



## SMEs OUTPUT AND GDP GROWTH: A DYNAMIC PERSPECTIVE



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### ABSTRACT

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In the contemporary era, the sector of SMEs has been considered essential for achieving macroeconomic objectives such as employment creation, poverty reduction and economic growth. Hence, SMEs have an ample and untapped potential to contribute in economic growth though enhancing entrepreneurial skills and indigenous technology. The contribution of SMEs sector to economic growth is thus a principle component in raising the internal efficiency of the resources. This study endeavors to find out the potential role of SME's output in GDP growth for Pakistan considering some macroeconomic variables. While using data from 1980 to 2017, ARDL bound testing approach has been used to incorporate the dynamic perspective in the study. In model estimation, the GDP growth rate has been taken as a dependent variable, whereas, output of small sale industry, unemployment rate, government expenditure, interest rate, domestic investment, foreign direct investment and finance provided by banks to private sector have been included as independent variables. The estimation findings of dynamic model confirmed the direct and significant association between output of SMEs and GDP growth in Pakistan. However; the sector still requires a policy design to overcome the problems of the sector in war-footing grounds. These policies require a pro-active strategy that can cater more growth of the economy through progress of SMEs. In this regard, the strengthening and elevation of potential output of SMEs, made in Pakistan, tentative policy plan for Industry 4.0; and the distribution of SMEs in remote areas are the relevant recommended policy initiatives.

**Contribution/ Originality:** This study contributes to the existing literature by investigating the role of SMEs output in growth of GDP of Pakistan using the ADRL Bound Testing approach.

### 1. INTRODUCTION

In emerging economies, Small and Medium Enterprises (SMEs) sector is playing an imperative role in establishing industrial base which supports small business activities which

further accelerate economic growth (Myslimi & Kaçani, 2016). SMEs have proved a major source of innovation and inventions through generating new ideas, investment and trade (Abor & Quartey, 2010). Although, the products and production process are limited in SMEs manufacturing relative to large sale business however, the products are manufactured with less investment. Hence, despite the limited role, the significance of SMEs in industrial development cannot be ignored.

Globally, all small business share same characteristics and face same barriers and constrains to expand their business however, they are differ in terms of determining the role and characteristics of SMEs in growth of the economy (Xayphone & Kimbara, 2007). It has been estimated that SMEs are contributing more than 90 percent of industrial output and employing over 60 percent of labor force in many Asian countries (Veskaisri, Chan, & Pollard, 2007). Therefore, the role of SMEs in economic growth have been witnessed the valuable interest of policy debates in developing economies from the last past few decades (Cook & Nixon, 2000). Many researchers have proved significant role of SMEs ensuing to economic growth and provision of substances for the socio-economic development of the economy (Afolabi, 2013; Hu, 2010; Leegwater & Shaw, 2008). SMEs have also improved the regional and sectoral economic balance through industrialization across different sectors and locations. It also promotes effective utilization of economic resources that are fundamental elements of engineering economic growth (Kongolo, 2010; Odedokun, 1988).

During 1950s to 1980s, many policies had been initiated for the support of large enterprises however; Pakistan changed it direction and took actions to promote SMEs since late 1990s. Government have already initiated various policies for the development of SMEs however, merely government cannot promote sustainable development. This compelled government for adopting different economic policies from switching capital and large industries which were based on import substitution strategies to small scale industries. SMEs have better prospects for developing domestic industry thus provides required goods that push economic towards development (Oni & Daniya, 2012). SMEs are supporting both major and minor economic activities that depend on domestic material and human resources while achieving high value-added operations. SMEs are mostly established in rural areas due to survival on rudimentary industrial infrastructure that serve as main initiator of industrial and rural development (Oduntan, 2014).

Like other developing economies, Pakistan also depends on SME's activities in all major sectors including farm, manufacturing, trade and services. These activities not only help to bring technological progression and outsourcing for big industries but also reduce poverty which encourages socio-economic development in the economy (Khalique, Isa, Shaari, & Abdul, 2011). SMEs are mostly established in rural and least developed areas due to survival on rudimentary industrial infrastructure and serves as main initiator of industrial and rural development (Oduntan, 2014).

