# Influence of China's trade imbalance on economy in the background of great nation

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#### Abstract

The developed countries have been accusing China for its trade surplus for a long time. In order to verify the influence of trade imbalance on the economy, our research applied techniques like error correction function, Granger test and impulse response function. The research outcomes manifest that: the influence of trade imbalance on the economy is not significant. On the contrary, the economy imposes certain impact on trade imbalance. Both imports and exports significantly promote the development of economy. Furthermore, imports remarkably facilitate exports. This can also be attributed as the reason of China's trade deficit before 1992.

Keywords: great nation, trade imbalance, error correction model

#### 1 Introduction

Since the implementation of the reform and opening up policy, China has witnessed rapid economic growth based on the constant introduction of international technology, talent and knowledge as well as the continuous output of Chinese talents and products. Therefore, trades have imposed monumentally positive impact on the economy of China. However, since 1994, China has maintained the trade surplus, which is constantly enhanced. To 2012, the trade surplus of China reached 1455.829 billion Yuan, accounting for 5.96% of total volume of imports and exports, and 12.68% of the gross exports. Many developed countries consider that the long-term trade surplus is the root reason of the rapid growth of China's economy, and it also generates adverse effects on the economy of other countries, such as the investment and employment of some regions and the development rate of regional economy. As a result, years of trade surplus in China have triggered an increasing amount of trade disputes. Domestically, many point out that the long-term trade surplus is highly harmful for China, a country with extremely limited per capita hold of resources. Besides, trade surplus may lead to the massive brain drain and resource loss of China, thus harming the future development of China. Our research, however, attributes the root cause of trade surplus and deficit to the development pattern of the world economy, and both surplus and deficit are to serve the regional economic development, thus showing more benefits than harms for regional economic development. From 1978 when China adopted the reform and opening-up policy to 1992, China maintained a long period of trade deficit. During this period, China primarily introduced technology, equipment and talent in the country.

Meanwhile, the output was very limited. This situation was determined by the position of China in the then international configuration.

#### 2 Relevant theories and research

Many scholars believe that the serious trade imbalance seriously influences the economy of China. However, most studies in China focus on the influencing factors and improvement measures of trade imbalance. Research on the specific influence of trade imbalance on the economy was highly limited. Lihua Lang (2006) explored into the influence of trade imbalance between China and U.S.A, indicating that trade imbalance would lead to trade conflicts and trade conflicts would inevitably influence the economy [1]. Jianqiang Wu (2009) pointed out that the continuing expansion of trade surplus in China would eventually bring about the prominence of negative influences [2]. For example, the increased degree of dependence upon foreign trade weakens the independence of China's economy; Appreciation of the Yuan will enhance the deterioration of the independence of China's monetary policy; the trade conflicts between China and the rest of the world are enhanced. Yanling Wu (2008) thought that the long-term trade imbalance of China not only intensifies trade conflicts between China and other countries but also enhances China's shielding ability against international financial risks [3]. Specifically, it ensures the stability of China's economy. However, with the development of trade surplus, the economy of China grows to be increasingly dependent on foreign trade, thus influencing the macroscopic readjustment and control of the economy by the Chinese government. Linjuan Jia (2013) researched the influence of global trade imbalance

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on the international economic order, and considered that the trade imbalance is mainly reflected in the long coexistence of trade surplus and deficit between China and U.S.A [4]. This manifests the economic status of developed country and developing country, and the trade imbalance is actually intensified by economic globalization and financial hegemony of U.S.A. A range of studies also analysed the causes of the long-term trade surplus in China. Jianying Chu (2006) analysed reasons of trade surplus between China and U.S.A, considering that trade surplus is not necessarily beneficial and trade deficit is not necessarily harmful [5]. The trade surplus in China is subject to the industrial transfer in East Asia and the advantage of labour cost due to the underdeveloped economic status of China. The trade surplus between China and U.S.A has produced positive influence on American consumers and the national industrial restructuring of China. However, China loses the opportunity of investment due to the substantive counterpart of foreign exchange reserves and foreign exchange reserve, and the government's subsidies to export enterprises are actually indirect subsidies to U.S.A. Wanging Lu (2009) believed that the international division of lab or determines the international trade, and China's status in the international division of labour of products in East Asia generates voluminous trade surplus of the processing industry in China [6]. At present, although the growth rate of imports and exports on year-on-year basis in China has declined drastically due to the global economic crisis, the remarkable foreign trade surplus of China would not change as long as the labour division pattern in East Asia remains unchanged.

