Impact of the Agricultural and Industrial sectors on the Pakistan's GDP

Nadia[1], Kanwal[3], Zara Jabeen[2]

ARTICLE DETAILS	ABSTRACT
History **Revised format:** Feb, 2019 **Available Online:** Mar, 2019 **Keywords** Agriculture; Industry; Economic Growth; Pakistan	The main objective of this study is trying to investigate the impact of the agricultural and industrial sectors on the Pakistan economic growth. Time series data over the period 1972-2018 used for the analysis. By applying the Ordinary Least Squared (OLS) method findings of the study show that AGRI, IND and LFPR have positive and significant impact on the Pakistan's economic growth. DI and FDI are insignificant. The study suggests that government would be adopted those strategies in which special incentives and facilities are given to the farmers and adopted new methods in which the glory of the industrial sector would be restored in Pakistan.

[1]PhD Scholar Universiti Putra, Malaysia.

[2]Lecturer in Economics Government Degree College for Women, Muzaffar Garh, Punjab, Pakistan.

[3]District Health Authority, Multan, Pakistan.

1 Introduction

Agriculture contributes massively to the GDP of the economy of Pakistan. It accounts for around 25% of the overall GDP, which is higher than in other sectors of Pakistan. GDP growth represents the evolving success of the economy. It has played a central role in Pakistan's GDP since independence. Agriculture is also the third highest contributory industry to GDP. In order to provide employment, livestock and fisheries constitute a huge sector of agriculture. Jobs leads to GDP; as with the growth in employment, per capita income would grow, leading to an increase in the economy's GDP rate.

"Agriculture is the of process of cultivation of land or soil for production purpose". Agriculture plays a very vital role in Pakistan's economy and its growth 48 percent of the labour force is directly concerned with agriculture. It is therefore the primary source of living or income of the bulk of the public of the economy. Around 70 percent of the population is directly or indirectly related to agriculture. Agriculture is the main source of food for Pakistan's enormous population. Agriculture is also a significant source of raw martial provision for Pakistan's industrial sector. Its share of Gdp is around 25 percent, which is greater than every other sector 's contribution. The following are the major aspects of agriculture 's significance to the economy of Pakistan.

The agriculture sector cultivated by 3.81%. During this year, crop growth was 3.83 percent. The production growth of 3 major crops, rice, sugar cane and cotton, is projected at 8.7%, 7.4% and 11.8%, respectively. Production declines in wheat and maize have been measured at 4.4 percent and 7.1 percent, respectively. The livestock sector reported a 3.76 percent rise.

Since the industrial revolution, industrialization has been considered necessary for the country's rapid growth. Countries that depend solely on agriculture have remained underdeveloped, whereas countries that have established industries have achieved high growth rates. Industrialization is promoted by industrialised countries on a wide scale and benefits have been transferred to agriculture. They have established a balance of growth across different economic sectors. Pakistan had a marginal manufacturing capability at the time of partition in 1947. All available resources have been used by the government for the accelerated growth of the manufacturing sector.

Provisionally, the total manufacturing sector reported an improvement of 5.80 per cent. The mining and manufacturing industry increased by 3.04%. The large-scale production sector is mainly powered by QIM data (from July 2017 to February 2018), that also indicated a 6.24 percent rise. Cement (12 percent), tractors (44.7 percent), trucks (24.41 percent) and petroleum products (10.26 percent) were largest sources to this growth. The sub-sector of electricity and gas showed 1.84 percent growth, whereas construction activity improved by 9.13 percent.

The study used Harrod-Domer model which is related to Classical growth theory. According to Harrod-Domer Model, quantity of labor and capital, greater investment plays very important role in the economic growth and performance of the country, which increase in economic growth. For less developed nations where labour is in ample supply, but physical capital is still in short supply, leading to sluggish economic development, the model has its practical consequences. To sustain high saving rates and thus capital accumulation, developing nations lack adequate average incomes. The model proposes policy steps to increase investment through higher savings, and then use the investment to advance technology.

