Quantitative Analysis of Real Effective Exchange Rate and The Related Economic Factors Based on Panel Data from 53 Countries

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Abstract

This paper makes empirical analysis for these panel data from 53 countries between real Effective Exchange Rate (REER) and the related economic factors. The results show that, in general, the effect of exports of goods and services on REER is negative; the effect of imports of goods and services, real GDP per capita and final consumption expenditure per capita is positive. However, these economic factors have different impacts on REER for different countries in direction. In addition, the effect of imports of goods and services on REER is the biggest and that of final consumption expenditure per capita is the smallest. Moreover, the outcomes also demonstrate that, for some countries including some leading trading nations, the effects of a change in these economic factors on REER don't follow the above rule. Therefore, the trading country needs to work out hedging strategies against exchange risk exposure.

Keywords: REAL EFFECTIVE EXCHANGE RATE, PANEL DATA, REAL GDP, IMPORTS AND EXPORTS OF GOODS AND SERVICES, HEDGING STRATEGIES.

1. Introduction

There are many methods that calculate real effective exchange rate (REER). However, real effective exchange rate index from the website of World Bank considers consumer price index, exchange rate and trade-weight from all countries. Therefore, REER is more effective than that of which is calculated using the methods of only considering CPI and exchange rate, it reflects both international trading levels and reality of exchange rate of related countries. Then how is the relationship between REER and the related economic factors? The study finds a long-run equilibrium relationship among GDP, services exports, imports and real effective exchange rate [2]. Some researches use cointegration analysis in estimating the long-run determinants of the real exchange rates to find out that terms of trade, government consump-

tion, and investment share all influence the real exchange rate for imports, while terms of trade influence the real exchange rate for exports in the long-run [5]. After Ghura analyzed data from 33 countries in SSA, he thought that there is a negative relationship between real exchange rate variability and economic performance [4]. Sekkat and Varoudakis found that exchange rate management matters for export performance in SSA, which is harmful to economic growth and economic development [9]. Rey analyzed the relationship between exports of six Middle Eastern and North Africa countries to 15 member countries of the European Union from 1970Q1 to 2002Q4 and real effective exchange rate volatility to get the results that it is negative for four countries (Algeria, Egypt, Tunisia, and Turkey), positive for the last two (Israel and Morocco), between MENA exports and exchange rate

volatility [8]. Simwaka suggested that while there is an inverse relationship between real effective exchange rate and governmernt consumption in the case of Malawi, a positive ralationship between real effective exchange rate and government consumption obtains in the case of South Africa [10]. A real exchange rate depreciation has negligible effects on output [6]. There is a paper that provides results of econometric modeling of influence of changes of private REER on volumes of import of products of individual TEAs groups, which gives an assessment of exchange rate elasticity of import and makes model calculations and shows that exchange rate effects significantly depend on participation of a branch in international competition [11]. Some researches show that both public and private inflows are associated with an appreciation of the real effective exchange rate [1]. Using bilateral exports from eight Asian countries to the US, the real exchange rate risk significantly affects exports for all countries, negative or positive, in periods of depreciation or appreciation [3].

2. Glossary of Terms and the Indicators Use

Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. It is calculated in a base period 2005. (World Bank)

Final consumption expenditure is the sum of household final consumption expenditure (formerly private consumption) and general government final consumption expenditure (formerly general government consumption). This estimate includes any statistical discrepancy in the use of resources relative to the supply of resources. Data are in constant 2005 U.S. dollars. (World Bank)

Based on the achievements in the past and information related to international trade, the impact factors of REER include: exports of goods and services (exogs), imports of goods and services (imogs), GDP per capita (gdppc) and final consumption expenditure per capita (fcepc). Their natural logarithm are calculated and used to analyze regression relationship between them. They are expressed as lnreer, lnexogs, lnimogs, lngdppc and lnfcepc. Final consumption expenditure per capita is calculated in the following equation (1).

$$fcepc = \frac{final \text{ consumption expediture}}{total \text{ population}}$$

Considering China's exchange rate reform began in 1994, and related data of some countries recorded on the website of World Bank also began in 1994, in this paper, select some indicators like real effective exchange rate, exports of goods and services, imports of goods and services, GDP per capita and final consumption expenditure per capita during 1994 to 2011 from 53 countries who have total data indicators on the website of World Bank as the sample of analysis, the regression relationship between five groups of data is analyzed.

