

DETERMINANTS OF LEATHER EXPORTS FROM PAKISTAN: A TIME SERIES ANALYSIS

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ABSTRACT: *This paper attempts to evaluate impact of major factors affecting leather exports from Punjab, Pakistan employing secondary sources of data. For time series analysis, data (1980 to 2010) were collected from various sources and used to develop an export supply function at macro-level. The value of the finished leather exports from Pakistan was taken as dependent variable, whereas export price, real exchange rate, trade openness and number of animal skins and hides were taken as independent variables. Co-integration analysis and Error Correction method were employed to estimate short and long run elasticities. According to the findings, exchange rate showed a negative effect on exports of finished leather. The coefficient of this variable explains that for every one percent increase in exchange rate there might be 5.2 percent decrease in exports of finished leather in the long run. In the similar context, Real GDP, share of semi manufactured goods exports and trade openness showed effect of 3.1, 0.72 and 2.4 percent increase in the export supply of finished leather in the long respectively. Export prices showed negative relationship with value of finished leather exports. The coefficient of this variable suggested that for every one percent increase in the export prices there might be -3.5 percent decreases in the export supply of finished leather in the long run. Based upon the findings, it is suggested exchange rate of Pakistani rupee should be stabilized with strengthening industry of semi manufactured leather goods in the country.*

Key Words: Leather, Exports, Cointegration Analysis and Error Correction Method

1. Introduction: Livestock sector is the important sub sector of agriculture which significantly contributes to overall agriculture by sharing 55.1 percent of value added and 11.5 percent to GDP during 2010-11, but unfortunately this sector was impacted by the massive floods and witnessed marked slowdown recorded growth at 3.7 percent in 2010-11 as against 4.3 percent last year. This sector was also immune from weather related problems and thus offered prospects for consistent growth (GOP, 2011). The leather sector is Pakistan's second most dynamic sector after textiles. It contributes 5 percent to manufacturing GDP, about 7 percent to export earnings and provides employment to more than 200,000 people. The leather industry consists of six sub-sectors namely, tanning, leather footwear, leather garments, leather gloves, leather shoe uppers and leather goods. Leather and leather products industry is concentrated mainly at Karachi, Sialkot, Kasur and Lahore. Pakistan's leather industry is export oriented, as 90 percent of the leather produced is exported abroad either in the form of finished leather or leather products. Leather sector is one of the established indigenous manufacturing sectors that have developed reasonably well. Leather exports have increased at an average rate of 11 percent per annum. There are more than 2500 tanneries and footwear manufacturing units, mainly located in Karachi, Lahore, Sialkot and Kasur (Mehmood, 2008). Leather is one of the important products of the livestock industry in Pakistan. The material made from the skin and hides of the animals by tanning or similar processing is called leather. Supply of leather mainly depends on the livestock population of the country. Pakistan is fortunate that the raw material required by the leather industry is available in the country in abundance. Local availability of raw materials and low wage cost gives the country a competitive edge in the world market. The above mentioned are the types of basic raw materials which are being used by this industry i.e. cow

hides, buffalo hides, goat skins and sheep skins. The quality of raw hides and skins generally depends upon the quality of livestock. The hides and skins removed out of young and healthy cattle may be taken as the best in its quality provided the conditions in which these are removed and also their collection, preservation and storage is satisfactory.

Pakistan is well known in the world for high quality and wide-range of finished leather, garments, (sports jackets) and gloves (working and industrial). However Pakistan's contribution of leather goods (hand bags, purses, suitcases, key chains, belts etc.) and footwear is small in the international market, mainly because the former sub sector is least developed and the other is inward/domestic market demand-oriented. Leather garments sector constituting 52.9 percent of the total value of leather export, ranking highest among exports of leather industry in Pakistan, followed by finished leather constituting 35.8 percent of the total export earnings. In Pakistan leather industry is running under capacity and working at 50 percent of there existing potential. Reason of this under capacity production is unavailability of raw material, unskilled labor, high utility bills and high running cost of machinery that energy consumptions is very high and their labor intensive nature (Syed, 2009).

The largest concentration of leather garments production in Pakistan is found in Sialkot, which has 186 units and having around 52 percent of the total number of units located in Pakistan. Whereas the second largest concentration of leather garments production in Pakistan is in Karachi where 130 units are located, which is around 36 percent of the total number of units located in Pakistan. Lahore has 21 units, which is nearly 6 percent of the total number of units.

