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Determinants of Industrial Sector Growth in Pakistan

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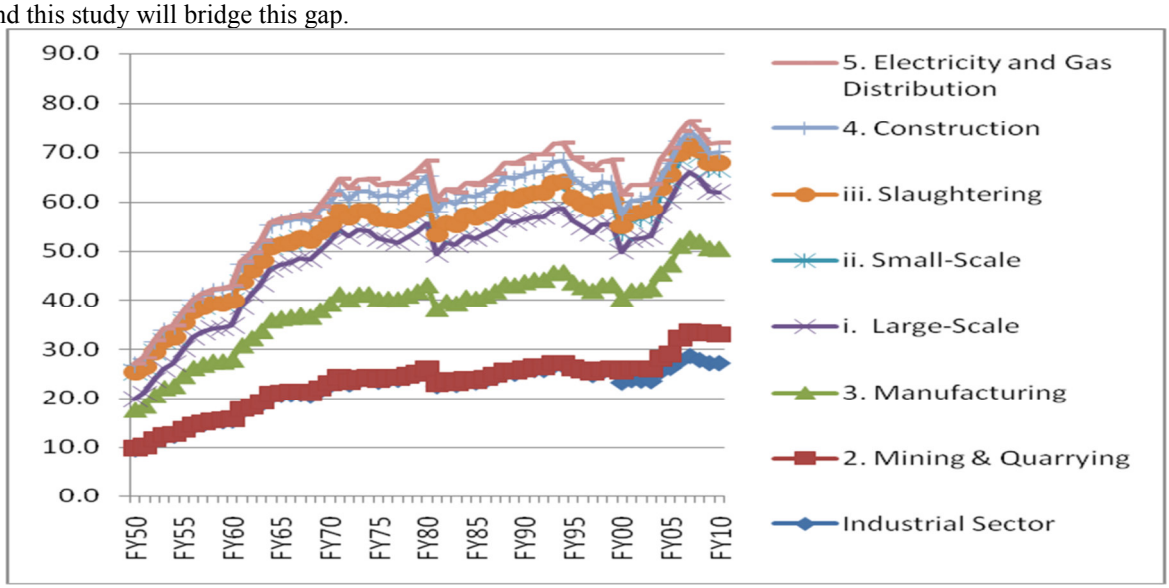
Abstract
Basic purpose to make this study was to find out the determinants of industrial sector growth in Pakistan. Factors were collected from the existing empirical literature. Neo classical model of economic growth was followed and autoregressive distributed lag (ARDL) method of estimation was applied to calculate the results. Augmented Dickey Fuller test was applied to check the presence of unit root in the time series data. Annual data from 1976 to 2014 was chosen to make the analysis. Trade (% of GDP) and Personal remittances, received (% of GDP) showed positive and significant association with Industry, value added (% of GDP) and lag value of industry, value added(% of GDP) showed negative and significant relationship with Industry, value added (% of GDP) in long run. But in short run, differenced lag value of industry, value added (% of GDP) showed negative and significant association with Industry, value added (% of GDP). The remaining variables did not show significant association with industrial growth. Wald test was applied on the long run variables to calculate F.statistic. Calculated F.statistic is higher than both the Pesaran *et al.* (2001) and Narayan (2004) upper bound critical values at 5% level of significance. Diagnostic test of correlation was conducted through Lagrange Multiplier (LM) test: LM(-1)=2.93(0.10). LM test confirmed that there was no serial correlation. The stability of the model for long run and short run relationship is detected by using the cumulative sum of recursive residuals (CUSUM) that resulted in the stable relationship.
Keywords: Industrial sector, Trade, Remittances, ARDL, Wald test, LM test, CUSUM.

1. Introduction

Economic growth refers to an increase in national level income; it is measured by GDP growth. It results from increase in productive capacity which is an indicator of economy capability to produce more goods and services. Economic growth is directly or indirectly linked with our standard of living. A higher output growth implies increase income level and hence higher standard of living for residents of the country (Palmer, 2102). Higher economic growth is also linked with increased employment level in the country. There are three sectors of GDP; agricultural sector, industrial sector and services sector.