Our research indicates that in terms of trade imbalance, trade surplus and deficit would generate negative influence

on China's economic environment but also positively boost the development of the entire economy. Hence, based on data and data analysis, error correction model and impulse response function was used to argue and analyse the influence of trade imbalance on the economy of China. Besides, the essence behind the influence was probed.

#### 3 Empirical research

#### 3.1 VARIABLES AND DATA

In order to identify the relationship between trade imbalance and the economy and highlight characteristics of trade imbalance, our research adopted the trade imbalance rate (MCB). Trade imbalance rate refers to the proportion of trade margin in the total volume of imports and exports. In order to reflect the directionality of trade imbalance, trade margin is obtained by using the gross exports of a region to deduct the gross imports. If the gross exports are larger than gross imports, MCB is a positive value, and vice versa. Regional GDP was used as the regional economy data. Since import proportion (IP), export proportion (EP) and GDP are large time series data, logarithmetics were carried out to heteroscedasticity without changing its linear relationship. Therefore, our research contains four variables: LGDP, import proportion (IP), export proportion (EP) and trade imbalance rate (MCB).

Data in the empirical analysis were obtained from the annual data released by the official website of Statistical Bureau of China. Data from 1978 to 2012 were included. Index data was calculated and shown in Table 1.

TABLE 1 GDP and MCB Data

Year	GDP (a hundred million yuan)	Total Export-Import Volume (a hundred million yuan)	Gross Export (a hundred million yuan)	ЕТО
1978	3645	355	167.6	0.0460
1979	4063	454.6	211.7	0.0521
1980	4546	570	271.2	0.0597
1981	4892	735.3	367.6	0.0751
1982	5323	771.3	413.8	0.0777
1983	5963	860.1	438.3	0.0735
1984	7208	1,201.00	580.5	0.0805
1985	9016	2,066.70	808.9	0.0897
1986	10275	2,580.40	1,082.10	0.1053
1987	12059	3,084.20	1,470.00	0.1219
1988	15043	3,821.80	1,766.70	0.1174
1989	16992	4,155.90	1,956.10	0.1151
1990	18668	5,560.10	2,985.80	0.1599
1991	21782	7,225.80	3,827.10	0.1757
1992	26923	9,119.60	4,676.30	0.1737
1993	35334	11,271.00	5,284.80	0.1496
1994	48198	20,381.90	10,421.80	0.2162
1995	60794	23,499.90	12,451.80	0.2048
1996	71177	24,133.80	12,576.40	0.1767
1997	78973	26,967.20	15,160.70	0.1920
1998	84402	26,849.70	15,223.60	0.1804
1999	89677	29,896.20	16,159.80	0.1802
2000	99215	39,273.20	20,634.40	0.2080
2001	109655	42,183.60	22,024.40	0.2009
2002	120333	51,378.20	26,947.90	0.2239

2003	135823	70,483.50	36,287.90	0.2672
2004	159878	95,539.10	49,103.30	0.3071
2005	184937	116,921.80	62,648.10	0.3388
2006	216314	140,974.00	77,597.20	0.3587
2007	265810	166,863.70	93,563.60	0.3520
2008	314045	179,921.47	100,394.94	0.3197
2009	340903	150,648.06	82,029.69	0.2406
2010	401513	201,722.15	107,022.84	0.2665
2011	473104	236,401.99	123,240.60	0.2605
2012	519470	244,160.21	129,359.25	0.2490

#### 3.2 ERROR CORRECTION MODEL

Firstly, we carried out the unit root test. Test results presented that LGDP and MCB sequences were not stabilized without difference. However, after first order difference, unit roots of sequences were eliminated and sequences were stabilized. Therefore, a co-integration relationship might exist between LGDP and MCB, and the error correction model could be established. Items of error correction were defined first, with LGDP as dependent variable and MCB as independent variables. On this basis, the least squares method was adopted to generate the regression coefficient of 12.5672. Therefore, GENR was used for definition:

$$ECM1 = LGDP(-1) - 12.5672 \cdot MCB(-1)$$
,

$$ECM 2 = LGDP(-1) - 0.7384 \cdot LEP(-1)$$
,

$$ECM3 = LGDP(-1) - 0.7563 \cdot LIP(-1)$$
,

$$ECM4 = LEP(-1) - 1.0243 \cdot LIP(-1)$$
.

