Globalization, Oil Price and Manufacturing Output in Pakistan: A Fresh Insight Through ARDL Approach

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ARTICLE DETAILS

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<tr>
<th>History</th>
<th>ABSTRACT</th>
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<td>Accepted 18 November 2023</td>
<td>The objectives of this study are to explore the fluctuation of oil prices impact on manufacturing sector of Pakistan. To check the asymmetric effects of real effective exchange rate on manufacturing sector of Pakistan. We Examined the role of gross capital formation as well as labor force in manufacturing sector of Pakistan and also discussed the globalization relationship with manufacturing sector of Pakistan. This enabled us to recommend the helpful policy to enhance capacity of manufacturing sector of Pakistan. Data is taken from World Development Indicator (WDI) time gap takes from 1995 to 2017 and analyzed through ARDL approach. The results indicated that Impact of manufacturing is negative effect on gross capital formation and positive impact with other variables.</td>
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<table>
<thead>
<tr>
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1. Introduction

The manufacturing industry plays a key important role in a modern economy. In a developed country manufacturing is the most important sector in many ways. It's a way of growing productivity and efficiency in relation to export substitution and import expansion, generating export-oriented capacity for foreign exchange and boosting employment, as well as encouraging investment growth more quickly than any other part that is part of a country's economy and also providing an increased and efficient linkage between different industries (Fakiyesi 2005). Exports of manufactured goods have been a key driver to boost economic growth in emerging countries. The policy of exchange rates is a key factor in generating incentives to export. Countries that have succeeded in promoting manufacturing exports have had real exchange rate. Despite its enormous boost, however, the continuing contraction in the manufacturing sector that is labor-intensive is a key element in many countries’ economic growth as well as job creation. Generally speaking, labor-intensive manufacturing is distinguished by a tiny quantity of capital for each unit of work and a high demand for labor.
Globalization is a multifaceted phenomenon that is increasingly responsible for the thriving economies all over the world. Globalization has led to a new millennium of communication in all spheres, be they social, political, or economic, since the beginning of the twenty-first century. The phrase "the world is getting smaller" now refers to cross-border and international trade in goods and services as well as easier access to transportation and communication (Guo 2018). In addition globalization promotes economies of scale and trade liberalization that support globally integrated resource sectors (Latif et al. 2018) and increase efficiency in businesses, where the globalization process has been fully adopted (Luo and Bu 2016). The majority of nations observe positive effects of globalization, including improvements in technology and increasing trade. Natural resources can boost economic development and globalization, depending on a state's economic integration, political ties, communication infrastructure, and cultural interchange (Rahman and Miah 2017; Shahbaz et al. 2018).

Globalization is the increase in interaction of resources and goods across borders through trade, immigration, as well as foreign investment via international flow of services and goods including people, investments, stocks and factories. Apart from the economic components, globalization also encompasses non-economic components like the environment and social, technological and cultural as well. Globalization is the term used to describe an increase in amount of interdependence between nations in a variety of methods, such as free flow of goods and service as well as the free movement of workers as well as different levels of political and sectoral opening, and military alliances and more. (Fazlul, Mohammad and Faud, 2010). Globalization, which is now taking place within the last decade brings unique challenges to HRM for firms, which global or multinational.

Dufey as well as Srinivasulu (1983) provides the different types of exchange rate risk for companies that are involved within international trade. They include transactional exposure, transformational exposure, and an economic exposure. The risk of economics that has changed due to changes in the exchange rate of foreign currency that has an impact on the value of a business (Prakash and Gopal, 2019).

The rationalization of environmental regulations causes companies to alter their methods of production and alter the structure of their inputs production processes (Porter and Linde 1995). As a major industry in the economy of the nation manufacturing faces problems like increased consumption of resources, severe environmental pollution, increasing comprehensive costs for capital, labor and other production elements and also poor production efficiency and high quality. The most pressing issue that the government must tackle is how to establish an efficient, green low-carbon, recycling, and green manufacturing system that optimizes the distribution of production elements.

