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TESTING THE ORCUTT HYPOTHESIS: EVIDENCE FROM PAKISTAN'S BILATERAL TRADE FLOWS

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Abstract

This study aims at testing Orcutt's hypothesis by using Pakistan's bilateral trade flows with its major trading partners. According to the Orcutt hypothesis, the exchange rate tends to affect trade flows more instantaneously than relative prices. The few earlier studies investigate the Orcutt hypothesis in Pakistan's case; however, these studies mainly rely on aggregate trade data and are supposed to have aggregation biases. We disaggregate the trade flows at the bilateral level to deal with the aggregation biasness and use the bound testing approach and error correction model to test the Orcutt hypothesis. The empirical results support the Orcutt hypothesis in the case of Pakistan's imports from China, India, Japan, Saudi Arabia, and the UAE. While in export case to the UK and China, results support the Orcutt hypothesis, and trade flows respond faster to the variation in exchange rate than to the relative prices.

Keywords: Orcutt hypothesis, Bound testing approach, ECM, Pakistan's trading partner.

JEL Classification: F31

1. INTRODUCTION

After the elimination of the fixed exchange rate and the Bretton Woods system in the 1970s, the adjustment of trade flows to the variation in exchange rate and relative prices attracted attention in the international trade literature. Before the fall of this system, the researchers only focussed on examining the impact of relative prices on trade flows, especially the Marshall-Lerner condition. After adopting a flexible exchange rate system, policymakers try to assess a currency devaluation's effectiveness on trade flows in developing and developed countries. In this regard, the study of Orcutt (1950) and Kreinin (1967) are considered the earliest studies that take trade flows as a function of relative prices (domestic prices relative to foreign prices). Afterwards, the estimation of price elasticity and the Marshall-Lerner condition became an essential topic for the policymakers to formulate and assess trade policy.

Orcutt (1950) was the first to postulate that trade flows respond quicker to the changes in exchange rate than to the changes in relative prices and the policy inference of both policies is not uniform. He believes that the price elasticities are somewhat biased and are supposed to affect currency depreciation/devaluation's

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effectiveness in determining its trade flows. Wilson and Tackacs (1977) agree with Orcutt's postulation that the price elasticities are downward biased, and the trade flows respond faster to changes in exchange rate than to the variation in relative prices. In the literature, this difference in response to the exchange rate and the relative price is associated with five lags, including recognition lag, decision lag, delivery lag, replacement lag, and production lag.

The variables mentioned above play a vital role in determining the country's trade flow or trade balance. In international trade traditional literature, the effectiveness of exchange rate depreciation strategy and trade policy entirely rely on the commodity's price elasticity. It suggests that commercial policy would only be effective if the price elasticities have a larger magnitude. On the other hand, if the price elasticities are low, the exchange rate devaluation policy is recommended and would be useful. However, as explained above, Orcutt disagrees with this view and believes that price elasticities are not statistically reliable. Based on his recommendation, the option of picking between these two policies depends on the reaction of trade flows to the variation in relative prices and exchange rate, not on the magnitude. If trade flows react faster to the exchange rate changes than relative prices, the exchange rate depreciation policy will improve country's trade balance.

Pakistan's trade deficit significantly increases during the last decade and reaches a historic high of USD 32.6 billion in 2018 (WTO) as the imports grew much quicker than exports. Furthermore, a number of factors adversely affect Pakistan's exports and competitiveness against its competitors in the region. There is a need to analyse Pakistan's trade policy and see whether the focus should be on exchange rate or relative price. Therefore, the present study analyses trade flows' response to the changes in exchange rate and relative prices and test the Orcutt hypothesis in Pakistan's case.

This study is organized in the following way. Section 2 briefly discusses the literature review, whereas the third section includes the methodology. The results and conclusion are given in section four and five, respectively. The data, variables, and their definition are given in the Appendix.

