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DO EXPORTS AND MONETARY POLICY AFFECT ECONOMIC GROWTH? AN ANSWER WITH COINTEGRATIONANALYSIS

Syed Akram Ali Shah[1], G. Akbar Tumrani[2], Majid Hussain Phul[3]

Ph.D (Economics), Lecturer in Economics, Government Boys Degree College Pir Jo Goth, Sindh, Pakistan.

Ph.D (Development Studies), Head Master Education and Literacy Department, Sindh, Pakistan.

Ph.D (Economics), Lecturer in Economics, Government Boys Degree College Pir. Jo. Goth, Khairpur, Sindh, Pakistan.

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Abstract:

This research aimed to investigate short and long run effects of export and monetary policy on economic growth by taking the listed manufacturing firms of Pakistan. The manufacturing sector works as an essential contributor in the economy and has immense ability to contribute in the gross domestic product (GDP) and export absorption of country. This research intend to investigate short and long run effects of export and monetary policy on GDP among listed manufacturing firms of Pakistan. The cointegration analysis is used after estimating data stationarity. The time series data (from 1998 to 2020) was collected for exports, exchange rate, interest rate and GDP. The study outcomes reveal that in short-run there is no effect of export, exchange rate, interest rate on GDP of listed manufacturing firms of Pakistan. However, interest rate, exports and exchange rate have long run effect on GDP of listed firms. The results are crucial for economic policy makers in searching suitable products to be exported that maintains the GDP.

1. Introduction

Manufacturing sector of Pakistan play a pivotal role in the economy of Pakistan. It is seen that whenever economic crisis hit Pakistan's economy, the government completely relied and recovered shock with the contribution of manufacturing sector. The manufacturing industry's turnover has increased over time. The manufacturing sector's turnover in 2019 was estimated to be 7,034.1 trillion rupees (Annual report, Finance Division of Pakistan, 2020). Similarly, worker absorption in Pakistan's manufacturing sector has increased year after year. The number of people employed in the listed manufacturing industry was at 119,562,843 at the end of 2019. As a result, the industrial sector in particular retains and absorbs a high number of workers. However, challenges such as product marketing and traditional management still exist in this industry (Abor&Quartey, 2010; Riani, 2011). The number of manufacturing enterprises and the gross domestic product (GDP) are the two most important elements in the sector's workforce absorption (Gusnadri et al., 2019 and Azhari, 2021).

The influence of changes in short-term interest rates, which are transferred to long-term interest rates through the supply and demand balancing mechanism in the money market, can affect the real sector (output). Changes in interest rates have an impact on the cost of capital, which in turn has an impact on investment spending. Although Keynes emphasized this approach when it came to business decisions about investment expenditure, the new approach considers consumer decisions about consumer durables and housing to be investment decisions as well. An rise in aggregate demand and output will result from increased investment and consumption (Mishkin, 2008). Aggregate demand and supply are continuously driving forces in the economy. The two will be in balance, resulting in an equilibrium price and output. The supply side adherents believe that the aggregate supply side is what drives the economy. On the other hand, supporters of the demand side believe that the purchasing power of goods and services is more important in driving the economy, and that as a result, production will fall if aggregate demand falls. Monetary, fiscal, and foreign policies are all factors that can influence aggregate demand. Monetary, expansionary fiscal, and exchange rate stability policies can be used to stimulate a rise in output in a slow economy (Astuti, 2014).

Several studies have been conducted in Pakistan to determine the impact of monetary policy on economic growth. Exports and the exchange rate have a substantial impact on long-term economic growth, while imports have a little impact (Astuti&Ayuningtyas, 2018 and Nurlinda et al., 2018). (Rinaldi, Jamal, &Seftarita, 2017) also found consistent research results, stating that the exchange rate and current account have a major impact on economic growth. This differs from the findings of Pratiwi, Dzulkiran, and Azizah (2015), who found that the exchange rate has a negative impact on economic growth in Pakistan, whereas the interest rate variable has a positive and significant impact. Furthermore, according to Asnuri (2013), the short-term of Bank Indonesia (CBI) Certificates has a detrimental influence on economic growth, although total finance and export contributions have no impact. Total financing, Bank Indonesia Certificates, and export contributions all have a detrimental impact on Indonesia's economic growth in the long run. Indonesian economic growth is also influenced by export determinants, according to Indriyani (2016).