The world has witnessed dramatic increase in the oil price which have largely affected the economic growth of many emerging economies over the past few years. There is evidence that suggests that since the early 1980s, oil prices have risen in real terms and negatively affected GDP, specifically the economies that import oil. Elder as well as Serletis (2010) provide theories of how oil price fluctuations affect economic activity.

The growth of the manufacturing sector is anticipated to be at the middle of this process of diversification. In addition, the proportion of the manufacturing industry in the GDP of a country is among the key indicators or measures of economic growth. Moreover, as of today, global warming is a serious event, not a prediction. It is widely believed that various GHGs, particularly CO2 emissions, are produced by economic activity (Danish et al. 2019).
Working on oil price volatility, Latife Ghalayini (2011) noted that macroeconomic performance would typically be impacted by oil price shocks through a variety of ways. Through commerce, oil prices move financial resources from oil-importing nations to those that export oil. Oil price increases reduce industry productivity by driving up manufacturing costs and inflation. The limited amount of reserves in industrialized economies and the unpredictability of their supply during reconstruction are another factor raising the demand for oil.

Oil is regarded as the most significant source of energy in the entire world and is becoming increasingly significant as a tool for the security and survival of developed nations. Countries that import oil will experience slower growth, as well as lower demand for imports which in turn reduces the oil producer’s exports. In the case of oil importers, they suffer directly from positive oil price changes, but could benefit indirectly through an increase in demand from the oil exporters. The oil price fluctuations impact the country’s manufacturing sectors, especially in countries that export oil. The fluctuations in the surge of price can have a rapid impact on the production of developing oil industries and is slower than other sectors such as manufacturing, agriculture and (Dutch disease). The various explanations for this impact on the manufacturing sector such as the classic supply-side shock demand shock, as well as the financial sector (Sachs and Warner, 2001; Brown et al. 2003). But research on the impact that price of oil price over other parameters is widely discussed to illustrate the relationship, but there’s some gaps in understanding the intricate relationship between oil and the output of manufacturing in oil-rich nations to test the theoretical basis. There are a myriad of studies which examine the impact of fluctuation in oil prices on the development of economic activity. The study examines the effects of the oil price and the effective real exchange rate, globalization gross capital formation and the labor force on the manufacturing sectors in Pakistan.

2. Literature Review

Odebode and Aras (2019) examined the impact of globalization on manufacturing output in Nigeria and structural vector autoregressive (SVAR) technique were used to check the relationship among variables. The findings showed that the manufacturing output as well as transportation was significantly affected by the globalization-related shocks to the world economy. David et al. (2010) examined the effect of fluctuations in exchange rates in research into the impact of exchange rate fluctuations on Nigerian manufacturing sector over a period of twenty-two years between 1986 and the year 2005. The conclusion was that changes in exchange rates adversely impact production of the manufacturing sector. due to manufacturing being heavily dependent on imports of capital goods and inputs.

Sekkat and Varoudakis (2000) demonstrated the effect of the exchange rate policy on manufacturing export performance in a group of important Sub-Saharan African _SSA. Countries over the period between 1970 and the year 1992. The results suggested that management of exchange rates are important for the export performance. Ayobami and Adeniran (2013) examined the impact of globalization on the practice of human resource management and practices in Nigerian manufacturing companies. The results of the study indicated a substantial connection between the global marketplace and human resource practices. The study revealed the global opportunities in market, market uncertainty globally and the threat of global competition were determinants of human resource practices. Yau et al. (2023) examined the effects of environmental regulations on the capital-labor ratio of manufacturing firms in China. This study examined the effects of capital deepening on the efficiency of production and operational effectiveness of heavy manufacturing companies. Mehboob and Ahmed (2017) revealed the impact of oil price changes on the manufacturing sector of Saudi Arabia and
quarterly data for the period 2002 to the year 2014. The study has concluded that it was not possible to determine the long-term impact of oil price fluctuations on the manufacturing industry.

