CHINA'S INDUSTRIAL DEVELOPMENT: THE IMPACT OF TRADE OPENNESS, FOREIGN DIRECT INVESTMENT, AND COMPETITION ON CHINA’S ECONOMIC GROWTH

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Abstract
This study investigates the effect of Foreign Direct Investment (FDI), Trade Openness, and Competitiveness on the economic growth of China for the period of 1984 to 2015 by using multiple regression analysis. Consequently, the concentration will be mainly on the three reasons that lead to the manufacturing development: (1) Trade Openness (Imports + Exports)/GDP, (2) Foreign Direct Investment (inflows and outflows of foreign direct investment), and (3) Competitiveness that will be represented by the IT competitiveness index and the world oil prices. The result of the test shows that the independent variables have a direct significant and positive impact on the manufacturing sector characterized by GDP. This study is the first to discuss the joint effect of TO, FDI, and competitiveness on the economic growth and has certain policy implications.

Keywords: China, FDI, Trade Openness, Competitiveness, GDP, Manufacturing, Autarkic

INTRODUCTION
China is a great industrial power because of its large size, unusual market structures, and unique institutional arrangements. It witnessed a rapid economic development, especially in its industrial sector, in the last three decades. The Chinese Industry has perceived the dramatic transformation of China from an undeveloped agrarian country to a giant industrial country and a worldwide trading powerhouse (Wen, 2016). The call from the G-30 Advisory Group for a new membership that gives more attention to the emerging economies such as that of China is a
sign of how important China has become among the developed countries (Lawder.D, & Bugg.A, 2009).

China’s industrial development is a result of many factors such as low-wage labour market, structural reforms, and strategies to implement higher growth (Javier Silva Reute, 2006). In addition to these factors, competitiveness, trade openness, technological development, and foreign direct investment have helped to propel China’s industrial sector (Investopedia).

The first indicator analysed is Trade Openness, it is defined as the sum of exports and imports of goods and services measured as a percentage of gross domestic product (GDP) (OECD.STATEXTRACTS). The second indicator is Foreign Direct Investment; FDI is the value of inflow and outflow of investment as a percentage of GDP (World Bank). The third indicator is Competitiveness, according to OECD. STAT EXTRACTS it is “the degree to which a country can, under free and fair market conditions, produce goods and services which meet the test of international markets while simultaneously maintaining and expanding the real income of its people over the long term”.

This study will mainly concentrate on the following three factors that have led to this industrial boom: Trade openness (Imports, Exports/GDP), Competitiveness represented by the IT competitiveness index and the Foreign Direct Investment (inflows and outflows of foreign direct investment. The motivation behind this study is to investigate the joint effect of the independent variables on GDP.

It is important to recognize that trade openness has helped in increasing the trade of goods and services and the acceleration of technology transformation. Trade openness can be expressed via different indices such as Import + Export)/GDP and Import/GDP (2009 KOF Index of Globalization: Definition and services). In this report, the first index analysed by Li and Zhang (2008) states that Trade Openness has improved China’s industrial development in three aspects. The first aspect is the international specialization which means that each country produces the goods that it has comparative advantage in producing which will allow the country to attain more additional goods by only domestic production. The second aspect is the aggregated demand. Since exports are a part of the aggregate demand, any increase in the aggregate demand will boost the national output of the country. The third aspect is modern technology and methods of management brought by the free trade which have increased the productivity in China.

According to Subramanian (2003), FDI plays a colossal role in global business by providing firms with new markets and marketing channels, access to new technologies, cheaper production facilities, skills, products and financing. In addition, the host country or the firm
receiving the investment will be provided with a source of new technologies, capital, products, processes, organizational technologies and management skills, which in return could provide a strong force for economic development.

Garelli (2002) points out that most of the competitive advantage today is done through taxes and subsidies. He also states that the classical evaluation of competitive advantages takes into consideration the factors of production: land, capital, natural resources and labor. Ricardo spoke about this but eventually discovered that it is not sufficient to base the study of competition only on these factors alone.

