively with the extent of depreciation. We note

[7] For these trading partners, REX carries at least one positive coefficient in the short-run and a positive coefficient in the long-run, whether significant or not.

[8] For Japan, the coefficient of REX is negative throughout and becomes insignificant post-crisis, implying currency devaluation is unlikely to improve Korea's trade deficit with Japan. This may have been because of Korea's heavy dependence on imported inputs from Japan. Currency depreciation boosts Korean total exports and thus Korean demand for Japanese components, hence REX takes on the paradoxical negative sign. For China, likewise, the REX is insignificant (although its signs change), again indicating relative ineffectiveness of currency devaluation in impacting the Korea-China trade balance.

that REX carries a positive and significant long-run coefficient in cases of Belgium, Indonesia, Italy, Mexico, New Zealand, Singapore, and the UK for the whole sample; Belgium, Germany, Indonesia, and Italy during the pre-crisis era; New Zealand, Norway, and Philippines during the post-crisis era. However, the coefficient is negative and significant in cases of Malaysia (whole-sample); Philippines, Portugal, and Spain (pre-crisis); and Greece (post-crisis), thus depreciation of the won relative to the currencies of these countries is likely to hurt Korean trade balance.

The long-run results also indicate that economic growth in Korea is often associated with deteriorations in her bilateral trade balance, especially with Denmark, France, Germany, Ireland, Italy, Malaysia, Netherlands, Sweden, and Thailand during 1988-2011 (whole sample); with Belgium, China, Indonesia, Italy, Spain, Switzerland, and the UK during the *pre-crisis era*; with Denmark, Germany, Greece, Hong Kong, Ireland, Malaysia, Philippines, Portugal, Singapore, Spain, Switzerland, the UK and the US during the *post-crisis era*. These income effects are reversed when it comes to Japan and New Zealand for the whole sample; Japan, Malaysia, Philippines, Portugal, and the US pre-crisis; and New Zealand and Norway post-crisis. Interestingly, economic growth in trading partners appears to help Korean bilateral trade balances in most cases, with the exception of Japan – a major supplier to Korea's exports sector. As the saying goes, Korea replaces Japan's exports!

IV. Concluding Remarks

Using the bounds-testing approach to cointegration and error-correction modeling, we find there is a long run relation among the won's exchange rates, incomes (both domestic and foreign) and trade balance. A real depreciation of the won helps

improve the Korean trade balance in the long run (Table 5). However, the effects vary from country to country, and interestingly enough, real exchange rate either took the wrong sign or was insignificant for Japan and China, Korea's major trading partners. In fact, post-crisis, it had the expected positive sign and significance only in three cases (New Zealand, Norway, and Philippines) compared to four (Belgium, Germany, Indonesia, and Italy), prior to the crisis. Thus, the Asian currency crisis likely has altered the long-run trade-dynamics of Korea. However, how long is the long-run? When we estimate our trade balance model for the whole sample, the real exchange rate takes on the expected positive sign in most cases and becomes significant for seven countries, viz. Belgium, Indonesia, Italy, Mexico, New Zealand, Singapore, and the UK. Thus, effectiveness of expenditure-switching policies (such as currency devaluation) depends on the planning horizon as well as the specific trading partner concerned, the latter finding a direct upshot of using bilateral (instead of aggregate) trade data, above and beyond reducing some aggregation bias.

As far as the short-run dynamics go, we could not decipher any specific pattern, let alone the strict, text-book version of the J-Curve. In fact, the sign patterns indicated the presence of several other patterns as well, including a W-, M-, and N-curves (Table 5). While short-run dynamics do not support the textbook version of the J-Curve, redefining the J-Curve hypothesis as short-run deterioration and long-run improvement of the trade balance yields better support. This is consistent with previous work.

Other than real exchange rate, domestic and foreign incomes, we recognize that trade restrictions such as tariffs and quotas, exchange rate regimes, currency crises, and various other institutional and infrastructural factors can all impact a country's trade

balance. While it is difficult to account for all these factors, consistent with economic theory, real exchange rate - the key policy variable – takes on the expected positive sign in most cases after the Asian crisis: Currency depreciation has a favorable impact on trade balance.

Appendix

Data, Definition and Sources

Sources

Quarterly data are used to carry out the empirical work. The sample comprises of Korea's trade with her 29 trading partners, viz. Australia (1988Q1-2011Q2), Austria (1988Q1-2011Q3), Belgium (1988Q1-2011Q3), Brazil (1991Q1-2011Q4), China ((1991Q1-2011Q4), Denmark (1988Q1-2011Q3), France (1988Q1-2011Q3), Germany (1988Q1-2011Q3), Greece (1995Q1-2011Q4), Hong Kong (1988Q1-2011Q3), India (1988Q1-2011Q1), Indonesia (1988Q1-2011Q4), Ireland (1988Q1-2011Q3), Italy (1988Q1-2011Q3), Japan (1988Q1-2011Q3), Malaysia (1988Q1-2011Q3), Mexico (1988Q1-2011Q3), Netherlands (1988Q1-2011Q3), New Zealand (1988Q2-2011Q3), Norway (1990Q4-2011Q3), Philippines (1988Q1-2011Q3), Portugal (1988Q1-2011Q3), Singapore (1988Q1-2011Q3), Spain (1988Q1-2011Q3), Sweden (1988Q1-2011Q3), Switzerland (1988Q1-2011Q3), Thailand (1993Q1-2011Q4), United Kingdom (1988Q1-2011Q3), and the United States (1988Q1-2011Q3).

a. Korea International Trade Association (KITA). The exports and imports data are collected from this source.
b. International Financial Statistics of IMF. This is used for other data.