This research on the influence of monetary policy is very intriguing to study because there are discrepancies in the implications for monetary policy depending on different studies that have been done, making this research interesting to pursue further. Furthermore, to our

knowledge, research on the influence of monetary policy on the real sector, particularly the manufacturing sector, is rarely conducted. Hakim (2012) did research on the subject of research in the financial sector. Budiyanti (2014) investigates the impact of monetary policy on the growth of Pakistan's manufacturing sector. The goal of this study is to determine which monetary instruments have the greatest impact on manufacturing sector growth in Pakistan, using a variety of variables such as interest rates, exports, exchange rates, and manufacturing sector GDP.

2. Literature Review

The country's central monetary unit initiates the monetary policy mechanism. The State Bank of Pakistan (SBP) serves as the country's central monetary unit, ensuring macroeconomic stability. Essentially, monetary policy is to maintain an optimum level of liquidity in the economy so that trade transactions can be smoothed without causing inflationary pressures. The money supply, inflation, interest rates, exchange rates, and public expectations are all indicators that are commonly used to assess monetary policy in the economy. Interest rates have an impact on industrial investment, which encourages production. The exchange rate has an impact on prices (products and production inputs). Interest rates and exchange rates are monetary policy instruments that have a significant impact on domestic and international trade in industrial products. If the goal is to expand the money supply, then the government will pursue an expansionary monetary policy. Otherwise, the government adopts a contractionary monetary policy if the money supply is reduced (Sukirno, 2012).

According to (Mankiw, 2003), the exchange rate, also known as the exchange rate between two countries, is the price level agreed upon by residents of the two countries to conduct transactions with each other. According to Mankiw (2003), the exchange rate is divided into real and nominal exchange rates. The nominal exchange rate depicts the relative prices of two countries' currencies, whereas the real exchange rate depicts the relative prices of goods between two countries. There are three different kinds of exchange rate systems: 1. A fixed exchange rate is the value of a country's currency that is determined directly by the country rather than by the balance of supply and demand in the money market (central bank). 2. A Managed Floating Exchange Rate is the exchange rate of a country's currency that is influenced by government intervention as well as supply and demand in the money market. 3. A free floating rate is an exchange rate for a country's currency that is allowed to reach supply and demand equilibrium in the money market based on the country's internal and external conditions. The government does not intervene directly in the currency's value. In addition to exchange rates, a literature review of international trade is used in this study. Pakistan follows a free-market economic system. This indicates that domestic demands are met not only through home production, but also through imports as necessary. Similarly, when the production of goods and services exceeds domestic demand, exports are possible. International commerce, according to Suryanto (2017), has a significant impact on a country's internal economy since it fosters rivalry amongst countries around the world. As a result, countries can be enticed to specialize and become more efficient. Rising incomes, capital transfers, and labor absorption benefit countries that succeed in international trade, whereas developing countries that are prone to exploitation suffer from import dependency and the destruction of local industries.

Export, according to Pakistan's finance ministry, is the process of moving goods from Pakistan's customs area to the customs area of another country. As a result, import can be defined as the activity of bringing goods from other countries into the Pakistani customs area.

Export and import activities are, without a doubt, carried out in compliance with applicable laws and regulations. Economic growth is the most commonly used economic indicator to describe a country's progress over time. The added value of economic growth is higher than in the prior period. The percentage increase in Gross Domestic Product (GDP) at constant prices in a year over the previous year is used to calculate economic growth. GDP can be calculated using numerous methods, including output, income, and expenditure. The production approach to GDP calculation involves calculating all added values that occur in a domestic area over the course of a year from various business fields. The income approach to GDP calculation is to calculate national income by calculating all income of economic actors in a domestic area over the course of a year. The expenditure approach to GDP calculation involves calculating all expenditures from various economic sectors in a domestic area over the course of a year. Several studies have been conducted in the past. Aliman&Purnomo (2001), for example, conducted a causation test between exports and Indonesian economic growth. Exports are being driven by economic growth, according to the findings of this study. Aliman&Purnomo (2001) used empirical data from 1969 to 1997 to conduct their test.

Other studies back up Aliman&Purnomo (2001) and Dewi (2018)'s findings, which suggest that GDP has a short-term impact on exports. Hakim (2012) did a similar analysis on the relationship between imports and GDP, but it was for the banking and financial industry. The findings show that exports and imports have an impact on the banking financial sector's GDP, and that the relationship between exports and imports is minimal. In general, the research of Astuti and Ayuningtyas (2018) looks at the relationship between exports, imports, exchange rate, and economic growth in Pakistan from 2000 to 2016. The findings suggest that exports and exchange rates have a long-term impact on economic growth, whereas imports do not. Exports and imports, on the other hand, have a short-term impact on economic growth, although the exchange rate does not. Unfortunately, the time allotted for study was insufficient. Rinaldi, Jamal, and Seftarita (2017) investigated the impact of the exchange rate on economic growth, finding that the exchange rate has a negative and significant impact on economic growth. Regrettably, the study only covered the years 2000 to 2015.