There is enough empirical evidence in literature on the determinants of economic growth. However there is an acute insufficiency of empirical existed literature on sectoral determining factors of economic growth and this study will bridge this gap.



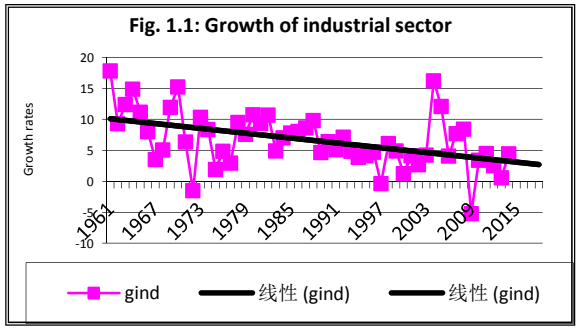
The purpose of conducting this research is to identify factors affecting industrial sector growth in Pakistan. Based on this study, a sectoral based instead of uniform policy will be recommended to the policy

makers to augment economic growth through industrial sector growth in the country.

1.1. Historical trends in industrial sector growth

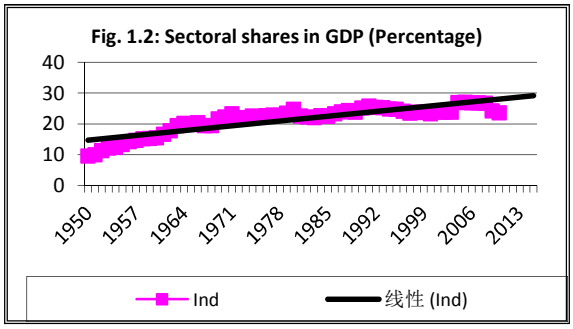
Figure 1.1 is representing the historical growth of industrial sector. Data was taken from World Development Indicators (WDI-2014) for annual percent growth rate of industrial sector. If we concentrated on actual graph, we will come to know that growth rate of industrial sector was zero or below zero in years 1972, 1997, 2009 and 2013. Growth of industrial sector was more than fifteen percent in years1961, 1970 and 2004 and remained between 0 and fifteen percent.

From linear trend we can conclude that growth of industrial sector is moving forward with decreasing trend.



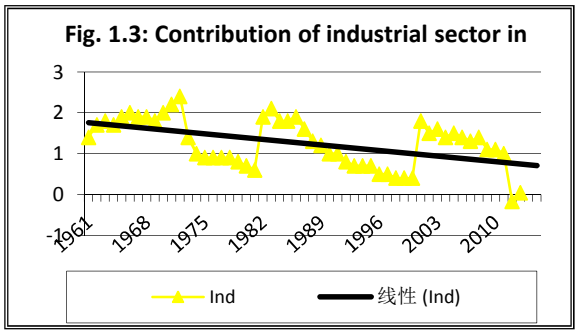
1.2. Contribution of each sector in economic growth

Figure 1.2 shows contribution of industrial sector in economic growth in Pakistan. The sector that contributes most in economic growth of the country after services sector is industrial sector. It is clear from the figure that contribution of each industrial sector is increasing overtime. Linear trend line is also drawn to show the trend of contribution of industrial sector in gross domestic product. Trend line shows that contribution of industrial sector in GDP is increasing with the passage of time.



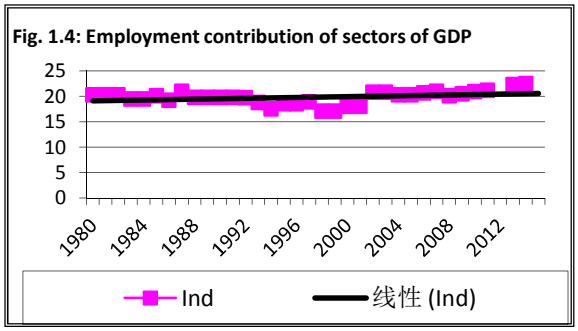
1.3. Contribution of industrial sector in exports

Figure 1.3 is showing that contribution of industrial sector in exports is decreasing with the passage of time. Data series was achieved by dividing the export data to industrial sector data. In years 1972 and 1983 contribution of industrial sector in exports was more than two percent while it was 0.5 percent or low in years 1981, 196, 1997, 1998 and 2013 according to my data series. Overall trend shows that contribution of industrial sector is decreasing in exports. Reason may be the energy crisis in year 2013.