3. The Relationship Analysis between Real Effective Exchange Rate and the Related Economic Factors Based on Panel Data from 53 Countries

Because there are only panel data of those variables that data series are stable and the same order cointegration between them can be analyzed if there exists regression relationship between them. Unit root tests and cointegration tests on these variables are needed.

3.1. Unit Root Tests and Cointegration Tests Based on Panel Data from 53 countries

These methods of common root- Levin, Lin & Chu, individual root- Im, Pesaran and Shin, individual root- ADF – Fisher and individual root- PP – Fisher are applied to analyze whether these variables have unit root or not. It is found that lnreer?, lnexogs?, lnimogs?, lngdppc? and lnfcepc? belong to the first difference. Using the methods of Pedroni Residual Cointegration Test, Kao Residual Cointegration Test and Johansen Fisher Panel Cointegration Test, the results are as follows:

As shown in table 1, there exists the cointegration relationship between REER and exports of goods and services, REER and imports of goods and services, REER and GDP per capita, REER and final consumption expenditure per capita for those panel data from 53 countries during 1994 and 2011. And then, the regression relationship is analyzed here by means of the method of LS-least square (and AR).

3.1. What Are The Effects of Exports of Goods and Services, Import of Goods and Services, GDP Per Capita and Final Consumption Expenditure per capita on REER

Variable-Coefficient Models with Fixed Effect is selected because different cross-section specific coefficients have different effects on real effective exchange rate and the effects of the selected explanatory variables on real effective exchange rate are more clear and easy to understand their meaning when other explanatory variables are assigned to common coefficients.

Because the number of cross-section is much more than the number of time series, cross-section weights is the best selection. At the same time, PCSE (Panel Corrected Standard Errors) is applied here.

Table 1. The Results of Pedroni and Kao Residual Cointegration Test

Test method	Test hypothesis	statistics	p
Pedroni Residual	no cointegration	Panel ADF-Statistic	-4.654571 (0.0000)
	no cointegration	Group rho-Statistic	8.923374 (1.0000)
		Group PP-Statistic	-5.578964 (0.0000)
		Group ADF-Statistic	-6.510842 (0.0000)
Kao Residual	no cointegration	ADF	-3.388451 (0.0004)
Johansen Fisher Panel	no cointegration	Fisher Stat.* from trace	2276.(0.0000)
		Fisher Stat.* from max-eigen	1570. (0.0000)
	At most 1 cointegration relationship	Fisher Stat.* from trace	1364. (0.0000)
		Fisher Stat.* from max-eigen	865.0 (0.0000)
	At most 2 cointegration relationship	Fisher Stat.* from trace	697.2 (0.0000)
		Fisher Stat.* from max-eigen	491.6 (0.0000)
	At most 3 cointegration relationship	Fisher Stat.* from trace	343.3 (0.0000)
		Fisher Stat.* from max-eigen	287.2 (0.0000)
	At most 4 cointegration relationship	Fisher Stat.* from trace	217.7(0.0000)
		Fisher Stat.* from max-eigen	217.7(0.0000)

Assume

$$lnreer = c(1) + c(2)lnexogs + c(3)lnimogs + c(4)lngdppc + c(5)lnfcepc + \varepsilon \qquad (2)$$

In this paper, based on panel data from 53 countries, eight Variable-Coefficient Models with Fixed Effect but different cross-section specific coefficients are established: respectively selecting lnexogs, lnimogs, lngdppc and lnfcepc as cross-section specific coefficients; selecting lnexogs and lnimogs as cross-section specific coefficients; selecting lnexogs, lnimogs and lngdppc as cross-section specific coefficients; selecting lnexogs, lnimogs and lnfcepc as cross-section specific coefficients; selecting lnexogs, lnimogs, lngdppc and lnfcepc as cross-section specific coefficients.