Next, with d (LGDP) as dependent variable, ECM and d(MCB), d(LIP) and d(LEP) as independent variables, we

carried out the least square regression. Results are shown in Table 2. According to the results, it can be found that the tailed probability of MCB and GDP exceeded 0.1 significantly. Therefore, MCB and GDP were not correlated. However, the tailed probability of LIP, LEP and GDP was much smaller than 0.01, showing strong correlation. The insignificant correlation between MCB and GDP indicated that the relationship between MCB and economy was not a long-term effect. It might also impose an effect so that could not be reflected in the model under the strong effects of other factors. It also manifested that the promoting or hindering influence of MCB on the economy was limited. LEP was significantly and positively correlated with LGDP, demonstrating that exports promoted the economic growth or economic growth facilitated exports. The significantly positive correlation between LIP and LGDP presented that imports greatly promoted the economic growth or economic growth promoted imports. The significant correlation between imports and exports verified the existence of a positive relationship between imports and exports. Or else, imports were conducive to exports or exports were conducive to imports. The relationship should be further verified through Granger test.

TABLE 2 ECM estimation and relevant test results

No.	Variable	Coefficient	Std. Error	t-Statistic	Prob.	R-squared	Adjusted R-squared
1	D(MCB)	-0.2596	0.1850	-1.4031	0.1705		
	ECM1	0.0080	0.0094	0.8499	0.4019	0.0652	0.0048
	C1	0.0640	0.0977	0.6545	0.5176		
	D(LEP)	0.1835	0.0547	3.3535	0.0021		
2	ECM2	-0.2104	0.0577	-3.6487	0.0010	0.4360	0.3996
	C2	0.9820	0.2391	4.1071	0.0003		
	D(LIP)	0.2208	0.0502	4.3956	0.0001		
3	ECM3	-0.2060	0.0495	-4.1637	0.0002	0.5510	0.5221
	C3	0.8195	0.1728	4.7439	0.0000		
4	D(LIP)	0.8826	0.0660	13.3783	0.0000		
	ECM4	-0.5331	0.1456	-3.6614	0.0009	0.8784	0.8705
	C4	-0.4569	0.1300	-3.5131	0.0014		

#### 3.3 GRANGER TEST

Granger test is a way to measure the causal relationship between variables, and an essential requirement to establish the VAR model and impulse response function. We thus conducted Granger test of LGDP, LIP, LEP and MCB sequences. Through several times of tests, it was found that time-delayed first-order showed the optimal performance. Results are shown in Table 3. According to the table, GDP is the reason of changes in MCB. Besides,

LIP and LEP generate changes in LGDP and LIP is the cause leading to changes in LEP.

According to the error correction model and Granger test, economic growth can give rise to changes in MCB to a certain degree. However, their correlation is not significant so that the specific direction was unable to be determined. In addition, imports and exports positively promoted the economic growth, indicating that any forms of trades impose certain impact on the economy. It is unscientific to simply define trade surplus or trade deficit as a harmful thing. Imports are beneficial to the

domestically technological development, management improvement and to the compensation of domestic disadvantages. For example, China lacks energy resources so that imports of energy are of great importance for the economic development in China compared with other developed countries. Besides, a country can participate in the international competition through imports and exports, which could improve the social division of labour and reflect the comparative advantage of a region, such as the advantageous labour power in China and the advantageous biotechnology of U.S.A. Meanwhile, imports greatly promote exports, which can be attributed to the highly limited productivity of each country or region. When a region does not produce one kind of products, the production of another kind of products will be enhanced, thus leading to the maintenance or increase of the productivity in the entire region. This reflects the theory of comparative advantage and the theory of social division of labour in a region. Furthermore, imports of excellent technologies and equipment remarkably promote the development of regional productivity, as well as the growth of imports and exports to a certain extent.