2. Literature Reviews

Anees et al. (2012) investigated by using the time series data from 1971-2007, the association among Industrial Development, Agricultural Growth, Urbanization and Environmental Kuznets Curve in Pakistan. Augmented Vector Autoregression technique and cointegration analysis is implemented to test Granger's causality. The research results suggest that GDP is the main cause of long-term improvements in Pakistan 's CO2 emissions and energy use. The data is taken from the World Bank's World Development Indices and is consistent from 1971 to 2007. The two-way causal relationship between CO2 and GDP emissions and the one-way causal relationship between energy use and emissions.

Chaudhry (2009), investigated the total factor productivity growth in Pakistan. The study of the agricultural and manufacturing sectors using the functions of Cobb-Douglas and trans-log production to measure total factor productivity (TFP) between 1985 and 2005 in Pakistan. The research reveals that TFP has developed at a higher pace in the manufacturing sector while TFP in the agricultural sector in Pakistan for the last two decades. Productivity is increasing at an average rate of 1.75 percent per year on the agricultural side. TFP is that at an

average rate of 1.1 percent a year for the economy as a whole, but nearly three quarters of GDP growth is induced by rises in labour and capital stocks.

Raza et al (2012), examined the impact of agriculture in Pakistan's economic growth over the period from 1980 to 2010. Easy regression was used for this reason to assess the significance of the association of agricultural sub-sectors with GDP. The findings indicated that agriculture sub-sectors play an important role in economic development, with only forestry showing an insignificant relationship with GDP.

Dorosh et al (2003) analyzed Pakistan's Distributional Impacts of Agricultural Development using a semi-input-output model based on the 2001-02 Social Accounting Matrix (SAM). Model simulations show that the expansion of conventional crop agriculture will help rural poor farmers significantly. Even so, landless agricultural workers and the rural non-farm poor do not benefit directly from growth in the crop sector because of the unequal distribution of land and earnings from land.

Awan and Aslam (2015) investigated the impact of Agriculture Productivity on Pakistan's Economic Growth covering the time series period 1972 to 2012. ARDL is used to estimate the economic growth. variables are used such as real gross domestic production per capita gross capital formation, employed labor force, inflation rate, trade, openness, agriculture value added. The inflation rate has a negative influence on economic growth, while economic growth is positively related to all other variables.

Azam et al. analyzed the role of agriculture in Pakistan's economic development. In the years 2005 to 2014, secondary data was collected. The research reveals that there is a substantial economic growth rate relationship, but because of many problems and difficulties, for example, less investment in the industry, untrained trainers, and weaknesses in facilities, fishing and forestry reveals an insignificant relationship with GDP. The paper also discusses a close connexion with the growth of agriculture.

Chandio et al (2016) analyzed the relationship between Pakistan' Agriculture and its GDP for the era of 1971-2015 using ARDL method of co-integration. The empirical findings suggest that the agricultural sector has a big impact on Pakistan's GDP growth rates. Agriculture's long and short-run coefficients are estimated to be 0.31 and 0.27, respectively the agricultural sector has played an important role in improving Pakistan's economic development.

Usman (2016) investigated the contribution of agriculture sector in the Pakistan's GDP Growth Rate and research has collected 25 years from economic survey of Pakistan and the duration is (1990-2014). For mitigating their outcomes researcher fit the regression model for this study. Study displays the significant impact of main crops and other crops on agriculture sector and contribution to Gross Domestic Product.

Ali and Saif (2017) investigated the factors of Pakistan's GDP using time series data for 1976-2015. The outcome demonstrates that agriculture, energy use, trade liberalisation and FDI have an affirmative effect on GDP. In addition, TO, AGRI and EC have a positive effect on economic growth in the short run, but FDI has a negative influence on GDP.

Azam and Shafique (2017) examined the findings demonstrate that there are fluctuations in Pakistan's economic growth (GDP) due to agricultural problems and their effect on the economy using time series data, so Pakistan's

economic growth would slow down. Because of these fluctuations, the overall output factor would also slow down.

Hayat et al (2019) assessed The dimensions of Pakistan's agricultural growth during the 1980-2018 period. In order to approximate the model, the ordinary least square method is usedThe analysis reveals that institutional credit plays a major role in achievement the country's agricultural development. Other model variables, such as agro-based industries, agriculture, mechanisation inputs and agricultural exports, have had a positive effect on agricultural growth and, consequently, on the economy's overall GDP growth.