Variables

TB_j = US trade balance with her trading partner j is defined as the ratio of Korea's imports from country j over her exports to j (collected from source a). Thus, a decrease in this ratio implies an improvement of the trade balance.

Y_j = Index of real GDP of country *j*. Industrial production index (collected from source b) is used as a proxy when GDP data are not available.

Y_k = Index of real GDP of the Korea. Again Korea's industrial production index is used whenever the trading partner's GDP data were not available.

REX_j = Bilateral real exchange rate between Korean won and trading partner *j*'s currency. It is defined as $P_k/(NEX_j*/P_j)$, where P_k is the Korean CPI, P_j is country *j*'s CPI, and NEX_j is the nominal bilateral exchange rate defined as the number of won per unit of *j*'s currency. Thus a decline in REX_j is a reflection of real depreciation of Korean won relative to *j*'s currency.

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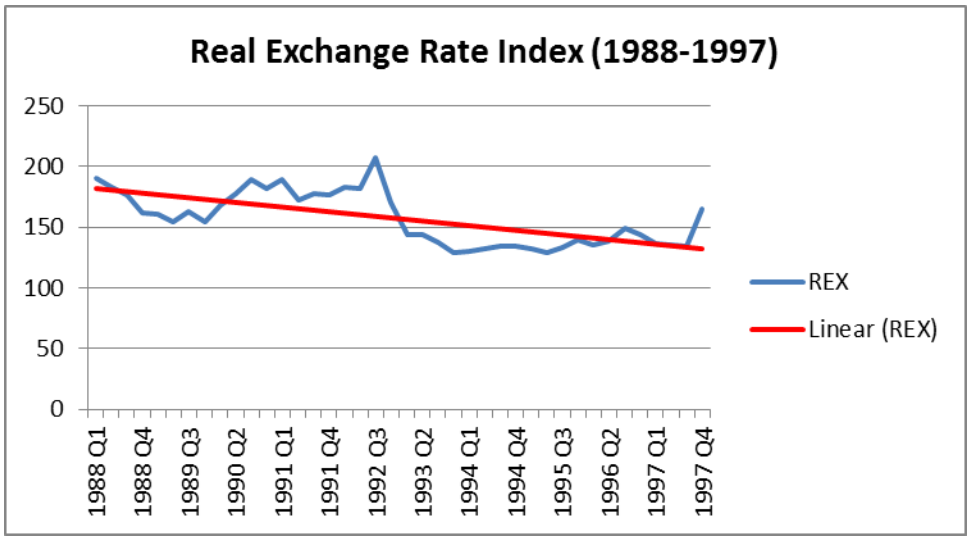
Figure 1a

Figure 1b

Figure 1c

Data Source: Korea International Trade Association, http://www.kita.net/

Figure 2a


Real Exchange Rate Index (1988-1997)
250
200
150
100
50
0
1988 Q1
1988 Q4
1989 Q3
1990 Q2
1991 Q1
1991 Q4
1992 Q3
1993 Q2
1994 Q1
1994 Q4
1995 Q3
1996 Q2
1997 Q1
1997 Q4
REX
Linear (REX)

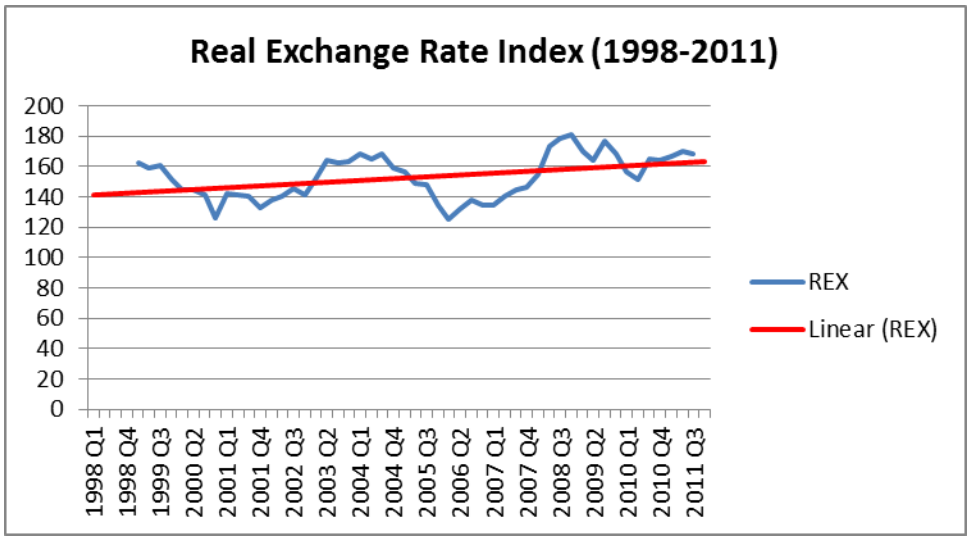

Real Exchange Rate Index (1998-2011)
200
180
160
140
120
100
80
60
40
20
0
1998 Q1
1998 Q4
1999 Q3
2000 Q2
2001 Q1
2001 Q4
2002 Q3
2003 Q2
2004 Q1
2004 Q4
2005 Q3
2006 Q2
2007 Q1
2007 Q4
2008 Q3
2009 Q2
2010 Q1
2010 Q4
2011 Q3
REX
Linear (REX)