According to the Trade Development Authority of Pakistan, Pakistan stands at 21st position in the world market of finished leather having the percentage contribution of 0.99 percent. If we talk about the leather garment sector, raw hides and skins, leather gloves, leather footwear and leather goods, Pakistan is contributing 6.17 percent, 1.12 percent, 10.76 percent, 0.28 percent and 0.21 percent respectively in the world market of leather goods respectively. Some of the leading importers of Pakistan's Leather include USA with 10.69 percent share, Germany with 9.33 percent, UK with 7.35 percent, China with 7.1 percent and Italy with 6.54 percent share of total exports of leather from country. Pakistan imports raw leather material from Saudi Arabia, China, Kenya, Sudan and Tanzania. Saudi Arabia and China has major share of leather raw material supply to Pakistan by contributing 13.54 and 12.89 respectively. Mostly Pakistan import raw material and related products of leather from the developing countries and export value added products to developed countries like USA. Considering above facts, it may be concluded that leather sector is an important component of Pakistan's economy. Leather export is a dynamic activity but still under utilized as the country exports semi-manufactured leather exports. Given this background, this study aimed at examining the impact of major determinants of leather exports identified using time series analysis.

2. An Overview Of Literature: Review of the available studies on exports of agricultural commodities in general and leather in particular revealed that limited and scanty literature is available which delineate effect of major variables affecting leather exports in Pakistan. There is however some relevant literature from other countries.

In Bangladesh, Sharif and Mainuddin (2003) narrated had been a continuous shift of leather, footwear and leather goods production from developed to developing countries mainly caused by price competitiveness. The developed countries imported low and medium end market leather footwear and leather goods from developing countries keeping their manufacturing limited to high fashioned costly products. Bangladesh had not yet been able to make a significant breakthrough in its leather sector through diversification and improvement of the quality of leather products. Bangladesh needed to improve the quality of leather products for better market access and economic benefits from the international export market including the developed countries. Jordaan and Eita (2007) analyzed the determinants of South African exports of raw hides and skins (other than fur skins) and leather (H41) using annual data covering the period 1997 to 2004 for 32 main trading partners. The results showed that importer's GDP, South Africa's GDP, importer's population, South Africa's population, infrastructure of South Africa and importing country and some regional trade agreements were the main determinants of raw hides and skins (other than fur skins) and leather exports. The paper then investigated if there was unexploited trade potential. The investigation revealed that among others, South Korea, United Kingdom, USA, Zambia and Zimbabwe had unexploited export potential. It was important to focus efforts on the unexploited trade potential accelerated growth and alleviated poverty in South Africa. Bekele and Ayele (2008) described that in their study, it was clear that Ethiopia had a clear comparative advantage in raw skin and hides production. However, the comparative advantage was not yet turned into a competitive advantage in the global market. Globalization had brought value chain and competitiveness issues, where individual efficiencies were less important.

In Pakistan, Siddiqui (2001) stated that the leather and leather products industry was mainly located at Karachi, Gujranwala, Multan, Peshawer, Lahore, Kasur and Sialkot. The major clusters of leather products were located at Korangi, Sialkot, Lahore and Kasur. There were 784 units, 461 leather garments manufacturing units, 348 gloves manufacturing units and over 524 footwear manufacturing units in the country. The leather sector was mainly an export oriented sector of our country. The major countries to which Pakistan was exported leather and leather products were Italy, Portugal, Germany, France, USA, Dubai and Singapore etc. The leather sector during the last decade had shown remarkable progress in exports of value added products. Bashar (2003) stated that high quality leather was mainly exported and was not available for high value-added leather products. Leather garments in Pakistan were made mostly from low quality and low grade leather. These garments faced tough competition from Chinese and Indian leather products. Because the cost of production was very high in Pakistan as compared to the China and India. The high cost of various kinds of raw material especially utilities and taxes made our products more costly in international markets. Pakistan could gained lost market share of leather industry by reducing the cost of production. Massood (2009) narrated that Pakistan's leather exports showed a decline of 29 percent in the period of 2008-09 after a decade of constant growth. This sharp decrease in the exports of high value added and labor intensive leather products , because this sector was Pakistan's second largest foreign exchange earner after textiles and provided employment to 500,000 workers, was a matter of serious attention, demanding for immediate remedial steps to stem the tide. Kalimullah (2010) stated that country's leather exports were likely to decrease by at least 30 percent due to the killings of animals in vast numbers in the ongoing deluge in Khyber Pakhtunkhwa, Punjab, Sindh and Balochistan. President RCCI Kashif Shabbir talked to a group of businessmen and industrialists at his office, one billion dollar of leather industry had badly affected due to floods. Prices of leather products were likely to jump further due to the dearth of leather emerging fast after the killings of animals in the floods.

