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THE INFLUENCE OF LABOR INTENSIVE EXPORT ON CHINA'S ECONOMY GROWTH

Emmanuel Olusegun Stober

EDITURA
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Department of International Economics and Business

Bucharest University of Economic Studies

Piata Romana 6, 010374 Bucuresti, Romania

Emmanuel Olusegun Stober

Doctoral candidate, Institute of Doctoral Studies

Faculty of Economics and International Business

Bucharest University of Economic Studies

tel: +40734280310

email: stober.emmanuel@gmail.com

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Abstract

This paper examines the sources of China's economic growth, emphasizing the role of factor endowment. After evaluating the determinants of gross domestic product growth, it goes further to decompose the total export with Cobb–Douglas production function, which revealed increasing return to scale of 0.75 for labor intensive exports and 0.31 capital intensive exports. Revealed comparative advantage results reported that labor intensive export exerts a major impact on China's development. They claim that margins for these goods are large. Thus, a drop in export arising from decrease in labor intensive export will cause a gap in China's gross domestic product.

Keyword: Factor endowment, GDP growth, Labor intensive export, Revealed Comparative Advantage, China's economic development.

1. INTRODUCTION

Since China opened its door to the world in 1978, it has not only been the world's fastest growing large economy, but also an outstanding exporter and a large recipient of foreign direct investment (FDI). It has emerged as a world "workshop", and has experienced remarkable export growth, averaging 14.4% per annual from 1978 to 2010, far higher than the world average of 8.7% of the same period[1]. Its share in total world exports grew from 0.78% in 1978 to 10.4% in 2010, and the export growth of Chinese manufactured goods was 19.2% on average during 1991–2009. The share of manufactured goods in total exports increased from 50% in 1979 to 95% in 2009 (China statistic yearbook 2010). Changjun Yue, Ping Hua (2002) found that export growth rates varied tremendously among provinces; for example, annual real export growth in the period from 1990 to 1998 ranged from 60.4% in Xinjiang province down to only 2% in Heilongjiang province. Manufactured goods' export growth for these two regions averaged 78.3% and 7.6%, respectively, over the same period. This transformation in export arrangements appears to be consistent with a shift in exports toward a pattern more harmonious with comparative advantage based on China's factor endowments. China's trade balance deficit of $1.176 billion in 1978, became surplus of $5.369 billion in 1994, peaked at $297.04 billion in 2008 and then slows down to $183.58 billion in 2010, and still remain 2nd in ranking after Germany (see Inward and outward FDI flows, UNCTAD, 1970-2012).

China's inflow of foreign direct investment also increases at an impressive annual average growth rate of 23.5% from 1984 to 2010 (55% in 1984 to 11.3% 2010), making China the 3rd largest FDI recipient in the world after United State and United Kingdom and also the largest among developing countries, with US$80,000 in 1979 to US$105.7 billion 2010[2]. (UNCTAD, 2010)

1.1. Objective

This paper intends to examine China's competitiveness in labor intensive export and its capacity as a tool to foster or sustain economy development. The root of the analysis is Chinese huge labor endowment and its cheap labor cost.

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1 Export values are the current value of exports (f.o.b.) converted to U.S. dollars and expressed as a percentage of the average for the base period (2000). UNCTAD's export value indexes are reported for most economies. For selected economies for which UNCTAD does not publish data, the export value indexes are derived from export volume indexes (line 72) and corresponding unit value indexes of exports (line 74) in the IMF's International Financial Statistics.

2 FDI inflow comprises capital provided (either directly or through other related enterprises) by a foreigner or body and it is calculated using US Dollars at current prices and current exchange rates.

1.2. Research Questions

In order to ascertain the importance of labor intensive export and its role on Chinese development; below questions will have to be considered.

1. Why is trade important to China's development?
2. Does comparative advantage explains China's export patterns?
3. Can current growth continue?
4. Could China still rely on its physical capital effectively?
5. Could China benefit more open trade?
6. What are the main policy challenges?

1.3. Significance

The growing reputation of Chinese economy has attracted numerous studies both at home and abroad about its economic reforms and on its role in the global economy. Yanling Wang (2005) examines China's cheap labor and its export capacity from 1978-2003 in term of balance of trade while Rumbaugh and Blancher (2004) analyze China's impact on trade pattern both in the world market and in the Asian regional market. Martin and Manole (2004) examine the transformation of China's exports relative to those of India and other low-income exporters. Mastel (1997) used the title "The Rise of the Chinese Economy—The Middle Kingdom Emerges" for his book and he argued why China should be brought into the world economy.

Though there are multiple studies about the raising influence of China in the world economy and its Gross Domestic Product (GDP) growth rate, very few which include Yanling Wang (2008), Akiko Tamura, Peng Xu (2007) and Deb Kusum Das, Gunajit Kalita (2009) have attempted to analyze China's competitiveness in terms of labor intensive export and if this is the most suitable pattern of trade for China with the highest impact on the GDP.