The results show that, in 53 countries, when other explanatory variables are constant, export of goods and services from South Africa has the biggest impact on its REER, followed by Tunisia. Their REER will respectively decrease by 0.9127 percent and 0.8256 percent whenever their exports increase by 1 percent; the one from Russian Federation has the smallest effect on its REER, followed by Romania and Zambia. Their REER will respectively rise by -0.0267 percent, 0.042 percent and 0.0447 percent whenever their exports increase by 1 percent. For 53 countries, the impact of import of goods and services from Czech Republic (developed country) on its REER is the largest, followed by Lesotho. Their REER will respectively rise by 0.8546 percent and 0.8346 percent whenever their imports increase by 1 percent; the impact of import of goods and services from Macedonia, FYR on its REER is the smallest, followed by South Africa. Their REER will respectively increase by 0.0266 percent and 0.0274 percent.

In 53 countries, when other explanatory variables are constant, the effect of Zambia's GDP per capita on REER is the biggest, followed by Japan and Czech Republic. Their REER respectively rise by 2.0126 percent, -1.9266 percent and 1.2942 percent whenever their GDP per capita increase by 1 percent. The effect of Dominican Republic's GDP per capita on REER is the least, followed by Nicaragua and Italy. Their REER respectively increase by 0.01778 percent, 0.02596 percent and 0.028 percent whenever their GDP per capita increase by 1 percent.

In 53 countries, when other explanatory variables are constant, the country whose final consumption expenditure per capita has the biggest impact on its REER is Czech Republic, followed by Japan. Their REER are respectively 1.49422 percent and -1.3272 percent whenever their final consumption expenditure per capita increases by 1 percent. The country whose final consumption expenditure per capita has the least effect on its REER is Nicaragua, followed by New Zealand and Australia. Their REER respectively rise by 0.0106%, -0.0116% and -0.0292% whenever their final consumption expenditure per capita increase by 1 percent.

In 53 countries, when all explanatory variables are variable, the country whose export of goods and services has the biggest impact on its REER is Canada, followed by the United Kingdom and Netherlands, their REER will increase by -2.8219%, -2.4399% and 2.2821% whenever their exports increase by 1%; the country whose export of goods and services has the smallest effect is Ukraine, and then Dominican Republic, their REER will increase by 0.004% and

0.0169%; the country whose import of goods and services has the largest impact is the United Kingdom, and then Netherlands and Canada, their REER will increase by 2.7194%, -2.5% and 1.712%; the country whose import of goods and services has the least effect is Nicaragua, then Cameroon, their REER will rise by 0.0005% and -0.0048% whenever their imports increase by 1%; the country whose GDP per capita has the biggest effect on its REER is Canada, and then Colombia and the United Kingdom , their REER will rise by 5.4192%, 4.4464% and 4.3285% whenever their GDP per capita increases by 1%, the country whose GDP per capita has the smallest effect is Cameroon, and then China, their REER will increase by 0.0376% and 0.0492% whenever their GDP per capita increases by 1%; the country whose final consumption expenditure per capita has the biggest effect on its REER is the United Kingdom, then Canada, their REER will decrease by 5.2686% and 4.2376% whenever their final consumption expenditure per capita increases by 1%; the country whose final consumption expenditure per capita has the smallest effect is Nicaragua, then Belgium, their REER will increase by 0.0009% and 0.022% whenever their final consumption expenditure per capita rises by 1%.

The results demonstrate that when one country is planning to trade with other countries, it needs to consider which economic factors will impact its real effective exchange rate and trade amounts because they are related to foreign exchange receipts and disbursements. And then, the related departments draw up risk management solution to avoid the exchange rate risk such as hedging its trade positions in capital market or with other physical trades or production swap trades against the exchange risk; if the country who trades with other countries intends to think of imports, exports, GDP per capita and final consumption expenditure as the explanatory variables that are variable, it will be seen that their REERs for some countries have great fluctuations with these explanatory variables, some others have slight fluctuations. Based on these results, the country with internal trades may hedge its trade positions in different internal markets.

More generally, real effective exchange rates of the leading trading nations are easily paid more attention to. The relationships between their REER and the related economic factors are shown From Table 2 to Table 9.