1.4. Employment contribution of industrial sector

To find out the graphical position of employment contribution of each sector of gross domestic product as Employment in agriculture, industry and services (% of total employment), data was taken from World Development Indicators (WDI-2014). Data of labor force in industrial sector was divided by the data of total employed labor force to calculate the employment contribution of industrial sector. Actual graph is showing that employment contribution of industrial sector remained in between fifteen to twenty five percent. It is clear from the linear trend lines in figure 1.4 that employment contribution of industrial sector is increasing.



Above mentioned changes in industrial sector and its contributions into economic growth, exports and employment created the following questions: Which factors determine industrial sector growth? What policy options government should follow to boost up industrial sector growth in the country like Pakistan?

2. Literature Review

Gross domestic product is the sum of three sectors: industrial sector is one of them. In 2014-15, industrial sector contribution in total GDP of the country was 20.30 percent. Industrial sector can further be divided into further sub sectors such as Mining and quarrying, manufacturing, manufacturing large scale, manufacturing small scale,

construction, and electricity and gas distribution. Industrial sector covers a reasonable portion of GDP therefore, it is necessary to find out the factors affecting industrial sector output growth.

Kathuria et al. (2010) to assessed the relationship between human capital and manufacturing productivity growth in fifteen different Indian states and used annual panel data for period 1994-2005 while estimating the Cob Doglous production function through this equation:

$$y_{i,s,t}^{i,v} = \alpha_{i,s,t} + \beta_l l_{i,s,t} + \beta_k k_{i,s,t} + \mu_i + V_{i,s,t} \quad \text{..... 2.1}$$

Where $y_{i,s,t}$ represents value added in industrial output, $l_{i,s,t}$ is labor force and $k_{i,s,t}$ is used for capital, i,s,t are used for industry, state and time. All variables are in log form.

On the basis of empirical findings they argued that labor force $(l_{i,s,t})$ affected total factor productivity growth positively in Indian industrial sector. Remaining variable capital $(k_{i,s,t})$ showed no positive with value added in industrial output $(y_{i,s,t})$.

Sola et al. (2013) designed a study to measure the manufacturing performance in Nigeria and used Solow growth model for panel data period 1980-2008 while estimating the following equation through ordinary least square methods.

$$y_{it}^{i} = \psi_1 \Sigma \sum_{j=2}^{k} \psi_j x_{jit} + \Sigma \sum_{p=1}^{s} \lambda_p \, \mathrm{w}_{\mathrm{pi}} + \phi_t + \eta_{it} \quad \text{..... 2.2}$$

Where y_{it}^{i} represents manufacturing output, x_j is the index of observed explanatory variables, w represents unobserved variables. i is used for unit of observation, j, p stands for the difference between observed and unobserved explanatory variables and 't' is time.

Based on empirical findings they suggested that the main determinants of manufacturing sector are observable variables (imports, exports, capacity utilization and investment) in Nigeria and government should provide incentives to firms to export more.

Another study was conducted by Otalu and Andreu (2015) to assess the determinants of industrial sector growth in Nigeria. They used Leontiff input output model and applied coitegration and error correction technique to estimate the following equation:

$$y_t^i = \alpha_0 + \alpha k_t + \alpha_2 l_t + \alpha_3 q_t + \alpha_4 cpi_t + \alpha_5 cu_t + \alpha_6 ltr_t + \alpha_7 to_t + \alpha_8 egn_t + \mu_t \quad \text{...2.3}$$

Where y_t^i represents industrial output growth, k_t is the gross capital formation, l_t represents labor force, q_t is used for exchange rate, cpi_t stands for inflation rate, cu_t is capacity utilization, ltr_t is used for education attainment, to_t stands for trade openness and egn_t is used for electricity generation. Subscript 't' is time period.

