Domestic Private Investment, and Export on Output Growth of Large-Scale Manufacturing Sector in Pakistan: An Application of Bound Tests to Cointegration Approach

[1]*Saif ur Rahman, [2]Sajid Ali, [3]Sadia Idrees, [4]Muhammad Sibt E Ali and [5]Mehvish Zulfiqar

[1,3]*School of Economics, Finance and Banking, Universiti Utara Malaysia*

[2] *School of Economics, Bahuddin Zakaria university, Multan, Pakisan*

[4] *School of Business, Zhengzhou university, Henan China*

[5] *Central University of Punjab*

***Corresponding: saifrao12@gmail.com**

ARTICLE INFO	ABSTRACT
	The objective of this analysis is to scrutinize the impact of maufaturer export, private domestic investment in large-scale manufacturing sector on the Pakistan's growth output into large-scale industry. The investigation utilized yearly data for the year 1973-2020. By applying the autoregressive distributed lag (ARDL) technique, the study examines both short-term and long-run effects of domestic private investment (DPI), manufacturing exports on output growth in large-scale manufacturing. However, the study affirms a positive and significant relationship among domestic private investment, exports and value-added, large-scale manufacturing (VAL) in both short-and long-run, while market size and inflation also have a negatively and significantly influence on the value-added, large-scale manufacturing sector. It is also confirmed that domestic private investment, export, inflation have a bidirectional causal relationships with large-scale manufacturing, value-added. Moreover, findings also implies that unidirectional causality is running between employment (EMP), market size (MS), and large-scale manufacturing growth output growth (VAL). Hence, numerous incentives with tax cuts or subsidizations must be sponsored by the supervision of government in a direction to foster private investment. Provided that political stability, better infrastructure, and management in industrial manufacturing zones empowers to attract transnational exports by improving law and order conditions in Pakistan.

Introduction

To classify investment in a firm or nation, foremost four categories have identified: private domestic investment, portfolio investment, government/public investment, and, finally, foreign direct investment (Glomm & Ravikumar, 1992; Erenburg, 1993; Arrow & Kruz, 2013). The measure of private local investment is determined with the aggregate measure of capital fixed formation besides expansion of disposable variations inward degree of inventories. Even though the government spending defends the investment through public authority and substances as of general society. Those investments are ordinarily finished at social and financial turn of events or

improvement of foundation too (Robert, Dansoh, & Ofori–Kuragu, 2014; Berezin, Sergi, & Gorodnova, 2018).

The current research is pondering on the initiative of private investment particularly in the Pakistan's manufacturing industry. The development and growth output of large-scale manufacturing areas reliably stresses physical investments with foreign and national investors. Since creating economies experience suffer from fiscal deficits/ financial shortages throughout the long term, hence the administrations in these nations can't finance and encouragement their manufacturing areas. In this manner, investments (foreign or local) are required for the adornment of the industrial area creates work or employment opportunities and expands monetary development (Rafat, 2018; Khodeir, 2016; Rahman & Bakar, 2019). The critical mediation by the government in the economy has been verified as monstrous investment, in the public area despite the fact making a few business endeavors within the conutry. Although, such thought develops some way or another an unfavorable impact through obliterating the motivators to deliver the different things, with the advancement of saving in the economy(Teece, 2007).

In addition, a new incentive under the title of a Laisse-faire economic system where the government must encourage the private sector and playing its significant role where it feels necessary, it under consideration (Berend, 2016; Haufler, 2013; Naseem, Spielman, &Omamo, 2010; Aslam et al., 2014). The key officials who are dealing with the development of various police related to the economy believe in the idea that growth of any country depends significantly on the private sector and its investment compared to the public investment or public sector. The reason is that private investment is more efficient in generating the output in the economy. To achieve the overall economic objectives for the country, various public enterprises around the globe have been privatized. The key institutions in the world economy like world

bank and the international monetary fund has hailed such type of structural reforms which can favourably provide the growth to various economies over time.

Like different areas of the economy, the large-scale manufacturing sector has its importance explicitly according to the point of view of development and improvement (Nuvolari, 2019; Giotopoulos, Kontolaimou, Korra, & Tsakanikas, 2017; Shah et al., 2022). Mananufacturing exports have significant connection with textile industries, however, overall adding their assurance for financial flourishing (Suleman, & Amin, 2015; Rahman, Bakar, & Idrees, 2019). For the manageability, as time goes on, it is particularly clear for a nation to expand the export manufacturing ratio on the planet budget and to grow intensity on the market. The COVID-19 will variation the macroenvironment of the Pakistan's economy when the characteristics of cumulative demand and supply, employment salary, and monetary marketplace trade. Furthermore, the peripheral surprise establishes a reduction in the charges of raw materials, exports demand, income, forign payments, tourism, and exterior sponsoring.

The development has subject to private investment excessively because of its importance in creating monetary action (Bermejo Carbonell, & Werner, 2018).The replacement of existing stock of capital, new purchases which are net additions in inventories and capital stocks are all included in domestic investments (Bu, 2006; Kanu, &Ozurumba, 2014; Rahman et al., 2021). The domestic investments can be categorized into three kinds, namely, residential and non-residential investments as well as changes in existing inventories. Furthermore, in context of Pakistan, the distinctive classifications of local investment have difficult to come by which encourages to examine the key variables influencing private/national investment in Pakistan. The focal point of the examination researchers and legislators has redirected to local investment from FDI since this factor is the genuine reason for long run development. In a developing economy,

domestic investment is often used to aid FDI. Hence, one of the key predictors of future investment flows is domestic investment Senibi et al., (2017) and Lauter &Moreaub, 2012). The exploration researchers and policymakers are sharp in examining the factor influencing private investmentby taking a gander at the contrast between the unit of domestic investment among different non-industrial nations. Accordingly, with regards to Pakistan, this issue holds essential significance. The current research endeavors to fill the gap in existing literature of economy by analyzing the influence of domestic investment in large-scale manufacturing on value added large-scale manufacturing growth in Pakistan.