Some other studies which focused on estimation of factors affecting exports for agricultural crops include Mbithi (2000) for maize, Haleem *et al.* (2005) for citrus, Ghafoor *et al.* (2010) for mango, Javed (2010) for rice.

3. Methodolody And Data

3.1 Time Series Analysis : Secondary data were used to capture effect of different variables which have direct or indirect impacts on export supply of leather at country level. Data for export supply was collected for a period of 1980-2010. Data of export value of finished leather taken from the agriculture statistics of Pakistan and data on other variables like hides and skins production, exchange rate, real GDP, Share in semi manufactured goods exports, domestic prices, export prices and trade openness collected from various issues of Economic Survey of Pakistan.

3.2. Theoretical Model: Co integration (Granger 1981) was designed for testing and estimating the long run and short run relationship among the variables. The estimation of long run relationship required the time series to be non stationary in the level form. If the time series data are non stationary then the common statistical tools are not suggested and regression becomes spurious in nature (Granger and Newbold, 1974). In co integration approach, first step is to test for stationary or non stationary of data set. Second step is to test for long run relationship between variables.

3.3 Testing for Unit Root: A series is stationary if its mean, variance and covariance all are independent of time or in other words remains constant over time. Conversely, a series is non stationary if it fails to satisfy any part of the above definition i e., its mean, variance or covariance change overtime. Various approaches are used to test the hypothesis of unit root but the most commonly used technique is Dickey-Fuller (DF) test (Dickey and Fuller, 1979) and (Dickey and Fuller, 1981). For the DF test, I have specified the number of lags and used Schwarz Bayesian Criterion (SBC) for each series. DF test estimates the following equation by OLS;

$$Y_t = \alpha_1 Y_{t-1} + \mu \quad (5)$$

If $\alpha_1 < 1$, the series Y_t is stationary and it is non-stationary if $\alpha_1 = 1$. The null hypothesis of unit root, ($H_0: \alpha_1 = 1$) is tested against the alternative hypothesis of no unit root, ($H_1: \alpha_1 < 1$).if H_0 is rejected; the series is stationary and vice versa.

3.4 Testing for Co integration: Co integration technique identifies equilibrium long run relationships between variables. If long run relationship exists between variables, then variables are co integrated. For implementation of co integration, two conditions must be fulfilled. First, at least two individual variables should be integrated of same order. Second, linear combination among variables should exist. Consider the co integration regression;

$$Y_t = \alpha + X_t \mu_t \quad (6)$$

If the series Y_t and X_t are both $I(1)$ and the error term μ_t is $I(0)$, then the series are co integrated of order $I(1, 0)$. In above equation, measures the equilibrium relationship between the series Y_t and X_t and μ_t is the deviation from long run equilibrium path.

If the DF test fails to reject the null hypothesis of unit root in levels but reject the null hypothesis in first differences, then the series contain one unit root and is of integrated order one $I(1)$. If the test fails to reject null hypothesis in levels and first differences but reject the null hypothesis in second differences, then the series contains two unit roots and is of integrated order to $I(2)$ (Mencet *et al.*, 2006).

Following functional form of export supply function of finished leather was employed.

$$\begin{aligned} \text{Log}(EV_t) = & a_0 + a_1 \log(ER_t) + a_2 \log(RGDP_t) + a_3 \log(SSMAN_t) + a_4 \log(HS_t) \\ & + a_5 \log(DP_t) + a_6 \log(TO_t) + a_7 \log(EP_t) + \mu_t \end{aligned} \quad (7)$$

Where

Log (EV_t)	=	Logarithm of export value of finished leather (Million Rs.)
Log (ER_t)	=	Logarithm of exchange rate (Pak.Rs./U.S.\$)
Log ($RGDP_t$)	=	Logarithm of real gross domestic product (Million Rs.)
Log ($SSMAN_t$)	=	Logarithm of share in semi manufactured goods (Percentage)
Log (HS_t)	=	Logarithm of hides and skins (Million No.)
Log (DP_t)	=	Logarithm of domestic prices (Per Sq.M)
Log (TO_t)	=	Logarithm of trade openness (Ratio)
Log (EP_t)	=	Logarithm of export prices (Per Sq.M)

a_0 is the intercept term and $a_1, a_2, a_3, a_4, a_5, a_6$ and a_7 are parameters

4. Empirical Findings: This section is divided into three parts. First part presents the descriptive statistics of the variables used for analysis; Second part reports unit root results, while third part presents co integration results.