Table 1: Korea's Bilateral Trade with Select Countries in 2011Q4
(Millions of US dollars)

Trading Partner	*Export*	*Import*	*Trade Balance*	*Total Trade*	*Share (%)*
Australia	8164	26316	-18152	34480	3.2
Austria	838	1330	-492	2168	0.2
Belgium	2255	1450	805	3705	0.3
Brazil	11821	6343	5478	18164	1.7
Pr.China	134185	86432	47753	220617	20.4
Denmark	438	715	-277	1153	0.1
France	5707	6315	-608	12022	1.1
Germany	9501	16963	-7462	26464	2.5
Greece	1350	91	1259	1441	0.1
Hong Kong	30968	2315	28653	33283	3.1
India	12654	7894	4761	20548	1.9
Indonesia	13564	17216	-3652	30780	2.9
Ireland	356	719	-363	1075	0.1
Italy	4107	4374	-266	8481	0.8
Japan	39680	68320	-28640	108000	10.0
Malaysia	6275	10468	-4193	16743	1.6
Mexico	9729	2316	7413	12045	1.1
New Zealand	1104	1474	-370	2578	0.2
Netherland	4627	4426	201	9053	0.8
Norway	666	2595	-1928	3261	0.3
Philippines	7339	3571	3767	10910	1.0
Portugal	713	100	613	813	0.1
Singapore	20839	8967	11872	29806	2.8
Spain	1857	1162	695	3019	0.3
Sweden	1043	2144	-1101	3187	0.3
Switzerland	1130	2555	-1425	3685	0.3
Thailand	8459	5413	3046	13872	1.3
U. Kingdom	4969	3818	1151	8787	0.8
U.S.A	56208	44569	11639	100777	9.3
TOTAL	**555214**	**524413**	**30801**	**1079627**	**68.6**

Note: The sample accounts for 68.6% of Korea's total trade in 2011Q4.

Table 2: The F-Test for Cointegration

Trading Partner	Calculated F-statistic for Different Lag Length Imposed on the First-Differenced Variables		
	Whole Sample	Pre-Crisis	Post-Crisis
Australia	18.31***	2.12	6.12**
Austria	1.79	2.91	4.79**
Belgium	6.95***	4.05*	9.21***
Brazil	1.04	4.55*	5.42**
China	4.27*	1.78	5.35**
Denmark	11.45***	2.37	9.12***
France	4.05*	7.94***	3.10
Germany	7.84***	6.44**	9.58***
Greece	5.21**	-	8.52***
Hong Kong	5.85**	2.72	19.08***
India	5.98***	3.66	3.88
Indonesia	7.84***	7.60***	2.10
Ireland	6.81***	4.67*	7.73***
Italy	11.00***	6.40***	7.68***
Japan	4.82**	7.50***	1.53
Malaysia	3.74	6.82***	13.71***
Mexico	10.45***	5.35**	3.50
New Zealand	11.32***	2.43	6.45***
Netherland	11.72***	7.09***	8.11***
Norway	0.80	2.95	8.61***
Philippines	5.54**	9.92***	2.98
Portugal	4.31*	6.30***	12.90***
Singapore	6.89***	2.69	8.93***
Spain	6.59***	7.40***	9.75***
Sweden	5.00**	2.86	3.05
Switzerland	8.50***	4.36*	7.42***
Thailand	5.35**	-	6.31***
U. Kingdom	10.11***	5.82**	6.85***
U.S.A	8.93***	6.84***	3.66

Note: Asterisks *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively.

Table 3a: Coefficient Estimates of Exchange Rate and Error Correction Term Based on Akaike Information Criterion (AIC)

Trading Partner	*DLREX*	*DLREX1*	*DLREX2*	*DLREX3*	*DLREX4*	*DLREX5*	*DLREX6*	*DLREX7*	*DLREX8*	*DLREX9*	*DLREX10*	*DLREX11*	*EC(-1)*
Australia	-0.12 (0.22)												-1.00*
Austria	0.31 (0.87)												-0.20* (2.02)
Belgium	-0.51 (0.97)												-0.47* (5.14)
Brazil	-0.98 (0.85)	-0.89 (0.80)	-4.59* (2.59)	-1.31 (0.88)	-2.32 (1.12)	0.51 (0.28)	-2.29 (1.08)	0.01 (0.004)	-1.60 (0.92)	0.45 (0.28)	0.51 (0.39)	1.93 (1.50)	-0.09 (0.34)
China	1.31* (2.75)	0.36 (0.70)	-0.84 (1.56)	-0.73 (1.23)	-0.79 (1.31)	-0.39 (0.50)	-1.49* (2.09)	-0.12 (0.19)	-0.84 (1.36)	0.14 (0.25)	-0.97 (1.67)		-0.12 (0.39)
Denmark	0.80 (1.62)												-0.65* (6.20)
France	-0.27 (0.89)												-1.74* (4.33)
Germany	-0.75 (1.92)	-0.99* (2.65)											-0.74* (5.43)
Greece	1.47 (0.29)	-4.32 (0.76)	-1.34 (0.23)	-3.53 (0.50)	2.06 (0.24)	-6.53 (0.87)	-7.53 (1.19)	-7.53 (1.22)	-13.93* (2.30)	-6.96 (1.23)	-10.86* (2.45)		-6.73* (3.87)