Investment performs a significant part in growth. Higher rates of development and growth have been evidenced in countries that accumulate considerable domestic as well as foreign investments. Infrastructure investment is considered a crucial prerequisite for private investments. Moreover, public sector investments in public offerings such as health and education are imprtant. However, if both the public and the private sectors act as substitutes, then public investment can crowd-out private investment, thereby leaving a negative effect on growth (Swaby, 2007). This crowding-out effect happens in case of increased taxes by the government, or increased interest rates (Phetsavong & Ichihashi, 2012).

Over the last three decades, the trend of private investment has been changed dramatically and the growth rate of the private sector and investment in this is 9.7 % in the present year as compared to 13.3 % in last year. In addition, the share of private investment and a sectoral portion is recorded in domestic fixed investment which is also increased over the decades. Such an increasing trend of private investment is reflecting the growing confidence of the private sector for the present and future economic growth. meanwhile, in Pakistan, it is expected that the policy developed by the present Government can shift towards the economic recovery and

overall sustainable development. However, at the same time, Pakistan is facing some serious issues and economic disorders. The key issues in the economy at the present time covers the title of low saving and investment levels, a higher rate of inflation and unemployment with the poverty as well. Such issues in the economic indicators have provided enough evidence to say that economic reforms are very much necessary in the country at present time. The significant portion in the private sector which can contribute towards the development of the country is yet to be achieved as various macroeconomic indicators are showing their poor performance. For instance, the private investment from 1972 to 2019 is very much significant and private investment has shown a decline of 12.3 % of GDP during 1991 and 8.3 % in the year 1992. Such a declining trend has various reasons. However, after the year 1992, there is an increase of 12.3% in 1993 and 16.0% in 1994 for the private investment and that in the year 1996, there is a decline of 8.9% as well. during the time of 2000 to 2019, the ratio of average private investment remained at 13.0% while the peak year was 2002 with the average value of 16.2% (Ministry of Finance, 2019).

Pakistan Manufacturing area : A Historic Assessment

The manufacturing area has for quite some time been a vital backbone of the Pakistan economy. The Pakistan manufacturing sector has second biggest area representing 13.6 percent of Gross Domestic Product (GDP). These areas mostly contains construction industry, chemical industry, fabric manufactiring industry, and cement industry. This area gives employment opportunities of 15.3 percent to the absolute workforce.. It is noticed that there existed the large-scale manufacturing gradually decreased from 19.9% in 2005 to 3.15% in 2020. The large-scale manufacturing in Pakistan has been facing several problems such as lack of capital due to insufficient domestic investment, shortage of skilled labor, usage of outdated technology-inefficient machinery, and low saving among others (Hassan et al., 2013; Ali & Maaz, 2015;

Malga& Din, 2015; Idrees, & Bakar, 2019; Rahman & Bakar, 2019; Waheed et al., 2021).In addition, this sector lacks diversification as the concentration is evidenced in very few industries, such as textile and food constitute more than 37.8 percent of manufacturing output. Likewise, the industries depending upon indigenous and domestic raw material constitute approximately 60 percent of manufacturing output. Similarly, the chemicals industry constitutes almost 15 percent, and 9 percent was from equipment, transport and machinery. Pakistan's large-scale manufacturing sector is comprised for very nearly 80% of the industry, be that as it may, the portion of small-scale industries persisted negligible and stayed nearby 12.9 percent of the business (Ministry of Finance, 2019).
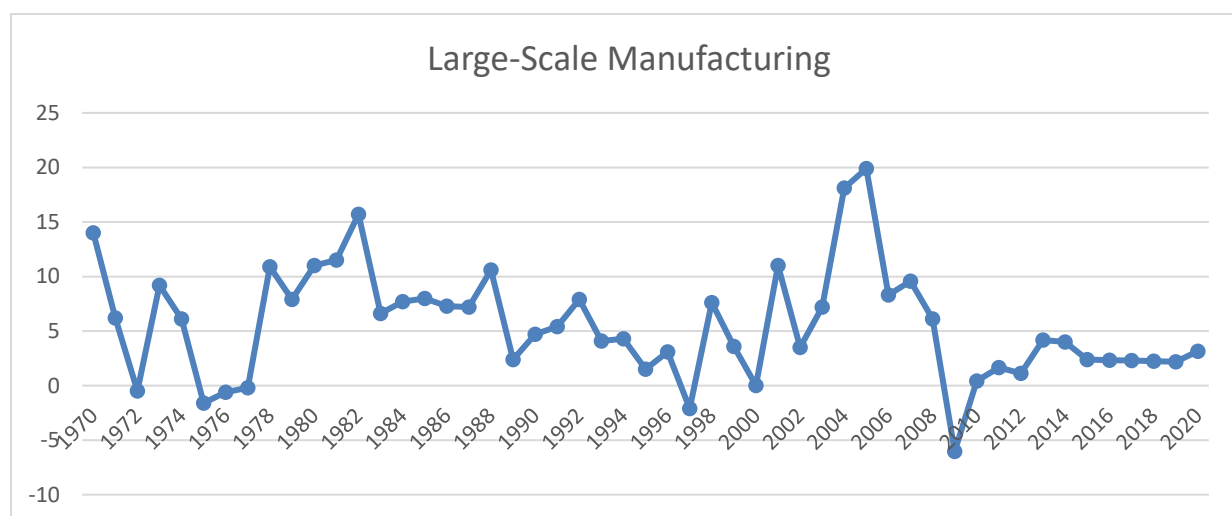
Figure 1: Large-ScaleManufacturing, value added (% of GDP)

Source: World Development Indicator 2019-2020.