For the leading trading nations in the world such as China, USA, Germany, Japan, France, the United Kingdom, Singapore, Canada, Russia and Australia, because of , these regression models have a high goodness-of-fit. What is their real effective exchange rate affected by different explanatory variables is as follows:

As shown in table 2, assuming the changes in other explanatory variables are all the same for 53 countries, a change in imports of goods and services, GDP per capita or final consumption expenditure will have a positive impact on real effective exchange rate, a change in exports of goods and services will have negative impact on real effective exchange rate. However, in the selected trading nations, Russia's real effective exchange rate is minimally affected by change in its export of goods and services, followed by Australia and the United Kingdom; Germany's real effective exchange rate is maximally affected by change in its export of goods and services, followed by Japan and USA.

As shown in Table 3, supposing that the changes in other explanatory variables are all the same for 53 countries, a change in exports of goods and services

Table 2. The Result of Pool Estimation for lnexogs? as Cross-Section Specific Coefficient

country	lnexogs?	lnimogs?	lngdppc?	lnfcepc?
Common Coefficients				
China	-0.261967			
USA	-0.460428			
Germany	-0.354618			
Japan	-0.584991			
France	-0.466478	0.25162	0.193147	0.008057
The United Kingdom(UK)	-0.202072			
Singapore	-0.383245			
Canada	-0.237168			
Russia	-0.026745			
Australia	-0.178415			
R- squared	0.73996			
Adjusted R- squared	0.70673			
Sample Data	Based on constant 2005 price during 1994 and 2011			

Table 3. The Result of Pool Estimation for lnimogs? as Cross-Section Specific Coefficient

	lnexogs?	lnimogs?	lngdppc?	lnfcepc?
Common Coefficients				
china		0.423710		
USA		0.231398		
Germany		0.273321		
Japan		-0.135792		
France	-0.352572	0.196251	0.072322	0.008756
The United Kingdom(UK)		0.456304		
Singapore		0.268621		
Canada		0.519431		
Russia		0.5204		
Australia		0.405937		
R- squared	0.72004			
Adjusted R- squared	0.68426			
Sample Data	Based on constant 2005 price during 1994 and 2011			

will have a negative impact on real effective exchange rate, a change in GDP per capita and final consumption expenditure will have a positive impact on real effective exchange rate. what's more, in the selected trading nations, a change in Japan's imports of goods and services will have a negative impact on real effective exchange rate; France's real effective exchange rate is minimally affected by change in its imports of goods and services, followed by USA and Singapore; Russia's real effective exchange rate is maximally affected by change of its imports of goods and services, followed by Canada and the United Kingdom.

As shown in Table 4, on the supposition that the changes in other explanatory variables are all the same for 53 countries, a change in exports of goods and services will have a negative impact on real effective exchange rate, a change in imports of goods and services and final consumption expenditure will have a positive impact on real effective exchange rate. However, in the selected trading nations, a change in Japan's GDP per capita will have the biggest negative impact on real effective exchange rate, followed by France and USA; Canada's real effective exchange rate is maximally affected by change of GDP per capita, followed by Canada and Russia.

As shown in Table 5, on the assumption that the changes in other explanatory variables are all the same for 53 countries, a change in exports of goods and services will have a negative impact on real effective exchange rate, a change in imports of goods and services and GDP per capita will have a positive impact on real effective exchange rate. However, in the selected trading nations, a change of Japan's final consumption expenditure per capita will have the largest negative impact on real effective exchange rate, followed by Germany, France, Singapore and USA; Canada's real effective exchange rate is maximally positively affected by change in final consumption expenditure per capita, followed by Russia, the United Kingdom and China.

