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Nexus between Financial Development, Agriculture Raw Material Exports, Trade Openness and Economic Growth of Pakistan

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Abstract

The objective of this of the study is to evaluate the role of financial development, Agriculture raw materials and the extent of openness to trade in economic development of Pakistan for the period 1980-2012, by using Vector Auto Regressive (VAR) model. Empirical results showed that there exist a long-run relationship between financial development, agriculture raw material exports, and output growth. Normalized co-integrating equations revealed that, Raw material exports, trade openness and domestic credit to private sector are positively effecting the Economic growth of Pakistan, while M2 has negative impact on Economic growth of Pakistan. A two way causal relationship has been determined between trade openness and economic growth and raw material exports and economic growth. Our results revealed that raw material exports and finial development are positively related to agriculture growth; however, the impact of financial development is relatively week.

Keywords: trade openness, agriculture raw material, exports, economic growth, vector auto regressive.

1. Introduction

The pivotal target of underdeveloped nations is efficient economic expansion. Exports are considered as the fuel for economic expansion. The drive for fast economic growth in underdeveloped countries is generally accomplished by means of trade. Large numbers of scientific studies pertaining to the role of exports in elevating the economic development are available in the literature. Economists from classical school of thought claimed that, international trade is primary source of economic growth and foreign exchange earnings; and further economic expansion is possible through specialization. See for example ((Bodman (1998), Shamsadini et al (2010), Anwar et al (2010), Serge and Yaoxing (2010)) etc. Many researchers have determined positive results when examined the export lead growth hypothesis, see for example (Ukpolo (1998),Ekanayake (1999), Ahmed et al (2000), Ibrahim (2002), Atique and Ahmad (2003), Majeed and Ahmad

(2006) Shombe (2008), Alam (2011)) etc.

Apart from foreign exchange earnings, there are many positive externalities of exports expansion such as, effective management, better production quality and technological proficiency. Hameed, et al (2005); calculated the outcome of positive externality of export area on non-export area and the productivity gap favoring the export sector in a usual neoclassical production function. They concluded that, exports enlargement has a positive effect on economic enlargement in the South Asian countries and output of exports sector is more than the non-exports sector. Majeed and Ahmad (2006) also found similar results.

Financial development has been considered as a major source of country's comparative advantage in trade. Kletzer and Bardhan (1987) stressed on the notion that, countries with better financial structure does have some sort of comparative advantage in all the sectors of the economy requiring external funding. Financial institutions are supposed to be the major funding source to export oriented industries and other sectors of the economy.

Chaney (2005) stated that, in case of weak financial system of the country; export oriented industries and other exporting sectors of the economy suffer from major liquidity constraints, which in turn affect the exports of the county and reduce the export volume significantly. A number of studies have suggested that countries with strong financial system have observed substantial volume of trade, See for example (Beck (2003) and Manova (2008).

Agriculture is the premier sector of Pakistan's economy; roughly 66.7 percent of Pakistan's total residents resides in remote areas and directly or indirectly relies upon agriculture for their sustenance. About 44.8 percent of the total labor force is employed in agriculture sector, however, its share in GDP is succumbing with the passage of time, and currently, it contributes only about 21.6 percent of total GDP.

According to State bank and economic survey of Pakistan (various issues), Major commodities produced in by Pakistan includes Cotton, Wheat and Rice. Though, Pakistan has taken significant liberalization steps in its agriculture sector by reducing the state intervention and putting prices closer to world market level during nineties, average trade difference was recorded at 5.43 as percentage of GDP which further declined to 3.3 during the decade of 2000's, it mainly due to the fact that Pakistan is lacking agro based industries and its exports largely constitutes on primary commodities, rather than finish goods.