2. LITERATURE REVIEW

In international trade literature, emphasis is on the determinants of exports and imports, which play an essential role in the country's growth and development. Theoretically, the main determinants that significantly influence exports, are trading partner's income, exchange rate and relative exports prices (Bahmani-Oskooee, 1986; Bahmani-Oskooee and Kara, 2008). As exchange rate and relative prices play a crucial role in determining exports and imports, the researcher's attention was continuously attracted by these variables. The idea to study the impact of exchange rate and relative prices was introduced by Orcutt in 1950. Orcutt supposed that unlike the relative prices, the exchange rate tends to affect the trade flows more quickly. After the introduction of Orcutt's

hypothesis, a few researchers tried to investigate the magnitude of exchange rate and relative prices empirically. To give a glimpse of empirical evidence, we include Junz and Rhomberg (1973) study who investigate for Orcutt hypothesis while using a sample of selected developed countries. The study shows that both nominal exchange rate and relative prices have a similar impact on trade flows. Nonetheless, Wilson and Takacs (1979) use data from 1957 to 1971 for the six countries, including Germany, France, Canada, the USA, and the United Kingdom. While estimating the exports and imports demand function, they find a quicker response of exchange rate than relative prices to the trade flows and support the Orcutt hypothesis. Similarly, Bahmani-Oskooee (1986) while estimating the exports and imports demand equation for the six developing countries including Israel, India, Greece, Brazil, South Africa, and Thailand, find the early response of exchange rate to the trade flows than relative prices. Similar results were found by Tagene (1989, 1991) while using the data of developing countries.

However, criticizing the above-mentioned studies for using the non-stationary data, Bahmani-Oskooee and Kara (2003) use the cointegration and error correction mechanism and use nine industrialized countries' trade data flows to test the Orcutt hypothesis. The study found mixed evidence on the Orcutt hypothesis. In another study, Bahmani-Oskooee and Kara (2008) use the data of 12 developing countries, including Pakistan, and investigate the reaction of trade flows to the changes in exchange rate and relative prices while using the quarterly data over the period of 1973 to 2002. They found no strong evidence of the Orcutt hypothesis in these selected developing countries. Similarly, to test the Orcutt hypothesis in the selected ECOWAS countries, Omisakin *et.al.* (2010) use the data for 1980Q1-2007Q4 on a quarterly basis and measure the exports and imports elasticities. They measure response of trade flows to the relative prices and the real effective exchange rate. The study reports quicker response of export flows to the relative prices than to the exchange rate while estimating the export demand model. However, the response of imports flows response is quicker to the exchange rate than to the relative prices.

As the above studies have either employed trade data at an aggregate level or have utilized the trade data at the bilateral level, Bahmani-Oskooee and Baek(2014)use the trade data at a disaggregate level for commodity trade flows at one digit industries to test the Orcutt hypothesis in the bilateral trade between Korea and the United States. They find a faster response of trade flows to the exchange rate changes than relative prices in few industries. Bahmani-Oskooee and Hosny (2015) also employ the commodity trade flows to test the Orcutt hypothesis to reduce the aggregation bias. They use the bilateral trade flows data of 59 industries between the European Union and Egypt and discover that one-third of the total industries support the Orcutt hypothesis. In another study, Bahmani-Oskooee and Hosny (2015) employ the bilateral trade data of 36 industries between the USA and Egypt and test the Orcutt hypothesis. After their estimation, they find evidence of the Orcutt hypothesis in 50% of the cases.

As far as Pakistan's case is concerned, we have evidence of only one study which supports Orcutt's hypothesis. Bahmani-Oskooee and Kara (2008) investigate the Orcutt hypothesis for 12 developing countries, including Pakistan; however, they use Pakistan's aggregate level trade data. The present study disaggregates the trade data at a bilateral level and investigates Orcutt's hypothesis for Pakistan against her major trading partners such as China, UK, US, UAE, Japan, Saudi Arabia, Singapore, and India.

