Trade Liberalization and Economic Growth in China

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Abstract: This study investigates the role of trade liberalization in China’s economy over the period 1980-2018. The Johansen cointegration and Granger causality tests, impulse response functions, and variance decomposition analysis are used in this study. The cointegration test indicates that GDP is positively related to trade openness, gross fixed capital formation, final consumption expenditure, and inflation, but negatively related to the oil price. The causality test reveals bidirectional short and long run causality relationships between trade openness, oil price, gross fixed capital formation, final consumption expenditure, inflation and GDP. The result also indicates that final consumption expenditure has the biggest effect on GDP, which suggests that improving standard of living, investments and trade openness will have tremendous effect on the economic growth.

1. Introduction

It is well known that exports play a significant role in improving the quality of production, supplying the state treasury with foreign currencies, attracting foreign investments, and creating a competitive and productive environment. Besides, imports also play an important role in supporting the country’s needs for goods and services that it could not produce or where the cost of production is very high. Therefore, trade liberalization, by simplifying export and import processes, can play a vital role in boosting the country’s economic growth. The discussion on the role of the trade liberalization in promoting economic growth has been ongoing since several decades ago. Many studies have shown that internationally active countries are more productive than countries that only produce for the domestic market. Besides, due to trade liberalization, the volume of international trade increases and country’s production would benefit from the economies of scale. Thus, investigating the effect of trade liberalization on economic growth is of great significance to researchers and policy makers.

Since 1987, the Chinese government has worked gradually to change its trade policies and open up its economy to the global market. Several measures have been implemented to liberalize the trade regime in the country. For example, the government has simplified many trade related procedures, lower most tariffs and nontariff barriers, eliminated export taxes, and reduced export and import quotas. China has signed
several bilateral and free trade agreements since it acceded to the World Trade Organization (WTO) in 2001. Besides, China’s participation in international trade and the opening up of its economy to the global market have contributed to remarkable economic transformations and impressive economic growth. The country’s industries were able to attract new investments and technology, eventually, some of these industries have become highly specialized in electrical and electronic productions. The productivity has improved and this leads to greater foreign trade and inflows of foreign currencies (Sun and Heshmati, 2010).

Given this backdrop, this study aims to investigate the effects of trade liberalization on economic growth in China over the period 1980-2018. The organization of this study is as follows. The next section is the literature review, and Section 3 provides a brief discussion on the methodology. Section 4 reports the empirical results, and the conclusion and recommendations are presented in Section 5.

2. Previous Studies

Trade liberalization plays a vital role in supporting economic growth, and this has resulted in a large number of studies that have investigated the effects of trade openness as an indicator of trade liberalization on economic growth. Based on the World Development Report 1987, countries that followed outward-oriented trade strategies have outperformed in terms of their export growth, income growth, savings and employment, compared to other countries that had adopted inward-oriented trade strategies (World Bank, 1987). Edwards (1992, 1998) also assumes that there is a negative relationship between trade distortion and economic growth, and more open economies will grow much faster than economies with trade distortions. Besides, trade liberalization has a positive effect on economic growth according to Heitger (1987), Dollar (1992), Matin (1992), Harrison (1996), Onafowora and Owoye (1998), Greenaway et al. (2001), Utkulu and Ozdemir (2004), Buehler et al. (2011), Oladipo (2011), Rahimi and Shahabadi (2011), Manni and Ibne Afzal (2012), Yavari and Mohseni (2012), Umer (2014), Hozouri (2016), Keho and Wang (2017), Khobai and Chitauro (2018), Gnagnnon (2018), Khobai et al. (2018), and Qayyum et al. (2018).