4.1. Descriptive statistics of the variables under study; Table 1 presents the descriptive statistics of the variables used for analysis for period 1981 to 2010. During the study period, Pakistan exported 16.45 Million Sq.M of finished leather annually on an average, with minimum 10.60 Million Sq.M and maximum 24.20 Million Sq.M of finished leather. Export prices of finished Leather varied from 102.26 Rs/Sq.M to 1202.84 Rs/Sq.M and its mean value was 559 Rs/Sq.M. The mean, minimum and maximum value of Domestic prices of finished Leather was 504.65, 75.23 and 1158.79. Real GDP of Pakistan was 31130.71 Million Rs per annum on an average, 12242.68 Million Rs per annum at minimum and 68279.65 Million Rs per annum at maximum. The mean, minimum and maximum value of exchange rate (Pak.Rs./U.S.\$) was 37.35, 9.91 and 83.56. Hides and Skins production of Pakistan varied from 31.91 Million No. to 60.10 Million No. and its mean value was 42.62 Million No.

Table 1
Descriptive statistics of the variables under study

Variables	Units	Minimum	Maximum	Mean	Std. Deviation
Leather exports(Q)	Million Sq.M	10.60	24.20	16.45	3.24
Leather exports Price/Value	Million Rs.	1084	26026.30	9590.81	7180.49
Exchange rate	Pak.Rs./U.S.\$	9.91	83.56	37.35	21.75
Real GDP	Million Rs.	12242.68	68279.65	31130.71	15200.59
Percent Share of semi manufactured goods	Percentage	9	25	16.32	4.89

Hides and Skins	Million No.	31.91	60.10	42.62	8.70
Export prices of Leather	Per Sq.M	102.26	1202.84	559	362.59
Trade Openness	Ratio	0.213	0.355	0.287	0.036
Domestic prices of Leather	Per Sq.M	75.23	1158.79	504.65	343.30

Source: Author's own calculations

Percent Share of semi manufactured goods exported increased from 9 percent to 25 percent and its average value was 16.32 percent. The value of Trade Openness varied from 0.213 to 0.355 and its average value was 0.287.

4.2 Unit Root Results: Most time series data exhibit trends (data series changes over time) and are termed non-stationary (Nelson and Plosser, 1982; Perron 1988). It is often the case that an economic series has a unit root when its first difference is stationary. Therefore, the first step in any time series empirical analysis is to test for the presence of unit root in order to avoid the problem of spurious regression. It is important to examine the order of integration of each variable in a model to establish whether it contains unit root and how many times it needs to be differenced to achieve a stationary series. In the first step all the data sets were tested for the presence of unit root. Export value of finished leather (LEV), Exchange Rate (LER), Real Gross Domestic Product (LRGDP), Share in semi manufactured goods exports (LSSMAN), Hides and Skins (LHS), Trade Openness (LTO), Domestic Prices (LDP) and Export Prices (LEP) were tested for unit roots for the period 1980-2010. Table 2 represents the results of tests of the series in logarithms for unit root using ADF test for both with and without linear trend. In non-trended model, the absolute values of the ADF statistics and τ_3 values for LEV, LER, LRGDP, LSSMAN, LTO and LEP are well below the 95% critical value of the test statistics (2.9706) and (6.73) respectively and hence the null hypothesis of unit root for these variables is accepted. Where as, LHS and LDP are stationary series in level form because the absolute values of the ADF statistics and τ_3 values for these variables are well above the 95% critical value of the test statistics.