They found that capital (k_t), labor (l_t), exchange rate (q_t), capacity utilization (cu_t), trade openness (to_t) and electricity generation (egn_t) have positive and significant effect on industrial sector growth. Education attainment (ltr_t), inflation rate (cpi_t) and trade openness (to_t) have negative effect on industrial sector output growth in Nigeria.

Mohsen et al. (2015) applied Johansen cointegration and Granger causality test to find out the determinants of industrial output in Syria. They used annual data from 1980 to 2010 to estimate the following equation:

$$y_t^i = \alpha + \beta_1 k_t + \beta_2 op_t + \beta_3 x_t + \beta_4 pop_t + \beta_5 y_t^a + \varepsilon_t \quad \text{..... 2.4}$$

Where y_t^i represents industrial output, k_t is the gross fixed capital formation of industry, op_t represents oil prices, x_t is used for manufactured exports, pop_t stands for population growth rate, and y_t^a is used for agricultural output. Subscript t is time period.

On the basis of empirical findings, they concluded that gross fixed capital formation (k_t), manufactured exports (x_t), population growth rate (pop_t) and agricultural output (y_t^a) affected industrial output (y_t^i) positively. Oil prices (op_t) however, have negative effect on industrial output.

Sertic et al. (2015) also focused upon finding out the determinants of manufacturing industry exports in European Union states[1]. They used panel data from 2000 to 2011 and applied generalized method of moments

[1] Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia,

(GMM) estimation technique. They estimated the following equation:

$$x_{it}^{m} = \alpha + \beta_1 q_{it} + \beta_2 y_{it}^{ind} + \beta_3 lc_{it} + \beta_4 dd_{it} + \beta_5 d_{it} + \varepsilon_t .... .2.5$$

Where x_{it}^{m} represents real manufacturing exports, q_{it} is the real effective exchange rate, y_{it}^{ind} represents industrial production, lc_{it} is used for labor cost, dd_{it} stands for domestic demand, and d_{it} is used for economic crisis. Subscript't' is time period 'i' is used for countries.

On the basis of empirical findings they concluded that domestic demand (dd_{it}), industrial production (y_{it}^{ind}) and real effective exchange rate (q_{it}) have positive and significant impact on real manufacturing exports (x_{it}^{m}). Labor cost (lc_{it}) and dummy for economic crisis (d_{it}) [1] affected the manufacturing exports negatively and significantly.

Martinaitytė and Kregždaitė (2015) used data for period 2003-2013 to assess the factors of creative industries development in now a day's stage in Lithuania. Authors defined the Creative industries as the area of overlap between culture, technology, science and commerce. They involve the supply of goods and services that contain a substantial element of artistic and intellectual activities associated with a vital role in social and human development.

Based on findings [2] they concluded that high weight factors affecting creative industries are expenditures on creative index and culture, medium weight factors are tolerance index, employment rate in research and development, number of patents and government expenditures on culture and low weight factors that influence creative industries growth are exports of production of creative index, employment in creative index, high level education and government expenditures on research and development.

Above empirical review of earlier studies indicate that labor force, capital formation, manufacturing exports and imports, capacity utilization and domestic investment , exchange rate, inflation rate, education attainment, trade openness, electricity generation, oil prices, manufactured exports, population growth rate, agricultural output, real effective exchange rate, industrial production, domestic demand, economic crisis, expenditures on creative index and culture, medium weight factors are tolerance index, employment rate in research and development, number of patents and government expenditures on culture and low weight factors that influence creative industries growth are exports of production of creative index, employment in creative index, high education level and government expenditures are the relevant determinants of industrial sector output growth around the world.

Most often used empirical analyzing relationships between industrial sector growth and its determinants in reviewed literature are cointegration and error correction technique, granger causality test, generalized method of moments (GMM), generalized least square methods and ordinary least square methods.