3. METHODOLOGY

To empirically test the Orcutt hypothesis, we use both import as well as export demand equations. Focusing on the import demand equation, we assume that country's imports depend positively on its income, the nominal bilateral exchange rate and the relative imports prices. Following the study of Bahmani-Oskooee and Kara (2003), we usethe following import demand equations with some manipulation to convert them into a bilateral level study.

$$\text{Ln } M_t = \alpha + \beta_1 \text{Ln} Y_{pak} + \beta_{2\text{Ln}} \left(\frac{PM}{Pi}\right) + \ln\beta_3 Er + e_t \qquad (1)$$

Where M is the Pakistan's imports fromi^{th} trading partner and is expected to be positively affected by its income as an increase in its GDP will boost up its imports. So we expect a positive sign for β_1. However, this sign could be negative if an increase in Pakistan's income results in an increase in the production of imports substitute goods. Second determinant of import demand is relative import prices which are denoted by imports prices (PM) relative to the domestic price level. The relative import prices will have a negative impact on import, and we expect a negative sign for β_2. The third and last determinant of imports is the nominal bilateral exchange rate, which is defined as the number of Pakistani rupee per its trading partner. An increase in the nominal exchange rate indicates depreciation, which is supposed to negatively impact imports; hence, β3 is expected to be negative.

We get only long-run estimates by estimating equation (1) while the main focus is to test the Orcutt hypothesis; we have to introduce the short-run dynamics to equation (1). To that, we employ Pesaran *et al*. (2001) bound testing approach to cointegration and the error correction model with model specification as follows:

$$\Delta LnM_t = \alpha + \sum_{k=1}^{n} \beta_{t-k} \Delta LnM_{t-k} + \sum_{k=0}^{n} \delta_{t-k} \Delta LnY_{t-k}^{pak} + \sum_{k=0}^{n} \gamma_{t-k} \Delta Ln(\text{PM/PD})_{t-k} + \sum_{k=0}^{n} \pi_{t-k} \Delta LnEr_{t-k} + \lambda_1 LnM_{t-1} + \lambda_2 LnY_{t-1}^{pak} + \lambda_3 Ln(\text{PM/PD})_{t-1} + \lambda_4 LnEr_{t-1} + \mu_t \qquad (2)$$

Equation (2) shows the error correction format that follows Pesaran *et al.* (2001) in which the short-run estimates are obtained from the coefficient of 1st

differenced variables and the long-run coefficients from the estimate of λ_2, λ_3, and $\lambda_4$normalized on λ_1. However, to ensure that the long-run variables are not spurious, we must establish cointegration through the F test(Pesaran et al, 2001). Using the Bounds testing approach to cointegration tends to have certain advantages. First, it doesn't require the variable to be integrated of the same order. Second, both short-run and long-run estimates can be accomplished through it. As far as testing theOrcutt hypothesis is concerned, we are dealing with annual data and use the Akaike information criterion to select the optimal lag length. For this purpose, we use the model with a maximum of five lags on the first differenced variable.

Once the optimum lag length is selected for the exchange rate and relative prices , we then compare the lags of relative prices with exchange rate. The Orcutt hypothesis will hold if the exchange rate carries a short lag length than relative prices. To test theOrcutt hypothesis, we estimate the export model as follows:

$$\text{Ln } X_t = \alpha_0 + \alpha_1 \text{LnYi} + \alpha_{2\text{Ln}}\left(\frac{\text{PX}}{\text{PXW}}\right) + \ln\alpha_3 \text{Er} + e_t \qquad (3)$$

$X_t$is Pakistan's exports to the i^{th} trading partner. It is the function of the trading partner's income denoted by Yi,(PX/PXW) indicates relative prices, where PX is domestic exports while PXW indicates exports of the world.Weexpect positive estimates for α_1 as an increase inpartner's income will boost Pakistan's export to that country. Similarly, the negative sign is expected for the estimates of α_2,which is the coefficient of the price that Pakistan charges on its exports relative to the price in the partner's country. In the last, we expect a positive sign for α_3 as depreciation (increase in the nominal exchange rate) is supposed to affect exports positively.

