Role of E-commerce in Foreign Trade Promotion: Some Evidence from Pakistan

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Abstract

This study scrutinizes facts relating to the empirical relevance between e-commerce and foreign trade in Pakistan. For the purpose of analysis quarterly based time series data (1998Q1-2011Q4) was considered. Number of internet connections (proxy for e-commerce) was taken as exogenous variable. While foreign trade was endogenous variable of the model. Study empirically proves that with the increase in internet facility foreign trade has greatly increased.

Key Words: E-commerce, foreign trade, internet connections, Pakistan.

Introduction

Internet is a set of millions of computers around the world that are all connected to one another. These computers are connected through different telecommunication links like phone calls. Fiber optics lines, satellites and wireless connections.

e- Commerce stands for electronic commerce. E-commerce means to carry out all trade and other related activities needed to enhance trade performed by using internet. To promote trade use of e-banking, e-marketing, e-shopping, e-auctions etc are common.

Business to consumer commerce consists of sales of goods and services to the general public. Consumer to consumer commerce takes place between to consumers. While business to business e- commerce takes place between two business parties.

Main purpose of this paper is to show the role of e-commerce in foreign trade promotion. For this purpose study is subdivided in to following sections:

Section II reviews the literature by including the theoretical and empirical findings.

Section III describes research methodology and about dependent and independent variables.

Section IV interprets regression results and analysis.

Finally the section V provides some concluding remarks.

II. Theoretical Frame work

Hashim and Zaman (2010) empirically conducted a comparative study on the effect of telecommunication sector investment on foreign and domestic trade in Pakistan for the period from 1950-51 to 2006-07. They used following models:

$$L\ FT = \delta 0 + \delta 1\ L\ IT + ut \qquad (1)$$

$$L\ DT = \delta 0 + \delta 1\ L\ IT + ut \qquad (2)$$

Results indicated that with the increase in investment in telecom sector both domestic and foreign trading activities gained a lot of boost.

Moodley (2002) studied South African wood furniture market to find the link between internet connectivity and access to international markets. He observed that more number of internet connections and their proper functioning enhanced easy and quick entry of wood furniture across the border.

shsYong *et al* (2011) studied the impact of e-commerce on international trade by using Paul Krugman's (1991) ice berg model. They empirically proved the impact of international trade on e-commerce by observing its effect on out prices, cost of production, import and export of products and on overall profit.

Bruckner (2003) explained the relationship between trade and telecommunication. He found positive impact of telecommunication on economic growth. He was in view that improvement in telecommunications infrastructure reduces costs that lead to a higher growth in trading other than non-trading sectors. He also stressed the importance of FDI in telecommunication sector. Excessive interconnection tariffs and restriction on licensing rules are major barriers to trade.

Freund and Weinhold (2004) studied the effect of internet in the promotion of international trade. He observed positive and significant impact of internet in trade promotion and concluded that 10% increase in web hosts in a country leads to rise in 0.2% increase in export growth.

Choi (2003) studied the role of internet in foreign direct investment (FDI) enhancement. He found that with the increase in internet users and internet hosts FDI has increased in the country. He also empirically proved that 10% increase in the growth of internet users and internet hosts leads to 2% increase in FDI.

Gani and Sharma (2003) studied the effects of information and communication technologies (ICT) in the promotion of foreign direct investment. They proved that various ICT's instruments (like cell phones and internet etc) are playing significant role in FDI promotion. They also proved that ICT enhances FDI efficiency by reducing related costs and search time or through increase in overall efficiency and productivity

Freund and Weinhold (1999) found ample evidence that development of global markets via the internet makes historical linkages less important and suggest that the countries with the fewest past trade links –most likely developing countries-have the most to gain from the internet.

III. Research Methodology

This study deals with the role of e-commerce in foreign trade promotion. For this study time series data have been taken from 1998Q1 to 2011Q4 on quarterly bases, keeping in view of data availability and the model is based on the work of Hashim and Zaman (2010).

The functional equation is based on theoretical formulation, developed earlier in this section. The equation is given as:

$FT = \delta_0 + \delta_1 \ INT.CON + u_t$

Where

FT= Foreign Trade

INT.CONN= Internet connections

ut= is the error term capturing left over effects, having no variance and zero mean.

Hypothesis

$\partial FT / \ \delta_1 \ INT.CONN \ > 0$

SPECIFICATION OF VARIABLES

Foreign Trade (FT) is taken as dependent variable. Data for foreign trade has been taken from Economic Survey of Pakistan (2010-2011). Since all level of e-commerce is possible through internet thus number of internet connections is used as proxy for e-commerce and this is the independent variable of the model

IV. REGRESSION RESULTS AND ANALYSIS

The empirical investigation on the role of e-commerce in foreign trade promotion uses quarterly time series data has been taken from 1998q1 to 2011q4. Details of Various summary statistics, correlation and results of Augmented Dickey fuller (ADF) Test and regression results are given below.