Hong Kong	0.55 (1.50)												-0.48* (4.59)
India	-0.77 (0.96)	0.45 (0.51)	1.21 (1.36)	3.58* (3.88)	0.59 (0.70)	0.20 (0.21)	-0.16 (0.17)	2.91* (3.13)	0.86 (1.02)	2.43* (2.99)	-1.38 (1.61)		-0.37* (2.06)
Indonesia	0.68 (1.93)												-0.54* (5.33)
Ireland	0.11 (0.37)												-0.82* (5.43)
Italy	-0.16 (0.22)	-1.20 (1.50)											-0.64* (6.23)
Japan	-0.27 (0.22)	4.68* (3.37)	1.04 (0.76)	0.14 (0.10)	2.28 (1.74)	4.77* (3.54)	2.59 (1.88)	4.37* (3.19)	3.55* (2.45)	1.56 (1.23)	2.01 (1.54)		0.81* (3.56)
Malaysia	-2.44 (1.69)	2.13 (1.54)	1.85 (1.29)	-0.26 (0.18)	-1.70 (1.25)	2.52 (1.88)	1.35 (0.90)	1.42 (0.98)	2.15 (1.51)				-1.21* (3.36)
Mexico	0.92* (2.87)												-0.64* (6.53)
Netherlands	0.28 (0.64)												-0.84* (6.61)
New Zealand	0.87* (2.21)												-0.78* (7.05)
Norway	2.45 (1.27)	-4.39 (1.81)	-2.29 (1.15)	2.80 (1.44)	-2.18 (1.08)	-2.03 (1.17)	2.27 (1.21)	0.51 (0.26)	2.48 (1.36)	2.64 (1.35)	-0.58 (0.30)	-3.50 (1.77)	-0.65 (1.59)

Philippines	0.43 (1.70)												-0.46* (4.81)
Portugal	0.50 (0.33)	-2.34 (1.44)	-3.51* (2.28)	-2.22 (1.48)	-0.59 (0.40)	-2.05 (1.55)	2.21 (1.52)						-0.04 (0.21)
Singapore	3.29 (3.37)	0.74 (0.93)	-0.37 (0.43)	-2.21* (2.34)	-0.98 (1.00)	-1.89* (1.96)	-0.78 (0.71)	-2.19* (2.07)	-2.17* (2.21)	-0.86 (1.03)	-1.40 (1.70)	1.39 (1.62)	-1.16* (3.82)
Spain	0.72 (0.89)	0.38 (0.39)	-0.02 (0.02)	-0.53 (0.62)	-0.90 (1.10)	-0.06 (0.07)	-0.28 (0.32)	-0.20 (0.23)	-0.71 (0.93)	0.31 (0.43)	1.75* (2.45)	1.37 (1.89)	-0.37* (2.24)
Sweden	0.46 (0.41)	-1.54 (1.28)	-0.70 (0.59)	-3.55* (2.95)	-2.66* (2.24)	2.31* (2.01)							-0.71* (4.45)
Switzerland	0.62 (0.65)	-0.49 (0.47)	-2.96* (2.81)	-1.45 (1.38)	0.04 (0.04)	3.57* (4.06)							-0.52* (5.28)
Thailand	-6.54 (1.15)	16.84* (3.70)	10.51* (2.34)	16.83* (2.82)	-1.68 (0.30)	13.88* (2.87)	16.11* (2.68)	10.91* (2.01)	3.69 (0.77)	-8.62 (1.85)	-0.50 (0.14)	-6.55 (1.52)	-2.51* (2.71)
United Kingdom	0.63* (2.70)												-0.56* (5.99)
United States	-0.07 (0.17)												-0.60* (5.67)

Note: Figures in parentheses represent absolute values of t-statistic; * denotes significance at 5% level.

Table 3b: Coefficient Estimates of Exchange Rate and Error Correction Term Based on AIC (Pre-Crisis)

Trading Partner	*DLREX*	*DLREX1*	*DLREX2*	*DLREX3*	*DLREX4*	*DLREX5*	*DLREX6*	*DLREX7*	*DLREX8*	*DLREX9*	*DLREX10*	*DLREX11*	*EC(-1)*
Australia	0.38 (0.06)	-42.36* (2.19)	-0.52 (0.05)	-23.99 (1.87)	-14.06 (1.60)	-17.61* (2.11)							-0.24 (0.33)
Austria	-2.03 (0.55)	-0.29 (0.08)	-1.02 (0.42)	1.26 (0.70)	2.40 (1.40)								-2.38* (2.96)
Belgium	1.52 (1.23)	-5.17* (2.15)	-5.59* (2.89)	-4.15 (1.88)	-1.00 (0.68)	-1.80 (1.55)							-4.22* (2.94)
Brazil	0.29 (0.14)	6.76* (2.91)											-0.43* (2.00)
China	6.35 (0.99)	2.43 (0.55)	6.88 (1.06)	9.41 (1.10)									-2.32 (1.94)
Denmark	-2.76 (1.43)	5.23 (1.82)	-5.51 (2.40)	11.24* (3.96)	-2.51 (1.05)	2.33 (0.96)							-2.05* (3.48)
France	-0.43 (0.33)	1.71 (1.09)	1.32 (1.07)	1.79 (1.56)	0.44 (0.37)	3.18 (2.90)							-1.00* (large)
Germany	-0.50 (0.44)	-3.65* (2.66)	-2.61* (2.46)	-2.63* (2.39)	-0.64 (0.77)	-1.20 (1.64)							-1.93* (4.35)
Greece	-2.26 (1.07)	-3.37 (1.74)											-1.92* (5.84)