Table 4. The Result of Pool Estimation for lngdppc? as Cross-Section Specific Coefficient

	lnexogs?	lnimogs?	lngdppc?	lnfcepc?
Common Coefficients				
china			0.193468	
USA			-0.361447	
Germany			-0.294381	
Japan			-1.926615	
France	-0.343633	0.351557	-0.553648	0.00918
The United Kingdom(UK)			0.287759	
Singapore			-0.146997	
Canada			0.397324	
Russia			0.383089	
Australia			0.18788	
R- squared	0.72382			
Adjusted R- squared	0.68853			
Sample Data	Based on constant 2005 price during 1994 and 2011			

Table 5. The Result of Pool Estimation for lnfcepc? as Cross-Section Specific Coefficient

	lnexogs?	lnimogs?	lngdppc?	lnfcepc?
Common Coefficients				
china				0.065354
USA				-0.533769
Germany				-0.779949
Japan				-1.32722
France	-0.37259	0.396445	0.145106	-0.7209
The United Kingdom(UK)				0.088576
Singapore				-0.558819
Canada				0.294713
Russia				0.165709
Australia				-0.029224
R- squared	0.73774			
Adjusted R- squared	0.70422			
Sample Data	Based on constant 2005 price during 1994 and 2011			

As shown in Table 6, under the condition of the same change in real GDP per capita and final consumption expenditure per capita for 53 countries, a change in GDP per capita and final consumption expenditure per capita will have a positive impact on real effective exchange rate. However, in the selected trading nations, a change of Russia's export of goods and services will have the largest negative impact on real effective exchange rate, followed by the United Kingdom, USA, Canada and France; a change of Russia's import of goods and services will have the biggest positive impact on real effective exchange rate, followed by the United Kingdom, Canada, Russia and Australia. However, a change in import of goods and services from China or Japan has negative impact on real effective exchange rate.

As shown in Table 7, under the condition of the same change in real GDP per capita for 53 countries, a change in final consumption expenditure per capita will have a negative impact on real effective ex-

change rate. However, in the selected trading nations, a change of the UK's export of goods and services will have the largest negative impact on real effective exchange rate, followed by France, USA, Canada and Russia; a change in the UK's import of goods and services will have the biggest positive impact on real effective exchange rate, followed by Canada, Russia and Australia. However, a change in export of goods and services from China has positive impact on real effective exchange rate; a change in import of goods and services from China has negative impact on real effective exchange rate; a change in real GDP per capita of China has the biggest positive impact on real effective exchange rate followed by France, that of Japan has the biggest negative impact on real effective exchange rate.

As shown in Table 8, under the condition of the same change in lnexogs, lnimogs and lnfcepc for 53 countries, a change in final consumption expenditure per capita will have a negative impact on real effec-

Table 6. The Result of Pool Estimation while selecting lnexogs? and lnimogs? as Cross-Section Specific Coefficients

	lnexogs?	lnimogs?	lngdppc?	lnfcepc?
Common Coefficients				
china	0.105218	-0.174176		
USA	-0.619945	0.250137		
Germany	-0.205658	0.105161		
Japan	-0.128433	-0.202645		
France	-0.584342	0.323349	0.02616	0.002717
The United Kingdom(UK)	-1.007261	1.162901		
Singapore	-0.272442	0.27149		
Canada	-0.611294	0.887588		
Russia	-1.12837	0.755071		
Australia	-0.112057	0.428333		
R- squared	0.85945			
Adjusted R- squared	0.82883			
Sample Data	Based on constant 2005 price during 1994 and 2011			

Table 7. The Result of Pool Estimation while selecting lnexogs?, lnimogs? and lngdppc? as Cross-Section Specific Coefficients

	lnexogs?	lnimogs?	lngdppc?	lnfcepc?
Common Coefficients				
china	0.017669	-0.381914	0.656844	
USA	-0.666649	0.534654	-0.774881	
Germany	-0.051181	0.1913	-0.706096	
Japan	0.306436	0.01503	-3.212894	
France	-0.672422	0.267149	0.884499	0.008169
The United Kingdom(UK)	-1.076998	1.002538	0.024136	
Singapore	-0.347352	0.321336	0.003186	
Canada	-0.638488	0.928055	-0.273741	
Russia	-0.302727	0.888181	-1.021702	
Australia	-0.52222	0.650733	-0.610702	
R- squared	0.8995			
Adjusted R- squared	0.86553			
Sample Data	Based on constant 2005 price during 1994 and 2011			