The figure 1 shows that the diminishing pattern of large-scale manufacturing esteem expansion since 2005. It is obviously seen from the figure 1 that esteem expansion so level of GDP in Pakistan is not extremely boosting. The diminishing tendency after the last fivteen years portrays that it ought to be watched that why it isn't expanding. Nonetheless, the momentum of Pakistan'smanufacturing industries ware recovered in the 2000s, when this sector experienced a

considerable growth rate of 7.3 per cent helping both small-scale as well as large-scale manufacturing industries. Moreover, the effect of poor terms of trade and globalization has further intensified the problem of slower growth rates of the manufacturing sector. In fiscal year 2020, the growth rate of manufacturing goes below 3.15 percent annually. All the economic indicators remained weak including private and public-sector investments, a collection of taxes, and particularly, exports have significantly declined. A high-cost debt has been taken by the government for maintaining the reserves of foreign exchange, thereby, putting more pressure on an external account by the year 2018.

This detailed review of the literature shows that the nature of the inflation–growth relation is controversial and there is a need for further exploration. It is also evident that most of the literature focuses on time domain analysis to empirically explore the relationship between inflation, the interest rate, and economic growth. However, the wavelet approach allows us to explore the relationship among variables for both the time and frequency domains. This research is the earliest attempt to understand the impact of inflation and the interest rate on output growth in the context of Pakistan using the wavelet technique. This study fills the gap by employing yourly based data, firstly, to find out the effect of domestic private sector investment in large-scale manufacturing on value-added of the large-scale manufacturing sector growth in Pakistan. Secondly, the study is to investigate the direction of causality between domestic private investment and value-added of the large-scale manufacturing sector growth in Pakistan.

Literature Review

The contemporary part is allocated for analysis of past works to see the impact of the domestic private investment on the output growth in the large-scale manufacturing sector. Likewise, numerous conclusions have incorporate local investment as a significant illustrative variable is measured similar segment. For instance, the study has examined determinants of investment for both aggregate and individual level for the data of 27 sub-sectors of manufacturing concern from 1970 to 2001. As per the findings of the study , the government has a key role to play in explaining the domestic or private investment. In specific, level of demand at the domestic level can increase the public investment expansion which will largely produce the private investment in the economy (Ndikumana, 2008; Sabir et al., 2015).

Ebekozien, Ugochukwu, and Okoye (2015) scrutinized the influence of FDI on construction industry in large -scale manufacturing sector in Nigerian. Applying regression analysis, and causality Test.The outcomes of study confirmed that the insignificant assocaitions are exist between FDI and construction industry for large-scale manufacturing when compared to other manufacturing sectors. Using Granger test, the findings affirmed that FDI has positive and significant correlation between FDI and the construction industry for large-scale manufacturing sector. Cheema (1978), used a methodology of output-input modelin sixteen large-scale manufacturing industries. The study are taken the time period from 1960-1970. The study additional contributed the efficiencyincreasesbetween capital and labor. The outcomes of the study establish that maximum large-scale manufacturing industries have substantial growth output, the foremost share of the productionevolutions was added to more capital than partial of manufacturing industries.

Conventionaleffort has been organized in Naqvi et al. (1983) in investigating several sub-sector of large-scale manufacturing firms in Pakistan. It also examined simultaneous equation models in Pakistan economy from time spaning of 1960-1979. The findings of the study exhibited that the positive relationship between the constant returns to scale and capital asset with large-scale manufacturing sector growth. Wizarat (2002) investigated the effect of overall factor of production in large-scale manufacturing and growth. The study covered the time period from 1951-91. The findings revealed an increase in total factor production has negative impact on growth. According to the study growth was mainly driven by capital and labor. Afzal (2006) have explained theabsolute issueof large-scale manufacturing industries is production in over period of 1975 -2001. The study have applied the three different approach. The first is based on the classical model and done the comparison for the four models which were established also. At second various simultaneous equations have been used to measure the contribution of factors which can affect the level of output(large-scale) of manufacturing firms. In the very third step, ARDL approach is applied to forecast the level of productivity for the various firms. Findings of the study indicate the idea that level of productivity has been affected by factors like capital, GNP per capita and labor, etc. Furthermore, many models have been utilised to estimate the level of Pakistan's large-scale manufacturing sector with some macroeconomic policies that may help in enhancing the productivity of Pakistan's major manufacturing units.