Table 2
Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variables	Non Trended Model	Trended Model	τ_3	Conclusion
LEV (Export value)	-1.9828	-2.9959	1.9072	I(1)
LER (Exchange rate)	-1.3865	-2.3445	2.2123	I(1)
LRGDP (Real gross domestic product)	-3.2262	-3.2758	5.4228	I(1)
LSSMAN (Share in semi manufactured goods exports)	-1.0243	-1.6829	1.6597	I(1)
LHS (Hides and skins)	-3.049570	-4.6382	11.3315	I(0)
LTO (Trade openness)	-2.4410	-1.0769	6.7193	I(1)
LDP (Domestic prices)	-4.8441	3.64241	16.4644	I(0)
LEP (Export prices)	-1.5539	-2.0877	3.3770	I(1)
Critical Values	-2.9706	-3.5796	6.73	---

$I(0)$ = Stationary

$I(1)$ = Non Stationary

Note: Critical values (95% confidence interval) are taken from Fuller (1976, pp.373)

Same is the case in trended model where the absolute values of the ADF statistics and τ_3 values for LEV, LER, LRGDP, LSSMAN, LTO and LEP are well below and for LHS and LDP are above the 95% critical value of the test statistics (2.9706) and (6.73) respectively. Hence the LEV, LER, LRGDP, LSSMAN, LTO and LEP are non-stationary series and LHS and LDP are stationary series in the trended and non-trended models in the level form.

Table 3 indicates the first differenced results in both non-trended model and trended model. The First differenced absolute values of ADF statistics for all variables (LEV, LER, LRGDP, LSSMAN, LTO, LEP, LHS and LDP) are

Variables	Non Trended Model	Trended Model	Conclusion
DLEV	-4.9575	-5.6770	I(0)
DLER	-6.0450	-5.8080	I(0)
DLRGDP	-6.7074	-6.5756	I(0)
DLSSMAN	-6.3615	-7.3292	I(0)
DLHS	-7.2971	-7.5275	I(0)
DLTO	-4.2221	-4.5194	I(0)
DLDP	-2.9940	-4.2780	I(0)
DLEP	-6.4179	-6.8693	I(0)
Critical Values	-2.9750	-3.5867	---

well above the 95% critical value in both Non-Trended and Trended Model, therefore the null hypothesis is rejected. This means that all the variables have no unit roots and have become stationary after first difference i.e. I (1).

Table 3
First differenced ADF Unit Root Test Results

I(0) = Stationary

Note: Critical values (95% confidence interval) are taken from Fuller (1976, pp.373)

From Table 2 and 3, it can be concluded that Hides and Skins production and Domestic Prices of finished leather are integrated of order of zero i.e. I (0) and Export value of finished leather, Exchange Rate, Real Gross Domestic Product, Share in semi manufactured goods exports, Trade Openness and Export Prices are integrated of order of one i.e. I (1).

4.2.3 Co integration Results: After testing for unit root, the next step is to test for co integration. For co integration, two conditions must be satisfied. First, at least two of the individual variables going to be integrated, should be of the same order and second, a linear combination of the series should exist which is integrated to an order lower than the individual variables. Johansson's procedure was applied to test the co integration between the respective variables. The first step in Johansen's procedure is the selection of order of Vector Auto Regressive (VAR). Adjusted LR test on the VAR with a maximum of three lags was carried out. According to the Table 4, the Adjusted LR test selects the order one of VAR because at order one the parenthesis values (p-values) of Adjusted LR test is greater than 0.05. The value of SBC is maximum at the order one i.e. 149.5417. Thus SBC also selects the order one of VAR. AIC selects order three because maximum value of AIC (227.2454) is at order three but Adjusted LR test and SBC both showed order one, so, order of VAR was taken as one.

Table 4: LR-Test on VAR with Maximum of Three Lags

List of variables included in the unrestricted VAR			
LEV	LER	LRGDP	LSSMAN
LEP	LTO		
List of deterministic and/or exogenous variables			
A	LHS	LDP	
Order	AIC	SBC	Adjusted LR test
3	227.2454	149.4952	-----
2	186.9708	132.5457	39.5498 (.314)
1	180.6417	149.5417	61.4982 (.807)
0	98.9280	91.1530	122.5349 (.160)

AIC= Akaike Information Criterion SBC=Schwarz Bayesian Criterion

After the VAR with order one has been selected, the second step in the Johansson's procedure is to test the presence and number of co integrating vectors among the series of the model. Table 5 indicates that first statistical value of Maximal Eigen value test (45.6757) is greater than its 95 percent critical value (40.5300), therefore, we reject the null hypothesis of no co integration and accept the alternative hypothesis, i.e., there is one co integrating vector. Where as for the remaining five statistical values of Maximal Eigen value test, null hypothesis of no co integration can not be rejected.