Villanthenkodath and Mohammed (2022) studied that how Japan’s economic development and environmental quality was affected by the production of electricity. Study used the data of years from 1966 to 2014 to assess the effects of electricity production from diverse sources on Japan’s economic development. The results of the ARDL showed that electricity generation from coal has not been viable for economic growth. Murshed et al. (2022) examined the effects of economic globalisation, financial growth, and urbanization on CO2 produced during the generation of electricity and heat.

Alvarado et al. (2022) investigated that how the informal sector, urbanization and globalisation have affected the ecological footprint achieving environmental sustainability is difficult since the informal economy accounts for around one-third of global output. The ecological footprint is the most comprehensive proxy for capturing the level of environmental degradation, despite the fact that there are numerous measures of environmental sustainability. In this study data was used from year 1990 to 2018. It has discovered that the ecological footprint’s long-term elasticity to an increase in the size of the informal sector is higher than the corresponding short-term elasticity. The findings showed the unfavorable effects of the informal economy on the ecological footprint. Sharif et al. (2022) examined that to build an environment that is more sustainable, this study examines the importance of green technological innovation as well as green financing. This study explores the ways in which green finance and technological innovations could help G7 countries reduce the CO2 emission of their countries. The study was based on to analyze empirical data taken from the G7 nations between 1995 and 2019. The study’s findings prove that green finance as well as green technology innovation (GINV along with GFIN) have an impact, although not as significant, upon CO2 emissions.

Chien et al. (2021) investigated that how technical advancement, globalization, and renewable energy might lessen environmental deterioration in Pakistan. For empirical estimate, the study used the quantile autoregressive distributed lag model (ARDL). This study’s findings indicated a considerable and unfavorable relationship between economic globalisation and growth. On the other hand, political globalisation and growth have a positive and important relationship. However, there was a strong and positive correlation between social globalisation and economic growth.

Acheampong et al. (2021) investigated the effects of social, economic and political globalizations on energy consumption-economic growth nexus in a study of 23 emerging economies data over the period of 1970 until 2015. Internationalization and Emerging economies, energy consumption, and Economic growth were utilized as variables. This study examines the hypothesis of economic growth and energy consumption. Globalization can have an adverse effect on economic growth but has an impact which is positive on the social impact of globalization and energy use interacts with social, economic and political globalisation, which slows growth in the economy. Chien et al. (2021) examined that how technical advancement, globalization, and renewable energy might lessen environmental deterioration in Pakistan. For empirical estimate, the study used the quantile autoregressive distributed lag model (ARDL). This study's findings indicated a considerable and unfavorable relationship between economic globalisation and growth. On the other hand, political globalisation and growth have a positive and important relationship. However, there was a strong and positive correlation between social globalisation and economic growth.
lag (QARDL) model and used time series data from 1980 to 2018. In the instance of Pakistan the study also supports the EKC theory. In addition, study discovered that environmental degradation is negatively correlated with technical advancement and renewable energy. Granger causality's findings also showed a two-way relationship between carbon dioxide emissions and GDP, innovation and renewable energy but for Pakistan, there only a one-way relationship between GDP and globalization. The study offers Pakistan's authorities helpful policy recommendations.

Sana et al. (2021) revealed that effect of globalisation on changes in employment in Pakistan's labour market. In this study the data year was used from 1991 to 2017. In this study empirically examined the effects of globalisation on shifts in employment in Pakistan depending on sector and gender. The research showed that Pakistan's real per capita GDP, ICT, and exports all contributed to a significantly lower male to female employment ratio. The study's general finding was that Pakistan's trade openness and FDI were started the sectoral shift toward employment in the services sector. ICT has been found to be beneficial in lowering Pakistan's male-to-female employment ratio. Tanveer et al. (2021) investigated that manufacturing sector is essential to the growth of an economy. The results of the (ARDL) demonstrated that while foreign direct investment and globalisation reduce environmental degradation, energy consumption and financial development enhance it; thus supporting Pakistan's pollution halo hypothesis.