3. Material and Methods

Augmented Solow growth model is used to identify the factors affecting industrial growth in Pakistan. The basic Solow growth model explains that output is the function of human capital and physical capital.Solow growth model (1956) is very simple and useful as it can further be extended to check the impact of other determinants on economic growth (Rao, B.B.:2006). Patrick Enu *et al.* (2013); Biswas and Saha (2014) also employed similar type of economic relationship to find out macroeconomic determinants of economic growth in Ghana and India respectively.

(a) Auto Regressive Distributed Lag Model to cointegration approach is followed to estimate the equations of interest. The autoregressive distributive lag(ARDL) approach was applied as it was preferred over other approaches of cointegration due to the reasons as under. It was referred to Pesaran et al., 2001: by (Oyakhilomen and Zibah: 2014). The autoregressive distributive lag bound testing approach does not care about the integration of variables under consideration whether they are integrated at I(1) or at I(0).
(b) This technique can be used even for small sample size of data.
(c) It is very simple technique as it can be estimated by ordinary least square method if the lag order of model is confirmed.
(d) The short run and long run relationships cam be estimated at the same time.

Annual data is taken from World Bank World Development Indicators was used for the period 1976-2014. All variables were taken as percent of GDP excluding the GDP itself that was taken as GDP growth annual

Slovenia, Spain, Sweden and the United Kingdom.

[1] Value 1 was assigned the year when there is any economic crisis in any country of European Union, otherwise 0 values were assigned.

[2] The theory of creative industries does not have a systemic approach to the creative industries' description. There is a lack of consolidated methodology on creative industries' impact assessment on the economy.

percent. Then all variables were converted into log form for final analysis. Data was taken from 1976 to 2014 instead of 1950 to 2014 because there was the structural break in data in 1971 due to the separation of East Pakistan. Data of mostly variables in my study was available from 76 to 2014. No need to check the variables for unit root test whether these are I(0) or I(1). But it is necessary to check the stationarity of variables to ensure that the variables are not stationary at second difference as the calculated value of F.statistic given by Pesaran et al. (2001) are not valid for variables that are stationary at I(2) or beyond(Oyakhilomen and Zibah :2014). Augmented Dickey Fuller (ADF) test was applied to check the unit roots whether the variables under consideration are stationary or not.

3.1. Model for determinants of industrial sector growth:

Industrial sector growth equation is given as:

$$y_t^i = \alpha + \gamma_1 exdept_t + \gamma_2 fdi_t + \gamma_3 ftrd_t + \gamma_4 gdp_t + \gamma_5 g\exp_t + \gamma_6 \inf_t + \gamma_7 mn\exp_t + \gamma_8 remt_t + \varepsilon_t \ldots\ldots\ldots\ldots 03$$

Equation (3) shows determinants of Industry, value added (% of GDP) denoted as (y_t^i) which include: External debt stocks (% of GNI) denoted as ($exbebt_t$),Foreign direct investment, net inflows (% of GDP) denoted as (fdi_t),Trade (% of GDP) denoted as ($ftrd_t$),GDP growth (annual %) denoted as (gdp_t),Gross national expenditure (% of GDP) denoted as ($g\exp_t$),Inflation, consumer prices (annual %) denoted as ($\inf_t$),Manufactures exports (% of merchandise exports) denoted as ($mn\exp_t$) and Personal remittances, received (% of GDP) denoted as ($remt_t$). All γ_s are considered to be constant elasticities.

The equation for short run and long run relationship in ARDL will be as under:

$$\Delta y_t^i = \alpha + \sum_{i=1}^{p} \gamma_{1i} \Delta y_{t-i}^i + \sum_{i=0}^{p} \gamma_{2i} \Delta exdebt_{t-i} + \sum_{i=0}^{p} \gamma_{3i} \Delta fdi_{t-i} + \sum_{i=0}^{p} \gamma_{4i} \Delta ftrd_{t-i} + \sum_{i=0}^{p} \gamma_{5i} \Delta gdp_{t-i} +$$

$$\sum_{i=0}^{p} \gamma_{6i} \Delta g\exp_{t} + \sum_{i=0}^{p} \gamma_{7i} \Delta \inf_{t-i} + \sum_{i=0}^{p} \gamma_{8i} \Delta mn\exp_{t-i} + \sum_{i=0}^{p} \gamma_{9i} \Delta remt_{t-i} + \gamma_{10} y_{t-1}^i + \gamma_{11} exdebt_{t-1} +$$

$$\gamma_{12} fdi_{t-1} + \gamma_{13} ftrd_{t-1} + \gamma_{14} gdp_{t-1} + \gamma_{15} g\exp_{t-1} + \gamma_{16} \inf_{t-1} + \gamma_{17} mn\exp_{t-1} + \gamma_{18} remt_{t-1} + \varepsilon_t \ldots (3.1)$$