Table 5
Co integration LR Test Based on Maximal Eigenvalue of the Stochastic Matrix

List of variables included in the cointegrating vector			
LEV	LER	LRGDP	LSSMAN
LEP	LTO	A (Intercept)	
List of I(0) variables included in the VAR:			
LHS	LDP		
Null	Alternative	Statistic	95% Critical Value
r = 0	r >= 1	137.9325	102.5600
r <= 1	r >= 2	92.2568	95.9800
r <= 2	r >= 3	57.4749	59.4800
r <= 3	r >= 4	28.9332	34.8700
r <= 4	r >= 5	14.9981	20.1800
r <= 5	r = 6	3.0616	9.1600

In Table 6 Trace test also proves that there is one co integrating vector at 95 percent critical value because first statistical value of trace test (137.9325) is greater than its 95 percent critical value (102.5600).Where as for the remaining five statistical values of Trace test, null hypothesis of no co integration can not be rejected.

Table 6
Cointegration LR-Test Based on Trace of the Stochastic Matrix

List of variables included in the Cointegrating vector			
LEV	LER	LRGDP	LSSMAN
LEP	LTO	A (Intercept)	
List of I(0) variables included in the VAR			
LHS	LDP		
Null	Alternative	Statistic	95% Critical Value
r = 0	r = 1	45.6757	40.5300
r <= 1	r = 2	34.3819	34.4000
r <= 2	r = 3	28.2417	28.2700
r <= 3	r = 4	13.9351	22.0400
r <= 4	r = 5	11.9365	15.8700
r <= 5	r = 6	3.0616	9.1600

In the Johansen model, parameters in the co integrating vector can be interpreted as estimates of long run co integrating relationship between variables (Hallam and Zanolli, 1993). Therefore the estimated parameter values from these equations when normalized on exported quantity of finished leather are long run elasticities. The results are reported in table 7; the coefficients represent estimates of long run elasticities of exported quantity of finished leather with respect to Exchange Rate, Real GDP, share in semi manufactured goods export, Export Prices and Trade Openness.

Table 7
Johansson's Normalized Estimates

Variables	Long Run Elasticities	Std.Errors	T-Ratio
LER	-5.2110	2.9255	-1.7812
LRGDP	3.0659	.96028	3.1927
LSSMAN	0.71764	.35710	2.0096
LEP	-3.4988	2.0944	-1.6706
LTO	2.4914	1.3023	1.9130
A*	36.0989	12.7200	2.8379

*Note: Indicates significant at 5 percent *A is an intercept*

The cointegrating vector in Table 16 can be written in the form of an equation as shown below:

$$\text{LEV} = 36.0989 - 5.2110 \text{ LER} + 3.0659 \text{ LRGDP} + 0.71764 \text{ LSSMAN} - 3.4988 \text{ LEP} + 2.4914 \text{ LTO}$$

Theoretically, a rise in the price of the foreign exchange rate (Dollar) is a depreciation of the home currency (Rupees). Foreign currency will become more expensive hence the relative value of the home currency will be fallen (Mencet *et al.*, 2006), (Haleem *et al.*, 2005). Table 7 indicates that exchange rate has a negative effect on exports of finished leather as expected. A one percent increase in exchange rate will cause 5.2110 percent decrease in exports of finished leather in the long run. The coefficient of exchange rate variable in the export supply of finished leather is statistically significant at 5 percent level. This empirical result suggests that a depreciation of Pakistani currency will cause a drop in the export supply of finished leather from Pakistan. Real GDP is the measure of Gross Domestic Product that seeks to reflect the actual value of production goods and services produced, by removing the effect of changes in prices. It is an important variable which shows the economic growth of a country in terms of goods and services produced. RGDP is positively related to the export supply of finished leather and is statistically significant at 5 percent level. The implication is that one percent increase in the RGDP will lead to 3.0659 percent increase in the export supply of finished leather from Pakistan in the long run. Share of semi manufactured goods in exports is also an important variable that shows the export concentration of any country in semi manufactured sector. More specifically we can say that with what pace a country exports its semi manufactured goods to other countries. In our model of export supply of finished leather Share of semi in manufactured goods exports is positively related and is statistically significant at 5 percent level. This indicates that one percent increase in the Share in semi manufactured goods exports will lead to 0.71764 percent increase in the export supply of finished leather from Pakistan in the long run. Export prices are considered to be important variable to check the export availability of the product. Theoretically, high export prices mean greater availability of the product in export markets while low export prices mean abundant availability of the product in domestic market. In our model of export supply of finished leather an export price are negatively related and is statistically significant at a 5 percent level. This indicates that one percent increase in the export prices will lead to -3.4988 percent increases in the export supply of finished leather from Pakistan in the long run. The variable of trade openness generated by the addition of total exports and total imports then the sum total, may be called total trade divided with Gross National Product (GNP) of respective year. Trade openness indicates the foreign trade performance of the country. So in our model of export supply of finished leather trade openness is positively related and is statistically significant at 5 percent level. This indicates that one percent increase in the value of trade openness will lead to 2.4914 percent increases in the export supply of finished leather from Pakistan in the long run.