Nazish et al. (2013) analyzed the effect of the agricultural, manufacturing and service industries on Pakistan's GDP rise. For 31 previous years, use of secondary data was obtained. Results of this study the agriculture, manufacturing and service industries have been shown to have a major impact on Pakistan's annual GDP growth. The agriculture sector is much more relevant to Pakistan than the other sectors of the economy.

Ajmair (2014) investigated the effect of the industry sector on Pakistan's GDP, using 61-year secondary data from 1950 to 2010. To measure the relationships, basic linear regression and time series methods are used. The study findings revealed that, except for the mining and quarrying market, all variables have a positive effect on GDP growth, which not only illustrates the significant connection, and also provides an insignificant outcome.

Khan and Siddiqi (2011) analyzed the influence of the manufacturing sector on Pakistan's economic growth is used over the duration of the Ordinary Least Square (OLS) simple regression. The research paper find the significance of the first and third law of Kaldor, whereas for the second law some results provide support is find with certain inferences on the rate of returns, indicating the importance of the manufacturing sector in Pakistan's economic growth.

Mehrara and Baghbanpour (2016) examined the contribution of industrial and agricultural exports to economic growth over the period from 1970 to 2014 in the case of developing countries. For 34 developed nations, using a panel data methodology. The study shows that the relation between exports from industry and economic growth is positive and important, but the relation between agriculture and economic growth is poor, and government final consumption and gross fixed capital creation are also significantly linked to economic growth.

Data and Methodology

Time series data during the 1972-2018 is used to get the required results of the study in the context of Pakistan. The econometric technique Ordinary Least Square (OLS) is applied to check the impact of the independent variables such as AGRI, IND, DI, FDI and LFPR on the dependent variable GDP in this study. The mathematical model of the study is

GDP= f (AGRI, IND, DI, FDI, LFPR)

The econometric model is;

$$GDP_t = \alpha_0 + \alpha_1 AGRI_t + \alpha_2 IND_t + \alpha_3 DI_t + \alpha_4 FDI_t + \alpha_5 LFPR_t + \varepsilon$$

Detail of variables are:

GDP=Gross Domestic Product

AGRI= Agriculture Sector

IND= Industry Sector

DI= Domestic Investment

FDI= Foreign Direct Investment

LFPR= Labor Force Participation Rate

ε= Error Term

t = Time Series data

Results and Discussion

Descriptive Statistics

Descriptive statistics explain the fundamental features of data. Central tendency used three measures of the random variable that is mean, median and mode (Gujarati, 2004).

Table: 1 Descriptive Statistics

	GDP	AGRI	IND	DI	FDI	LFPR
Mean	4.956596	8.766631	11.04198	15.92268	0.872128	54.54787
Median	4.7	8.823502	10.32379	16.48396	0.69	52.17
Maximum	9	17.12315	21.66298	19.23542	3.75	62.99
Minimum	0.36	0.113972	0.193127	11.43511	0.02	49.19
Std. Dev.	1.943792	3.307939	3.719316	1.887324	0.794193	4.541482
Skewness	0.023757	-0.13316	-0.02987	-0.55886	2.152689	0.591115
Kurtosis	2.504784	4.197874	4.233809	2.40977	7.636144	1.709428
Jarque-Bera	0.484681	2.948908	2.98813	3.128801	78.39229	5.99885
Probability	0.784789	0.228904	0.224458	0.209213	0	0.049816
Sum	232.96	412.0317	518.973	748.3659	40.99	2563.75
Sum Sq. Dev.	173.8031	503.3531	636.3324	163.8516	29.01419	948.7526
Observations	47	47	47	47	47	47

Source: Software E-View 9

The dispersion of the variables is measure by the standard deviation. Skewness values of GDP, FDI and LFPR display that the distribution is progressive but the skewness values of AGRI, IND and DI display that the distribution is not progressive. Standard value is 3 for the kurtosis but the kurtosis value of AGRI, IND and FDI is greater than 3 which show leptokurtic distribution is present in the data. But the platykurtic distribution is shown by the GDP, DI and LFPR due to the values of these are less than 3.