Just like equation (1), we also express equation (3) in the error correction format to test the Orcutt hypothesis.

$$\Delta LnX_t = \alpha + \sum_{k=1}^{n} \beta_{t-k} \Delta LnX_{t-k} + \sum_{k=0}^{n} \pi_{t-k} \Delta LnY_{t-k}^{partner} + \sum_{k=0}^{n} \Omega_{t-k} \Delta Ln(\text{PX/Pi})_{t-k} + \sum_{k=0}^{n} \phi_{t-k} \Delta LnEr_{t-k} + \delta_1 LnX_{t-1} + \delta_2 LnY_{t-1}^{partner} + \delta_3 Ln(\text{PM/PD})_{t-1} + \delta_4 LnEr_{t-1} + \mu_t \qquad (4)$$

We employ the same methodology to estimate equation (4) as we applied to equation (3) to test the Orcutt hypothesis.

4. THE RESULTS

To test the Orcutt hypothesis" in Pakistan's bilateral trade with her eight major tradingpartners, we employ the annual data from 1974 to 2018. We first estimate the import demand equation and only address the short-run estimate of the

nominal exchange rate and relative imports prices in Table 1 as these are the main variables to test theOrcutt hypothesis. Whereas, in Table 2, we report the long-run estimates of all the variables along with their diagnostics in Table 2.

Table 1: Short Run Estimates of Imports Demand Equation

Country	Lags on Relative Imports Prices							
	0	1	2	3	0	1	2	3
China	-0.05 (0.03)				0.92 (2.06)*	0.03 (0.06)		
India	0.91 (0.39)				-2.79 (0.96)			
Japan	0.22 (0.87)				-0.39 (0.82)			
Saudi Arabia	-0.25 (0.34)	0.04 (0.07)			-0.26 (0.35)	0.56 (1.08)		
Singapore	0.85 (0.66)				-3.32 (1.24)			
UAE	-1.01 (1.71)*				0.20 (0.21)			
UK	0.10 (0.45)				0.43 (1.79)*			
US	-0.47 (1.21)	-0.95 (1.69)*	-0.57 (1.12)	-0.42 (1.01)	0.05 (0.14)	0.86 (1.92)*	0.33 (0.76)	0.22 (0.58)

*Note: Lags are selected on the basis of Akaike Info Criterion. Number inside the parenthesis next to each coefficient is absolute value of the t-ratio. * represents the significance at 10% levels.*

From the short-run coefficients of imports demand equation (equation 1) given in Table 1, we observe a shorter lag for the variable of exchange rate compared to relative imports pricesin 5 cases,thus supporting the Orcutt hypothesis in Pakistan'simports fromthese five out of eight selected countries. These countries are China, India, Japan, Saudi Arabia, and the UAE. The imports respond equally to the changes in exchange rate and relative import pricesin Pakistan's imports from the US and Singapore, where both these variables take the same lag length. Whereas in bilateral trade with the UK, the imports respond quicker to relative imports price than the exchange rate. To know about the long-runbehavior of these variables, we move to Table 2. So long as Pakistan's GDP is concerned, it carries expected positive impacts on the bilateral imports in Six cases. The coefficient is significant only in three cases, indicating that as Pakistan's GDP increases, imports of Pakistan from these countries also increase. In the remaining two cases (US and Singapore), the GDP carries negative but insignificant coefficients. Thevariables of exchange rate tend to carry significant coefficients in three cases, whereas, on the other hand, the relative imports prices carry significant coefficients in two cases. "In the significant coefficients, the exchange rate carries expected negative sign only in one casewhereas, in the remaining two cases, the sign is positive. However, the relative import prices take an unexpected sign in both cases.Pesaran et al (2001) recommend establishing joint significance among the lagged level variables to confirm the results' validity. For this purpose,

the F stat values, along with other diagnostic are given in Table 2. The results indicate the existence of cointegration in five cases, as indicated by the significant F stat value.Moreover, to know about the adjustment speed towards the long-run equilibrium, we estimate the error correction term(ECM). For this purpose, we use the normalized coefficients of equation (1). Alternatively, we also check for cointegration among variables by replacing the ECM term with its lagged value and estimate the model by the same optimum lags.

Table 2: Long Run Estimates and Diagnostics of Imports Equation.