Pakistan's agriculture products generally have strong demand in international market but it is also facing some strong competition. In order to promote the agriculture exports in Pakistan different governments have taken a number of steps, jointing the general agreement on tariff and trade and also adhering the regulations of WTO by liberalizing the trade by reducing the tariff and production subsidies are the part of all such efforts steps. However, the outcome of all such efforts was negligible because of low productivity and inefficiencies in pricing policies, as, Shaikh et al (2011) while studying WTO reforms and rice market in Pakistan, found that there are lags because of complications and the cost required of rapid adjustment in economic activities, in the mean while trade acts a s a catalyst for both economic and agriculture growth.

Even though Pakistan is ranked 58 among 62 countries in financial development index that indicates the week financial system of Pakistan, financial institutions are still playing

very important role in agriculture development in Pakistan. To foster the agriculture growth by means of financial inclusion SBP has established the "Agricultural Credit & Microfinance Department" the department is working to facilitate the farmers by developing the credit markets and easy access to financial resources by providing facilities such as branch less banking. SBP is also focusing on training programs to enhancing the knowledge of farmers regarding agriculture financial and services & facilities offered by different financial institutions to farming community.

All most all the commercial banks are providing funding facilities to farmers at differnet levels. Apart from that, government has established a specialized institution namely: Agriculture development bank (ADBP) that is providing the financial facilities to large and small scale farmers in the form of short, medium and long term loans for the purchase of heavy machinery and new improved technology to improve the agriculture yield.

The objective of this study is to determine the Nexus between trade openness, financial development, agricultural raw material exports and economic growth of Pakistan for the period 1980-2012.

2. Literature Review

Kletzer and Bardhan (1987) modeled the capital market imperfections and international trade mechanism. They stated that, because of capital market imperfections the comparative cost of production differs across the countries, and even if the countries possess the same type of technology and factor of productions.

Ahmed et al (2000) performed a multivariate causality analysis of South East Asian countries by using the data of exports growth and GDP for the period 1970-1997 to determine no evidence of export lead growth in all the countries except for India. Anwar et al (2010) performed time series analysis to determine the impact of trade liberalization on cotton exports in Pakistan for the period 1971-2008. The study found positive relation between terms of trade and demand for cotton around the globe on cotton exports of Pakistan.

Atique and Ahmad (2003) analyzed the world demand for Pakistani products by utilizing Polynomial Distributed Lag methods by using the data for the period 1972-2000. They used real effective exchange rate, industrial production index and quantity of exports to Identify economic integration and real effective exchange rate as the two of the most important determinants of exports demand of Pakistan.

Beck (2003) determined the interaction between trade and financial development across different countries by using firm's level industrial data of imports, exports, market canalization and GDP to conclude that financial development helps the countries with better capital and financial markets in gaining the comparative advantage in trade over other countries with weak financial system.

Chaney (2005) developed a model of international trade with liquidity constraints for the export oriented firms. He found that the firms with liquidity constraints face unequal distribution of resources within the firm and consequently reduces the exports ratio of the firms.

Ekanayake (1999) used time series data of eight Asian countries for the period 1960-1997 to determine the nexus between exports and GDP growth by using co-integration and

error correction estimation techniques. The study found by-directional causal relationship between the variables in seven out of eight countries.

Faridi (2012) by utilizing the data for the period 1972-2008 determined the relationship between agriculture exports and economic growth of Pakistan to conclude that, the agriculture exports have negative impact on economic growth of Pakistan. Sulaiman et al (2012) determined the relationship between trade liberalization, FDI and GDP in Pakistan for the priod1970-2012 by using co integration and error correction methods. They found positive impact of exports and FDI on economic growth, while imports exhibit negative relation with GDP growth.

Kim et al (2012) investigated the simultaneous relationship between trade, financial development and economic growth in a panel of 63 countries by using the trade value in domestic market, private credit GDP growth and trade share as percentage of GDP. They found positive impact of trade openness in low inflation industrial countries, while the negative impact was determined in countries that are coping with high inflation rate and have less developed industrial sector. The study further concluded that financial development has more significant positive role in well-established industrial countries as compare to countries with week industrial structure and low income.

In a recent study Menyah et al (2014) developed financial development index for a panel of countries and tested the relationship of financial development, trade openness and economic growth to find week empirical evidence of finance led growth and trade led growth hypothesis.