Variance Inflation Factor (VIF)

Variance Inflation Factor (VIF) is applied to check the multicollinearity in the data. If the values of all the variables is less than 10 (according to the rule of thumb) that predict multicollinearity not exist in the data.

Table:2 VIF Results

Variable	Centered VIF
AGRI	1.078086
IND	1.16757
DI	1.163135
FDI	1.657277
LFPR	1.70352

Source: Software E-View 9

Outcomes of the VIF predict that values of all variables are less than 10. Findings show, multicollinearity not present in the data of the study.

Table 2: Auto-Correlation

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.394732	Prob.Value	0.1045

Source: Software E-View 9

Results of the Breusch-Godfrey Serial Correlation LM Test reveals that auto does not exist in the data because the p-value is greater than 5%.

Table 3: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.864823	Prob.Value	0.5129

Source: Software E-View 9

Results of the Breusch-Pagan-Godfrey Test reveals that hetro does not exist in the data because the p-value is greater than 5%.

Table 3: Heteroskedasticity Test

Heteroskedasticity Test: White			
F-statistic	1.32725	Prob.Value	0.246

Source: Software E-View 9

Similarly, results of the White Test confirm that hetro does not exist in the data because the p-value is also greater than 5%.

Regression Analysis

Impact of independent variables on dependent variables is checked by the Ordinary Least Square (OLS). Coefficients tell about the strength and directions of the variables. Criteria of the decision making is taken on the behalf of the values of the R-square, adjusted R-square, P- value and Durbin-Watson statistics are used to check the overall fitness of the model, significance level, auto correlation in the data. Model is using the P- value to test the statistical hypotheses for accepting or rejecting in this study.

Table: 5 Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGRI	0.267876	0.021479	12.47131	0.0000
IND	0.371542	0.0332	11.1911	0.0000
DI	-0.06627	0.062025	-1.06844	0.2916
FDI	0.098455	0.150465	0.654338	0.5165
LFPR	0.059728	0.027382	2.181312	0.0349
R-squared	0.846477		F-statistic	45.21232
Adjusted R-squared	0.827755		Prob(F-stat)	0
Durbin-Watson stat	1.754082			

Source: Software E-View 9

Note: Level of significance is 5%.

Findings of the Ordinary Least Square (OLS) Method predicts that coefficient value and p.value of the AGRI are 0.267876 and 0.0000 respectively, show when the AGRI increased by 1 unit, then the change in the GDP will be 0.267876 units that means AGRI has positive and significant impact on the Pakistan's economic growth. This result is similar to the (Anwar, Farooqi & Khan, 2015; Kohansal, & Torabi, 2013). Similarly, coefficient value and p.value of the IND are 0.371542 and 0.0000 respectively, show when the IND increased by 1 unit, then the change in the GDP will be 0.371542 units that means IND has positive and significant impact on the Pakistan's economic growth. This result is similar to the (Ajmair, 2014). The coefficient value and p.value of the DI are -0.06627and 0.2916 respectively, that means DI is insignificant and not taking the part in the development of Pakistan economy. Similarly, coefficient value and p.value of the FDI are 0.098455 and 0.5165 respectively, that means FDI is insignificant and not taking the part in the growth of Pakistan economy. While the coefficient value and p.value of the LFPR are 0.059728 and 0.0349 respectively, show when the LFPR increased by 1 unit, then the change in the GDP will be 0.267876 units that means LFPR has positive and significant impact on the Pakistan's economic growth. R^2 value show the goodness-of-fit of the model in multiple regression analysis. Almost 84% of changes in the Gross Domestic Product (GDP) is due to the Independent variables (AGRI, IND, DI, FDI, LFPR) but the exogenous factors work only 19% from outside the model that only enclosed by the error term.