Table 8

The Long-Run and Error Correction Model Estimates for Finished Leather Export

Regressors	Short Run Elasticities	Long Run Elasticities
A	-14.8970 (-3.9683)	36.0989 (2.8379)
LER	-1.0095 (-2.1861)	-5.2110 (1.7812)
LRGDP	1.8269 (3.6878)	3.0659 (-3.1927)
LSSMAN	0.57475 (2.9188)	0.71764 (-2.0096)
LEP	0.76458 (1.8953)	-3.4988 (-1.6706)

LTO	0.75060 (-2.1823)	2.4914 (1.9130)
LDP	0.16646 (0.41255) ^{NS}	
LHS	0.22287 (1.8768)	
ECM1	-0.23194 (2.3487)	
Diagnostic Tests		
R-squared	0.64	
DW-statistics	1.8282	
LM-test- χ^2 (1)	0.84689[.369]	
RESET test - χ^2 (2)	5.4722[.060]	

Note: Indicates significant at 5 percent, Values in parenthesis are t-ratios, Values in square brackets are p-values and ^{NS} indicates non significant

It is also apparent from table 8 that exchange rate is negatively related in short run with export value of finished leather as if one percent increase in the exchange rate there will be 1.0095 percent decrease in the export value of finished leather from Pakistan. If we talk about the signs of Real Gross Domestic Product (LRGDP), Share in semi manufactured goods exports (LSSMAN), Trade Openness (LTO) and Export Prices (LEP) in the short run, these variables showed the same trend as showed in the long run. These variables are directly related with the export value of finished leather, if there is one percent increase in Real Gross Domestic Product, Share in semi manufactured goods exports, Trade Openness and Export Prices, there will be 1.8269, 0.57475, 0.75060 and 0.76458 increase in the export value of finished leather respectively in the short run. Skins and hides production and domestic prices are also directly related but the domestic prices are not statistically significant. Because if the domestic prices of the exports increased then exporters will sell their products in the domestic markets rather than export the products. But in our model the coefficient of the domestic prices showed the opposite result, which is not true. If the production of Skins and hides increased by one percent there will be 0.22287 percent increase in the export value of finished leather in the short run. The coefficient of error correction term has expected negative sign. It measure speed of adjustment towards long-run equilibrium. The coefficient (-0.23194) indicates that about 23 percent of deviation of export value of finished leather, from long-run equilibrium is corrected in the current period. In table 8, the value of R-squared (goodness of fit measure) shows that 64 percent of variation in the export supply value of finished leather is caused by the independent variables included in the model, while remaining 36 percent variation is due to some unknown factors. The value of Durbin-Watson Statistics is near about 2 which indicate the absence of autocorrelation among the variables. For all Diagnostic Tests, the model gives satisfactory results. The LM-test for up to one order indicates no serial correlation problem in the residuals. The *p*-value for RESET test for functional form misspecification is greater than 0.05. This means that functional form is correct and the residuals are normally distributed.

5. Concluding Remarks: This study estimated the impact of major determinants of leather exports from Pakistan. The findings of this study confirmed that major factors affecting leather exports from Pakistan. The exchange rate has a negative effect on exports of finished leather as expected. A one percent increase in exchange rate will cause 5.2110 percent decrease in exports of finished leather in the long run. RGDP, share of semi manufactured goods exports and trade openness will lead to 3.0659, 0.71764 and 2.4914 percent increase in the export supply of finished leather in the long respectively. Export prices are negatively related and indicate that one percent increase in the export prices will lead to -3.4988 percent increases in the export supply of finished leather in the long run. So in order to promote leather exports from Pakistan, there is need to develop quality standards according to importing countries requirement.

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