Moreover; SMEs are dominating the fastest growing exporting sectors such as cotton weaving, textile, sport goods, surgical items in Pakistan. SMEs have also been identified as an important source of poverty reduction through significant contribution in value addition and exports of manufacturing goods with 35, and 25 percent respectively. Moreover; SMEs are generating more employment opportunities for 78 percent of industrial labour force in Pakistan (ESP, 2016-17). Around 53 percent of all SME activities take places in trade, retail and wholesale sectors whereas; 20 percent in manufacturing sector and 22 percent in the provision of services (Pakistan Bureau of Statistics, 2011).

Now, for achieving macroeconomic objectives such as employment creation, poverty reduction, economic growth and investment opportunities, SMEs has become the main source while developing entrepreneurial skills and indigenouse technology (Adebiyi, 2004). SMEs have also improved the regional and sectorial economic balance through industrialization across sectors and locations. It also promotes effective utilization of economic resources that are crucial elements of engineering economic growth (Kongolo, 2010; Odedokun, 1988). Furthermore; SMEs are also promoting socio-economic development in Pakistan. Many small organizations are working for the betterment of health and education sectors. Many small industries are established in rural areas which provide employment opportunities particularly for female labours which enhance their earning, living standard and indirectly stimulate economic growth.

Despite its significance on economy, there has been worry that SMEs have not realized its maximum capacity yet which has restricted their growth and brought various insufficiencies. SMEs are facing several constrains that hamper their competence to achieve full potential level of production. It has been identified that SMEs have many internal and external challenges in terms of production, marketing, non-availability of financial resources and raw material, lack of skilled labour, insufficient infrastructures and inadequate government policies and supports (Aruna, 2015; Mathai, 2015).

While summing up the discussion, several studies have proved positive association between SMEs and economic growth for developing economies (Afolabi, 2013; Leegwater & Shaw, 2008) however; literatures are limited in the context of Pakistan. Therefore; the main objective of this research is to prove a nexus between SME's out and GDP growth for Pakistan.

## 2. REVIEW OF LITERATURE

Bello, Jibir, and Ahmed (2018) examined importance of SMEs in growth and development of Nigeria while highlighting the fact that SMEs are considered as fundamental element of growth for industrial sector in developing countries. The authors utilized data from 1986 to 2016 using simple regression analysis. The results proved direct and significant association between SMEs and growth of output which demonstrates the contribution of SMEs toward economic progress of Nigeria. The study recommended to restrict massive imports and to protect the local producers of SMEs. Okafor, Ugwuegbe, and Chijindu (2016) found the same results between SMEs output and growth employing co-integration technique.

According to Dar, Ahmed, and Raziq (2017) SMEs sector in Pakistan still lagged behind in playing its real part in the economy. This could be attributed to multifarious glitches that had restrained the growth and contribution of the sector. These impediments include indeterminate extent of SMEs (size of SMEs), financial accessibility, capital constraints (human and physical) and technological backwardness. Contrary to this, Nalini, Alamelu, Amudha, and Motha (2016) noted that the activities of small industries were making noteworthy share in enhancement of exports and employment opportunities in Pakistan.

Furthermore, Chinweuba and Sunday (2015) observed the linkage between growth of the economy and SMEs in Nigeria. The outcomes confirmed a strong link between economic growth and the activities of SMEs. Furthermore, due to prominence of SMEs in surging the growth, various studies evaluated the significance of SMEs based on different economic activities. The studies by Nagaya (2017) and Aremu and Adeyemi (2011) found a substantial impact of SMEs sector on economic development in India through providing more employment opportunities and reducing poverty. The same findings were verified by Aremu and Adeyemi (2011).

Oyeniran, David, and Ajayi (2015) have explored an extensive role of SMEs sector in economic growth for Nigeria from 1983 to 2013 using ARDL approach. The findings of the study showed that provision of more capital (investment) in SMEs sector would have a direct and significant contribution for economic advancement in Nigeria. Moreover, surge in credit accessibility, improvement in capacity building; and development of infrastructure in diversified sectors of SMEs would facilitate long run economic growth for the economy of Nigeria.