Country	Ln GDP	Ln (PX/Pi)	Ln E	F	ECM t-1	LM	RESET	Normality	CUSUM (CUSUM SQ)	ADJ R^2
China	*0.09 (0.13)*	*0.31 (0.33)*	*-0.29 (0.12)*	*1.46*	*-1.05 (3.25)*	*0.14*	*0.01*	*1.08*	*S (S)*	*0.50*
India	*0.25 (0.76)*	*2.74 (1.21)*	*-0.38 (0.28)*	*10.99*	*-1.04 (6.53)*	*1.82*	*0.72*	*15.82*	*S (S)*	*0.53*
Japan	*-1.16 (2.71)**	*-0.56 (1.72)**	*0.09 (0.59)*	*2.68*	*-0.24 (1.95)*	*2.16*	*0.61*	*2.89*	*S (S)*	*0.17*
Saudi Arabia	*0.33 (1.90)**	*-0.02 (0.24)*	*0.12 (0.20)*	*1.41*	*-0.31 (2.31)*	*2.26*	*0.29*	*0.66*	*S (S)*	*0.21*
Singapore	*-1.51 (0.61)*	*-1.59 (0.29)*	*-0.06 (0.02)*	*2.08*	*-0.51 (1.99)*	*1.94*	*0.59*	*0.77*	*S (S)*	*0.10*
UAE	*-0.23 (0.43)*	*-0.05 (0.11)*	*-0.12 (0.26)*	*1.96*	*-0.30 (2.01)*	*0.24*	*0.47*	*0.42*	*S (S)*	*0.15*
UK	*0.35 (0.62)*	*0.07 (0.55)*	*0.03 (0.16)*	*2.16*	*-0.15 (1.98)*	*0.92*	*9.91*	*0.33*	*S (S)*	*0.21*
US	*1.07 (1.97)**	*-0.36 (0.99)*	*0.53 (1.69)**	*0.54*	*-0.27 (1.70)*	*2.76*	*3.13*	*6.21*	*S (S)*	*0.48*

(a) The value in the parenthesis next to the coefficients are the absolute value of t ratios.
(b) The Upper bound value at 10% level of significance is 4.10. This is taken from Narayen (2005).
(c) LM denote the Lagrange multiplier test for used for serial correlation test which is a chi square distribution test with one degree of freedom. Its value at 5% level is 3.84.
(d) Reset indicate the Ramsey Reset test which is also a chi square distribution test and is used to check the model specification.
(e) Jarque Berra test is used to check the normality. It is also a chi square distribution test with 2 degree of freedom. Its value at 5% level is 5.99.

The coefficient of ECM_{t-1}shows the adjustment towards the long-run equilibrium, which is fulfilled by all the models here. Moving toward the other diagnostics given in Table (2), we report the value of the LM test (Lagrange Multiplier), which is a Chi-square distribution test with one degree of freedom and isusedto detect the serial correlation. The value is insignificant in all cases at a 5% level of significance, indicating that the models are free of serial correlation residuals.

Similarly, to check the model specification, we apply Ramsey Reset test.By comparing it with the tabulated value, we also conclude that the seven models are correctly specified, whereas the value is significant only in one case. For normality of the residuals, we report the value of Jarque-Bera,which is a Chi-square distribution test with two degrees of freedom. Comparing it with its critical

value of 5.99 at 5% level, we conclude that the normality assumption is fulfilled in all the cases. For stability of short-run as well as long-run results, we use CUSUM and CUSUM square tests. Our results indicate that our results are almost stable. In the last, the Adj R-square value is given, which shows the goodness of fit of every optimum model.

To estimate the export demand equation for Pakistan's trade flows against her major trading partners, we estimate equation (3). We use optimum lag length and report the short-run results in Table 3,while the long-run results are reported along with diagnostic tests in Table 4.