3. Material and Method

VAR model is used when we are not certain about the exogeneity of variables; we have to treat each variable symmetrically. Consider a two variable VAR model with *K*= 2:

$$y_t = b_{10} - b_{12}z_t + c_{11}y_{t-1} + c_{12}z_{t-1} + \varepsilon_{yt} \quad \ldots\ldots (1)$$

$$z_t = b_{20} - b_{21}y_t + c_{21}y_{t-1} + c_{22}z_{t-1} + \varepsilon_{zt} \quad \ldots\ldots (2)$$

With $\varepsilon_{it} \sim i.i.d(0, \sigma_{\varepsilon i}^2)$ and $\text{cov}(\varepsilon_y, \varepsilon_z) = 0$

We can rewrite the above eq (1) & (2) in matrix form as:

$$\begin{bmatrix} 1 & b_{12} \\ b_{21} & 1 \end{bmatrix} \begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} b_{10} \\ b_{20} \end{bmatrix} + \begin{bmatrix} c_{11} & c_{12} \\ c_{21} & c_{22} \end{bmatrix} \begin{bmatrix} y_{t-1} \\ z_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix}$$

More simply:

$$BX_t = \Gamma_0 + \Gamma_1 X_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots (4)$$

The above model is the structural or primitive form of the VAR model.

To obtain standard form of VAR, we need to multiply the both sides of equation (4) by B^{-1}:

$$B^{-1}BX_t = B^{-1}\Gamma_0 + B^{-1}\Gamma_1 X_{t-1} + B^{-1}\varepsilon_t \text{ ……..} (5)$$

Thus we obtain the standard form of VAR:

$$X_t = A_0 + A_1 X_{t-1} + e_t \text{ ……} (6)$$

We can rewrite the equation (6) as:

$$Y_t = A_1 Y_{t-1} \_ \text{.....} + A_p Y_{t-p} + Bx_t + \varepsilon_t \text{ ……} (7)$$

3.1. Data Description

Purpose of this study is to investigate the dynamic relationship between agriculture raw material exports, financial development and economic growth in Pakistan. Data has been collected from World Development Indicators (WDI) and Economic Survey of Pakistan. M2 and domestic credit are used as a measure of financial development. Real GDP growth rate has been used to indicate economic growth, while trade % of GDP has been used as an indicator of trade openness.

Where:

LN = Natural Logarithm

Y= Real GDP Growth Rate

RX= Agriculture Raw Material Exports

M2 = Money Supply

DC = Domestic Credit to private sector

TOP = Trade Openness

μ_i = Error Term

4. Results and Interpretations

In order to estimate the long run relationship amongst the time series variables, it is important that the data ought to be integrated of same order. The stationarity process involves that; each variable should be serially uncorrelated and follow equal variance and covariance in its first difference form, i.e. I(1). Augmented Dickey Fuller unit root test is applied to confirm the order of integration.

If all variables qualify the condition of integrated of order I(1), we can test the model for long run relationship. Johnson co-integration test is used to test the presence of long run relationship.

Once the long run equilibrium is identified Vector error correction model can be implemented to figure out the short run relation in the equation. Finally, granger causality test is used to establish the course of action among the variables.

Result of ADF unit root test has been presented in table-1. ADF test is applied on level and first difference and the lag length “2” was determined by the "FPE, and AIC” criterion. Result indicates that each of the series is non-stationery when examined at level but the 1st difference estimates clearly reject the null hypothesis of non-stationarity at 5% level of significance and represents that all variables are integrated of order one I(1).