Akugri, Bagah, and Wulifan (2015) investigated the nexus between rapid infrastructural progress and employment in the presence of SMEs in Ghana. The study was based on primary data from 160 respondents from SMEs through random sampling method for the year of 2013. The findings revealed that SMEs were not providing substantial employment opportunities to the youth segment in Ghana and thus most of these enterprises prefer family labor to minimize input costs. Furthermore, limited credit facilities, proper infrastructure, storage facilities and water shortages were the prominent impediments in the development of SME sector. Bouazza (2015) also recognized the relevance of the small business sector in employment creation and development in Algeria. The findings revealed that underdeveloped SMEs were paltry in creating employment opportunities and thus unemployment is very high in the economy.

Mačerinskas, Vengrauskas, and Veličkaite (2013) qualitatively analyzed the experience of European Union (EU) member economies to develop an insight about the role of SMEs in the context of developed economies. The authors also assessed that the sector had an immense potential to promote competitiveness and hence facilitated growth in the economy

of Lithuania. Furthermore, the study revealed that the sector of SMEs was highly responsive to supply and demand changes and meanwhile showed very speedy adjustment showing market diversification in given time period.

Taiwo, Ayodeji, and Yusuf (2012) and Motilewa, Worlu, Ogbari, and Aka (2015) studied the activities of SMEs in promoting growth. The common findings of the all studies verified the expected positive association between SMEs and economic growth. These studies also highlighted several issues which were faced by SMEs including financial constraints, lack of training corruption, unskilled labor and capacity building. Savlovschi and Robu (2011) emphasized that globally SMEs exhibit an exceptional segment in the national economy. The study proclaimed that the sector was predominantly considered as the key vector of the economic progress since last three decades. This argument was found to be effective for both developed and developing economies.

Numerous studies examined the empirical techniques to examine SMEs-growth nexus in various developed and developing economies. Carree, Van Stel, Thurik, and Wennekers (2002) confirmed direct and positive association between growth of the economy and entrepreneurial activities of SMEs. Somoye (2013) inspected consequences of SMEs financing on the economic progress of Nigeria while using endogenous development system. The outcomes divulged in favor that financial accessibility, real GDP, unemployment and industrial efficiency were acute factors to surge the growth of SMEs sector. Moreover; Onakoya, Fasanya, and Abdulrahman (2013) observed the effect of finance availability on SMEs using quarterly series for the period of 1992-2009. The outcomes demonstrated performance of SMEs was subjected to the credit accessibility through operational loan facilities.

Afolabi (2013) considered SME's financing and growth for the time span of 1980-2010 employing Ordinary Least Square (OLS) technique. The study considered wholesale and retail trade as a proxy of SME's output with other set of control variables. The author concluded that SME's output and credit by commercial bank to SME showed a direct link with the economic development. Hu (2010) examined the performance of SMEs sector and economic growth applying panel data approach. The author considered 37 (developed and developing) economies for the time period of 1960-1990. The study endorsed the applicability of the fact that SMEs were found prominent to enhance economic activity in developed economies. Correspondingly, the author also pointed out in the study that SMEs of developed economies usually grow through increase in the entrepreneurship activities, whereas in under-developed economies, these enterprises contribute more to create employment in the economy.

Cravo, Gourlay, and Becker (2009) evaluated the activities of SMEs and explored the indirect link of the activities with the development of the economy. Additionally, the authors suggested that development of human capital was essential for the advancement of SMEs and yet more crucial for advancing economic activities. Leegwater and Shaw explored positive link between Micro, Small and Medium Enterprises (MSMEs) and growth (per capita income) in United States (US). The authors took panel data for different companies in recognized manufacturing divisions with less than 10, 20, 100, or 250 workers. The outcome of the study proves direct correlation between economic development and the firm's pervasiveness of MSMEs. Notwithstanding, they have found restricted association amongst firm's pervasiveness and development of MSMEs.

Van Stel, Wennekers, Thurik, and Reynolds (2004) figured out entrepreneurial activities of small industries and GDP growth of 36 economies. The estimates of the study demonstrated no significant impact of entrepreneurial activities on economic growth. Besides, the association between the two core variables relied on per capita GDP of economies. Beck, Demirgüç-Kunt, and Maksimovic (2002) also estimated standard growth model for a cross country analysis while considering the share of SMEs in determining employment. However, the effect was found to be positive yet not robust.