TABLE 3 Granger test results of LGDP, LIP, LEP and MCB

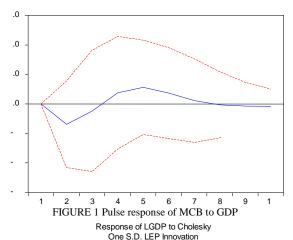
Null Hypothesis:	F-Statistic	Prob.
LGDP does not Granger Cause MCB	3.6383	0.0658
MCB does not Granger Cause LGDP	0.8026	0.3772
LGDP does not Granger Cause LIP	0.1381	0.7127
LIP does not Granger Cause LGDP	11.5369	0.0019
LEP does not Granger Cause LIP	1.5909	0.2166
LIP does not Granger Cause LEP	6.8796	0.0134
LEP does not Granger Cause LGDP	9.3653	0.0045
LGDP does not Granger Cause LEP	0.0011	0.9736

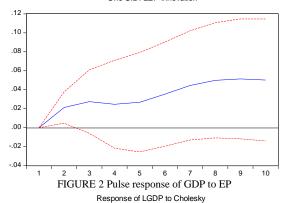
#### 3.4 IMPULSE RESPONSE FUNCTION

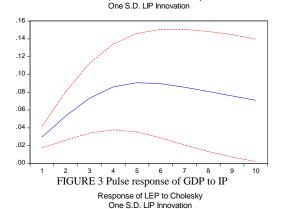
Based on results of Granger test, the VAR model and a diagram of impulse response function were established, as shown in Figure 1-4.

According to Figure 1, the impact of economic growth on MCB is very complex, and the complexity negatively influences the model accuracy. In the figure, when an impact is imposed on GDP, its effects on MCB are not immediate but decreasing first, rising and then reducing to zero. We assumed that MCB is a positive value at first. In other words, when the volume of exports is larger than that of imports, the economic growth would reduce the gap between exports and imports, and then expand the gap. Eventually, effects of the economic growth would gradually disappear. The time limit of the effects is approximately 7 years. It can be seen from Figure 2 that exports could dramatically drive the economic growth. The effects are not formed suddenly but increased gradually. In Figure 3, firstly, effects of imports on economic growth commence at a high level, and keep enhancing until reaching the maximum value, and then gradually decrease, showing a tendency of returning to zero. This pattern indicates that effects of imports cannot last long as effects of exports. According to Figure 4,

effects of imports on exports also commence at a high level, and remarkably and positively promote exports. However, the effects would gradually decrease, showing a trend of returning to zero.







.20 - .16 - .04 - .00 - .04 - .00 FIGURE 4 Pulse response of EP to IP

#### 4 Analysis of empirical findings

#### 4.1 RELATIONSHIP BETWEEN GROWTH AND MCB

Empirical findings verified that the impact of trade imbalance on economic growth is highly limited, which cannot be proved based on analytic demonstration through error correction model, Granger test and impulse response functions. This indicated that it is useless for any country to rely on trade surplus to promote the economic growth. Besides, the accusation of China's adoption of trade surplus for high-speed economic development made by developed countries is not scientifically justified. Contrarily, economic growth influences MCB, showing a pattern of decreasing first, followed by rising. This demonstrates that MCB is correlated with the status of economic development. With the rapid development of China's economy and the increase of productivity, trade surplus has become a trend. At the initial stage of the economic development in developed countries, the trade surplus was remarkable. However, due to the currently constrained rate of economic development, the duration of effects of economic growth on MCB is also limited. Meanwhile, developing countries develop rapidly, leading to a change in the direction of trade imbalance. To this end, trade surplus is a trend of economic development, rather than a means of achieving economic growth by developing countries. With the comprehensive analysis, the status of trade imbalance is determined by the following aspects.