Mahmood et al. (2007) analyzed the large-scale business firms in Pakistan by employing the stochastic manufacture and frontier function technique. The research has covered the ime span from 1995 to 1996 and 2000 to 2001 for the 5-digit. The study exhibited that there is some improvement in the form of technical efficiency for the large-scale manufacturing units with a very little magnitude of power. However, the outcomes were in a mixed trend for the major

industrial manufacturing groups who have gained in terms of technical efficiency. Morever, results of the study also affirmed that there is a raise organizational productivity score over the selected time and firms in pre-reform score and post-reform. Abdul and Barnabas (2012) investigated the influence of invetestments (foreign and domestic) on industrial performance. The results of the study revealed that the causality correlation occurs amongst domestic investment and manufacturing FDI and output of manufacturing industry performance.

Afza and Nazir (2009) exploredthe capital (investment)organization proficiencyand output growth of cement industryfor large-scale manufacturing sector. The study has taken time period from 1988-2008. Applyingperformance index and over-all efficiency index which isproposedin Bhattacharya (1997). The outcomes of study demonstrated that the large-scale manufacturing sector of cement industry has accomplish admirable.Nzdikumana and Verick (2008)have examined the key determinant of investment by using the aggregate industry level data for the 27-subsector of manufacturing from spanning of 1970-2001. As per the findings of the study, the Government had potential power means at its disposal to stimulate the level of private investment specifically the level of domestic demand with the expansion of public investment which can gain and produce private investment as well. In addition, domestic demand has stimulated the level of public investment as well. the findings in this have also indicated the fact that to minimize the exchange rate instability to the promotion of investment is very much necessary.

Ahmed et al. (2012) scrutinized the impact of domestic private investment on economic growth by using VAR approach. The findings showed a private investment has a positive impact on the growth factor . However, the coefficient of inflation has reported positive linkson growth.In his study of Aurangzeb and Haq (2012) evaluatedthe influence of domestic investment to the growth

of Pakistan has been examined. The data used in the study is from 1981 to 2010 with multiple regression analysis techniques which considers GDP as major outcome factor, while public investment, private investment and FDI are considered as major explanatory variables of the study. based on the findings, it is found that all the explanatory factor of the study has statistically positiveassociations with growth. The findings of granger causality explain the bi-directional association of GDP with the FDI and public investment, while the unidirectional association of GDP is found with the private investment.

Karim and Yin (2015) explored the effect of investment (private) on manufacturing output and employment. The study have covered a time span of 1980-2010. The findings affirmed that the coefficients of private investment have significant impact on output growth of manufacturingsector and employment. Atlam et al. (2017) investigated the effect of national private investment on manufacturing sector growth in Egypt. The study has covered the annully data from the time span 1990-2015. Appling the Johansen co-integration test to examine the existence of long-run relationship between the national private investment and the manufactured product The outcomes of the study revealed negative effect of private investment on manufacturing sector in long run.Ali., Li., and Kamran (2015) examined the effect of private investment on growth in large-scale manufacturing sector of Pakistan. The study are taken the time span 1981-2010. Employing Ordinary Least Square technique, the outcomes of the study confirmed that the coefficient of manufacturing private investment have a significant associations with growth into large-scale manufacturing sector of Pakistan.

Din, Ghani, and Mahmood, (2007) analyzed the efficiency of Pakistan large -scale manufacturing firms. Applying the stochastic production frontier method, the finding of the study exhibited that various advancement in efficiencyof manufacturing sector (large scale), though the magnitude of improvement remains small. In disaggregate framework, the outcomes of the study confirmed that the majority of industrial manufacturing groups have obtained technical efficiency, some manufacturing firms have reveal declining in their efficacyabsorptions.

Mensi et al., (2017)studied private domestic investment and manufacturing sector growth output. Using the ordinary least square regression approach,the findings confirmedthat a significant association with manufacturing sector growth and domestic private investment and of Pakistan. In addition, all the selected variables have a true sign which was expected while hypothesizing the association between the variable of the study. To create a sufficient level of domestic demand it is also suggested that Government must increase the purchasing power of the consumer in the country, export expansion and with the substitution of imported goods as well. But the key problem is the implementation because all these factors are directly or indirectly associated with the economic growth. So, Government must consider these factors in a significant way and should work for the growth of the domestic economy with the asset redistribution as well.

Data and Methodology

Econometric Model

The present study has selected to examine the impact of private domestic investment in large-scale manufacturing and value-added of large-scale manufacturing growth in Pakistan, the study follows the primary theme of the models developed by Danmola*et al*. (2017), Rahman et al. (2019), Idoko, & Taiga (2018), and Djulius*et al*. (2019); model.

The econometric form of the model is as follows:

$$\Delta lnVAL_t = \alpha_0 + \sum_{i=1}^{Z} \beta_1 \Delta lnVAL_{i-1} + \sum_{i=0}^{Z} \beta_2 \Delta lnDPI_{t-i} + + \sum_{i=0}^{Z} \beta_3 \Delta lnEXP_{t-i} +$$

$$\sum_{i=0}^{Z} \beta_4 \Delta lnSM_{t-i} + \sum_{i=0}^{Z} \beta_5 \Delta EMP_{t-i} + \sum_{i=0}^{Z} \beta_6 \Delta INF_{t-i} + \pi_1 lnDPI_{t-1} + + \pi_2 lnEXP_{t-1} +$$

$$\pi_3 lnSM_{t-1} + \pi_4 lnEMP_{t-1} + \pi_5 lnINF_{t-1} + \varepsilon_t \alpha \qquad (1)$$

Where dependent variable, VAL is value-added, large-scale manufacturing sector growth which is measured by real GDP output growth rate in large-scale manufacturing sector. DPI is domestic private investment in large scale manufacturing are measured by Gross Fixed Capital Formation (GFCF) is a proxy for domestic private investment in manufacturing (Constant 2010 US$),EMP is manufacturing employed labor force, EXP is Exports of goods and services (Constant US$), INF is macroeconomic uncertainty measure (inflation, GDP deflator (annual %)),SM is the size of market and εt is error term assumed to be independent and identically distributed (iid). The annual data is used for the period of 1973-2020. The data for advancing rate are taken from State Bank of Pakistan and Economics Survey of Pakistan(various issues).