However, some studies found that trade liberalization alone might not be the main factor that drives economic growth. Rodriguez and Rodrik (2000) found little evidence to prove that open trade policies (such as lower tariff and non-tariff barriers) are significantly associated with economic growth. Greenaway (1998) also pointed out that a liberalized trade regime may be necessary, but insufficient for rapid growth, and that trade liberalization in itself cannot move an economy to a new growth trajectory. However, trade liberalization can help in achieving
economic growth, but at the same time, it needs to be compatible with other policy reforms and needs to be sustainable. Levine and Renelt (1992) also did not find any positive relationship between trade openness and economic growth, but they obtained a positive correlation between growth and the share of investment in GDP. On the other hand, Yanikkaya (2003) concluded that trade liberalization does not have a simple and straightforward relationship with growth, but trade barriers are positively and significantly associated with growth, and the restrictions on trade can promote growth, especially for developing countries.

Since then, many studies have focused on other factors such as oil price, investment, consumption, and inflation on economic growth in different countries. In (2008) found that a rise in oil prices have a positive effect on the economic growth of Japan and China. Darby (1982), Hamilton (1983), Burbidge and Harrison (1984), Gisser and Goodwin (1986), Jimenez-Rodriguez and Sanchez (2005), Lin and Mou (2008), Hsieh (2008), Zhang and Xu (2010), Lee et al. (2001), Le and Chang (2013), and Morana (2013) also concluded that oil price increases have a negative effect on the economic growth of oil-importing countries. However, Du et al. (2010) and Chen et al. (2015) concluded that the output in China is positively correlated with oil price shocks. Other studies found that oil price has a positive effect on the economic growth of oil-exporting countries such as Russia (Ito, 2008), a group of 15 oil-exporting countries (El-Anshasy, 2009), Nigeria (Aliyu, 2009), selected Sub-Saharan countries (Yong et al., 2011), Iran (Emami and Adibpour, 2012), Nigeria (Oyeyemi, 2013), Kenya (Wanjala, 2018), and Nigeria (Victor and Ogbonna, 2018).

Other researchers tested the effect of investments on economic growth. Some of these studies such as Kormendi and Meguire (1985), Levine and Renelt (1992), Mankiw et al. (1992), Islam (1995), Caselli et al. (1996), Qin et al. (2006), Loncan (2007), Tang et al. (2008), Merican (2009), Adams (2009), Bond et al. (2010), Adhikary (2011) and Soliu and Ibrahim (2014) found that investment has a positive effect on economic growth. However, Elboiashi et al. (2009), and Hooi and Wah (2010) concluded that an increase in investment did not contribute to GDP growth. Moreover, a number of studies revealed that consumption has a positive effect on economic growth, including Abdul Karim et al. (2010), Ramli and Andriani (2013), Ridzuan et al. (2014), Abdul Karim et al. (2012) and Aslam (2017). Other studies examined the impact of inflation on economic growth. According to Mundell (1963), Tobin (1965), Mallik and Chowdhury (2001), Fabayo and Ajilore (2006), Wang (2008), Umaru and Zubairu (2012), Wajid and Kalim (2013), and Anidiobu et al. (2018), inflation has a positive effect on economic growth. However, De Gregario (1992), Fisher (1993), Barro (1995), Sarel (1996), Khan and Senhadji (2001), Quartey (2010), Kasidi and Kenani (2012), Kasidi and Mwakanemela (2013),
Bakare et al. (2015), Chughtai et al. (2015), Semuel and Nurina (2015), and Hussain et al. (2016) found that economic growth is affected negatively by inflation.

3. Methodology

The vector autoregression (VAR) model will be used in this study. Our model consists of six variables, namely, the gross domestic product (GDP), trade openness (OPEN), oil price (OILP), gross fixed capital formation (GFCF), final consumption expenditure (FCE) and inflation (INF) of China. GDP is the dependent variable. The model is presented as follows:

\[
\ln GDP = \beta_0 + \beta_1 OPEN + \beta_2 \ln OILP + \beta_3 \ln GFCF + \beta_4 \ln FCE + \beta_5 \ln INF + \varepsilon_t \tag{1}
\]

where \(\beta_0\) is the intercept, \(\beta_1, \beta_2, \beta_3, \beta_4, \beta_5\) are the slope coefficients, \(\ln GDP\) is the natural log of real GDP, OPEN is the trade openness as an indicator of the degree of trade liberalization and it is defined as the percentage of total exports and imports to GDP, \(\ln OILP\) is the natural log of oil price per barrel, \(\ln GFCF\) is the natural log of real gross fixed capital formation, \(\ln FCE\) is the natural log of final consumption expenditure, \(\ln INF\) is the inflation rate proxy by the annual percentage change of the GDP deflator, and \(\varepsilon_t\) is the error term. All variables are in US dollars except for OPEN and INF, which are in percentage.