In case of equation (3.1), Δ represents the first difference, γ_{1i} , γ_{2i} , γ_{3i} , γ_{4i} , γ_{5i} , γ_{6i} , γ_{7i} , γ_{8i} and γ_{9i} show the short run dynamics of the model and γ_{10} , γ_{11} , γ_{12} , γ_{13} , γ_{14} , γ_{15} , γ_{16} , γ_{17} and γ_{18} indicate the long run association. p is the optimal lag lengths. Wald test or F-statistics is computed to check whether the whole series have cointegration or not. The null hypothesis is tested,

$H_0 : \gamma_{10} = \gamma_{11} = \gamma_{12} = \gamma_{13} = \gamma_{14} = \gamma_{15} = \gamma_{16} = \gamma_{17} = \gamma_{18} = 0$ against the alternative hypothesis:

$H_a : \gamma_{10} \neq \gamma_{11} \neq \gamma_{12} \neq \gamma_{13} \neq \gamma_{14} \neq \gamma_{15} \neq \gamma_{16} \neq \gamma_{17} \neq \gamma_{18} \neq 0$

The critical bounds values were taken from Pesaran et al. (1999, 2001). If the computed Wald or F-statistic is greater than the upper bound I(1), the null hypothesis of no cointegration will be rejected. That means that there is long run relationship among all the series. However, if the Wald or F-statistic lies between the upper and lower bounds, results will be inconclusive. If the computed Wald or F-statistic is less than the lower bound I(0), the null hypothesis of no cointegration cannot be rejected. It means that there is no long run relationship among all the series. To check the validity of estimated ARDL model, we apply different diagnostic tests. Parameter stability test is used by applying the CUSUM test. Lagrange multiplier (LM) test is used to check the serial correlation.

4. Results and Discussion

4.1. Unit Root Test

All variables are stationary at first difference except Foreign direct investment, net inflows (% of GDP) (fdi_t), Inflation, consumer prices (annual %) $(\inf_t)$, GDP growth (annual % (gdp_t) and Trade (% of GDP) $(ftrd_t)$; that were found out stationary at level with intercept and no trend.

Table 4.1: Unit Root Test

Variables	ADF Test			
	Levels		First Difference	
	Intercept	Intercept + Trend	Intercept	Intercept + Trend
y_t^i	-2.57	-2.81	-7.02	-7.04
$exdebt_t$	-1.06	-0.95	-4.31	4.58
fdi_t	-2.66	-3.13	-5.15	-5.20
$ftrd_t$	-3.01	-2.97	-7.45	-7.55
gdp_t	-4.04	-4.65	-9.21	-9.08
$g\exp_t$	-1.44	-1.62	-5.28	-5.20
$\inf_t$	-4.39	-4.25	-5.97	-5.93
$mn\exp_t$	-1.90	-1.15	-3.00	-3.38
$remt_t$	-1.49	-1.55	-5.58	-5.55
5 % critical values	-2.60	-3.19	-2.60	-3.19
1% critical values	-3.62	-4.22	-3.62	-4.22

Note: y_t^i, $exdebt_t$, fdi_t $ftrd_t$, gdp_t, $g\exp_t$, $\inf_t$, $mn\exp_t$ and $remt_t$ denote Industry, value added (% of GDP), External debt stocks (% of GNI), Foreign direct investment, net inflows (% of GDP), Trade (% of GDP), GDP growth (annual %), Gross national expenditure (% of GDP), Inflation, consumer prices (annual %), Manufactures exports (% of merchandise exports), and personal remittances received(% of GDP). All variables are in log form. 5% one sided critical values are taken from McKinnon (1996).