First of all, it is affected by the international economic division of labour. For the trade condition of a country, factors that dominated the trade condition, such as outputs or inputs of technology, equipment, capitals, resources and talents are subject to the international economic division of labour. If a region has abundant resources like rare earth, the region will inevitably output rare earth. Similarly, if a region has rich capitals, in addition to domestic investment, the capital would be substantially exported to other countries. Contrarily, if a region lacks technology, imports of technology would dominate the region. If a region lacks capitals, foreign capital will be imported to the region. Under such circumstances, the international economic division of labour is formed, which determines the trade pattern. For example, when capital is scarce and resources are abundant in a country, international capitals will be imported and resources are applied to make products. In this way, the product exports exceed imports, forming trade surplus.

Secondly, it is affected by the status of region in the arena of international economy. According to the trade imbalance process of China, at the initial stage of implementing the reform and opening-up policy, this economically underdeveloped country primarily imported international technology, equipment, talent and capital, with less exports. On this basis, the situation of trade deficit was formed. With the economic development, a wide range of international technology, equipment, talent and capital have been introduced into China and become

relatively saturated. Exports of products manufactured by these techniques and equipment changed the status of trade and formed trade surplus.

Thirdly, advantages and disadvantages of a region are relative to the control country. For two countries, the status of trade imbalance should be determined by advantages and disadvantages of two countries. Therefore, for China and U.S.A, the advantage of labour force in China is very obvious, so is the disadvantage of technology, equipment and other factors in China. To this end, China primarily exported talents and products, while U.S.A focusing on exports of technology and equipment. Moreover, the labor force in China is highly abundant compared with the limited exports of technology and equipment in U.S.A, thus forming a long period of trade surplus.

## 4.2 RELATIONSHIP BETWEEN IMPORTS AND ECONOMIC GROWTH

Trade imbalance has little impact on economic growth, but imports and exports positively promote the economic development, indicating that the influence of imports or exports on the economy is monumental. This also points out that both imports and exports remarkably promote the economic development. It is unscientific to adopt strategies and views about the promoting role of larger volume of imports or exports in promoting the economic development. According to the respective impact of imports and exports on the economic development, imports often impose a greater impact on the economy at the initial stage but exports' influence on the economy last longer. In general, the influence should be balanced. For China, the country remained a state of trade deficit at the beginning of implementing the reform and opening policy. This trend is conducive to improving the technological level of China, level of productivity and promoting the development. With the economic technological advancement and increased productivity, effects of exports would continue, thus gradually enhancing the exports. On this basis, the influencing trend of imports and exports on the economy can be verified. With the rapid economic development, the dependency of a region on imports of advanced technology and designs decreases, gradually reaching the advanced level. At this moment, imports cannot further improve the level of productivity. The constrained rate of productivity increases also leads to the limitation of exports, thus altering the trade tendency. To this end, with the slowdown of the economic growth rate in China, exports may be constrained and the development tendency of trades may be altered, making China a country with trade deficit. Hence, China should gradually expand the domestic demand to relieve the trade crisis. Therefore, both imports and exports positively promote the economy. This is attributed to the following aspects:

First of all, imports can supplement the inadequate aspects of a region. At the beginning of implementing China's reform and opening up policy, the county was faced with insufficient productivity, technology,

equipment and capital. Therefore, at that moment, China primarily imported the above mentioned elements. Even now, China still faces the problem of insufficient capital and technology. Therefore, China needs to purchase or import the advanced production technologies from other countries at a frequent basis.

Secondly, imports are beneficial to promoting the renewal of regional technology. For one thing, imports of advanced technology and equipment could improve the level of productivity in China. For another, imports of foreign products could promote both domestic products and foreign products, thus facilitating the technological upgrades of Chinese enterprises.

Thirdly, exports are the redistribution of regional resources. If a region has abundant capitals, exports of capital could redistribute the regional capitals. If a region has rich labour resources, talents can be exported to realize the redistribution of labour power. If a region has sufficient material resources, the region can adopt exports of material exports, thus realizing the redistribution of material resources. The redistribution of material resources can improve the utilization efficiency of resources and the rapid development of regional economy.