Table 3: Short run Estimates of Export Demand Equation

Country	Lags on Exchange Rate						Lags on Relative Imports Prices					
	0	1	2	3	4	5	0	1	2	3	4	5
China	-0.73 (1.48)	0.13 (0.25)					1.17 (1.84)*	-1.20 (1.25)				
India	1.36 (1.22)	2.79 (2.05)*	1.74 (1.30)				0.52 (0.36)	-4.21 (2.81)*	-3.69 (2.72)*			
Japan	-0.16 (0.64)	0.08 (0.31)					0.53 (0.96)	-1.11 (1.77)*	-0.02 (0.04)			
Saudi Arabia	-0.66 (0.84)	-0.98 (1.04)					2.45 (2.59)*	0.33 (0.21)				
Singapore	0.17 (0.29)						0.74 (1.05)					
UAE	-1.28 (1.35)						3.75 (3.38)*					
UK	-0.13 (0.41)	0.26 (0.97)	0.47 (1.68)*	-0.14 (0.45)	-0.74 (2.37)*	-0.03 (0.10)	0.91 (2.06)*	-0.42 (0.36)	0.19 (0.17)	-0.17 (0.21)	0.86 (1.43)	
US	0.29 (0.43)						-0.15 (0.25)					

Note: * represents the significance at 10% levels. Lags are selected on the basis of Akaike Info Criterion

The short-run estimates indicate a quick response of trade flows to exchange rate than relative exports prices in two cases(China and UK).Thus the Orcutt hypothesis is supported in Pakistan's exports to these countries. However, Pakistan's exports to India, Japan, Saudi Arabia, and Singapore show the same response of trade flows to exchange rate and relative export prices where both these variables take the same lag length. Whereas, in case of Pakistan's exports to UAE, the relative export price takes shorter lags than exchange rate and affect trade flows quicker than the exchange rate.

Table 4 : Long run Estimates and Diagnostics of Exports Demand Equation

Country	LnGDPpak	Ln(PM/PD)	LnE	F	ECMt-1	LM	RESET	Normality	CUSUM(CUSUM SQ)	ADJ R2
China	0.13 (0.20)	0.60 (0.44)	-0.05 (0.11)	0.42	-0.21 (1.71)	4.61	1.70	0.77	S (S)	0.22
India	4.68 (3.80)*	9.83 (3.89)*	-3.05 (2.87)*	5.89	-0.57 (4.01)	1.22	0.01	1.61	S (S)	0.33
Japan	0.48 (0.69)	1.01 (1.16)	-0.05 (0.36)	6.07	-0.22 (2.11)	0.22	0.06	0.21	S (S)	0.18
Saudi Arabia	1.96 (0.92)	1.61 (0.71)	0.78 (1.24)	4.50	-0.20 (1.87)	1.34	0.13	0.14	S (S)	0.23
Singapore	-0.59 (0.94)	-0.51 (0.80)	-0.22 (0.94)	5.48	-0.59 (4.58)	0.58	1.19	1.94	S (S)	0.35
UAE	4.06 (4.32)*	4.70 (4.82)*	0.98 (2.50)*	16.3	-0.49 (5.18)	4.71	8.93	3.49	S (S)	0.63
UK	1.50 (1.86)*	1.61 (1.08)	0.40 (1.69)*	0.63	-0.35 (1.87)	0.94	2.24	3.75	S (S)	0.33
US	-0.59 (0.93)	-0.40 (0.61)	-0.26 (0.97)	4.56	-0.44 (3.01)	0.07	0.68	0.49	S (S)	0.20

(a) The value in the parenthesis next to the coefficients are the absolute value of t ratios.

(b) The Upper bound value at 10% level of significance is 4.10. This is taken from Narayen (2005).

(c) LM denote the Lagrange multiplier test for used for serial correlation test which is a chi square distribution test with one degree of freedom. Its value at 5% level is 3.84.

(d) Reset indicate the Ramsey Reset test which is also a chi square distribution test and is used to check the model specification.

(e) Jarque Berra test is used to check the normality. It is also a chi square distribution test with 2 degree of freedom. Its value at 5% level is 5.99.