Abid and Alotaibi (2022) the goal of this study is to clarify through indigenizing public sector investment, gross savings, and the financial sector, one can understand the type of this relationship. Development, economic expansion and globalisation are three more important factors that affect private decisions. In this study data time period was used from 1980 to 2016 for Saudi Arabia. Oil price, private investment, public investment, globalization and gross domestic product were used as variables and Bayer-hanck cointegration technique used to check the relationship among the variables. The findings demonstrated that public investment has negative consequences other factors help to encourage private investment, domestic private investment. Jawad (2013) study's major goal examined the effect of oil price volatility on Pakistan's economic expansion. The coefficients were estimated used secondary data from 1973 to 2011. Through the ADF test all variables in the oil price, supply, demand, gross domestic product, public and private investment and trade balance are stationary at the first difference. The trade balance, private sector investments, public sector investments and the volatility of oil prices all have a significant effect on gross domestic product.

Wang et al. (2019) utilized the pool mean group estimate method to study the effects of Human Capital Index, globalisation, and financial development on carbon dioxide emissions of a set of OECD nations between 1990 and 2015. The results showed that by using this PMG longer-run estimation panel technique environmental improvements have been triggered by the human development index as well as the growth in financial markets. Anwar (2002) examined that although globalisation is thought to be essential for future economic growth some contend that it also worsens poverty, endangers employment opportunities and lowers the living standards of the poor. Pakistan made an effort like many other developing nations to integrate its economy into the global economy by liberalizing its trade and investment laws under the framework of the IMF and the World Bank. In this study globalization, liberalization, economic growth, trade openness, employment, poverty and structural adjustment were used as variables and data year was used from 1980 to 2000.

3. Data and Methodology

In this chapter we describe the econometrics techniques which were used to check the association between variables.
3.1 Data Sources and Variables Description

The data is taken here to check the impacts of manufacturing on oil price, globalization, labor force, real effective exchange rate and gross capital formation. Data is taken from World Development Indicator (WDI) time gap takes from 1995 to 2017.

Table 1: Data Sources and Variables Description

<table>
<thead>
<tr>
<th>Variables</th>
<th>Descriptions</th>
<th>Relationship signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF</td>
<td>Manufacturing</td>
<td>_</td>
</tr>
<tr>
<td>OIL</td>
<td>Oil Price</td>
<td>_</td>
</tr>
<tr>
<td>GLOB</td>
<td>Globalization</td>
<td>+</td>
</tr>
<tr>
<td>LF</td>
<td>Labor Force</td>
<td>+</td>
</tr>
<tr>
<td>REER</td>
<td>Real effect exchange rate</td>
<td>+</td>
</tr>
<tr>
<td>GCF</td>
<td>Gross capital formation</td>
<td>_</td>
</tr>
</tbody>
</table>

3.2 Model Specification

Variables descriptions are following:

\[ MF = f(\text{OP}, \text{GLOB}, \text{LF}, \text{REER}, \text{GCF}) \]

In the following

MF=Manufacturing.
OP= Oil price.
GLOB= Globalization
LF= Labor force
REER= Real effective exchange rate.
GCF= Gross capital formation.

\[ MF_t = \beta_1 + \beta_2 \Delta OP_t + \beta_3 \Delta GLOB_t + \beta_4 \Delta LF_t + \beta_5 \Delta REER_t + \beta_6 \Delta GCF_t + \beta_7 x_i + \mu_t \]

Where,
MF = Manufacturing
\( x_i \) = Control variables like oil price, globalization, labor force, real effective exchange rate and gross capital formation.
\( \mu_t \) = Error Term

The above model, \( \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 > 0 \) and \( \beta_6 > 0 \) are following standard error. The coefficients \( \beta_2, \beta_3, \beta_4, \beta_5 \) and \( \beta_6 \) are the elasticity's of manufacturing with respect to the oil price (OP), globalization (GLOB), labor force (LF), real effective exchange rate (REER) and gross capital formation. Model specification of ARDL given below.