Table 8. The Result of Pool Estimation while selecting lnexogs?, lnimogs? and lnfcepc? as Cross-Section Specific Coefficients

	lnexogs?	lnimogs?	lngdppc?	lnfcepc?
Common Coefficients				
china	0.273288	-0.652596		0.586676
USA	-0.637571	0.261494		0.080949
Germany	-0.266194	0.284279		-0.97213
Japan	-0.177065	-0.199334		-0.276078
France	-0.8044	0.523832	0.225138	-0.227136
The United Kingdom(UK)	-1.579802	2.239896		-1.96609
Singapore	-0.468076	0.510994		-0.624412
Canada	-0.828178	1.054257		-0.477237
Russia	-1.02062	0.72259		-0.021049
Australia	-0.327876	0.576453		-0.585422
R- squared	0.8909			
Adjusted R- squared	0.85708			
Sample Data	Based on constant 2005 price during 1994 and 2011			

Table 9. The Result of Pool Estimation while selecting lnexogs?, lnimogs?, lnfcepc? and lngdppc? as Cross-Section Specific Coefficients

country	lnexogs?	lnimogs?	lngdppc?	lnfcepc?
china	0.326833	-0.780394	0.049162	1.116096
USA	-0.71902	1.065131	-0.677912	-1.062356
Germany	-0.058417	0.203606	0.182946	-1.87782
Japan	0.284146	-0.152607	-3.800697	-0.134591
France	-0.512265	-0.226535	1.013401	1.201125
The United Kingdom(UK)	-2.439933	2.719363	4.32852	-5.268574
Singapore	-0.357031	-0.152607	0.31922	-0.801787
Canada	-2.821859	1.712018	5.419208	-4.237585
Russia	0.139011	0.828467	-1.995445	0.542044
Australia	-0.385713	0.815426	-2.383919	1.061841
R- squared	0.88954			
Adjusted R- squared	0.84721			
Sample Data	Based on constant 2005 price during 1994 and 2011			

tive exchange rate. However, in the selected trading nations, a change in the UK's export of goods and services will have the largest negative impact on real effective exchange rate, followed by Russia and Canada, but that of China has positive impact; a change of the UK's import of goods and services will have the largest positive impact on real effective exchange rate, followed by Canada and Russia, but that of China has negative impact; a change in the UK's final consumption expenditure per capita will have the largest negative impact on real effective exchange rate, followed by Germany and Singapore, but that of China and USA have positive impact.

As seen in Table 9, all explanatory variables are regarded as cross-section specific coefficients, the results of pool estimation will find that In the 53 countries selected in this paper, a change in export of goods and services from 34 countries will have negative impact on real effective exchange rate; a change in import of goods and services from 35 countries will have positive impact on real effective exchange rate; a change in real GDP per capita from 27 countries will have positive impact on real effective exchange rate; a change in final consumption expenditure per capita from 28 countries will have positive impact on real effective exchange rate.

As seen in table 9, the regression models of ten leading trading nations are as follows:

$$lnreer\_chn = 2.79809 + 6.17009 + 0.32683 lnexogs\_chn - 0.78039 lnimogs\_chn + 0.04916 lngdppc\_chn + 1.1161 lnfcepc\_chn$$
$$t = \quad (158.8164) \quad (27.41716) \quad (-56.33567) \quad (5.471526) \quad (108.2244)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

$$lnreer\_usa = 6.74976 + 6.17009 - 0.71902 lnexogs\_usa + 1.06513 lnimogs\_usa - 0.67791 lngdppc\_usa - 1.06236 lnfcepc\_usa$$
$$t = \quad (158.8164) \quad (-72.72747) \quad (27.67388) \quad (-4.912341) \quad (-21.80709)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

$$lnreer\_deu = 11.62879 + 6.17009 - 0.05842 lnexogs\_deu + 0.20361 lnimogs\_deu + 0.18295 lngdppc\_deu - 1.87782 lnfcepc\_deu$$
$$t = \quad (158.8164) \quad (-2.771363) \quad (6.713197) \quad (3.649088) \quad (-32.6758)$$
$$p = \quad (0.0000) \quad (0.0057) \quad (0.0000) \quad (0.0003) \quad (0.0000)$$