## 4.3 RELATIONSHIP BETWEEN EXPORTS AND EXPORTS AND IMPORTS

According to the empirical analysis, imports positively promote exports, yet showing a gradual decreasing influence. For China, the initial imports were conducive to the technological advancement. Besides, the introduction of advanced equipment improved the then level of productivity, thus promoting the economic growth of China. For example, the manufacturing industry in China was a primary industry for exports, and its initial equipment and production technologies were imported. However, exports could not influence imports. Thus, the unidirectional relationship between imports and exports demonstrates the importance of imports. Thus, the initial trade deficit in China was a key process for the later economic growth at a fast pace. When a region maintains trade deficit for a long period, the economic development is hindered to a certain extent because of an insufficient imports of technology and a focus on exports of products. At this moment, if the technological innovation of the region is not effective, the economic development will be confined. This can be attributed to one of the reasons for the gradual slowdown of the current economic growth rate in China. Hence, the view held by developed countries on China's benefiting from trade surplus is not supported by scientific proofs. The trade surplus of China primarily originates from the insufficiency in technological innovation, imports of technology, and exports of cheap products from the manufacturing industry. As a result, the long-term trade surplus is harmful for the economic development of China. Specifically, the relationship between imports and exports is mainly caused by the following aspects:

Firstly, imports for insufficiencies. From a microscopic perspective, the purchasing choice between domestic technology and foreign technology made by an enterprise is subject to price as well as the comparison between domestic and foreign technologies. In other words, if the domestic technologies are equivalent or slightly inferior to foreign technologies, an enterprise would give the priority of purchases to domestic technologies. From the macroscopic aspect, insufficiencies are the principal drive of imports. If a region has insufficiencies in product imports, imports of technologies and talents could compensate for the insufficiencies, thus promoting the rapid economic development.

Secondly, exports for surplus. According to the exporting status of China, most exported products are abundant commodities in China. In other words, under general circumstances, products of a region should satisfy the needs of the region. Under the premise of satisfying the domestic needs, products would be exported to foreign markets.

Thirdly, the regional macro-control cannot ensure the completely clear trade passage. With the traffic development, gaps of prices between domestic products would be narrowed and the market is greatly intervened by the macro-control of other countries. For one thing, a country needs to protect the domestic products to a certain extent. For another, the exports of domestically insufficient resources need to be prevented so as to avoid the influence on civil life and economic development of the region.

#### 5 Policy suggestions

According to the above analysis, it can be found that the influence of trade imbalance on the economy is limited, and the long-term trade surplus reflects the insufficiency of technological innovation in China. This insufficiency partly originates from the insufficient imports of advanced technologies from other countries and partly stems from the limited technological reform of China. Moreover, with the economic development, the tendency of foreign trade in China would gradually change from trade surplus to trade deficit. On this basis, in order to promote the economic development, the government may proceed from two aspects:

Firstly, vigorously promoting domestic demand and easing trade conflicts. This measure is proposed based on three factors. Firstly, in a recessing concept of great nation, the long-term trade surplus will cause remarkable trade conflicts and hinder the economic development; Secondly, with the decreasing rate of China's economic development, the altering of trade tendency becomes an inevitable outcome. Since the reliance on foreign trade would lead to altered process of the economic development. However, the promotion of domestic demands can reduce the reliance on other countries, thus eliminating the influence of the alteration on the economy.

Secondly, highlighting the increase of productivity and changing the currently embarrassing trade situation. In recent years, developed countries have been accusing the commodity dump of China. This is mainly attributed the concentration of China's exports on labour-intensive manufacturing industries. At present, exports in China also depend on the advantage of labour force, which is gradually diminishing. To change the situation, the productivity of China should be improved. To realize the goal, China needs to enhance the domestic innovation and imports of advanced technology and equipment. Nowadays, China primarily exports products at a low level of productive forces. Under this context, profit margin is low and the resource protection in China may be undermined. Furthermore, China cannot obtain the competitive edge in trades, and more significant trade conflicts may be generated.

Thirdly, enhance communications with other countries. All countries should pursue the true nature of trade imbalance, and China needs to clarify the view on trade imbalance. International laws and regulations should be applied to protect the legal rights and interests in trades between China and other countries. In this way, China can avoid influence and harms on legal trade freedom and economic development of China from sophism of other countries. Some developed countries attribute the long-term trade surplus as an intentional measure of China, and jeopardize the smooth trades of China by anti-dump cases. To this end, China should adopt reasonable and legal measures to protect the normalization of trades with other countries.

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