Audretsch (2002) developed a conceptual and empirical model to unveil the dynamics of SMEs in US. The study incorporated a distinctive insight of net employment benefits for the time span of 1999-95 employing production function which was based on knowledge. In this regard, the author elaborated that large enterprises were better than small firms in terms of number of patents while small enterprises were prominent in the context of number of employees. The study also supported US policy initiatives for promoting SMEs and its dynamics through providing a competitive

environment, job creation, new start-ups, and spillovers (technological and knowledge). A comprehensive review of various relevant national and international studies has outlined the fact that SMEs sector is the most divergent yet prominent sector for the growth and development of the economy. Meanwhile, it is also evident that the sector faces innumerable issues due to various internal and external factors. The review identifies that developing economies are still striving to develop the infrastructure for SMEs while developed economies are far ahead in nurturing the sector of SMEs. Hence, we have identified that the sectoral development of SMEs differs from country to country and more specifically from developed to developing economies.

### 3. METHODOLOGY

#### 3.1. Data Source

This study has taken time series data from 1981 to 2017 for Pakistan. All variables have been gathered from national and international sources such as World Development Indicator (WDI) Economic Survey of Pakistan (ESP) and Pakistan Bureau of Statistics (PBS). We have taken GDP growth rate, as dependent variable, whereas, output of small sale industry, unemployment rate, government expenditure, interest rate, domestic investment, foreign direct investment and finance provided by banks to private sectors have been used as independent variables.

#### 3.2. The Model Specification

The growth models have been presented by Barro (1991); Mankiw, Romer, and Weil (1992) whereas; many researchers have presented different theoretical frameworks in order to analyze factors that stimulate economic growth. This development in growth theories and literatures have taken step forward when many other variables have been considered into growth model with traditional factors such as capital, labor and technology. In the extended version of growth model, SME has been included for analyzing as an important element of growth. In this regards, this study pursues approach of Tulio, Becker, and Gourlay (2015) in order to determine growth model while considering output of SMEs. Furthermore, the modern economic theories also highlights the role of SMEs in order to accelerate economic growth through contribution of SME's output to GDP and reduce poverty while providing employments opportunities and income generation.

The mathematical form is represented as following:

$$GDP\ Growth_t = f(SMEO_t, FDI_t, UNEM_t, GE_t, INR_t, DI_t, CPS_t) \quad (1)$$

Equation 1 explains that GDG growth depends on SMEs output with some other macro-economic variables. The Econometric form of model is required to provide consistent estimated without any biasness.

The following equation is modeled as follows:

$$(GDPG)_t = \alpha_0 + \beta_1(SMEO)_t + \beta_2(FDI)_t + \beta_3(UNEMR)_t + \beta_4(GE)_t + \beta_5(INR)_t + \beta_6(DI)_t + \beta_7(CPS)_t + Ut \dots \dots \dots (2)$$

Where,

GDPG = GDP growth rate.

SMEO = Output of small scale industry as a proxy of SME's output (million in rupees).

FDI = Foreign Direct Investment (% of GDP).

UNEM = Unemployment Rate.

GE = Government Expenditure (% of GDP).

INR = Call Money Rate as proxy of interest rate.

DI = Gross Capital Formation (% of GDP) as a proxy of domestic investment.

CPS = Credit to Private Sectors by Banks (% of GDP).

While adding  $U_t$  as error term, Equation 1 has been transformed into econometric form of the model which has been estimated

#### 3.3. Estimation Technique

The traditional method Johanson Co-integration and VECM are used for determining long-run and short-run relation among the variables. However, this method suffers from serious issues of spurious result due to stationarity in time series data. Therefore, this study implies Autoregressive Distributed Lag Model (ARDL) which has been presented by Pesaran. and Shin

(2002) and further extended by Hashem, Shin, and Smith (2001). This technique provides consistent, reliable and significant estimates of the variables in both time period (long and short run). There is no requirement of pretesting of stationarity for the existence of relationship among variables irrespective of underlying variables are integrated at I(0), I(1) or combination of both. The equation of ARDL model is as followed;