Hong Kong	-0.63 (0.07)	-1.63 (0.06)	-0.49 (0.06)	-2.37 (0.06)	3.08 (0.06)	8.87 (0.06)							-3.48* (2.40)
India	1.48 (0.70)	-3.21 (1.33)											-0.15 (0.24)
Indonesia	10.30* (2.36)	-0.39 (0.06)	-8.17 (1.31)	2.57 (0.37)	5.13 (0.79)								-4.07* (5.49)
Ireland	1.81 (1.12)	-4.16 (1.31)	-5.97* (2.58)	0.87 (0.44)	-3.00 (1.78)								0.29 (0.37)
Italy	0.38 (0.45)	-1.91* (2.52)	-1.03 (1.23)	-0.22 (0.31)	-1.27 (1.74)								-1.80* (3.97)
Japan	-8.61* (3.11)	14.89* (4.46)	8.96* (2.62)										-1.00* (large)
Malaysia	1.47 (1.33)	-2.96* (2.16)											-1.99* (5.42)
Mexico	-2.12 (1.52)	0.21 (0.13)	1.12 (0.89)	1.96 (1.77)									-1.61* (4.01)
Netherlands	-1.08 (0.69)	10.90 (4.43)	5.18* (2.41)	3.28 (1.92)	13.76 (4.43)								-0.29 (0.60)
New Zealand	0.47 (0.05)	-3.27 (0.32)	9.48 (0.91)	-7.31 (0.98)	-11.77 (1.36)								-3.72* (2.11)
Norway	-0.35 (0.07)	0.40 (0.06)	-1.37 (0.29)	7.25 (1.54)									-1.19* (2.07)

Philippines	-1.88 (1.72)	4.30* (3.13)	2.63* (2.32)	1.53 (1.47)									-1.53* (5.64)
Portugal	-11.50 (1.83)	18.84* (2.72)	16.17* (2.06)	5.70 (1.40)	17.87* (3.16)								-1.77* (4.83)
Singapore	-3.68* (2.04)	-0.17 (0.10)	-1.26 (0.63)	-4.06* (2.37)	2.53 (1.52)								-2.61* (2.66)
Spain	0.99 (1.07)	1.00 (1.02)	4.07* (3.67)										-2.23* (5.30)
Sweden	13.42* (3.56)	3.04 (0.86)	16.22* (4.66)	-0.81 (0.26)	1.45 (0.47)	19.33* (4.03)							-0.49 (0.87)
Switzerland	-2.91 (1.41)	-5.52 (1.88)	-1.41 (0.56)	0.01 (0.005)	-4.46 (1.82)								-0.84 (1.00)
Thailand	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)	0.38 (0.06)
United Kingdom	0.49 (0.80)	-0.46 (0.44)	0.21 (0.25)	-1.73* (2.37)	0.06 (0.09)	-0.84 (1.32)							-1.95* (4.11)
United States	3.74 (1.81)												-1.00* (large)

Note: Figures in parentheses represent absolute values of t-statistic; * denotes significance at 5% level.

Table 3c: Coefficient Estimates of Exchange Rate and Error Correction Term Based on AIC (Post-Crisis)

Trading Partner	*DLREX*	*DLREX1*	*DLREX2*	*DLREX3*	*DLREX4*	*DLREX5*	*DLREX6*	*DLREX7*	*DLREX8*	*DLREX9*	*DLREX10*	*DLREX11*	*EC(-1)*
Australia	0.05 (0.29)												-0.61* (4.75)
Austria	0.75 (1.39)	-0.10 (0.18)	0.37 (0.68)	1.36* (2.63)	1.14* (2.16)	1.40* (2.33)							-0.18 (1.35)
Belgium	-2.80* (3.12)												-0.84* (5.25)
Brazil	-0.95 (1.28)	1.83* (2.37)	0.02 (0.02)	-0.65 (0.77)	1.85* (2.09)	2.05* (2.42)							0.04 (0.18)
China	0.78 (1.56)	0.28 (0.60)	-0.92* (2.43)	-0.56 (1.15)	0.27 (0.60)	0.54 (1.12)							-0.03 (0.08)
Denmark	1.04 (1.08)	-1.90 (1.75)	-0.52 (0.54)	-1.74 (1.59)	-0.36 (0.37)	0.59 (0.60)	-1.70 (1.95)	2.82* (2.95)					-1.12* (5.83)
France	-0.41 (0.84)												-0.92* (2.89)
Germany	-2.48* (4.98)	-2.13* (4.72)	-0.41 (0.78)	-0.44 (0.98)	-0.28 (0.73)	-0.79* (2.10)	0.57 (1.51)	0.53 (1.35)					-2.05* (5.93)
Greece	-2.26 (1.07)	-3.37 (1.74)											-1.92* (5.84)