Therefore, the main aim of this study is to highlight the impact of these factors on China’s GDP. It concentrates mainly on the manufacturing development characterized by GDP as China has moved from an agricultural country with a closed autarkic economy to a huge industrial powerhouse in the world. China has become the main manufacturer and exporter of industrial goods mostly to all developed countries. A justification will be provided at the end, showing the connection between the methodology and the following research question:

*What is the impact of Foreign Direct Investment, Trade Openness and Competition on China’s economic growth characterized by GDP?*

The contributions of this study are as follows: first, the study analyse the background of the Chinese economy. Secondly, this study analyses for the first time the joint effect of TO, FDI, and COMP on China’s manufacturing development. Thirdly, the study analysed this relationship using multiple regression analysis, heteroskedasticity and autocorrelation through White and Breush–Godfrey tests.

The study is organized as follows: prior the introduction is section 2; i.e. the literature review. This section is both theoretical and empirical proof of the impact of Trade Openness, FDI, and Competitiveness on GDP. The third section is the methodology and data for the model of the study. The fourth section shows and analyses the empirical results of the diagnostic test and the coefficients. The final section is the conclusion of the study and policy implications.

**LITERATURE REVIEW**

Since 1978, before the economic reform, China has encouraged trade openness and moved from the position of being the world’s greatest rival of globalization into a huge supporter. Chow (2005) states that trade openness increased the total volume of China’s exports and imports from 20.64 billion US dollars in 1978 to 620.8 billion dollars in 2002 which is equivalent to 65% of GDP, growing at a rate of approximately 35% a year. The volume of exports and imports reached the level of 1.1 trillion US dollars in the year 2004 which is equivalent to a GDP rate of
30%. According to Chow, the average of the life expectancy reached 71.8 years in 2002, and 200 million people and more were lifted out of poverty. By 2005, China was the 6th largest economy in the world. China’s customs administrations announced that the volume of exports and imports jumped to 3.87 trillion US dollars in 2012.

China joined the World Trade Organization (WTO) in 2001 and became the 143rd member. That membership obliged China to lower its tariffs on manufacturing and agricultural goods. The decline in tariffs increased the competition for the Chinese manufacturers and led to cheaper products for the Chinese consumers. Jiabao (2011) entitled that China in the year 2011 scored the following remarkable achievements after the WTO accession:

1. 2nd largest economy in GDP terms
2. 1st largest merchandise exporter
3. 2nd largest merchandise importer
4. 4th largest commercial services exporter
5. 3rd largest commercial services importer

China’s trade openness (globalization) success has influenced its surrounding neighbours; especially India that learned from the Chinese case of a more open and free economy. Balkrishan (2004) mentioned that India had opened up and adopted globalization in the early nineties. That new policy led to a more open and market oriented economy. He also stated that India reduced the tariff rate sharply from a weighted average of 72.5% in 1992 to 35.1% in 2002. As a result, India’s GDP growth rate stepped up due to its domestic economy liberalization, it picked up from 5.6% in 1991 to a peak of 70% in 2004. A Global comparison shows that India is now the fastest growing economy just after China.

An empirical study was performed to show the direct relationship between trade openness and economic growth. The trade openness of Malaysia increased its economy to reach the 29th largest economy in the world by Purchasing Power Parity (PPP) in 2007 with an estimated GDP of $357.9 billion (World Bank). “The boom in the economy went uninterrupted from 1988 to 1996 when the economy grew between 7 and 10 % per annum. The main source of growth was the openness of the manufacturing sector whose share of GDP increased to 31.4% in 2005” (Ministry of Finance, 2006).