Results and Discussions

Gujarati, 2004 have been used that the descriptive statisticsand dataset basic features aredealingsthe central tendency of aarbitrary variableslike median, mode and mean. The crucialfeature of the descriptive statistics of data remains to existingmeasurable descriptions which remain predictable designed for entirely the variables encompassed in flexible method like Table 1.

Table 1: Descriptive Statistic

	VAL	DPI	EXP	SM	EMP	INF
Mean	11.588	10.316	22.707	9.908	12.809	44.797
Median	12.025	10.781	22.924	8.640	13.217	28.667
Maximum	14.100	12.846	24.147	25.433	15.767	143.220
Minimum	8.900	6.546	20.567	0.401	8.270	3.185
Std. Dev.	0.774	2.061	1.050	5.853	1.687	43.599
Skewness	-0.388	-0.416	-0.392	1.156	-0.855	1.123
Kurtosis	3.464	1.830	2.052	3.854	3.015	2.954

The average adjusted ratio of value-added, large-scale manufacturing is 11.588 percent for period of analysis with standard deviation 0.774, while average for domestic private investment in large-scale manufacturing is 10.316 million US\$ with 2.061 standard deviation. Exports manufacturing has a mean of 22.707 million US\$ with 1.050 variations. On the other hand size of market, employment and inflation are 9.908, 12.809 and 44.797 respectively on the average while standard deviation are 5.853, 1.687 and 43.599 respectively. The averageworth for Kurtosis of normality is 3 althoughrate of Kurtosis of value-added, large- scale manufacturing (VAL), employment in manufacturing (EMP) and market size of market (SM)havemore than 3 thusleptokurtic distribution is occurred. Although the coefficient of domestic private investment in large-scale manufacturing sector (DPI), export manufacturing (EXP), inflation (INF) area smaller amount of 3 thatindicate Platykurtic distribution.

Table 2: Correlation matrix

Variables	VAL	DPI	EXP	SM	EMP	INF
VAL	1.000					
DPI	0.089	1.000				
EXP	0.073	0.586	1.000			
SM	0.146	-0.165	-0.173	1.000		
EMP	-0.210	0.099	0.126	-0.132	1.000	
INF	-0.165	0.5134	0.543	-0.163	0.340	1.000

Outcomes of correlation matrix in Table 2, reveal the correlation between regressand variable value-added, large-scale manufacturing and independent variables (domestic investment in large-scale manufacturing, exports, manufacturing employment, size of market and inflation rate) demonstrated towards be identical beneficial in pre-estimation investigation specifically regarding possible associations recommended by theories.The large-scale manufacturing industries measures have positive relation among exports,size of market and private domestic investment,.Besides, an rise in output growth into large-scale manufacturing have also negative influence of manufacturing employment and inflation. These results show that domestic private investment is strongly correlated with employment in manufacturing and inflation but weakly correlated with size of market and employment. Exports manufacturing is strongly correlated with inflation but weakly correlated with employment and size of market.

Units Root Tests (ADF Test and PP Test)

To evadeambiguousfindings, theystartanalysisthrough time series properties that the studyare assigning to examinebut the variable quantity are nonstationery or stationary. The methodexpendedpresentlyfollows Augmented Dickey-Fuller (ADF) and Phillips Perron (PP). The Table 3 indicates that predicted variableof large-scale manufacturing output(VAL)and explanatory variables of domestic private investment in large-scale manufacturing,manufacturing export, size of market, employment in manufacturing sector and inflation rate.

Table 3: Augmented Dickey-Fuller Test ADF and Phillips Perron PP for unit root

Variables	ADF level	ADF first diff	PP level	PP first diff	Results
VAL	-3.891*	-6.289	-3.551*	-8.219	1(0)
DPI	-1.953	-6.831*	-1.814	-10.030*	1(1)
EXP	-1.910	-5.781*	-2.084	-5.814*	1(1)
SM	-4.837*	-7.798	-4.964*	-11.553	1(0)
EMP	-2.653	-12.720*	-4.491	-12.753*	1(1)
INF	-0.605	-4.764*	-0.463	-4.793*	1(1)

Note: * denotes rejection of Null hypothesis at 5 % significance.

From the results of above Table 1.3, the Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) test results indicate that some variables like value-added large-scale manufacturing (VAL) and size of market (SM) are stationary in level while othervariables are stationary in first difference. Then, ADF and PP tests outcomes, we select to apply the autoregressive distributed lag (ARDL)bound tests to cointegration approach to conduct the shortterm and long-termestimation. The autoregressive distributed lag teachnique is appropriatewhile mixture of orders of integration exists, that is, levelI(0) or first difference I(1). The situationarises that amongst the variables confirmed, not any is cohesive of order twoI(2), which canrefute theexhaustionof ARDL method. Consequently, study is free for the misleading result.