$$\begin{aligned} \Delta GDPG_t = & \alpha_0 + \alpha_1 \Delta T + \alpha_2 SMEO_t + \alpha_3 FDI_t + \alpha_4 UNEM_t + \alpha_5 GE_{t-1} + \alpha_6 INR_{t-1} + \alpha_7 \Delta I_{t-1} \\ & + \alpha_8 CPS_{t-1} + \sum_{i=1}^a \alpha_{9+i} \Delta GDPG_{t-i} + \sum_{m=0}^b \alpha_{10+m} \Delta SMEO_{t-m} + \sum_{n=0}^c \alpha_{11+n} \Delta FDI_{t-n} + \sum_{o=0}^d \alpha_{12+o} \Delta UNEM_{t-o} \\ & + \sum_{p=0}^e \alpha_{13+p} \Delta GE_{t-p} + \sum_{q=0}^f \alpha_{14+q} \Delta INR_{t-q} + \sum_{r=0}^g \alpha_{15+r} \Delta DI_{t-r} + \sum_{s=0}^h \alpha_{16+s} \Delta CPS_{t-s} + \epsilon \end{aligned} \tag{3}$$

$\Delta$  denotes the first difference operator, whereas;  $\epsilon_t$  is the usual white noise residual which assumed to have normal distribution with finite variance and zero mean. The next step is to compute the ARDL F-statistic to examine whether co-integration between the variables exists or not. Akaike.

Null hypothesis:

$$H_0 : \alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = \alpha_8 = \alpha_9 = 0$$

Alternative hypothesis:

$$H_0 : \alpha_0 \neq \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq \alpha_6 \neq \alpha_7 \neq \alpha_8 \neq \alpha_9 \neq 0$$

We will conduct a bound test of no co-integration and the value of F-statistics will be compared with critical values of upper and lower bound which had been tabularized by Pesaran and Pesaran (1997) and Hashem et al. (2001). If the value of calculated F- statistics is more than upper critical value then null hypothesis of no long run relation among variables will be rejected without considering the order of integration of variables.

In second step, after confirming the co-integration through bound test, then the following long-run model will be estimated;

$$\begin{aligned} GDPG_t = & \delta_1 + \sum_{i=1}^a \delta_2 \Delta GDPG_{t-i} + \sum_{m=0}^b \delta_3 \Delta SMEO_{t-m} + \sum_{n=0}^c \delta_4 \Delta FDI_{t-n} + \sum_{o=0}^d \delta_5 \Delta UNEM_{t-o} \\ & + \sum_{p=0}^e \delta_6 \Delta GE_{t-p} + \sum_{q=0}^f \delta_7 \Delta INR_{t-q} + \sum_{r=0}^g \delta_8 \Delta DI_{t-r} + \sum_{s=0}^h \delta_9 \Delta CPS_{t-s} + \epsilon_t \end{aligned} \tag{4}$$

Equation 4 has been estimated to for long-run coefficients, which shows that increase in SMEs output has positive impact on GDP growth with other variables.

Whenever, if a long-run relationship is verified then Error Correction Model (ECM) is applied to find short run equilibrium. It indicates speed of adjustment at which economy will converge towards long run equilibrium from short run aftershocks into economy. The standard ECM equation is modelled as:

$$\begin{aligned} \Delta GDPG_t = & \delta_1 + \sum_{i=1}^a \delta_2 \Delta GDPG_{t-i} + \sum_{m=0}^b \delta_3 \Delta SMEO_{t-m} + \sum_{n=0}^c \delta_4 \Delta FDI_{t-n} + \sum_{o=0}^d \delta_5 \Delta UNEM_{t-o} \\ & + \sum_{p=0}^e \delta_6 \Delta GE_{t-p} + \sum_{q=0}^f \delta_7 \Delta INR_{t-q} + \sum_{r=0}^g \delta_8 \Delta DI_{t-r} + \sum_{s=0}^h \delta_9 \Delta CPS_{t-s} + \psi ECM_{t-1} \end{aligned} \tag{5}$$

Equation 5 has been estimated for Short-run coefficient where ECMt-1 is lagged error term which captures the speed of adjustment from short run towards long run equilibrium path. Here, we say

that differenced of female labor force participation is explained by differenced of linear (non-linear) term of real GDP per capita plus lagged error term and stochastic term.

After short run estimation, goodness of fit of model is determined through conducting and stability and diagnostic tests. In diagnostic tests, serial correlation, functional form, normality, and Heteroscedasticity have been checked through respective tests, whereas cumulative residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) are used to check structural stability of the model.