Moghaddam and Redzuan (2012) investigated the effect of Globalization indicators on GDP growth in Brazil, China, India, Turkey, Malaysia, Singapore, and Iran for the period 1980 to 2010, using time series data. They used quantitative and empirical observation. For Brazil, the value of exports had increased from 36$ billion to 366$ Billion, and imports rose from 42$ billion
to 326$ billion. The remarkable growth in merchandise trade led to a GDP increase from 191$ billion to 2061 billion. As for China, the value of exports increased from 7$ billion to 633 $ billion, and imports rose from 8$ billion to 619 $ billion, leading to an increase in GDP from 306$ billion to 5871$ billion. The performance of the Merchandise Trade of the above mentioned countries had an impressive and direct effect on GDP; the independent variables are correlated. The KOF index of globalization was introduced by Dreher in 2006 to study the effect of globalization on growth with an unbalanced panel data of 123 countries from 1970 – 2000. The result showed that globalization stimulates economic growth. Rao and Vadlamannati (2011) supported the claim of Dreher and made a study to examine the effect of KOF on economic growth. They used a panel data for 21 African countries from 1970-2005. The result assured the positive effect of globalization on economic growth. Moreover, it showed that the effect of globalization on economic growth is higher than the effect of domestic investment on growth.

It is important to analyse and formulate a relation between competitiveness and the industry. The IT industry competitive index is seen as an indicator for economic growth and the level of technological development that a nation is experiencing. China’s IT index is 39.8 which show a technological development. It moved from being the 50th rank in 2008 to the 38th in 2011 (Xavier, 2015). During the earlier years till around 2002, China was known for its low labor wages. That fact increased the labor intensive products (or labor intensive process for technology intensive products). Thus, it increased the demand for labor. The labor intensive products were the main source for competitiveness in the nation. China was also depending on the agriculture sector; whereas it was interested in labor more than productivity, the reason for having an undeveloped industrial sector. China showed a huge increase in its energy and technology sector. Most of China’s industrial products and technologies were shipped to foreign markets where they were sold in much lower prices. That fact in addition to cheap raw materials enabled China to dominate foreign markets and increase its competitiveness, thus making it one of the most important trading countries in the world. In addition to that, the Chinese R&D environment had increased by 20% a year over the past five years which is a service firm providing environmental remediation services, emergency response, oil spill response and consulting services. It tells the clients about what are the most practical technological services to recover the environment (The Economist, September 23rd, 2006, p. 43).

The UNIDO organization made a study about the relation between competitiveness and industrial development in India. It stated that "the liberalization of the economy has opened new windows of opportunity for the manufacturing sector. Increasingly, the success of India’s manufacturing industry depends on competition, research, and development" (UNIDO). It is critical not only to remain competitive but also gain significant advantages by developing and
commercializing new technologies. High quality human resources are a main determinant for a country’s competition advantage. India had a very high quality of engineers and human resources that gave her a huge competitive advantage, and it scored the 4th in the world in its availability of scientists and engineers.

The impact of China’s competitive trade on both the developing and developed economies is an important policy question and has recently received significant academic attention. Autor et al. (2011) analysed the labor market outcomes in the US in response to the Chinese competition and quantified significant employment loss in the manufacturing sector. Bugamelli et al. (2010) tested the pro-competitive effects of Chinese imports on Italian firms, finding a significant effect.

Moreover, Padilla and Juarez (2007) stated that in Latin America countries whose economies are increasingly open and integrating into global production chains, improved competitiveness is essential to the attainment of greater economic and social development. In order to assess the impact of training on manufacturing competitiveness, field work was conducted on the electronics industry in Mexico in October 2005. The electronics industry there is the most likely to train its workers. Accordingly, it obtained the highest returns from training in terms of productivity. In addition, it is characterized by rapidly changing technology, which means it must work continuously to develop human capital. Training enhances competitiveness by improving product quality and increasing efficiency (less reworking and fewer product rejections), flexibility and the ability to develop innovative products and processes.