Hong Kong	-0.77 (1.30)	0.55 (0.76)	1.06 (1.59)	1.09 (1.50)	0.97 (1.46)	1.49* (2.45)							-1.64* (8.54)
India	0.003 (0.002)	-2.53* (2.10)	-1.34 (1.20)	0.44 (0.38)	-1.84 (1.58)	-1.93 (1.63)							-0.63* (3.13)
Indonesia	0.41 (0.51)	-0.56 (0.71)	-1.02 (1.36)	-2.23* (3.40)									-0.29 (1.49)
Ireland	0.28 (0.79)												0.38 (0.06)
Italy	-1.39 (1.20)												-1.00* (4.03)
Japan	0.12 (0.10)	0.12 (0.07)	0.22 (0.16)	-1.35 (0.83)	1.44 (0.85)	3.02 (1.94)	1.47 (1.06)	1.47 (1.17)					-0.55 (0.69)
Malaysia	3.38* (2.35)												1.90* (7.77)
Mexico	0.29 (0.57)												-0.39* (3.30)
Netherlands	0.10 (0.18)												0.80* (5.56)
New Zealand	-0.22 (0.39)	-0.91 (1.37)	-1.46* (2.46)	-1.42* (2.32)									-1.27* (4.95)
Norway	5.28* (0.06)	-0.21 (0.12)	-3.77* (2.12)	-1.74 (0.98)	-6.76* (3.75)	-1.75 (1.04)	-1.74 (0.84)	-8.49* (4.02)					-1.95* (5.08)

Philippines	0.53* (2.18)												-0.79* (3.28)
Portugal	-1.67 (1.08)	-1.76 (1.32)	-6.28* (4.41)	-3.36* (2.60)	-2.10 (1.78)								-1.32* (7.03)
Singapore	2.59* (3.28)	1.52 (1.83)	1.36 (1.61)	0.62 (0.74)	1.97* (2.58)	-0.88 (1.24)							-2.24* (5.97)
Spain	-0.97 (1.24)												-1.28* (5.70)
Sweden	2.07* (2.17)												0.14* (2.17)
Switzerland	-2.04 (1.94)	0.16 (0.14)	-3.77* (3.35)	-2.26 (1.66)	-3.14* (2.14)	2.43 (1.60)	-0.49 (0.36)	3.64* (3.04)					-1.74* (5.09)
Thailand	7.06 (1.49)	7.57 (1.87)	12.53* (3.11)	3.24 (0.79)	3.57 (0.94)	6.11 (1.77)	10.13* (2.74)	5.84 (1.90)					-2.19* (4.75)
United Kingdom	-0.64 (0.96)												-1.02* (5.23)
United States	2.57 (1.59)	-0.89 (0.74)	1.54 (1.33)	-1.23 (1.11)	0.58 (0.55)	-2.62* (2.41)	2.90* (2.75)						-1.05* (3.80)

Note: Figures in parentheses represent absolute values of t-statistic; * denotes significance at 5% level.

Table 4a: Estimated Long Run Coefficients of the Bilateral Trade Balance Model Based on Akaike Information Criterion

Trading Partner (country *j*)	Y_K	Y_j	REX_j	*Intercept*
Australia	3.28 (1.71)	-4.32 (1.56)	-0.12 (0.22)	5.34 (1.46)
Austria	2.41 (0.69)	-5.19 (0.65)	1.60 (0.80)	24.43 (1.15)
Belgium	0.11 (0.11)	0.47 (0.31)	1.64* (2.51)	8.32* (3.34)
Brazil	33.75 (0.31)	-81.13 (0.31)	6.14 (0.33)	258.63 (0.33)
China	-0.38 (0.05)	1.24 (0.22)	7.32 (0.34)	33.46 (0.33)
Denmark	2.43* (2.05)	-5.21 (1.79)	1.23 (1.64)	21.88* (2.09)
France	1.44* (5.25)	-4.25* (5.83)	-0.15 (0.89)	11.93* (5.27)
Germany	2.24* (3.45)	-6.89* (3.44)	0.34 (1.03)	24.04* (3.42)
Greece	2.50* (3.63)	-10.36* (6.52)	0.29 (0.19)	34.96* (2.43)
Hong Kong	2.84 (1.65)	-4.11 (1.70)	1.14 (1.51)	9.62 (1.36)
India	-9.12 (1.82)	10.59 (1.77)	-2.09 (1.47)	-15.25 (1.77)
Indonesia	0.002 (0.004)	-0.18 (0.18)	1.25* (2.13)	1.54 (0.47)
Ireland	1.06* (2.02)	-0.63* (2.22)	0.13 (0.36)	-0.77 (0.32)
Italy	2.49* (2.51)	-10.47* (3.27)	1.76* (2.20)	49.05* (4.76)
Japan	-4.06* (2.10)	26.18* (2.47)	-4.25* (2.80)	-111.33* (2.59)
Malaysia	11.62* (6.78)	-11.17* (7.00)	-1.43* (2.00)	-10.25* (2.12)
Mexico	-2.65 (1.65)	5.16 (1.74)	1.45* (3.05)	-6.23 (1.21)
Netherlands	2.89* (2.88)	-6.32* (3.12)	0.34 (0.65)	17.64* (3.52)
New Zealand	-2.32* (2.20)	2.24 (1.30)	1.12* (2.22)	8.35* (2.69)
Norway	-0.11 (0.02)	0.51 (0.07)	-1.09 (0.38)	-9.54 (0.36)