1.4. Scope and Limitations

The scope of this work is both qualitative and quantitative. The qualitative aspect will be the meta-analysis of causality correlation in determining the orders of integration of the variables and then offer an economic interpretation to the findings. A limitation of the quantitative approach for the Revealed comparative advantage (RCA) will be limited to 16 years (1995-2010) instead of the intended 21 years (1989-2009) due to the availability data; nonetheless the GDP and Cobb-Douglas Growth Accounting for export output will be analyzed for 21 years (1989-2009).

2. LITERATURE REVIEW

2.1 Theoretical Framework

Neo-classical theorists argue that discrimination is impossible in a competitive market economy; Any firm or individual with a 'taste for discrimination' will be driven out of business by lower cost competitors who employ trade and produce according with the criteria of profit and productivity maximization. By this logic, free markets and free trade will allow a developing country to exploit a comparative advantage in labor intensive manufacturing and agro-processing. Thus, China's large endowments of factor abundance will not only be shaping its trade pattern and export capacity but its absolute advantage in labor cost makes, its labor- intensive goods very competitive in the world market and driving down prices, which also make China a favorable destination for FDI.

The concept of growth as increased stocks of capital goods was classified as the Solow-Swan Growth Model, which elaborates a series of equations that shows the relationship between labor-time, capital goods, output and investment. This model assumes that countries use their resources efficiently and that there are diminishing returns to capital and labor increases. From these two grounds, the Neoclassical Model makes three vital estimates. First, increasing capital relative to labor creates economic growth, since people can be more productive given more capital. Second, poor countries with less capital per person will grow more rapidly because each investment in capital will produce a higher return than in rich countries with abundant capital. Third, because of diminishing returns to capital, a country's economies will eventually reach a point at which an increase in capital will no longer create economic growth. This point is known as a "steady state". The development of steady state economics is a response to the observation that economic growth has limits. The growth in terms of a modern state economy is an increase in the production and consumption of goods and services. Classical economists like Adam Smith to present-day ecological economists have considered a transition from a growing economy to a stable one.

In setting out to explain the pattern of international trade by reference to inter-industry differences in factor intensities and inter-country differences in factor endowments, the Heckscher-Ohlin Theory (H-O) postulates the existence of a well-defined correlation among trade flows, factor intensities and factor endowments. Leamer (1984, p. 49) correctly notes that "the way to measure the accuracy of the theory is to obtain direct and independent measures of all three concepts." Branson et al (1977) and Baldwin (1971 and 1979) analyzed the structure of United State (U.S.) trade with respect to inter-industry variations in net exports and sectorial factor use and verified the factors underlying U.S. comparative advantage and found that capital is only marginally significant (and negative) in its effect on trade flows[3]

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3 Baldwin, Robert (1979) did estimate a single equation based on sales of U.S. foreign affiliates in Latin America which included

Rather than presenting all three elements of H-O theory in their empirical investigations, Branson, William H (1973), Stern et al (1976), Stern and Maskus (1981), Keith E. Maskus (1983) and Urata, Shujiro (1983), focused on the relative factor endowment of a country vis-à-vis the rest of the world from the factor intensity of its trade which shows the relevance of human capital for an explanation of international trade patterns. Nevertheless, following Leamer, et al (1981), Aw and Bee-Yan (1983) proved that inferences about relative factor abundance from cross-section results obtained for the trade of a particular country cannot be made, unless very stringent condition are met. The principle of comparative advantage developed by David Ricardo arises from differences in technology and in factor proportions. It was originally developed to explain the underlying reasons for international trade and to predict the trade pattern resulting from changes in factor endowments. According to this principle, a country should export the products that use its relatively abundant factor intensively and import the goods that use its relatively scarce factor intensively. H-O didn't require production technology to vary between countries, so (in the interests of simplicity) the H-O model has identical production technology everywhere. Ricardo however considered a single factor of production (labor) and could not have been capable of producing comparative advantage without technological differences between countries (all nations would become autarkic at various stages of development, with no reason to trade with each other). The H-O model did not consider technology variations. However it introduced variable capital endowments, thus recreating endogenously the inter-country variation of labor productivity that Ricardo had imposed exogenously. As a labor-abundant developing country, China appears to have a comparative advantage in labor-intensive products and thus tend to export them to world markets. The justification underlying the comparative advantage principle is that the latter will determine export performance under the notion of homogeneity of tastes within the region. The issue of the comparative homogeneity of the newly industrialized countries NICs' (Taiwan, South Korea, Hong Kong and Singapore) manufactured exports are explored by Peter C. Y. Chow and Mitchell H. Kellman (1993) who finds that the export responses of the four tigers to changes in the U.S. market after taking into account domestic supply capabilities were highly coordinated. Murray, T. and Turdaliev, N. (1999) use cross-country panel data in explaining heterogeneous performance in exporting labor intensive products by the developing countries to demonstrate how the high dependence on cheap labor is one of the important reasons behind the gradual migration of the garment industry from the high income to low-income countries. Due to the need for development, China's economic reforms and its open-door policies have indorsed its economy to move from a heavy industry-oriented development strategy in a capital-scarce economy to a comparative advantage strategy in a labor-intensive economy (Lin, Cai, & Li, 1996). This

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the capital-output ratio, labor-output ratio, three education categories, concentration, transportation costs, and tariffs. Only education was significant, indicating a positive effect of both very low and very high education on U.S. foreign production.

change has stemmed in a better exploitation of China's comparative advantage in labor-intensive manufacturing which sustained the country's export promotion strategy for the last two decades.