Ulku (2004) studied the relationship between R&D and economic growth (R&D based Growth Model), using panel data techniques for 20 OECD countries and 10 non OECD countries from 1981-1997. Using OLS regression, the study showed a positive and significant relationship between R&D, Innovation, and per capita GDP in both OECD and NON OECD countries. It also showed that only the big economies in OECD countries like Australia, Netherlands, Spain, and Switzerland are able to increase their innovation by R&D. Haskel (1991) used UK micro level panel data from 1980-1986 to explore the impact of competition on productivity. He used the quantitative observation method and found a positive impact of competition on total factor productivity. Bourlès et al. (2013) analysed the impact of competition in intermediate goods market on the TFP. The authors used a panel data of “15 OECD countries and twenty industries” from 1985-2007. The industry product market regulation data were used as a proxy for the level of competitive pressure. The study concluded that anticompetitive regulations limited and decreased the TFP. This is proof evidence that competition is a tool to stimulate TFP and productivity. The author suggested eliminating the
anticompetitive regulations in order to increase TFP by 1-1.5% per year. Tang and Wang (2005) used the survey-based approach on a sample of firms in Canada to study the impact of competition on productivity levels. They concluded that the medium sized firms that receive a higher boost of product market competition reach to a high level of productivity. Petersen (2013) studied a sample of 154 countries during the period 1960 to 2007. He analysed the relationship among competition, percentage change in GDP per capita, and economic development using the panel data model. The study revealed a positive relationship between the variables.

Moreover, Graham and Spaulding (2004) pointed that FDI is playing a major role in the internationalization of business by reacting to changes in technology, in capital markets, and the growing liberalization of the national regulatory framework that governs investment in enterprises leading to major changes in the size, scope and methods of FDI. The most significant medium for FDI’s great role includes the change in investment and trade policies, tariff liberalization, easing of restrictions, and the privatization and deregulation of numerous industries.

Furthermore, foreign investment has helped in promoting the Chinese industrial development. Since 1978, the economic reform has started in China. The policy concerning foreign investment has changed from treating foreign investment as an exploiter to a vehicle in promoting China’s economic development. The amount of foreign direct investment increased from 49.7 to 56.1 billion U.S dollars during the years 2001 to 2003 Chow (2005).

Nowadays China is exporting capital to the less developed countries and to the U.S at the same time. This investment leads to the economic achievement of many countries in Asia and Africa. In 1994, the inflow of FDI rose to 15.1 per cent of domestic gross investment and stayed from 1995 to 1998 at around 13 per cent. In the late 1990s the inflow of FDI was constant at 11 per cent of China’s domestic gross fixed capital formation. But there was an increase in the gross capital formation and the shares of FDI inflows, so the FDI inflows used in fixed capital investment were around 60 to 70 per cent. At that juncture, it showed the inefficiency use of FDI because 30-40 per cent of the foreign investors were used in inventory or as working capital (Main determinants and impacts of foreign direct investment on China’s economy, 2000). By the end of 1995, 9.30 per cent workers were employed in China’s total manufacturing labor force or the FDI employed 8.5 million workers in manufacturing industries in China.

The skill structure of employment in FDI firms in developed countries is similar to these in China. In 1995, 76.66 per cent of total employment of FDI firms is the percentage of workers and apprentices engaged in direct manufacturing in China. The domestic firms have lower level of labour quality in their employment composition than the FDI firms (Main determinants and
impacts of foreign direct investment on China’s economy, 2000). More employees with higher education and university are hired by the FDI firms than domestic firms, especially in technology industries and capital intensive. In addition, fewer employees with year 0 and lower education are hired by FDI firm than domestic firm. Higher salaries, wages, bonuses and non-monetary and monetary fringe benefits are paid in China by the FDI firms. Only for cooking and petroleum refining sector, domestic firm pays higher rate of employee compensation. Moreover, higher labour productivity is recorded by the FDI firms, and they also have higher capital intensity than their local competitors.