Bound Test for Co-integration

The study use Bounds test to check that thecointegration exist among the variables or not, from results,showthe F-statistic value is larger than crtical value of I_1 Bound with 10 %hencethe studyinvestigate that co-integration exists between the predicted variable and explanatoryvariables. The resultreveals that F-statisticvalueis 6.952 in excess of upper bound critical value with 5% significance.

Table 4: Bound Test Results

			Critical Value Bounds		
Test Statistic	Value	k	Significance	I_0Bound	I_1Bound
F-Statistic	6.952	5	10%	2.26	3.35
			5%	2.62	3.79
			2.50%	2.96	4.18
			1%	3.41	4.68

Source: Author's Estimation

In bound test cointegration findings, they come proceeding to coordinate the long-runrelationships between dependent variable and explanatory variables of this model.

Long Run ARDL Estimations Results

Table 5 reveal that co-integrationoccursamongstoutput growth of large-scale manufacturing and independent variables (manufacturing private domestic investment, and manufacturer exports) have positive relations on large-scale manufacturing (VAL) growth of Pakistan with level of significance 1 and 5 percent respectively. However, the coefficients of market size and inflation rate have negative links with the output growth into large-scale manufacturing in Pakistan. While the employment in manufacturing has insignificant and positive coefficient associations with large-scale manufacturing growth. The outcomes of the study affirms that a one percent increase in domestic private investment in causes value added large-scale manufacturing growth to increase by 0.580 units. The outcomes of the study are aligning with previous studies (Chandran & Krishnan 2009; Hamid & Pichler, 2009; Ullah, Shan & Khan, 2014; Rahman, Bakar, & Idrees, 2019) and contradictory findings in previous literature (Atlam, et al., 2017 and Mahmood & Siddiqui, 2000).

This finding contributed some support for more permissive policies toward domestic private investment on output growth into large-scale manufacturing..Furthmore, foreign direct

investmenthascapable to increase domestic private investment as a close assiciation between the investments (Rahman, Bakar, & Idrees. 2019; Ilyas et al., 2010; Wang, 2010; Morrissey &Udomkerdmongkol, 2012).

The coefficients of exports have significant and positive influencing on growth in large-scale manufacturing industries. The results of study reveals that a one percent increase in exports leads to 0.740 units in value added large-scale manufacturing growth. Moreover, these findings attained for the effect of manufacturing exports and large-scale manufacturing growth are in line with previous studies (Sultana, 2016; Lin & Chaung, 2007; Chaudhry et al., 2016; Rahman & Bakar, 2018; Sohail et al., 2014). However, one percent rise in employment results in increase 0.152 percent hasinsignificant realtionswith the (value -added) growth for large-scale manufacturing. Furthermore, the findings of the study confirms that the manufacturing employment has insignificant relation with value added in large-scale manufacturing which are aligning with previous studies (Khan, 1994; Mahmood & Siddiqui, 2000; Mahmood et al., 2007). The employment (labor) indicates a significant negative effect on value added large-scale manufacturing sector. The possible reason of negative impact of employment (labor) on large scale manufacturing sector is that these manufacturing industries are capital-intensive and required heavy investments and capital while producing lesser jobs (World Trade Organization, 2019).

Table 5.: ARDL Estimation Long Run Dynamics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DPI	0.580	0.223	2.592	0.014***
EXP	0.740	0.2381	3.105	0.003**
SM	-0.174	0.060	-2.902	0.006*
EMP	0.152	0.128	1.180	0.246
INF	-0.067	0.019	-3.460	0.001**

Note: ***, **, and *,shows 1, 5 and10percent level of significance, respectively.The following notation applies: VAL, value added, large-scale of manufacturing sector; DPI, domestic private investment; SM, market size; EMP, employed labor force; EXP: exports of goods and services, & INF, inflation.

Two coefficients (size of market and inflation) have negative and significant impact on the value -added large-scale manufacturing sector. The variable size of marketsignifiesthat a one percent rise in market size leads to value-added large-scale manufacturing (VAL) to changes by -0.174 units. Additionally, the results foundthat the influence of size of market andvalue added growth rate large-scale manufacturing are aligning with the past studies (Batten &Vinhvo, 2009; Imtiaz & Bashir, 2017). The coefficient value of inflation has negative and significant influencing value added, large-scale manufacturing sector. The results of the study affirmsan one unitpoint expand in inflation grow about -0.067 unitsin large-scale manufacturing output growth. These findings are aligning with previous studies of Ndikumana, (2008), Rahman & Bakar (2019), Chaudhry, Ayyoub, & Imran, (2013) and Mwakanemela, (2014). Inflation is an important element to be closely monitored by the government, however, the production would not be upraised in immediately and simultaneously impact the large-scale manufacturing sector growth. It is contemplated that inflation has negative effect on growth of manufacturing.

Estimation of Short Run Dynamics

The results of Table 6 are exhibited for short term relationships. The sign of Error Correction term is negatively significant. Furthermore, the bound test to cointegration results, shows that value added, large-scale manufacturing has long run associationsamong thecontrolled variables (DPI, EXP, EMP, INF, SM). The findings reveal that positive and significant effect of manufacturing domestic private investment (DPI) and value added, large-scale manufacturing growth of Pakistan.