$$lnreer\_jpn = 36.04989 + 6.17009 + 0.28415 lnexogs\_jpn - 0.15261 lnimogs\_jpn - 3.8007 lngdppc\_jpn - 0.13459 lnfcepc\_jpn$$
$$t = \quad (158.8164) \quad (12.67703) \quad (-5.78921) \quad (-29.60945) \quad (-1.99765)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0461)$$

$$lnreer\_fra = -4.42175 + 6.17009 - 0.51227 lnexogs\_fra - 0.22653 lnimogs\_fra + 1.0134 lngdppc\_fra + 1.20112 lnfcepc\_fra$$
$$t = \quad (158.8164) \quad (-25.47042) \quad (-7.2551) \quad (18.8102) \quad (20.14407)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

$$lnreer\_gbr = -0.35262 + 6.17009 - 2.43993 lnexogs\_gbr + 2.71936 lnimogs\_gbr + 4.32852 lngdppc\_gbr - 5.26857 lnfcepc\_gbr$$
$$t = \quad (158.8164) \quad (-167.3608) \quad (135.5202) \quad (60.0711) \quad (-99.07822)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

$$lnreer\_sgp = 2.16366 + 6.17009 - 0.35703 lnexogs\_sgp + 0.38639 lnimogs\_sgp + 0.31922 lngdppc\_sgp - 0.80179 lnfcepc\_sgp$$
$$t = \quad (158.8164) \quad (-13.86138) \quad (16.32229) \quad (14.25405) \quad (-85.94431)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

$$lnreer\_can = 14.71042 + 6.17009 - 2.82186 lnexogs\_can + 1.71202 lnimogs\_can + 5.41921 lngdppc\_can - 4.23759 lnfcepc\_can$$
$$t = \quad (158.8164) \quad (-127.7769) \quad (128.9514) \quad (90.59081) \quad (-88.01557)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

$$lnreer\_rus = -13.93177 + 6.17009 + 0.13901 lnexogs\_rus + 0.82847 lnimogs\_rus - 1.99545 lngdppc\_rus + 0.54204 lnfcepc\_rus$$
$$t = \quad (158.8164) \quad (13.87264) \quad (102.2463) \quad (-83.30357) \quad (34.23425)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

$$lnreer\_aus = 1.416895 + 6.17009 - 0.38571 lnexogs\_aus + 0.81543 lnimogs\_aus - 2.38392 lngdppc\_aus + 1.06184 lnfcepc\_aus$$
$$t = \quad (158.8164) \quad (-15.02925) \quad (57.26125) \quad (-17.72058) \quad (8.24578)$$
$$p = \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000) \quad (0.0000)$$

As seen in the above, the negative effect of Canada's export of goods and services on real effective exchange rate is the largest, followed by the UK and USA, but that of China, Japan an

t will impact the international trade? What are those economic factors that can be quantified and to what extent they affect the corporate revenues with international businesses and its balance of payment. If possible, hedge strategies will be worked out according to different risk exposure and the characteristics of different markets against international trade risk.

In more than 20 countries out of 53 countries under the condition that other impact factors are constant, the remaining impact factors have different effect on real effective exchange rate have conflicting results. It means that the pricing of exchange rate has not regular rule to abide by and maybe is related to the country's macro and micro economic environment home and abroad. Furthermore, the exchange-rate market is possibly beyond market rule. Price volatility is out of people's views.

4. Conclusions

Generally speaking, a change in exports of goods and services has positive impact on it; a change in imports of goods and services has a big impact on it; a change in final consumption expenditure per capita has the smallest impact on it. The results of empirical research based on panel data from 53 countries demonstrate that a change in exports of goods and services, imports of goods and services, real GDP per capita or final consumption expenditure per capita have positive or negative impact on real effective exchange rate to different degree in different countries, and the effect of imports of goods and services on REER is the biggest and that of final consumption expenditure per capita is the smallest. So do these leading trading nations. It indicates that the exchange-rate market can be manipulated. In addition, an open country had better to carefully analyze the impact factors of exchange rate those countries with which it has international trade activities, and then make hedging strategies related to exchange risk exposure in different market like capital market and the physical market or trading merchandises to avoid risk.

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