Philippines	-0.16 (0.12)	1.65 (1.15)	0.94 (1.72)	-4.46* (2.28)
Portugal	-43.13 (0.19)	257.74 (0.21)	86.19 (0.21)	-355.99 (0.20)
Singapore	-1.01 (0.56)	1.62 (1.09)	2.65* (4.90)	14.88 (3.17)
Spain	-0.03 (0.01)	3.60 (0.61)	1.07 (0.36)	-10.28 (0.60)
Sweden	4.39* (2.37)	-6.76* (2.08)	-0.34 (0.27)	9.34 (1.55)
Switzerland	-0.15 (0.12)	6.47 (1.72)	2.28 (1.84)	12.46 (0.99)
Thailand	6.24* (2.28)	-9.16* (2.48)	-2.39 (1.76)	4.40 (1.09)
United Kingdom	1.03 (1.17)	-1.73 (1.02)	1.12* (2.72)	11.39* (4.02)
United States	1.86 (1.18)	-4.30 (1.52)	-0.12 (0.18)	9.95 (1.83)

Note: Figures in parentheses represent absolute values of t-statistic; * denotes significance at 5% level.

Table 4b: Estimated Long Run Coefficients of the Bilateral Trade Balance Model Based on Akaike Information Criterion, Pre-Crisis

Trading Partner (country *j*)	Y_K	Y_j	REX_j	*Intercept*
Australia	59.20 (0.42)	-6.86 (0.11)	76.04 (0.42)	-703.31 (0.40)
Austria	4.55 (1.41)	-3.96 (0.47)	0.26 (0.11)	1.20 (0.12)
Belgium	5.03* (6.71)	-10.31* (4.07)	1.94* (5.96)	35.50* (4.23)
Brazil	-13.67 (1.64)	17.34 (0.88)	-3.75 (1.17)	-45.58 (0.81)
China	11.15* (6.81)	-7.77* (9.26)	-0.93 (0.77)	-21.81* (4.99)
Denmark	0.39 (0.41)	7.22 (1.81)	-1.61 (1.03)	-44.37 (1.82)
France	0.69 (0.20)	1.88 (0.11)	-0.93 (0.40)	-17.42 (0.35)
Germany	-0.71 (1.01)	1.79 (1.36)	2.20* (1.98)	11.44* (2.13)
Greece	-	-	-	-
Hong Kong	-5.80 (1.24)	6.70 (0.80)	0.85 (0.23)	-2.98 (0.54)
India	-162.80 (0.23)	184.62 (0.23)	36.20 (0.23)	-0.07 (0.02)
Indonesia	3.34* (4.27)	-2.51* (3.32)	6.36* (2.97)	-13.98* (2.81)
Ireland	-5.52 (0.54)	7.67 (0.42)	-38.99 (0.40)	-283.95 (0.40)
Italy	2.24* (7.16)	-2.35 (1.73)	1.40* (2.43)	11.53 (1.49)
Japan	-8.76* (2.31)	57.68* (3.44)	-13.41* (4.14)	255.58* (3.85)
Malaysia	-0.92* (2.97)	-1.32* (5.20)	0.08 (0.24)	9.61* (4.65)
Mexico	0.99 (0.49)	-2.44 (0.43)	0.63 (0.67)	6.74 (0.52)
Netherlands	-18.23 (0.46)	121.14 (0.52)	-39.02 (0.54)	-721.91 (0.53)
New Zealand	0.53 (0.26)	0.57 (0.12)	2.52 (1.16)	13.01* (2.70)
Norway	7.84 (0.35)	-18.58 (0.50)	6.28 (1.07)	92.09 (1.19)

Philippines	-2.69* (4.76)	4.15* (4.30)	-2.74* (2.23)	-16.45* (3.39)
Portugal	-11.15* (4.05)	0.40 (0.03)	-18.49* (2.74)	-83.52* (2.47)
Singapore	0.97 (0.69)	-1.42 (1.24)	-0.82 (1.26)	-4.55 (1.23)
Spain	4.27* (11.87)	-10.78* (8.00)	-1.37* (3.38)	17.96* (4.15)
Sweden	3.10 (0.78)	45.60 (0.75)	-10.23 (0.76)	-263.55 (0.82)
Switzerland	4.62* (2.77)	-61.81 (1.25)	0.96 (0.18)	261.67 (1.13)
Thailand	-	-	-	-
United Kingdom	1.88* (7.72)	-4.08* (3.66)	0.11 (0.21)	10.27 (1.31)
United States	-2.35* (2.02)	5.44 (1.79)	3.74 (1.81)	12.14 (0.59)

Note: Figures in parentheses represent absolute values of t-statistic; * denotes significance at 5% level.