4.2. Cointegration Estimation

Auto regressive distributed lag (ARDL) was applied to find out determinants of overall economic growth in Pakistan. According to Table 4.2, Trade (% of GDP) $(exdebt_{t-1})$ and Personal remittances, received (% of GDP) $(remt_{t-1})$ showed positive and significant association with Industry, value added (% of GDP) (Δy_t^i) and lag value of industry, value added (y_{t-1}^i) showed negative and significant relationship with Industry, value added (% of GDP) (Δy_t^i) in long run.

But in short run, differenced lag value of industry, value added (% of GDP) (Δy_{t-1}^i) showed negative and significant association Industry, value added (% of GDP) (Δy_t^i). All other variables did not affect significantly the Industry, value added (% of GDP) (Δy_t^i). It is to be noted that first nine variables before constant are indicating long run association and variables with differenced sign (Δ) are showing short run association in table 4.2.

Table 4.2: Estimation of long run and short run relationship (ARDL): Dependent variable is Industry, Value added, % of GDP

Variables	Coefficient	T. Statistic(P.Values)
y^{i}_{t-1}	-0.98	-3.54(0.00)
$exdebt_{t-1}$	0.27	3.16(0.00)
fdi_{t-1}	0.03	1.15(0.14)
$ftrd_{t-1}$	-0.06	-0.30(0.76)
gdp_{t-1}	0.00	0.21(0.83)
$g\exp_{t-1}$	0.10	1.13(0.27)
$\inf_{t-1}$	-0.06	-1.97(0.06)
$mn\exp_{t-1}$	0.10	0.78(0.44)
$remt_{t-1}$	0.09	2.27(0.03)
C	0.67	1.78(0.09)
Δy^{i}_{t-1}	0.00	0.01(0.98)
$\Delta exdebt_{t-1}$	-0.31	-2.26(0.03)
Δfdi_{t-1}	-0.01	-0.65(0.51)
$\Delta ftrd_{t-1}$	-0.01	-0.06(0.94)
Δgdp_{t-1}	-0.00	-0.27(0.78)
$\Delta g\exp_{t-1}$	-0.23	-1.59(0.12)
$\Delta\inf_{t-1}$	0.03	1.06(0.30)
$\Delta mn\exp_{t-1}$	0.04	0.18(0.85)
$\Delta remt_{t-1}$	-0.02	-0.52(0.60)

Wald test was applied on the long run variables (Table: 4.3) to calculate F.statitic. Significant F.statistic:4.54(0.00) was compared to the critical values cited from Pesaran et al. (1999), Table CI (iii): Case I unrestricted intercept and no trend and Narayan(2004) Critical values for the bounds test: Case III restricted intercept and trend. It proved the existence of cointegration at 5% level of significance among the variables of interest.