The use of export-oriented FDI by China succeeds. Subramanian (2003) stated that China’s impressive export growth during the 1990s was accompanied by a substantial growth in FDI inflows. Less than 9% of total Chinese exports in 1989, the share of foreign affiliates jumped to 48% in 2000, and more than 90% of exports by foreign affiliates were manufactured goods. At the same time, the share of exports by foreign affiliates in technology intensive industries such as electronic circuits and automatic data processing machines rose from 59% in 1996 to 81% in 2000. Nadiri (1993) finds positive and significant effects from US sourced capital on productivity growth of manufacturing industries in France, Germany, Japan and the UK. Also, Borensztein et al. (1998) find a positive influence of FDI flows from industrial countries to developing countries’ industrial growth.

Likewise, Zhang (2001) examined the causality between FDI and economic growth. He used data of 11 countries in East Asia and Latin America. With the support of Granger Causality and Co-integration tests, he concluded that 5 out of 11 cases FDI had enhanced economic growth. In like manner, a study was done by Chowdhury and Mavrotas (2003) to examine the causal relationship between FDI and economic growth in Malaysia and Thailand. They used time series data from 1969 – 2000 with an innovative econometric methodology to study the causality. The result indicated that there was a bi-directional relationship and causality between the two variables.

**METHODOLOGY**

In order to examine the impact of Foreign Direct Investment (FDI), Trade Openness (TO), and Competition on China’s economic growth (GDP), the present research is conducted using multiple regression analysis. The change in GDP is taken as a dependent variable while Trade Openness, FDI, and Competition as independent variables.

The estimated model is as follows:

\[ \log (GDP) = C + \beta_1(FDI) + \beta_2(TO) + \beta_3(IT) + \beta_4(WOP) + \epsilon_t \]
The data set of this research is time series data which consist of 122 observations over the period from 1984 to 2015 (quarterly); whereas, GDP: gross domestic product, FDI: foreign direct investment, TO: trade openness, IT for IT competitiveness index, and WOP for world oil prices. Due to data limitation we limit the scope of the study from 1984 to 2015. For diagnostic purposes White test for heteroskedasticity and Breush-Godfrey for auto correlation were applied.

**ANALYSIS AND RESULTS**

The diagnostic result of heteroskedasticity as shown in (table1) failed to reject the null hypothesis that the variance of the error term is constant which means that the model is heteroskedastic. Moreover, the result of the Breush-Godfrey test failed to reject the null hypothesis of equal variances which means there is an autocorrelation problem in the model.

In order to cure the autocorrelation and heteroskedasticity problems, the Auto Regressive model AR (1) was used. As reported in (table 1), the Durbin Watson showed that there are no autocorrelation and heteroskedasticity in the model. The Autoregressive Model was estimated as follows:

$$\log(GDP) = c + \beta_1(FDI_{t-1}) + \beta_2(TO_{t-1}) + \beta_3(IT_{t-1}) + \beta_4(WOP_{t-1}) + \epsilon_t$$

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<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Probability</th>
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<tbody>
<tr>
<td>C</td>
<td>-0.089350</td>
<td>0.0004*</td>
</tr>
<tr>
<td>FDI(-1)</td>
<td>0.014087</td>
<td>0.0038*</td>
</tr>
<tr>
<td>TO(-1)</td>
<td>0.056165</td>
<td>0.0037*</td>
</tr>
<tr>
<td>WOP(-1)</td>
<td>-0.069757</td>
<td>0.8379*</td>
</tr>
<tr>
<td>IT(-1)</td>
<td>0.001822</td>
<td>0.0355*</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.756207</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.745699</td>
<td></td>
</tr>
<tr>
<td>Durbin Watson</td>
<td>1.918539</td>
<td></td>
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<tr>
<td>N</td>
<td>122</td>
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<tr>
<th>Diagnostic Tests</th>
<th>Probability</th>
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<tr>
<td>Breush-Godfrey Auto Correlation</td>
<td>P-Value 0.011761</td>
</tr>
<tr>
<td></td>
<td>F-test: 4.108065</td>
</tr>
<tr>
<td>White Heteroskedasticity</td>
<td>P-Value 0.020794</td>
</tr>
<tr>
<td></td>
<td>F-Test: 3.230861</td>
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Note: * denotes significant level at 5%
As shown in Table 1, the empirical results revealed a positive and significant relationship between FDI and GDP in China; 1% increase in FDI causes a 0.014087% increase in GDP. This finding is consistent with Subramanian (2003) who stated that China’s impressive growth during the 1990’s was accompanied by a substantial growth in FDI inflows. Moreover this result match with Har et al. (2008) who found that FDI has positive direct impact on RGDP, When FDI rate increase by 1%; this will lead to a growth rate increase of 0.046072%.