Table 1: ADF Unit Root Test

Variables	Level		1st Difference		Results
	Intercept	Trend & intercept	Intercept	Trend & intercept	
LNY	-1.04	-4.08	-1.23	-7.11	I(1)
LNTOP	-2.59	-3.61	-1.88	-6.84	I(1)
LNRX	-0.23	-4.73	-1.63	-6.45	I(1)
LNM2	-1.47	-4.95	-0.59	-5.45	I(1)
LNDC	0.65	-2.4	-0.85	-4.74	(1)

Table 2 and 3 indicates the result of Johansen co-integration test. The trace statistics in panel (a) indicate 3 co-integrated equations and maximum eigenvalue in panel (b) shows 2 co-integrating equation. This indicates that there exists a long run relationship between the combination of variables, and it confirms the existence of long run equilibrium in the model.

Table 2: Johansen Multivariate Co-integration Test Trace Statistics

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.722940	71.20064	55.24578	0.0011
At most 1 *	0.693135	42.96314	35.01090	0.0058
At most 2	0.364101	16.97347	18.39771	0.0782
At most 3 *	0.272984	7.013744	3.841466	0.0081
At most 4 *	0.209088	6.098794	3.841466	0.0135

Table 3: Max-EigenValues

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.853633	46.11924	30.81507	0.0003
At most 1	0.546514	18.97897	24.25202	0.2139
At most 2	0.503138	16.78665	17.14769	0.0563
At most 3 *	0.150447	3.913069	3.841466	0.0479
At most 4 *	0.209088	6.098794	3.841466	0.0135

To obtain further inference about the results of co-integration equation, Table 4 presents the results of normalized co-integrating coefficients. Normalized co-integrating equations revealed positive signs for TOP, RMX, and DC while negative sign for M2. It indicates that, RMX, TOP and DC are positively effecting the Economic growth of Pakistan, while M2 has negative impact on Economic growth of Pakistan; it is evident that the negative effect of money supply is more significant as compare to the effect o domestic credit to private sector.

Table 4: Normalized Co-integrating Coefficients

LNY	LNTOP	LNRX	LNRMI	LNM2	LNDC
1.000000	0.090628	0.105628	-3.668843	-2.52E-06	0.377698
	(0.08983)	(0.07830)	(0.46009)	(5.0E-07)	(0.03550)

The presence of co-integration often indicate that, there may exist an error correction term in the model. Error correction term tells about how much of previous errors /disequilibrium is removed in the current year. Table 5 shows the results of error correction model. The result indicates no short run relationship between the variables.

Granger causality with in error correction term is used to determine the direction of causality between the variables. Table 6 presents the results of granger causality test show bidirectional causality between Y and TOP and also between RX and Y. Unidirectional causality running from M2 to Y. The chi-square values also indicate unidirectional causality between RX and TOP where the direction of causality runs from RX to TOP. Financial development indicators show interesting causal relationship with other indicators. M2 has unidirectional relationship with GDP and DC, where the direction of relationship running from M2 to GDP and DC to M2. DC also has unidirectional relationship with TOP, RX, and GDP.