Table 4.3: Upper and lower critical values

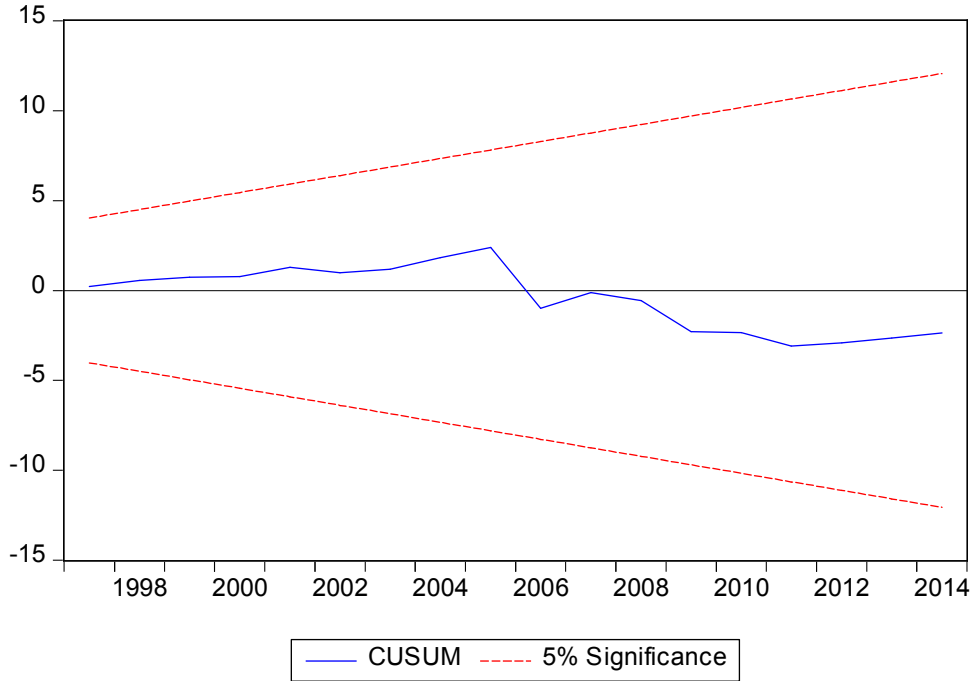
	Pesaran et al.(2001)		Narayan(2004)	
Critical Values	Lower bound value	Upper bound value	Lower bound value	Upper bound value
1 percent	2.79	4.10	4.10	6.15
5 percent	2.22	3.39	2.87	4.44
10 percent	1.95	3.05	2.38	3.72

The critical values reported for Pesaran *et al.* (2001) are the case with unrestricted intercept and no trend (case III) and Narayan(2004) are the case with intercept and no trend(Case II) in table 4.3. In this study we have been used Narayan (2004) which is developed based on 30 to 80 observations. As the calculated F statistics (4.54) is higher than both the Pesaran *et al.* (2001) and Narayan (2004) upper bound critical values at 5% level of significance. This means that the null hypothesis of no long-run relationship is rejected; there is long-run relationship based on the Pesaran *et al.* (2001) and Narayan (2004) critical values at 5% level of significance. Therefore, there is cointegration among the variables in long run.

Diagnostic test of correlation was conducted through Lagrange Multiplier (LM) test: LM(-1)=2.93(0.10).LM test confirmed that there was no serial correlation.

The stability of the model for long run and short run relationship is detected by using the cumulative sum of recursive residuals (CUSUM). The test finds serious parameter instability if the cumulative sum goes outside the area between the two critical lines. As it can be seen from the figure 4.1, the plot of CUSUM test did not cross the critical limits (two red dotted lines). So, we can conclude that long run estimates are stable and there is no any structural break.

Fig.4.1:Testing parameter stability using CUSUM



5. Conclusion

Basic purpose to make this study was to find out the determinants industrial sector growth of Pakistan. Factors were collected from the existing empirical literature. Neo classical model of economic growth was followed and autoregressive distributed lag (ARDL) method of estimation was applied to calculate the results. Augmented Dickey Fuller test was applied to check the presence of unit root in the time series data. Annual data from 1976 to 2014 was chosen to make the analysis.

Trade (% of GDP) and Personal remittances, received (% of GDP) showed positive and significant association with Industry, value added (% of GDP) and lag value of industry, value added(% of GDP) showed negative and significant relationship with Industry, value added (% of GDP) in long run. But in short run, differenced lag value of industry, value added (% of GDP) showed negative and significant association with Industry, value added (% of GDP). The remaining variables did not show significant association with industrial growth. Wald test was applied on the long run variables to calculate F.statistic. Calculated F.statistic is higher than both the Pesaran *et al.* (2001) and Narayan (2004) upper bound critical values at 5% level of significance. Diagnostic test of correlation was conducted through Lagrange Multiplier (LM) test: LM(-1)=2.93(0.10). LM test confirmed that there was no serial correlation. The stability of the model for long run and short run relationship is detected by using the cumulative sum of recursive residuals (CUSUM) that resulted in the stable relationship.

Government should focus on the trade with other countries of World particularly on increasing the quantity and quality of exports. Overseas employment should be encouraged and facilities should be provided to labor force for overseas employment by the Government to boost up the growth of industrial sector in Pakistan.

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