This study uses annual time series data of China during the period from 1980 to 2018. These data were collected from the World Bank. Since this study uses time series data, it is necessary to begin the analysis with the unit root tests. Augmented Dickey-Fuller (ADF) unit root tests will be conducted on each variable in the model to find out whether the time series data are stationary at the level or first difference. After testing for stationarity and confirming the order of integration of each time series, and if the variables in the model are found to be integrated of the same order, the Johansen cointegration test will be applied to establish whether there is any long run or equilibrium relationship between the variables in the model. If the variables are found to be cointegrated, then the Granger causality tests will be conducted based on the VECM to determine the long and short run causality relationships among the variables in the model. However, if the Johansen test results indicate no cointegration among the variables in a particular model, then the Granger causality tests will be based on the VAR model. Lastly, Impulse Response Functions (IRFs) and Variance Decomposition (VD) analysis will be computed for the model to evaluate if the independent variables have any significant role in explaining the variation of the dependent variable at the short and long run forecasting horizons.

4. Empirical Results and Discussion

The results from unit root test in Table 1 shows that all six variables are not stationary at the level, but become stationary after first difference at either the five
or one per cent level of significance. This means that all the variables are integrated of order one, that is, \( I(1) \).

<table>
<thead>
<tr>
<th>ADF</th>
<th>Level</th>
<th>First difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intercept</td>
<td>Trend and no intercept</td>
</tr>
<tr>
<td>lnGDP</td>
<td>0.295078</td>
<td>-2.205583</td>
</tr>
<tr>
<td>OPEN</td>
<td>-1.813882</td>
<td>-1.436192</td>
</tr>
<tr>
<td>lnOILP</td>
<td>-1.201537</td>
<td>-2.324732</td>
</tr>
<tr>
<td>lnGFCF</td>
<td>-0.484304</td>
<td>-1.968949</td>
</tr>
<tr>
<td>lnFCE</td>
<td>0.100083</td>
<td>-2.373045</td>
</tr>
<tr>
<td>INF</td>
<td>-2.731379</td>
<td>-3.475449</td>
</tr>
</tbody>
</table>

Note: *** Denotes significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

4.1. Johansen Cointegration Test Results

Since all the variables are stationary in the first difference, we can determine the presence of any cointegration or longrun relationship among the variables based on the Johansen cointegration test. However, before running the cointegration test, we run the VAR model first to determine the optimal lag length. Using the minimum Akaike Information Criterion (AIC) an optimal lag length of three is selected for the model.

We then proceed with the cointegration test. Table 2 shows that there are six cointegration equations based on the trace test and the maximum eigenvalue test.

<table>
<thead>
<tr>
<th>No. of CE(s)</th>
<th>Trace Statistic</th>
<th>Prob</th>
<th>Max-Eigen Statistic</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>( r = 0 )</td>
<td>309.1135***</td>
<td>0.0000</td>
<td>0.96950***</td>
<td>0.0000</td>
</tr>
<tr>
<td>( r \leq 1 )</td>
<td>186.9620***</td>
<td>0.0000</td>
<td>0.81093***</td>
<td>0.0000</td>
</tr>
<tr>
<td>( r \leq 2 )</td>
<td>128.6649***</td>
<td>0.0000</td>
<td>0.79781***</td>
<td>0.0000</td>
</tr>
<tr>
<td>( r \leq 3 )</td>
<td>72.7162***</td>
<td>0.0000</td>
<td>0.61294***</td>
<td>0.0010</td>
</tr>
<tr>
<td>( r \leq 4 )</td>
<td>39.4948***</td>
<td>0.0000</td>
<td>0.46220***</td>
<td>0.0054</td>
</tr>
<tr>
<td>( r \leq 5 )</td>
<td>17.7852***</td>
<td>0.0010</td>
<td>0.39839***</td>
<td>0.0010</td>
</tr>
</tbody>
</table>