Table 1 SUMMARY STATISTICS (Sample period: 2000Q1 to 2006Q4)

Variable(s)	FT	INTCON
Maximum	1026822	0.925
Minimum	202375	0.0025
Mean	529763.6	0.49882
Std. Deviation	279199.4	0.33017
Skewness	0.38029	-0.062029
Kurtosis-3	0.38029	-1.4708
Coef of Variation	0.52703	0.66191

Table 2   Estimated Correlation Matrix of Variables

Variable	*FT*	INTCON
FT	1.0000	5338
INTCON	0.95338	1.0000

Table 3   RESULTS OF ADF TEST

Variables	Level/Difference	With trend	Without trend	Conclusion
FT	Level	-1.6134	-0.93744	
	First Difference	-7.1788	-7.2227	I(1)
INTCON				
	Level	-1.5563	-1.2010	
	First Difference	-7.8345	-7.7679	I(1)

95% critical value for ADF Statistics for all variables: -3.5025(with trend)
95% critical value for ADF Statistics for all variables: -2.9215(without trend)

Ordinary Least Squares Estimation

Dependent variable is FT
56 observations used for estimation from 1998Q1 to 2011Q4
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Regressor	Coefficient	Standard Error	T-Ratio[Prob]
A	127602.0	21527.9	5.9273[.000]
INTCON	806276.4	36109.7	22.3286[.000]
Q1	-435.0914	20330.9	-.021400[.983]
Q2	-435.0914	20330.9	-.021400[.983]
Q3	-435.0914	20330.9	-.021400[.983]

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R-Squared   .90895   R-Bar-Squared   .90167
S.E. of Regression   87552.4   F-stat.   F(4, 50) 124.7862[.000]
Mean of Dependent Variable 529763.6   S.D. of Dependent Variable   279199.4
Residual Sum of Squares   3.83E+11   Equation Log-likelihood   -701.3202
Akaike Info. Criterion   -706.3202   Schwarz Bayesian Criterion   -711.3385
DW-statistic   .39329

Diagnostic Tests
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*   Test Statistics   *   LM Version   *   F Version   *
* A:Serial Correlation*CHSQ(4)= 35.8877[.000]*F(4, 46)= 21.5938[.000]*
*   *   *   *   *
* B:Functional Form   *CHSQ(1)= 13.1785[.000]*F(1, 49)= 15.4405[.000]*
*   *   *   *   *
* C:Normality   *CHSQ(2)=   1.5001[.472]*   Not applicable   *
*   *   *   *   *
* D:Heteroscedasticity*CHSQ(1)=   6.4108[.011]*F(1, 53)=   6.9928[.011]*
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Error Correction Model

Dependent variable is FT

55 observations used for estimation from 1998Q2 to 2011Q4
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Regressor	Coefficient	Standard Error	T-Ratio[Prob]
A	122544.9	13441.1	9.1172[.000]
INTCON	812776.8	22335.9	36.3889[.000]
Q1	-4545.9	12652.7	-.35928[.721]
Q2	1335.8	12319.1	.10844[.914]
Q3	1335.8	12319.1	.10844[.914]
K(-1)	.79678	.085487	9.3204[.000]

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R-Squared	.96726	R-Bar-Squared	.96385
S.E. of Regression	52885.8	F-stat. F(5, 48)	283.5990[.000]
Mean of Dependent Variable	535826.4	S.D. of Dependent Variable	278142.6
Residual Sum of Squares	1.34E+11	Equation Log-likelihood	-660.7406
Akaike Info. Criterion	-666.7406	Schwarz Bayesian Criterion	-672.7076
DW-statistic	1.8353		

Diagnostic Tests
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*	Test Statistics *	LM Version *	F Version *
* A:Serial Correlation	*CHSQ(4)=	3.3914[.495]*F(4, 44)=	.73713[.572]*
*	*	*	*
* B:Functional Form	*CHSQ(1)=	.015893[.900]*F(1, 47)=	.013837[.907]*
*	*	*	*
* C:Normality	*CHSQ(2)=	55.1096[.000]*	Not applicable *
*	*	*	*
* D:Heteroscedasticity	*CHSQ(1)=	7.5090[.006]*F(1, 52)=	8.3988[.005]*

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In order to determine the order of integration of variables Augmented Dickey Fuller (ADF) test was conducted. ADF test results indicate that both variables were integrated by first difference i.e. I (1) in with and without trend situations. Thus we conclude that both variables have stationarity in the levels of 95% critical values with and without trend.

In order to check the dependency of one variable over other ordinary Least Square (OLS) estimation was applied. Results indicate positive and significant impact of internet connections on foreign trade. Co-efficient is also looking strong. Value of R square is high and measures the goodness of fit of the regression model. Adjusted R square value is also high but value of Dubin Watson (DW) test is too low and indicating the problem of serial correlation. Since, we have converted original yearly based data into quarters, so this problem has arisen. To resolve the difficulty of serial correlation an error correction model (ECM) was applied. Again the results are positive and significant. Value of R square and adjusted R square has also improved. Values of both Akaike information criterion and Schwarz information criterion are very low since both criteria impose much harsher penalty that adjusted R square on increasing number of variables. Residual is also found significant and indicates 79% rate of adjustment.

V. Concluding remarks

E-commerce brings closer to the buyer and seller. The internet has made the process of initiating and doing trade greatly easier, quicker and cheap. That is the reason that volume of international trade has greatly increased. Use of e-commerce helps the buying and selling organizations to act freely without the consideration of time and distance. Services like technical and legal consultation, research, inventory control employees training etc can now be easily operated via e-commerce.

The major focus of this paper is to study the role of e-commerce to promote international trade in Pakistan. In the modern world no one can ignore the importance e-commerce in foreign trade since it fastens the trading process with great efficiency. In this study empirically has been proved that e-commerce facility has greatly enhanced the foreign trade in Pakistan.

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