\[ \Delta MF_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{i1} \Delta OP_{t-i} + \sum_{j=1}^{q} \alpha_{j2} \Delta GLOB_{t-j} + \sum_{j=1}^{q} \alpha_{j3} \Delta LF_{t-j} + \sum_{j=1}^{q} \alpha_{j4} \Delta REER_{t-j} + \sum_{j=1}^{q} \alpha_{j5} \Delta GCF_{t-j} + \mu_t \]

(4)

In the above equation, \( \Delta \) described the first distinction operator of the concerned variable and the deterministic drift parameter is \( \alpha_0 \).
4. Results and Discussions

The following section describes models for the oil, manufacturing price and labor force the real effective exchange rate and the gross capitalization will described and dependable. Utilizing econometric techniques and methods, the results will be explained. To identify the precise connection between variables and their effect in relation to dependent variables an economic analysis is a great way to do so. In this scenario, data consists of notes from Pakistan from between 1995 and 2017. First, a descriptive analysis was done. Then ADRL approach was used. Empirical calculations were done by using Ramsey Test, Bound test, and Beursch Godfrey serial correlation LM test.

4.1 Descriptive Statistics

The result of descriptive statistics in following tables 2 shows the mean value of manufacturing, oil price, real effective exchange rate, globalization, labor force, and gross capital formation are 23.5422, 3.7825, 4.6682, 3.9222, 3.9581 and 24.2241 respectively. The maximum value of manufacturing 24.3692, oil price 4.7181, real effective exchange rate 4.8012, globalization 4.0136, labor force 3.9881, and gross capital formation 24.6144 are respectively. The minimum value of manufacturing, oil price, real effective exchange rate, globalization, labor force, and gross capital formation are 22.8493, 2.5429, 4.5694, 3.7513, 3.9219, and 23.9442 respectively. The standard deviation value of manufacturing 0.57799, oil price 0.68833, real effective exchange rate 0.07799, globalization 0.07799, labor force 0.0163, and gross capital formation 0.20455 are respectively. The correlation matrix shows the association between the variables which are used in the study.

Table 2: Descriptive and Correlation Analysis

<table>
<thead>
<tr>
<th></th>
<th>LMF</th>
<th>LOIL</th>
<th>LREER</th>
<th>LGLOB</th>
<th>LLF</th>
<th>LGCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>23.5422</td>
<td>3.7825</td>
<td>4.6682</td>
<td>3.9222</td>
<td>3.9583</td>
<td>24.2241</td>
</tr>
<tr>
<td>Median</td>
<td>23.6035</td>
<td>3.9583</td>
<td>4.6423</td>
<td>3.9771</td>
<td>3.9574</td>
<td>24.2572</td>
</tr>
<tr>
<td>Minimum</td>
<td>22.8493</td>
<td>2.543</td>
<td>4.5694</td>
<td>3.7513</td>
<td>3.9219</td>
<td>23.9442</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.5779</td>
<td>0.6883</td>
<td>0.0773</td>
<td>0.0899</td>
<td>0.0163</td>
<td>0.2045</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.0441</td>
<td>-0.1662</td>
<td>0.4337</td>
<td>-0.6156</td>
<td>-0.1105</td>
<td>0.1857</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.3497</td>
<td>1.7312</td>
<td>1.6793</td>
<td>1.8313</td>
<td>2.6422</td>
<td>1.7552</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>2.6172</td>
<td>1.6486</td>
<td>2.3972</td>
<td>2.7616</td>
<td>0.1694</td>
<td>1.6172</td>
</tr>
<tr>
<td>Probability</td>
<td>0.2701</td>
<td>0.4385</td>
<td>0.3023</td>
<td>0.2513</td>
<td>0.9187</td>
<td>0.4454</td>
</tr>
<tr>
<td>Sum</td>
<td>541.47</td>
<td>86.99</td>
<td>107.37</td>
<td>90.21</td>
<td>91.03</td>
<td>557.16</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>7.3496</td>
<td>10.43</td>
<td>0.1314</td>
<td>0.1779</td>
<td>0.0058</td>
<td>0.9205</td>
</tr>
<tr>
<td>MF</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OIL</td>
<td>0.8518</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REER</td>
<td>-0.0051</td>
<td>-0.4513</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GLOB</td>
<td>0.8811</td>
<td>0.9342</td>
<td>-0.4223</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LF</td>
<td>0.8794</td>
<td>0.6137</td>
<td>0.1796</td>
<td>0.6998</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>GCF</td>
<td>0.9176</td>
<td>0.7371</td>
<td>0.0348</td>
<td>0.8417</td>
<td>0.8821</td>
<td>1</td>
</tr>
</tbody>
</table>