Note: *** Denotes significance at the 1 percent level, and ** at the 5 percent level
In other words, the results indicate more than one long run relationship exists among the variables in the system comprising lnGDP, OPEN, lnOILP, lnGFCF, lnFCI, and INF.

After having found a cointegration relationship between the variables, the cointegrating equation was normalized using the real GDP variable. Table 3 shows the normalized cointegrating vector.

**Table 3**

<table>
<thead>
<tr>
<th>lnGDP</th>
<th>OPEN</th>
<th>lnOILP</th>
<th>lnGFCF</th>
<th>lnFCE</th>
<th>INF</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000000</td>
<td>-0.459564</td>
<td>0.096335</td>
<td>-0.771672</td>
<td>-1.959499</td>
<td>-0.008973</td>
<td>4.991477</td>
</tr>
<tr>
<td>(0.07127)</td>
<td>(0.00764)</td>
<td>(0.05705)</td>
<td>(0.06517)</td>
<td>(0.00065)</td>
<td>(0.29666)</td>
<td></td>
</tr>
</tbody>
</table>

From Table 3, the long run equation can be written as:

\[
\text{lnGDP} = -4.991 + 0.459\text{OPEN} - 0.096\text{lnOILP} + 0.771\text{lnGFCF} + 1.959\text{lnFCE} + 0.008\text{INF}
\] (2)

The cointegration equation given by equation (2) above shows that lnGDP is positively related to OPEN, lnGFCF, lnFCE and INF, but negatively related to lnOILP.

The coefficient of OPEN indicates that for every one percent increase in trade openness, GDP will increase by 0.459 percent. This suggests that trade openness plays a vital role in boosting the economic growth in China. By simplifying the customs procedures, imports and exports of the country are certain to increase. Exports will motivate producers to produce more, and imports of investment goods will stimulate the production process in the country. Besides, trade openness increases competition among domestic firms, which encourages producers to improve the quality of their products by employing new and modern production technologies. This will lead to higher economic growth in the country. Our finding agrees with the results of Heitger (1987), Dollar (1992), Onafowora and Owoye (1998), Greenaway *et al*. (2001), Utkulu and Ozdemir (2004), Effiom and Samuel (2012), Hozouri (2016), Gnangnon (2018), and Khobai *et al*. (2018).

The coefficient of lnOILP denotes that when the oil price increases by one percent, GDP will decrease by 0.096 percent. This outcome is as expected since the high oil price increases the cost of production activities in the country. The rise in the production cost will drive producers to reduce their production. Hence, the high oil price will cut the output and slow down the economic growth in the country. This finding agrees with the results obtained by Hamilton (1983), Burbidge
and Harrison (1984), Jimenez-Rodrigueza and Sanchez (2005), Hsieh (2008), Le and Chang (2013), and Morana (2013). Furthermore, the coefficient of lnGFCF shows that when the gross fixed capital formation increases by one percent, GDP will increase by 0.771 percent. With the rise in the capital, investment and production activities in the country will increase too, which creates new job opportunities, increases the output of different goods and services, and enhances exports and imports in the country. This will support the national economy and improve economic growth. This result is similar to the results that were obtained by Kormendi and Meguire (1985), Levine and Mankiw et al. (1992), Caselli et al. (1996), Loncan (2007), Adams (2009), Bond et al. (2010) and Soliu and Ibrahim (2014).