**4. EMPIRICAL FINDINGS OF THE STUDY**

Unit root is conducted to de-trend the data or in other words to find the stationarity of the data. Before applying and econometric technique on the data set, it is necessary to check stationarity of data in order to avoid spurious results. Table 1 portrays the unit root results of the model.

Table-1. Unit root test.

ADF test with trend and intercepts				
	Level		1st difference	
	T-statistics	Probe- values	T-statistics	Probe- values
RGDP	-4.011705	0.0169	-7.672312	0.0000
SMEO	-0.607035	0.9725	-6.126162	0.0000
UNEMR	-2.043472	0.5590	-7.204842	0.0000
FDI	-2.768788	0.2173	-4.024143	0.00167
GE	-1.737961	0.7139.	-4.790754	0.0024
INR	-5.384341	0.0006	-5.534353	0.0003
CPS	-2.981279	0.1512	-3.428488.	0.0634
GCF	-5.087951	0.0001	-9.688423	0.0000
Philiphs-Perron test with trend and intercepts				
	Level		1st difference	
	T-statistics	Prob- values	T-statistics	Prob- values
RGDP	-3.975696	0.0184	-18.18003	0.0000
SMEO	-0.07035	0.9726	-6.125479	0.0001
UNEMR	-2.015669	0.5738	-7.227054	0.0000
FDI	-1.680714	0.7397	-3.985387	0.0183
GE	-1.890528	0.6392	-4.800329	0.0024
INR	-2.673692	0.2526	-5.536548	0.0003
CPS	-2.344942	0.4008	-3.428488	0.0634
GCF	-5.096488	0.0010	-12.01168	0.0000

Table 1 depicts unit root test of ADF and Philiphs-Perron. INR, GCF and RGDP are integrated at level however; remaining variables are integrated at 1<sup>st</sup> difference. The estimates of PP unit root test shows that RGDP and GCF are integrated at level and remaining variables are integrated at 1<sup>st</sup> difference. The hypothesis of unit root is tested against 1%, 5% and 10% level of significance. In a nutshell, economic series of data are stationary at levels and 1<sup>st</sup> difference, which justifies applying ARDL method to estimate the model. Results of the ARDL bound testing approach are obtained using Eview-10 and presented below.

Table 2 illustrates the results of the ARDL Co-integration Analysis. The bound test proves co-integration among variables in the long-run. If computed F-statistic is greater than upper bound critical value, then null hypothesis is rejected which confirms long run co-integration among the variables. The value of calculated F-statistic is 13.14384 which is greater than upper critical value thus it has affirmed long run association among the variables.

Table-2. ARDL co-integration analysis.

Dependent variable	RGDP	
Model selection method:	Akaike info criterion (AIC)	
Estimated model	RGDP f(SMEO UNEMR GE FDI GCF CMR CPS)	
Selected lag structure	(4, 3, 3, 3, 2, 0, 3, 2)	
F-statistic	13.14384	K= 7
Significance	Lower bound I(0)	Lower bound I(1)
10%	2.38	3.45
5%	2.69	3.83
2.5%	2.98	4.16
1%	3.31	4.63
R-Square	0.977958	
Adjusted R-squar	0.909383	
F-statistic	14.26120	
Prob(F-statistic)	0.000127	
Durbin-Watson stat	2.988122	

Table-3. Long run estimates.

Variable	Coefficient	Std. error	t-statistic	Prob.
SMEO	7.89E-06	3.52E-06	2.240682	0.0518
UNEMR	-0.85753	0.163	-5.26078	0.0005
GE	-0.23233	0.10761	-2.15912	0.0592
FDI	1.771374	0.334	5.303545	0.0005
GCF	0.028428	0.01957	1.452694	0.1803
CMR	-0.36186	0.04729	-7.6522	0
CPS	0.021227	0.08166	0.259963	0.8007