4.2 Unit Root Test

Unit root test applies to test the data stationarity in this ADF (augmented dickey fuller) and PP (Phillips perron) test apply. In the ADF test MF stationary at level and all other variables stationary at 1st difference. In the PP test all variables are stationary at 1st difference.
Table 3: Unit Root Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF Test</th>
<th>PP Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level</td>
<td>1st Difference</td>
</tr>
<tr>
<td>MF</td>
<td>-3.7961</td>
<td>-0.0072 (0.9493)</td>
</tr>
<tr>
<td>OP</td>
<td>-1.0005</td>
<td>-5.8871 (0.0000)</td>
</tr>
<tr>
<td>REER</td>
<td>-2.5660</td>
<td>-4.7242 (0.0006)</td>
</tr>
<tr>
<td>GLOB</td>
<td>-2.2053</td>
<td>-4.7398 (0.0006)</td>
</tr>
<tr>
<td>LF</td>
<td>-0.2904</td>
<td>-4.8864 (0.0007)</td>
</tr>
<tr>
<td>GCF</td>
<td>-0.3165</td>
<td>-5.8184 (0.0000)</td>
</tr>
</tbody>
</table>

4.3 Bound Test Results

The F-statistic for long-term integration and the estimated value is 4.564 which means that the long-term association between variables as calculated F-values are greater than the upper bound.

Table 4: Bound Test Results

<table>
<thead>
<tr>
<th>Linear ARDL Model</th>
<th>F-Statistic</th>
<th>I(0)</th>
<th>I(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.564</td>
<td>2.26</td>
<td>3.35</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5%</td>
<td>2.62</td>
<td>3.79</td>
</tr>
<tr>
<td></td>
<td>2.5%</td>
<td>2.96</td>
<td>4.18</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>3.41</td>
<td>4.68</td>
</tr>
</tbody>
</table>

I(0) shows Lower bound and I(1) shows Upper bound

4.4 Long and Short Run Results

The long-term results demonstrate how all factors have a significant influence on manufacturing. Particularly, the coefficient of price of oil price is 0.381 that is substantial with a positive sign indicating that a one percent increase in the oil price could result in a decrease of 0.304 per cent in the manufacturing. The coefficient of an effective real exchange rate is significant when it has a positive sign. Globalization’s coefficients are important with positive signs. The labor force is significant with positive sign, and gross capital formation is significant in negative.

Table 5: Long Run Result

<table>
<thead>
<tr>
<th>Vari</th>
<th>Coefficients</th>
<th>Std. Errors</th>
<th>t-Statistics</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OIL</td>
<td>-0.380517</td>
<td>0.061906</td>
<td>6.146707</td>
<td>0.0000</td>
</tr>
<tr>
<td>GLOB</td>
<td>4.429151</td>
<td>0.917799</td>
<td>4.825841</td>
<td>0.0003</td>
</tr>
<tr>
<td>LLF</td>
<td>10.045837</td>
<td>2.407996</td>
<td>4.171866</td>
<td>0.0011</td>
</tr>
<tr>
<td>REER</td>
<td>3.328258</td>
<td>0.452750</td>
<td>7.351204</td>
<td>0.0000</td>
</tr>
<tr>
<td>GCF</td>
<td>-0.754842</td>
<td>0.344075</td>
<td>-2.193829</td>
<td>0.0470</td>
</tr>
<tr>
<td>C</td>
<td>-32.245242</td>
<td>5.921455</td>
<td>-5.445493</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Similar to short-run studies, they indicate the fact that every variable has a significant impact on manufacturing. Particularly, the coefficient of price of oil price is 0.381 which is significant with the -
ive sign indicating that an increase of one percent in the oil price is equivalent to 0.304 percentage in production. The coefficient of the real effective exchange rate is significant with positive sign. The coefficient of globalization is significant with positive sign, labor force is significant with positive sign and gross capital formation are significance with negative sign.