On the demand side, the coefficient of lnFCE shows that when the final consumption increases by one percent, GDP will increase by 1.959 percent, which reflects the critical role that the final consumption plays in supporting the economic growth in China. The rise in final consumption means an increase in the local demand for different goods and services in the country, which motivates producers to increase their production, and that will encourage economic growth in the country. This result agrees with Abdul Karim et al. (2010), Ramli and Andriani (2013), Ridzuan et al. (2014), Abdul Karim et al. (2012) and Aslam (2017). Besides, the coefficient of INF shows that when inflation increases by one percent, GDP will grow by 0.008 percent. This explains why when prices rise, firms tend to produce more to increase their profits. Thus, inflation can be a reason that motivates producers to increase their production, which boosts the country’s economic growth. Our finding is in line with the results of Mundell (1963), Tobin (1965), Mallik and Chowdhury (2001), Fabayo and Ajilore (2006), Wang (2008), Umaru and Zubairu (2012) and Wajid and Kalim (2013).

4.2. Granger Causality Tests Results

Since the variables in the model are cointegrated, the Granger causality test based on the VECM is used to determine the short and long run causal relationships among the variables in the model. The F-test results show the significance of the short-run causal effects, while the significance of the coefficient of the lagged error correction term [ect(-1)] shows the longrun causal effect.

It is clear from Table 4 that there is a bidirectional causal relationship between OPEN and lnGDP in the short and long run. Trade openness makes export and import processes much easier, which stimulates investment and boost economic growth in the country. The government should continuously find ways to simplify the export and import processes to motivate the producers to increase their production in the country. There is also a bidirectional short and long run causality relationship between lnOILP and lnGDP, suggesting feedback effects between oil
prices and economic growth in both the short run and long run. Moreover, there is bidirectional causality between lnGFCF and lnGDP in the short and long run. The result suggests that investment Granger causes economic growth in China through improved and increased production, and economic growth in turn creates an attractive investment climate, which motivates investors to increase their investments in the country. There is also a bidirectional short and long run causality relationship between lnFCE and lnGDP. This result shows that the final consumption expenditure causes economic growth in China by stimulating production in the country to meet the rise in the local demand for different goods and services. There is also a bidirectional short and long run causality relationship between INF and lnGDP. Inflation causes economic growth by raising the rate of profit, thus motivating the producers to increase their production in the country. On the other hand, the rise in the total demand after improving the standard of living in the country due to higher economic growth causes an increase in inflation.

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>lnGDP</th>
<th>OPEN</th>
<th>lnOILP</th>
<th>lnGFCF</th>
<th>lnFCE</th>
<th>INF</th>
<th>ect(-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ lnGDP</td>
<td>-</td>
<td>7.12 (3)**</td>
<td>5.31 (2)**</td>
<td>11.24 (4)**</td>
<td>4.21 (3)**</td>
<td>11.86 (2)*</td>
<td>-2.31**</td>
</tr>
<tr>
<td>Δ OPEN</td>
<td>4.34 (3)**</td>
<td>-</td>
<td>3.19 (2)**</td>
<td>2.14 (2)*</td>
<td>2.06 (2)</td>
<td>3.66 (2)*</td>
<td>-2.37**</td>
</tr>
<tr>
<td>Δ lnOILP</td>
<td>6.20 (4)**</td>
<td>4.38 (3)**</td>
<td>-</td>
<td>4.32 (3)*</td>
<td>2.58 (2)</td>
<td>2.34 (2)</td>
<td>-3.14**</td>
</tr>
<tr>
<td>Δ lnGFCF</td>
<td>11.29 (5)**</td>
<td>7.16 (3)**</td>
<td>4.07 (3)**</td>
<td>-</td>
<td>6.12 (3)*</td>
<td>11.98 (3)**</td>
<td>-2.62*</td>
</tr>
<tr>
<td>Δ lnFCE</td>
<td>4.25 (3)*</td>
<td>6.20 (3)**</td>
<td>4.13 (3)**</td>
<td>5.46 (3)**</td>
<td>-</td>
<td>3.92 (2)**</td>
<td>-2.17**</td>
</tr>
<tr>
<td>Δ INF</td>
<td>3.61 (3)**</td>
<td>6.81 (4)**</td>
<td>1.23 (2)</td>
<td>2.21 (2)</td>
<td>1.68 (3)*</td>
<td>-</td>
<td>-3.17*</td>
</tr>
</tbody>
</table>