Table 5: Vector Error Correction Model

Error Correction:	D(LNY)	D(LNTOP)	D(LNRX)	D(LNM2)	D(LNDC)
CointEq1	0.205037	0.117981	0.070876	0.121733	0.644519
	(0.08800)	(0.13355)	(0.16589)	(0.04934)	(0.38410)
	[2.32996]	[0.88344]	[0.42725]	[2.46724]	[1.67801]
D(LNY(-1))	-0.170603	-0.209187	0.545449	-0.084832	-0.421669
	(0.21646)	(0.32849)	(0.40804)	(0.12136)	(0.31391)
	[-0.78816]	[-0.63681]	[1.33675]	[-0.69899]	[-1.34329]
D(LNY(-2))	-0.342443	0.674400	-0.616164	-0.096311	0.186781
	(0.23945)	(0.36339)	(0.45139)	(0.13426)	(0.26677)
	[-1.43011]	[1.85587]	[-1.36505]	[-0.71737]	[0.70015]
D(LNTOP(-1))	0.453050	-0.165259	0.021413	0.093730	0.539830
	(0.17078)	(0.25917)	(0.32194)	(0.09575)	(1.55102)
	[2.65281]	[-0.63764]	[0.06651]	[0.97887]	[0.34805]
D(LNTOP(-2))	-0.411692	0.320773	0.083367	0.036045	0.413976
	(0.17111)	(0.25968)	(0.32257)	(0.09594)	(1.05572)
	[-2.40594]	[1.23526]	[0.25845]	[0.37570]	[0.39213]
D(LNRX(-1))	-0.027023	-0.066352	0.020886	0.061210	-0.066352
	(0.14731)	(0.22355)	(0.27769)	(0.08259)	(0.22355)
	[-0.18345]	[-0.29681]	[0.07521]	[0.74111]	[-0.29681]
D(LNRX(-2))	0.229724	0.304316	-0.322210	0.013260	0.304316
	(0.13277)	(0.20148)	(0.25028)	(0.07444)	(0.20148)
	[1.73027]	[1.51037]	[-1.28741]	[0.17813]	[1.51037]
D(LNM2(-1))	2.000998	0.539830	1.782396	0.707432	-0.165259
	(1.02204)	(1.55102)	(1.92662)	(0.57303)	(0.25917)
	[1.95785]	[0.34805]	[0.92514]	[1.23454]	[-0.63764]
D(LNM2(-2))	1.871355	0.413976	1.645574	0.201503	0.320773
	(0.69566)	(1.05572)	(1.31137)	(0.39004)	(0.25968)
	[2.69005]	[0.39213]	[1.25485]	[0.51662]	[1.23526]
D(LNRM(-1))	2.000998	0.539830	1.782396	0.707432	1.645574
	(1.02204)	(1.55102)	(1.92662)	(0.57303)	(1.31137)
	[1.95785]	[0.34805]	[0.92514]	[1.23454]	[1.25485]

D(LNRM(-2))	1.871355	0.413976	1.645574	0.201503	0.539830
	(0.69566)	(1.05572)	(1.31137)	(0.39004)	(1.55102)
	[2.69005]	[0.39213]	[1.25485]	[0.51662]	[0.34805]
C	-0.076245	0.160642	-0.472502	-0.050838	0.160642
	(0.36425)	(0.55278)	(0.68664)	(0.20423)	(0.55278)
	[-0.20932]	[0.29061]	[-0.68814]	[-0.24893]	[0.29061]

Table 6: Granger Causality Based on Error correction Framework

	Independent				
Dependent	**LNY**	**LNTOP**	**LNRM2**	**LNRX**	**LNDC**
LNY	-------	7.89186*	7.364158*	3.084976*	2.214732*
LNTOP	4.466847*	------	0.156662	2.441608*	7.422777*
LNM2	0.841933	0.968587	------	0.565627	4.271667*
LNRX	4.515527*	0.066848	0.596178	------	2.574675*
LNDC	0.842618	1.223875	0.902852	0.598674	-------

5. Conclusion

This study aims to examine the nexus between financial development, agriculture raw material exports, trade openness and economic growth in Pakistan. Results indicate long run relationship between the variables but no evidence was found when checked for the existence of short run relationship. The results are contradictory to Faridi, (2012) who in his study found negative relationship between agriculture exports And GDP growth. We found positive impact of trade openness on economic growth of Pakistan supporting the findings of Sulaiman et al (2012) however; it is also evident that there is room for improvement in going more toward liberalization of trade to increase the term of trade for the country and to reduce the imports volume.

Financial development seems to be partly affecting the trade openness and agriculture raw material exports. Domestic credit to private sectors has positive relationship with trade liberalization and exports. However the positive impact of financial development is weak thus; our findings support the arguments of Kletzer and Bardhan (1987) Chaney (2005) and Menyah (2014) in case of Pakistan.

Finally our study suggest that, based on our findings, 'to expend the liberalization process and expend the volume of exports' the government should look to further strengthen its financial institutions and develop a mechanism for proper allocation and utilization of loans give to all exports oriented sectors of the economy. A national outreach training program for farming community is required to provide information about available funding facilities and knowledge about recent technological development in agriculture sector.

Further studies can be done by utilizing different set of financial indicators, different agriculture indicators or different estimation techniques.

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