The estimates of long run are reported in Table 3. The results reveal that GDP growth is positively associated with SME's output and FDI while GE and CMR show indirect link with the GDP growth. We have found no evidence of long run relation between inflation and investment with GDP growth. The long run estimates confirm a positive and significant effect of output of SME sector on growth of GDP in the long time period. The positive link of SMEs to GDP is attributed to a number of conventional justifications as the economic fundamentals of various economies vary with the contribution of SMEs. Therefore, SMEs sector play its significant part to determine the growth of the GDP. Starting with the SMEs contribution in employment, it is the positive association between SMEs output and GDP is in line with the findings Oyeniran et al. (2015) and Bello et al. (2018). However; in developing economies such as Pakistan, the contribution of SMEs have not recognized its potential level. Turning to the other explanatory variables, the link between government expenditures and GDP growth has been questioned for decades and yet the association of these two has not clearly specified yet (Hasnul, 2015) in our model, we have found a negative and significant impact of government expenditures. This could be due to the fact that most part of the government expenditures in Pakistan is grabbed by the non-developed segment and a very little value amount is ascended for development expenditures, therefore, the aggregated impact of the government expenditures is found to be negative in the model. These results are in line with the findings of Alshahrani and Alsadiq (2014) and Butkiewicz and Yanikkaya (2011). Negative relation between interest rate and GDP growth supports Keynesian view, which shows that higher interest rate discourages investments that further decline economic growth (Ali, Saifullah, & Kari, 2015; Gul, Mughal, & Rahim, 2012).

We have found positive and significant relation between FDI and GDP growth. The finding of the FDI in the model is consistent with the study of De Mello (1997); Khan and Khan (2011). Javaid (2016). FDI has brought, new knowledge and advanced technologies, to developing countries while it also increases employment opportunities and productivity that support long run



development in developing countries like Pakistan. Unemployment is a macroeconomic issue that affects individuals. The study proves negative link between unemployment rate and GDP growth which means that decrease in unemployment rate with raise living standard and earning which ultimately enhance growth in the economy (Mosikari, 2013). The finding is confirmed by Sahoo and Sahoo (2019); Hussain, Siddiqi, and Iqbal (2010).

Table-4. Diagnostic tests.

Diagnostic tests	F-statistics (Prob. value)
$\chi^2$ Norm	1.49705 [0.473062]
$\chi^2$ Serial	3.210188 [0.10252]
$\chi^2$ Hetero	1.032501 [0.5142]
$\chi^2$ Reset	0.099191 [0.7609]

Table 4 present diagnostic estimates of the ARDL model which follows the classical axioms. The results prove that the estimated model is correctly specified with normal distribution, constant variance while no serial correlation has been detected.

Table-5. Error correction model for short run estimation

Variable	Coefficient	Std. error	t-statistic	Prob.
C	36.90983	2.711821	13.61072	0.0000
@TREND	-0.396833	0.030816	-12.87754	0.0000
D(RGDP(-1))	0.569682	0.122079	4.666486	0.0012
D(RGDP(-2))	0.289661	0.084011	3.447914	0.0073
D(RGDP(-3))	0.190365	0.055191	3.449186	0.0073
D(SMEO)	-3.51E-05	5.91E-06	-5.933478	0.0002
D(SMEO(-1))	-3.03E-05	5.89E-06	-5.146433	0.0006
D(SMEO(-2))	1.87E-05	5.90E-06	3.160934	0.0115
D(UNEMR)	-0.316130	0.103577	-3.052138	0.0137
D(UNEMR(-1))	0.903639	0.111660	8.092740	0.0000
D(UNEMR(-2))	0.263198	0.101513	2.592751	0.0291
D(GE)	0.100358	0.116113	0.864311	0.4099
D(GE(-1))	0.028754	0.144306	0.199258	0.8465
D(GE(-2))	-0.789312	0.121478	-6.497550	0.0001
D(FDI)	0.673770	0.362269	1.859864	0.0958
D(FDI(-1))	-0.893686	0.451582	-1.979009	0.0792
D(CMR)	-0.500625	0.065403	-7.654494	0.0000
D(CMR(-1))	-0.468157	0.083231	-5.624775	0.0003
D(CMR(-2))	-0.151668	0.077889	-1.947235	0.0833
D(CPS)	0.611868	0.068243	8.965993	0.0000
D(CPS(-1))	-0.147064	0.074688	-1.969041	0.0805
ECM(-1)	-2.310487	0.168989	-13.67241	0.0000
R-squared	0.979639	Mean dependent vary		0.018316
Adjusted R-squared	0.952916	S.D. dependent var		2.180764
F-statistic	36.65848	Durbin-Watson stat		2.988122
Prob(F-statistic)	0.000000			

Table 5 depicts the short run estimates of the model as per the criteria i.e. error term should be significantly negative. This implies that the model of the study will converge towards long run in

case of occurrence of any shock. The value of  $ECM(t-1)$  for the model is  $-2.310487$  which indicates adjustment of variables in long run. Moreover; if any disequilibrium is formed in short run then it will be temporary and will be corrected over a period of time with a high speed of 231 percent per year.