Notes: ect(-1) represents the error correction term lagged one period. The numbers in the brackets show the optimal lag based on the AIC. Δ represents the first difference. Only F-statistics for the explanatory lagged variables in first differences are reported here. For the ect(-1) the t-statistic is reported instead. ** denotes significance at the 5 percent level and * indicates significance at the 10 percent level.

4.3. Impulse Response Functions (IRFs) Results

Impulse response function (IRF) is used to study the dynamic effects of a particular variable’s shock on the other variables that are included in the same model over a ten-year forecast horizon. Through the IRF we are able to determine if the response of one variable to changes in other variables is positive or negative and whether it is significant or not. If the point estimate of the IRF is above the zero line the response is positive, but if it is below the zero line, then the response is negative.
Besides, if the point estimate of the IRF passes through the zero line, the response is insignificant. There are many options for transforming the impulses. We will use the generalized impulse response functions.

Figure 1 shows that there is a positive long-term effect of OPEN, lnOILP, lnGFCF, lnFCE and INF shock on GDP growth, which shows the important role of trade liberalization in supporting the economic growth in China through simplifying export and import process. Gross fixed capital formation and final consumption also play a vital role in boosting the country’s economic growth by motivating the producers to increase and improve their production. Besides, inflation supports economic growth by encouraging producers to increase their production in order to generate higher profit. Thus, the government should attempt to open up its economy to foreign trade, improve the standard of living and intensify investments in the country.

![Figure 1: Generalized impulse response functions (GIRF) results](image-url)

4.4. Variance Decomposition (VD) Analysis

The forecast error variance decompositions (VD) for the 1 to 10-year forecast horizons are examined to explain how much of the forecast error variance of lnGDP can be explained by its own shocks and shocks to the other variables in the model at the various forecast horizons. Table 5 shows the percentages of the forecast error variances accounted for by each shock. At shorter forecasting
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5. Conclusions

This study investigates the role of trade liberalization in the economic growth in China using annual time series data from 1980 to 2018. The model consists of six variables, with the GDP as the dependent variable and trade openness, oil price, gross fixed capital formation, final consumption expenditure, and inflation as the independent variables. The Johansen cointegration test, Granger causality test, impulse response functions, and variance decomposition analysis were used in this study.

The unit roots test results indicate all variables are $I(1)$. The cointegration test showed that trade openness, gross fixed capital formation, final consumption, and inflation have a positive effect on the GDP, but oil price affects it negatively. Furthermore, from the causality tests, we found that there are bidirectional causality relationships between trade openness, oil price, gross fixed capital formation, final consumption expenditure, inflation, and GDP in the short and long run. The
impulse response functions indicated that when there is a shock to trade openness, oil price, gross fixed capital formation, final consumption expenditure, and inflation, GDP will respond positively in the following years. The variance decomposition analysis showed that at a ten-year forecasting horizon, 37 percent of the forecast error variance of GDP is explained by trade openness, while 15, 6, 1.8 and 1.6 percent of the GDP forecast error variance are explained by oil price, final consumption expenditure, gross fixed capital formation, and inflation variations, respectively.

Based on the findings of this study, it is vital for the Chinese government to liberalize its economy to foreign trade by continuously finding ways to reduce its trade barriers and customs procedures, improving the quality and competitiveness of the China’s products in the local and global markets, and using modern management and technology in the production activities. It is also important that the government strive to create an attractive investment climate and improve the living standard of its citizens. This will eventually lead to an increase in domestic consumption and higher production, which makes China’s economic growth sustainable.

References