In addition, Sugiartiningsih (2015) investigated the relationship between the currency rate and imports. As a result, imports suffer as a result of the exchange rate. Ginting (2013) looked at the impact of the currency rate on Pakistani exports in another study. The data used is for the years 2005 to 2012. The findings revealed that the exchange rate has a considerable negative impact on exports both in the long and short term. Dewi (2018) did another study using data spanning a longer time period, from 1980 to 2016, and found that the exchange rate had a substantial impact on exports only in the long run. These studies produce a wide range of outcomes when it comes to the relationship between exports, imports, exchange rates, and economic growth. However, the item and research data used in this study is listed manufacturing sector of Pakistan.

3. Methodology

The impact of exports and monetary policy in Pakistan's listed manufacturing sector was investigated using the Error Correction Model (ECM) as the analysis method. The Pakistan Bureau of Statistics and the State Bank of Pakistan provided the time series data (SBP). The data used was time series data from 1998 to 2020, specifically data on interest rates, growth, exports, and GDP of Pakistan's manufacturing sector.

This study's data analysis method included the following steps: (1) performing a stationarity test on the independent and dependent variables; (2) determining the degree of integration; (3) cointegration testing; (4) ECM estimation analysis; and (5) interpreting the estimation results. The following is the estimation model for both the short and long term, which is based on the ECM method.

$$\Delta \ln Growth_t = \alpha_0 + \sum_{j=1}^{k1} b_j \Delta \ln INT_{t-j} + \sum_{j=0}^{k2} c_j \Delta \ln GDP_{t-j} + \sum_{j=0}^{k3} d_j \Delta \ln Export_{t-j} + n_1 \ln INT_{t-1} + n_2 \ln GDP_{t-1} + n_3 \ln Export_{t-1}$$

$$\Delta \ln INT_t = \alpha_0 + \sum_{j=1}^{k1} b_j \Delta \ln Growth_{t-j} + \sum_{j=0}^{k2} c_j \Delta \ln GDP_{t-j} + \sum_{j=0}^{k3} d_j \Delta \ln Export_{t-j} + n_1 \ln Growth_{t-1} + n_2 \ln GDP_{t-1} + n_3 \ln Export_{t-1}$$

$$\Delta \ln GDP_t = \alpha_0 + \sum_{j=1}^{k1} b_j \Delta \ln INT_{t-j} + \sum_{j=0}^{k2} c_j \Delta \ln Growth_{t-j} + \sum_{j=0}^{k3} d_j \Delta \ln Export_{t-j} + n_1 \ln INT_{t-1} + n_2 \ln Growth_{t-1} + n_3 \ln Export_{t-1}$$

The above Error Correction Models specifications exhibit various summation signs, which are referred to as ECMs. Furthermore, the term n s is used in the ECMs to comprehend the long-term relationship. H 0:n 1=n 2=n 3=n s=0 is used to find the null hypotheses for long-term relationships (No Cointegration). If H 0=0, it's linked to alternate hypotheses, such as H 1:n s 6=0. The F-test is used, and the critical values have elasticity or variance among the variables, which are written as I (0) or I (1). (1). The acceptance and rejection of hypotheses are based on F-statistics' upper and lower bounds. If the upper bound level is less than the estimated F-statistics, the rejection zone of null hypotheses shrinks. On the other hand, if the lower bound level is bigger than the estimated F-statistics, the null-hypotheses cannot be rejected. If the results influence the first aspect, we can conclude that there is no evidence of cointegration among research variables; however, if the results influence the second aspect, we can conclude that there is evidence of cointegration among study variables. If the estimated f-stat falls between the lower and higher bound values, the results may be unique; however, it assures that the results are persuasive (Pesaran et al., 1996).