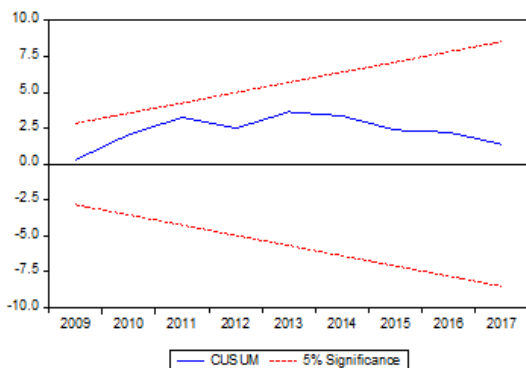


Figure-1. CUSUM.

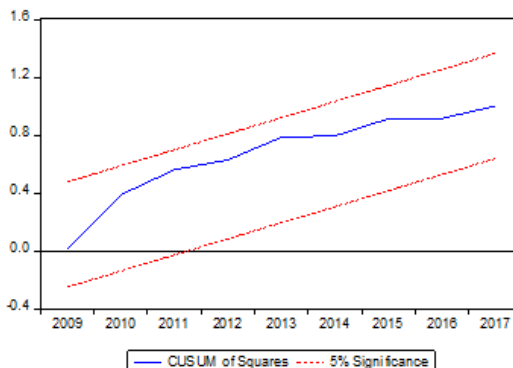


Figure-2. CUSUMsq.

The straight lines represent critical bounds at 5% significance level. The CUSUM and CUSUMsq tests show that graphs of both tests do not cross the lower and upper critical limits. Figure 1 and Figure 2 explicates the outcomes of stability tests of recursive estimates. The plot of the CUSUM and CUSUMsq test are between the upper and lower critical limit. Therefore, we conclude that the mode is stable at 5 percent level of significance and long-and-short runs estimates are reliable and efficient.

## 5. CONCLUSION AND RECOMMENDATIONS

SME sector is playing a pivotal role in the economy while not only supporting local industries but also facilitating exports and employment opportunities in Pakistan. However, still the sector is striving hard due to lack of several financial and non-financial imperatives, consequently, hindering the GDP growth. This study is an attempt to develop a nexus between SME's output and GDP growth. The positive attribution of SMEs output to GDP growth provides an empirical evidence for Pakistan. The sector requires a policy design to overcome the problems of the sector in war-footing grounds. These policies require a pro-active strategy that can cater more growth of SMEs. There is no doubt that government and State Bank of Pakistan is endeavoring to introduce various alternatives for SMEs financing and to assist the SMEs owners to grow their businesses in healthy business environment. Yet, here we present some doable policy recommendations for the policy makers that may offer essential support to SMEs to build on their strengths in the future.

- The strengthening and elevation of potential output of SMEs is highly recommended. This could be done by expediting the export orientation as it will foster the process of internationalization in the economy.
- The Industry 4.0 revolution requires a tentative plan for mergers and joint ventures to prepare SMEs for the upcoming rivalry and innovative shudder in the economy of Pakistan. In this regard, potential SME owners must integrate with the bigger players of the manufacturing sector. Hence, at least to become prominent in manufacturing, SMEs will have to sustain on the curve.
- The technical outsourcing of SMEs may access to become backbone of global manufacturing giants.
- SMEs must be skilfully upgraded to compete in the intellectual international market.
- Pakistan must introduce and follow "Made in Pakistan" initiative so that it can provide an international identity for the products of SMEs.
- The distribution of SMEs in remote areas would improve the regional and sectorial economic balance through industrialization across sectors and locations. It also promotes

effective utilization of economic resources that are crucial elements of engineering economic growth.

- Some relevant policies should be formulated in order to restrict massive imports of foreign goods that may facilitate local prouder to compete with foreign firms.
- Government should take imitative to ample proper SMEs sector data base for future research.
- Encourage young entrepreneurs to start business decrease unemployment and economic growth.

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