The findings confirmed that one percent rise in manufacturing domestic investment builds to rise 0.305 unitsis positive and significant impact on the value added, large-scale manufacturing growth (VAL) at 5 percent level of significance. Whilein the short run, exports (EXP) has positively significant in disturbing the output growth of large-scale manufacturing. This exemplifies that a one percent rise in exports makes the value added, large-scale manufacturing to increase by 0.910 units have positive and significant associations in VAL, Size of market (SM) is positively influencethe value added, large-scale manufacturing growth (VAL). Theoutcomes confirm that, one percent raise in market size(SM) expand to (0.037) significant positive rise in VAL. However,in short run, one percent increase ininflationleadsto0.081 units increaseinVAL.

Table 6 ARDL Estimation Results of Short Run Relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DPI)	0.305	0.108	2.808	0.008*
D(EXP)	0.910	0.237	3.833	0.000***
D(MS)	0.037	0.014	2.620	0.013***
D(MS(-1))	-0.050	0.015	-3.192	0.003***
D(EMP)	0.010	0.059	0.171	0.864
D(INF)	0.081	0.024	3.375	0.001**
D(INF)	-0.052	0.026	-1.951	0.059*
ECT	-0.525	0.124	-4.213	0.002***

Note: ***, **, and *,shows 1, 5 and10percent level of significance, respectively

Source: Author's Estimation

The study also found that employment (EMP) has positive insignificant influence on value added, large-scale manufacturing growth. It shows that an increase in employment grow to 0.010 units have a positive and insignificant increasein value added, large-scale manufacturing (VAL). Theadjustmentmechanisminin value added, large-scale manufacturing (VALend up being delayed with 52% speed of change inside the current time frame. It implies hence that, 52 of imbalance in paradigm will be adjusted inside a time of one year. It is accordingly affirmed that the Error correction term or modification system is extremely delayed in VAL

Determining the direction of causality domestic private investment on large-scale manufacturing

Thissectionexplorestheexistingrelationshipbetweencausality domestic private investmentand value-added,large-scale manufacturing in Pakistan.

The Granger Causality Test

To analyzing, the Granger causality test whether one-time series examination is helpful in determining another or not. A time series X is supposed to be Granger-cause Y on the off chance that it tends to be noticed that lagged X values give measurably huge data about future values of Y. Following table outcomes show the Granger Causality test. Inverse direction of causation is likewise a significant issue in in regression testing. The consequences of Granger Causality have been accounted for in below Table.7. The outcomes revealed the presence of bidirectional causality between *DPI* and *VAL, EXP* and *VAL, INF* and *VAL* with a very strong statistical significance in this Model. In addition, findings implies that causality between MS and VAL, EMP and VAL is unidirectional that runs from VAL to MS and EMP to VAL.

Table 7: Resultsof Grangercausalityforthe Large-Scale Manufacturing Model

| Null Hypothesis:	F-Statistic	Prob.	Decision
DPI does not Granger Cause VAL	2.627	0.074*	bidirectional
VAL does not Granger Cause DPI	3.664	0.058**	
EXP does not Granger Cause VAL	2.890	0.054**	bidirectional
VAL does not Granger Cause EXP	1.991	0.042**	
MS does not Granger Cause VAL	2.914	0.678	unidirectional
VAL does not Granger Cause MS	6.446	0.003**	
EMP does not Granger Cause VAL	2.440	0.047**	unidirectional
VAL does not Granger Cause EMP	1.604	0.551	
INF does not Granger Cause VAL	3.517	0.029**	bidirectional
VAL does not Granger Cause INF	2.358	0.013***	

Source: Author's Estimation

Diagnostic tests

The investigation directs approximately diagnostic tests in the direction of paradigm is fit and consistency. Table 8 demonstrates that this allows every one of the diagnostic criteria escorted. For instance, a magnitudes of heteroscedasticity and autocorrelation tribulations have not critical with the 5percent. It implies issues of heteroscedasticity and Breusch-Godfrey Serial Correlation could not occur. Nowaccretion, the consequences of of Ramsey RESET stability tests remainnonsubstantialwith the 5% level, indicatingthat the models are stable and fitted.

Table 8: Diagnostic Tests Results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.590	Prob. F	0.181
R-squared	7.326	Prob. Chi-Square	0.257
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.205	Prob. F	0.325
R-squared	12.857	Prob. Chi-Square	0.307

Ramsey RESET Test: Omitted Variable (Square of fitted value)