The results also revealed the positive and significant relationship between trade openness and economic growth; 1 % increase in TO causes a 0.056165% increase in GDP. This result goes along with Balkrishan (2004) who mentioned that India had opened up and adopted trade openness in the early 90’s. This new policy increased the GDP from 5.6% in 1991 to 70% in 2004. Decreasing tariff rates and shifting to market oriented economy will lead to an increase in economic growth.

Consisting with Bourlès et al. (2013), the study empirically revealed a positive and significant relationship between competitiveness and GDP; 1% increase in IT competitiveness causes a 0.001822 % increase in GDP. This result is clearly vindicated by analysing the impact of competition in intermediate goods market on TFP and GDP growth. The results showed that anti-competitiveness regulations limited TFP and decreased GDP. Thus eliminating the anti-competitiveness is a tool to stimulate economic growth.

As to world oil prices, it negatively and significantly correlates with economic growth in China; and 1 % increase in WOP causes a 0.069757% decrease in GDP. This result is inconsistent with Faria et al. (2004) who found a positive correlation between China’s economic growth and oil prices. They justified that one of the main motives behind this result is that China’s economic growth is driving the increase in the world oil prices.

The empirical results revealed that the independent variables are jointly significant and explain the economic growth; except for the world oil prices. Trade Openness, FDI, and IT competitiveness have a significant impact on China’s economic growth. The results goes along with Sengupta (1991) and Romano (2015) showing that competition policy and trade openness have a significant and positive contribution to economic growth. Changing tax policies and regulations along with R&D expansion stimulated FDI inflow and increased GDP. The result of the R-Squared is 0.7562; this means that 75.62% of the variance in log (GDP) is explained by the constant C and by the independent variables. The independent variables have a significant and positive impact on the GDP in China; except for the world oil prices. The Durbin Watson test in Table1 revealed that the observations of the independent variables are not serially auto correlated.
CONCLUSION AND POLICY IMPLICATIONS

This study examines the impact of trade openness, FDI, and competition on China’s manufacturing sector. The result of the test shows that the independent variables have a direct significant and positive impact on the manufacturing sector characterized by GDP.

To sum up, China has succeeded in developing the industrial sector within a few years, and the rates of growth in these years are more than expected. The Boom of China’s industrial and manufacturing production will be likely to increase. In all, the economy of the world for each “up” there is a “down”, and the high rate of GDP has made China one of the most important competitors of the US in a certain period of the economic history.

We suggest that China should soothe tariff rates, facilitate the process to obtain a trade license, and remove requirements for the legalization of trade documents. Moreover, China should decrease the number of goods subjected to import quotas, expand the number of Chinese enterprises with trading rights and the products they could import, and increase the transparency of its licensing procedures. In certain cases, China imposes foreign equity limitations or other discriminatory measures on foreign suppliers. High minimum capital requirements plague other sectors. China also sometimes applies overly burdensome regulatory regimes or other restrictions. These restrictions should be reduced in order to encourage foreign investors. At the HR-Management level, constraints need to be treated. The education curriculum in the engineering departments needs to be oriented from theoretical to critical and practical thinking. On the one hand, fresh graduates mismatch the criteria of the recruiting domestic/international companies, and on the other hand these companies are seeking fresh graduates with practical experience in the real markets which China’s fresh graduates do not have.

The skilled executives in China are favouring to apply to MNC rather than domestic companies. This, in fact, leads to a gap in professional executives applying to the domestic companies. The domestic of international Chinese companies must increase the benefits of the package offered to the executives in order to attract the skilled labor.

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