Conclusion

The main objective of this study is trying to investigate the impact of the agricultural and industrial sectors on the Pakistan economic growth. Time series data over the period 1972-2018 used for the analysis. By applying the Ordinary Least Squared (OLS) method findings of the study show that AGRI has positive and significant impact on the Pakistan's economic growth. This result is similar to the (Anwar, Farooqi & Khan, 2015; Kohansal, & Torabi, 2013). Similarly, IND has positive and significant impact on the Pakistan's economic growth. This result is similar to the (Ajmair, 2014). DI and FDI are insignificant and not taking the part in the development of Pakistan economy. Moreover, LFPR has positive and significant impact on the Pakistan's economic growth. The study suggests that government would be adopted those strategies in which special incentives and facilities are given to the farmers and adopted new methods in which the glory of the industrial sector would be restored in Pakistan.

REFERENCES

Aamir, M. (2014). Impact of industrial sector on GDP (Pakistan Case). *SJCC Management Research Review*, *4*(1), 1-26.

Ajmair, M. (2014). Impact of industrial sector on GDP (Pakistan Case). *Eur. J. Cont. Econ. & Mgmt.*, *1*, 106.

Ali, A., & Saif, S. (2017). Determinants of Economic Growth in Pakistan: A Time Series Analysis. *European Online Journal of Natural and Social Sciences*, *6*(4), pp-686.

Anees, M., Sajjad, M., Falki, N., & Shahzad, F. (2012). Industrial development, agricultural growth, urbanization and environmental Kuznets curve in Pakistan. *American Journal of Scientific Research*, (63), 52-66.

Anwer, M., Farooqi, S., & Qureshi, Y. (2015). Agriculture sector performance: An analysis through the role of agriculture sector share in GDP. *Journal of Agricultural Economics, Extension and Rural Development*, *3*(3), 270-275

Awan, A. G., & Aslam, A. (2015). Impact Of Agriculture Productivity On Economic Growth: A Case Study Of Pakistan. *Global Journal of Management and Social Sciences*, *1*(1), 57-71.

Azam, A., & Shafique, M. (2017). Agriculture in Pakistan and its Impact on Economy. *A Review. Inter. J. Adv. Sci. Technol*, *103*, 47-60.

Chandio, A. A., Jiang, Y., & Guangshun, X. (2016). Agriculture and Economic Growth: Evidence from Pakistan. *International Journal of Advanced Biotechnology and Research*, *7*(3), 1037-1045.

Chaudhry, A. A. (2009). Total factor productivity growth in Pakistan: An analysis of the agricultural and manufacturing sectors. *The Lahore Journal of Economics*, *14*, 1.

Chowdhury, A. N. (1970). " Economic Policy and Industrial Growth in Pakistan"—A Review.

Dorosh, P., Niazi, M. K., & Nazli, H. (2003). Distributional impacts of agricultural growth in Pakistan: A multiplier analysis. *The Pakistan Development Review*, 249-275.

Gujarati, D. N. (2004). Basic Econometrics: Student solutions manual for use with Basic econometrics.

Hayat, U., Shah, T., & Bacha, M. S. (2019). An Empirical Assessment of the Dynamics of Agricultural Growth in Pakistan. *Sarhad Journal of Agriculture*, *35*(3).

Khan, K. S., & Siddiqi, M. W. (2011). Impact of manufacturing industry on economic growth in case of Pakistan: A Kaldorian Approach. *Interdisciplinary Journal of Contemporary Research in Business, Forthcoming*.

Kohansal, M. R., & Torabi, S. (2013). Agricultural impact on economic growth in Iran using Johansen approach cointegration. *International Journal of Agronomy and Plant Production*, *4*(12), 3216-3221.

Mehrara, M., & Baghbanpour, J. (2016). The Contribution of Industry and Agriculture Exports to Economic Growth: The Case of Developing Countries. *World Scientific News*, (46), 100-111.

Nazish, A. R., Iqbal, A., & Ramzan, M. (2013). Impact of agriculture, manufacturing and service industry on the GDP growth of Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, *5*(4), 727-734.

Raza, S. A., Ali, Y., & Mehboob, F. (2012). Role of agriculture in economic growth of Pakistan.

Usman, M. (2016). Contribution of agriculture sector in the GDP growth rate of Pakistan. *Journal of Global Economics*, *4*(2), 1-3.