Table 4c: Estimated Long Run Coefficients of the Bilateral Trade Balance Model Based on Akaike Information Criterion, Post-Crisis

Trading Partner (country *j*)	Y_K	Y_j	REX_j	*Intercept*
Australia	0.10 (0.10)	1.14 (0.67)	0.08 (0.29)	-4.15 (1.73)
Austria	-2.84 (0.46)	15.19 (0.91)	-0.71 (0.28)	-61.93 (1.23)
Belgium	-4.27* (3.29)	4.87* (2.57)	0.16 (0.30)	2.36 (0.42)
Brazil	-222.10 (0.18)	520.59 (0.18)	43.31 (0.18)	-1124.10 (0.18)
China	-5.53 (0.08)	9.99 (0.08)	18.33 (0.08)	94.73 (0.08)
Denmark	1.96* (2.46)	-3.73 (1.73)	0.66 (0.74)	13.04 (1.17)
France	1.03 (0.80)	-3.90 (1.14)	-0.44 (0.78)	10.03 (0.78)
Germany	0.89* (4.28)	-2.01* (2.64)	-0.55* (2.84)	1.27 (0.39)
Greece	1.03* (2.81)	-7.14* (6.60)	-1.48* (2.46)	13.97* (2.01)
Hong Kong	5.39* (10.01)	-4.16* (6.59)	-0.87* (3.46)	-12.21* (4.66)
India	1.91 (0.97)	-1.05 (0.44)	0.68 (0.48)	-1.52 (0.46)
Indonesia	-2.20 (0.81)	6.08 (0.93)	4.85 (1.83)	-28.01 (1.19)
Ireland	1.92* (2.26)	-1.16 (1.63)	0.41 (0.79)	-0.30 (0.10)
Italy	-0.01 (0.01)	-2.42 (0.66)	0.03 (0.03)	11.10 (0.75)
Japan	-2.09 (0.47)	10.16 (0.38)	-1.40 (0.32)	-39.99 (0.35)
Malaysia	8.94* (8.55)	-8.50* (8.79)	0.46 (1.63)	0.71 (0.37)
Mexico	-2.41 (0.70)	5.68 (0.94)	0.77 (0.55)	13.12 (1.00)
Netherlands	2.01 (1.52)	-4.68 (1.42)	0.12 (0.18)	12.61 (1.18)
New Zealand	-1.35* (2.05)	0.71 (0.64)	1.12* (3.89)	10.90* (5.37)
Norway	10.13* (5.38)	-17.33* (4.28)	1.38* (2.13)	42.66* (4.35)

Philippines	2.36 (1.89)	-0.66 (0.57)	0.67 (2.12)	-6.11* (3.57)
Portugal	6.90* (7.13)	-2.39 (1.00)	1.29 (1.65)	-13.25 (1.23)
Singapore	3.32* (8.78)	-1.68* (5.69)	0.06 (0.37)	-7.33* (5.25)
Spain	5.41* (7.22)	-6.77* (6.04)	0.47 (1.12)	8.40* (2.73)
Sweden	50.18 (0.61)	-86.13 (0.60)	-3.24 (0.63)	146.66 (0.57)
Switzerland	6.57* (8.77)	-9.95* (5.23)	-0.47 (0.86)	13.32* (2.79)
Thailand	2.97 (1.39)	-4.15 (1.93)	0.63 (0.98)	7.20* (2.91)
United Kingdom	4.38* (6.36)	-6.57* (5.28)	-0.62 (0.99)	4.74 (0.87)
United States	4.51* (3.56)	-11.60* (3.45)	0.47 (0.47)	35.25* (2.14)

Note: Figures in parentheses represent absolute values of t-statistic; * denotes significance at 5% level.

Table 5: Patterns Based on the Signs of REX

Trading Partner	Short-Run			Long-Run		
	Whole Sample	Pre-Crisis	Post-Crisis	Whole Sample	Pre-Crisis	Post-Crisis
Australia	–	+ –	+	–	+	+
Austria	+	*J*	*N*	+	+	–
Belgium	–	*J*	–	+*	+*	+
Brazil	*W*	+	*W*	+	–	+
China	*M*	+	*N*	+	–	+
Denmark	+	*W*	*M*	+	–	+
France	–	*J*	–	–	–	–
Germany	–	–	*J*	+	+*	–
Greece	–	–	–	+		–*
Hong Kong	+	*J*	*J*	+	+	–
India	*W*	+ –	+ –	+	+	+
Indonesia	+	*N*	+ –	+*	+*	+
Ireland	+	*M*	+	+	–	+
Italy	–	+ –	–	+*	+*	+
Japan	*J*	*J*	*N*	–*	–*	–
Malaysia	*W*	+ –	+	–*	+	+
Mexico	+	*J*	+	+*	+	+
Netherland	+	*J*	+	+	–	+
New Zealand	+	*M*	–	+*	+	+*
Norway	*M*	*W*	+ –	–	+	+*
Philippines	+	*J*	+	+	–*	+*
Portugal	*N*	*J*	–	+	–*	+
Singapore	*N*	*J*	+ –	+*	–	+
Spain	*N*	+	–	+	–*	+
Sweden	*N*	*M*	+	–	–	–
Switzerland	*N*	–	*W*	+	+	–
Thailand	*W*		+	–	+	+
U. Kingdom	+	*M*	–	+*	+	–
U.S.A	–	+	*M*	–	+	+

Note: * in the long−run results denotes significance at 5% level.