As far as the empirical long-run estimates are concerned, Table 4 indicates that GDP tends to have a positive impact in five cases.The GDP coefficient is significant in case of Pakistan's exports to Saudi Arabia and the US. Thisimplythat as these economies grow, they import more from Pakistan which improves Pakistan's exports to these countries. On the other side, Pakistan's exports decline with the increase in GDP of three economies (Japan, Singapore, and UAE), where the coefficient is negative. Out of these three economies, the coefficient is significant (at 10%) only in Japan. The relative export price takes a positive sign in 6 cases. However, the value is significant only in three cases. Whereas in the two cases, the relative export price takes a negative and insignificant coefficient. The exchange rate takes its expected positive and significant coefficient in two cases, whereas it takes a negative and significant coefficient in one case. Just like the imports demand model, we also establish cointegration to ensure that the long-run variables are not spurious. The F stat value is significant as it is above the upper bound value, hence indicating cointegration among the variables. The ECM_{t-1} is given, which is another way to confirm the cointegration relationship among variables. The value is negative and

significant in all the cases showing the convergence speed towards the long-run equilibrium. The models are free from serial correlation and correctly specified checked by LM and Ramsey Reset test, respectively. Additionally, all the estimates are stable, and every optimum model enjoys a good fit indicated by adj R square.

5. CONCLUSION

The researchers discuss the three determinants of the trade flows in the literature: nominal exchange rate, relative imports prices, andGDP of home and a foreign country. Orcutt (1950) believed that the trade flows respond quicker to the nominal exchange rate than to the changes in relative prices. After the introduction of Orcutt hypothesis, few studies have tested it empirically. Orcutt hypothesis was investigated either between an individual country against the rest of the world, or it was investigated between a country against her bilateraltrade partners. In the case of Pakistan, Orcutt's hypothesis hasneithertested between Pakistan against the rest of the world, nor it has been tested between Pakistan and her bilateral trade partners. To fill this gap,we test the Orcutt hypothesis by using Pakistan's trade flows against her eight trading partners. Theempirical results confirmtheevidence of Orcutt's hypothesis in five cases whileestimating the imports demand equation. On the other hand, we find the evidence in two cases while estimating the exports demand equation. Besides testing the Orcutt hypothesis, we also findthat Pakistan's GDP, trading partner's GDP, nominal bilateral, exchange rate, and relative prices are the other long-run determinants that affect Pakistan's trade flows.

The results have important policy implications that indicate that exchange rate policy can play an effective role in curtailing the unnecessary imports in Pakistan's case. At the same time, it would be conducive to encouraging exports that are already at the lowest level compared to other countries. These results also can be supported by the idea that the exchange rate has been manipulated in the last few years thanks to political considerations by keeping it overvalued, which resulted in excessive imports. Furthermore, it played a role in dwindling Pakistan's exports to major trading partners. In this regard, targeted and selected industries may be supported by export subsidies for a limited period to provide sound footings in the international market.

Appendix

"Data, variables definition and Sources"

"To test the Orcutt hypothesis, we employ the annual data from 1974 to 2018and the source of data are given below:

a) WDI and World bank WITS system.
b) International Financial Statistics."

Variables and data sources

"M_i: It is defined as the value of Pakistan's imports from an i_{th} trading partner. the imports value data comes from a source (a)."

X_i: It is defined as the value of Pakistan's exports to ith trading partner over time. The data of export values come from the source (a).

"$Y_{partner}$: Measure the trading partner's real GDP. The data is taken from WDI.

Y_{pak}: Ypak denotes Pakistan's GDP measured by real GDP. Its data also comes from WDI.

PM= It denotes the imports prices and is reflected by imports price values the data comes from source (b)."

PD= Denotes the domestic price and we measure it by the CPI. The data of CPI comes from source b.

PX= It denotes the price of exports. It is measured by the unit value of exports. The data comes from a source (b).

PXW= It denotes Word Export Price index (1910=100). The data comes from the source (b).

Pi= Pi denotes the prices at trading partner. it is measured by their CPI and the data comes from source (b).

Er= indicates bilateral exchange rate. It is defined in a way that the increase reflects the depreciation of Pakistani rupee . The data comes from source (b).

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