Table 6 Co-integration Form

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>Std.Error</th>
<th>t.statistics</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D(LOIL)</td>
<td>-0.301347</td>
<td>0.056349</td>
<td>5.347871</td>
<td>0.0001</td>
</tr>
<tr>
<td>D(LGLOB)</td>
<td>0.384677</td>
<td>1.229064</td>
<td>0.312984</td>
<td>0.7593</td>
</tr>
<tr>
<td>D(LLF)</td>
<td>7.955711</td>
<td>2.045558</td>
<td>3.889263</td>
<td>0.0019</td>
</tr>
<tr>
<td>D(LREER)</td>
<td>1.048903</td>
<td>0.400293</td>
<td>2.620341</td>
<td>0.0212</td>
</tr>
<tr>
<td>D(LGCF)</td>
<td>0.067313</td>
<td>0.241400</td>
<td>0.278843</td>
<td>0.7848</td>
</tr>
<tr>
<td>CointEq(-1)</td>
<td>-0.791941</td>
<td>0.116896</td>
<td>-6.774733</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Note: All variables taking in log forms.

4.5 Diagnostics Test Result
According to the diagnostic result there is no heteroskedasticity, normality, autocorrelation and model is stable.

Table 7 Diagnostic Test Results

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>0.9952</td>
<td>D.W= 2.4890</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. R</td>
<td>0.9919</td>
<td>F-Value=303.5607</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J.B Test</td>
<td>1.2568</td>
<td>(0.5334)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LM Test</td>
<td>1.2444</td>
<td>(0.2865)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hetero Test</td>
<td>1.6152</td>
<td>(0.2092)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramsey Test</td>
<td>0.0170</td>
<td>(0.8983)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: the numbers in ( ) are showed p-values.

5. Conclusion
The aim of this study is to examine the effects of globalization, oil prices and output on manufacturing in Pakistan. The study uses data from 1995-2017. We apply a linear autoregressive distributive the lag model (ARDL) and discover the heterogeneous performance of response to globalization as well as manufacturing output in Pakistan. The results indicated that, using the ARDL model for manufacturing, the price of oil has a negative impact on manufacturing in Pakistan Other variables of control include the effective exchange rate, globalization and exchange rate impacted positively, while gross capital formation impacted negatively manufacturing.

6. Policy Implication
Based on our research findings, we suggest an appropriate policy for Pakistan as well as other countries with manufacturing. The rise in the price of oil is doesn't favor manufacturing nations, which affects manufacturing. However lower oil prices boost manufacturing and economic growth. The second reason is that exchange rates are not ideal to produce manufacturing. The results show that exchange rates have a negative effect on the manufacturing sector. Policy makers and government officials should regulate the exchange rate in a way that it increases manufacturing output.

The third labor force positively impacted manufacturing output. Policy makers should concentrate on skilled workers that can increase production. The results of this study are valuable to
policy makers as well as officials of the government to develop policy decisions for long-term economic growth and improving globalization and manufacturing. We suggest that efforts be taken for diversification of the economy so that the government’s expenditure is funded by the revenue it generates instead of borrowing money or relying on foreign aids. Additionally, the authorities in charge of monetary policy should be swift in tackling inflation to ensure that the meaningful and tangible effects of spending are felt by the manufacturing industry, which would result in growth for the economy overall.

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