	Value	Probability
t-statistic	1.971	0.157
F-statistic	3.887	0.015

We additional conduct CUSUM of squares and CUSUM to analysis for the dependability of models. A Figure 2 plot CUSUM and CUSUM of squares in Pakistan individually. The Figures 3 show that the models are steady since CUSUM and CUSUM of squares lines don't go past the 5% critical lines for the examination..
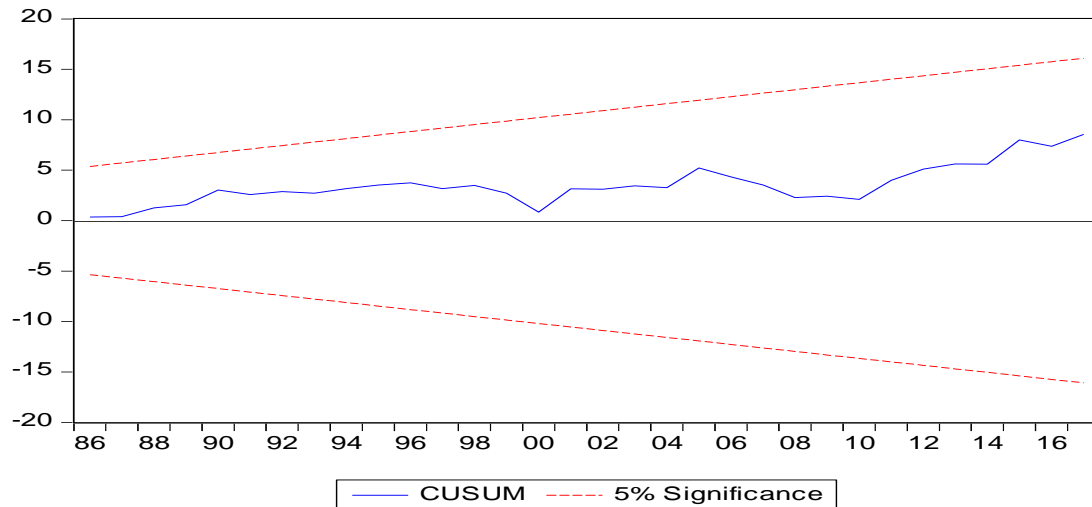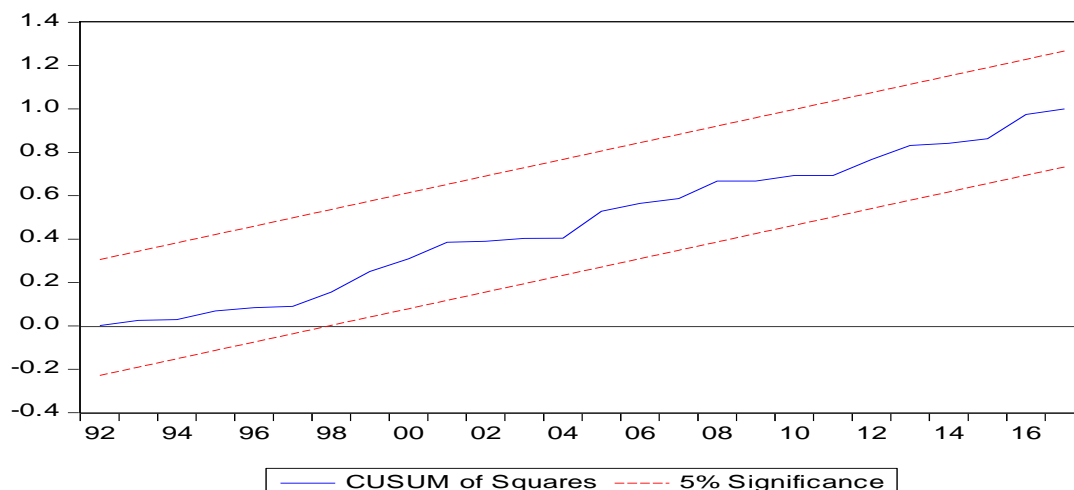

Figure 2; plot CUSUM

Figure 3; Plot in CUSUM of squares

Conclusion and Policy Implications

The aim of study to scrutinize the impact of domestic private investment in large-scale manufacturing on growth output, in large-scale manufacturing in Pakistan and also test the causal relationships between the variables. The large-scale manufacturing sector has faced several serious issues including inadequate foreign and domestic private investment, energy shortage, high inflation and averyslowgrowthrateduetotheretardedspeedofthe growing manufacturing sectorprocess. Utmost of previous studies concentrating on the national private investment and gross domestic product has examined their association by ignoring the sectoral growth such as manufacturing sector. This study fills this gap by incorporating the role of domestic private investment in large-scale manufacturing on growth output in large-scale manufacturing sector of Pakistan.

An ARDL approach are used for empirical analysis from the period 1973 to 2020 of Pakistan. Our result shows that domestic private investment, size of market, export, and inflation significantly affect the value-added, large scale manufacturing of Pakistan. Furthermore, long-run and short-run findings indicate that exports and domestic investment have positively and significantly impact of the value-added, large-scale manufacturing sector, while market of size

and inflation are reporting negative effect on large-scale manufacturing sector value-added; Morever, the employment has positive influence of value-added, large scale manufacturing (VAL). In the short-run, the Error Correction term performed by the suitable sign and statistically significant while variables relations were confirmed in the short run for the long-runanalysis. Finally, the second objective of our study is that the causal association between domestic private investmentand large-scale manufacturing in Pakistan findings of the study established that DPI, EXP, and INF have a bidirectional causal relationwith VAL and statisticall ysignificant at 5%.However, EMP and MS reported unidirectional causal association with value-added, large manufacturing (VAL) of Pakistan.

The findings of this study do have some significant ramifications for policymakers in Pakistan. Since domestic investment, developing countries should boost foreign investment, for which proper domestic private investment approaches and guidelines are required. Thus, for Pakistan solid approach ought to be taken on about investmentwhich not only attract foreign investors but also influence them to play their role in promoting domestic investment in Pakistan. For instance, Pakistan's governments should execute guidelines on MNEs to urge them to start export compulsions or motivate direct foreign shareholders to participate in risky zones or in resource industries where domestic investment is restricted

In specific, Pakistan can develop large-scale manufacturing sector growth through implementation further investments, exports, and size of market in direction to participate in international market. According to the Pakistan Bureau of Statistics (2018), the domestic private investment and exports are declining in recent years. Hence, the Pakistan should promote and encourage the domestic private investment and multinational export activities by improving

security conditions, good infrastructure, political stability, control of corruption and energy sector in the country.

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