4. Results

4.1 Data Stationarity

Table 1: Stationaity of Data

Variable	Level			1st Difference		
	ADF Value	Critical Value	Result	ADF Value	Critical Value	Result

GDP	-1.2826	-4.0033	Non stationary	-4.5565	-4.0222	Stationary
INT	-3.3110	-4.0033	Stationary	-6.6235	-4.0222	Stationary
EXPORT	-3.4218	-4.0033	Stationary	-6.1884	-4.0222	Stationary
GROWTH	-1.3410	-4.0033	Stationary	-6.4189	-4.0222	Stationary

4.2 Cointegration Results

Table 2: Cointegration Outcomes

Johansen Fisher Test	*p-value*	*Critical Value*	*Prob.*
Trace Statistic	71. 6023	42.1163	0.0000
Max Eigen Test	51. 1935	29.1213	0.0000

Table 1 demonstrates the results of the stationary test at the level; only the GDP variable is not stationary, while interest rates, exports, and growth are. All variables, however, are stationary at the level of first difference.

The Johansen Test method was used to determine whether or not there is a long-term correlation tracking inter variables using the cointegration test. The cointegration variables were discovered by comparing the statistic value to the critical value (0.05). The data variables were not cointegrated if the p-value was less than the crucial value; alternatively, if the p-value was more than the critical value, all variables were cointegrated.

Table 3 shows that the critical p-value was more than the value, either through the findings of the trace statistic test or the results of the Max-Eigen test. In long-term connections, the variables of GDP, interest rates, exports, and growth were thus stagnant.

4.3 Short-run and Long-run relationship

This section described the short-term estimation results using the error correction model (ECM), which were summarized in Table 3. The test results in Table 3 stated that in the short term, all variables had no effect on the GDP of listed manufacturing sector. This was proven with the value of Prob. (F-stat) of 0.006 which was greater than 0.05. Furthermore, the results of the partial analysis showed that the variables of interest rates, growth and exports had no effect on GDP, with imbalance value of 31% of the data used.

The results are similar to several previous studies, including Asnuri (2013) which states that interest rate has a negative impact on economic growth. However, the results of this research were not consistent (Rinaldi, Jamal, &Seftarita, 2017) where the exchange rate and the current account were significant on economic growth. And Ayuningtyas (2018), stated that in the short term the exchange rate did not have any effect on economic growth.

Basically, economic growth will encourage exports in the short term. Research conducted by Aliman&Purnomo (2001) is a test of empirical data from 1969-1997. The results of other studies

support the conclusions of Aliman&Purnomo (2001) and Dewi (2018) which show that in the short term GDP has an effect on exports.

Table 3: Short Run Outcomes

Variable	Coefficient	t-stat	Prob
Constant	-0.2776	-1.6937	0.1086
D(Growth)	-0.0434	-1.5217	0.1465
D(Interest)	2.5641	1.0809	0.2948
D(Export)	2.9154	1.1706	0.2579
RES(-1)	-0.3145	-2.2327	0.0393
R2	0.3912		
Adj R^2	0.2479		
Prob,(F-stat)	0.0636		

Table 4: Lon Run Outcomes

Variable	Coefficient	t-stat	Prob
Constant	19.0116	1.8121	0.0858
Growth	-1.0046	-0.0990	0.9221
Interest	6.0016	2.3677	0.1874
Export	4.4235	2.8183	0.0068
R2	0.80164		
Adj R^2	0.6473		
Prob,(F-stat)	0.0015		

5. Discussion & Conclusion

The next step was to make a long-term estimation using an error correction model (ECM). The results were shown in Table 4. The results of the long-term test between the variables of interest rates, growth and exports in the listed manufacturing sector of Pakistan have a significant effect on gross domestic product (GDP). This was proven by the value of Prob. (t-stat) of 0.0045 which was greater than 0.05. But partially, only export variables had an influence on GDP of manufacturing sector of Pakistan, while interest rates and growth have no effect on GDP of listed firms. In the long term, the total financing, interest and export contributions had a negative impact on economic growth. Indriyani (2016) export variables also affect economic growth in several economies. Long-term economic growth is influenced by exports and the interest rate, while the influence of the import variable is not significant (Astuti&Ayuningtyas, 2018). In contrast to the research conducted by Pratiwi, Dzulkiran and Azizah (2015), which revealed that the exchange rate has a negative effect on economic growth, while the interest rate variable has a positive and significant effect on economic growth in Pakistan. Basically, economic growth will encourage exports.

The results of the research indicates that in the short-term estimates of interest rates, growth rate and exports do not have a partial and simultaneous influence on the GDP of listed manufacturing firms of Pakistan. However, in the long term, all variables have an influence on the GDP of manufacturing sector. Partially, only export variable which have an influence on GDP. The results of this research recommends the importance for doing a more in-depth study to the types of products exported and GDP per sector owned by manufacturing sector of Pakistan. Definitely, this research will have an impact on the policies that will be taken by policy makers in this country.

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