Against this background, this paper attempts to review the concept of comparative advantage "domestic resource costs" (DRC) and the RCA approach; DRC perspective uses social profitability to measure comparative advantage, while RCA uses export specialization patterns to infer comparative advantage patterns; i.e., a country's actual high specialization in an activity implies that it has strong comparative advantage in that activity (Balassa, 1965). Due to difficulties in accessing data, I have focused my research using the revealed comparative advantage assessment along with the role of human capital in shifting the composition of trade in the context of Chinese economy development. We know that a country has comparative advantage in the goods whose autarky relative prices (in terms of other goods) are lower than in other countries. Such lower autarky relative prices reflect that the country is relatively more efficient in producing these goods so that under free trade it would be better off allocating more resources to producing them and then exporting to pay for imports of other goods with less production as a result of the resource reallocation.

Following an earlier study by Balassa (1965, 1979 & 1989), the paper sets out to test the H-O theory by simultaneously introducing trade flows, factor intensities, and factor endowments in an empirical investigation of the pattern of comparative advantage in manufactured goods in a multi-country model. Balassa's export share RCA index developed in 1965 has been frequently used in many studies. It simply stated that country j in the trade of product i is measured by the item's share in the country's exports relative to its share in world trade. That is, if Xij is the value of country j's (China's) exports of product i (labor intensive product) and Xtj is the country's total exports (China's total export), then its RCA index is:

Balassa RCA: $RCA_{ij} = (X_{ij}/X_{tj})/(X_{iw}/X_{tw})$

$$RCA_{China} = \frac{Cliexp/Ctexp}{Wliexp/Wtexp}$$

RCA Augmented:

Cliexp is China's labor intensive export and Ctexp is China's total export, while Wliexp is World's labor intensive export and Wtexp is World's total export. The index RCA_{ij} (RCA_{China}) has a relatively simple interpretation. If it takes a value of less than 1 (which indicates that the share of product I (labor intensive product) in country j's (China's) exports is less than the corresponding world share), this implies that China has a revealed comparative disadvantage in labor intensive product. Similarly, an RCA index greater than 1 implies that the China has an advantage in labor intensive product.

2.2 *Labor Cost and Its Comparative Advantage*

Resources and their costs play an important role in determining a country's comparative advantage in the world trading market. The classical H-O trade theory offers a good analytical basis.[4] Meanwhile, China's labor and capital endowments and its labor cost could well explain its export capacity in the context of the H-O theory, and why it was a large FDI recipient.

The structure of factor endowments and the relative abundance of factors of production in an economy depend both on the natural endowments of that economy and on its stage of economic development. At an earlier stage of China's development, capital was scarce as usual to every developing country, and its economy typically has a comparative advantage in land- and labor-intensive products, i.e., agricultural and mineral products. However, as the opening up began, capital started accumulating and labor-force growth proceeds, land becomes relatively scarce and comparative advantage shifts to labor-intensive manufacturing in the wake of rural-urban migration. As capital accumulates further and labor cost gradually increases, capital becomes the relatively abundant factor of production, and comparative advantage shifts toward technology-intensive industries (nevertheless, China still has comparative advantage in labor intensive product due to it abundant labor). Adopting a comparative advantage strategy implies that, through the introduction of a competitive market system and the opening of the economy, the relative scarcity of factors of production is revealed to domestic producers through relative prices, which in turn induce them to engage in activities that fully exploit the economy's comparative advantages. The economy will thus become more competitive and will grow quickly.

Since first suggested by Balassa (1965), the definition of RCA has been revised and modified such that an excessive number of measures now exist. Changjun Yue, Ping Hua (2002) calculated RCA indices of China at national and province level; they observed a shift from a heavy industry-oriented development strategy to a comparative advantage one. Vollrath (1991) measures RCA at the global level, others at a sub-global / regional level (see Balassa's original index), while some others evaluates the measurement as bilateral trade between two countries or trading partners (see e.g. Dimelis and Gatsios, 1995). Many of the early research pertaining to the RCA index focused on Organization for Economic Cooperation and Development (OECD) countries (e.g., Balassa, 1965, 1979). Related studies aimed at identifying the industries that had comparative advantage in individual countries and drawing some link between trade and economic growth. In more recent studies, the focus has shifted to the Asia Pacific region.

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4 In the H-O framework, there are only two countries (Home and Foreign), each producing two goods, (e.g. cloth and machinery). There are only two factors of production, labor and capital—both mobile between sectors. Workers earn wages, and capital owners collect rents for capital.

The so-called flying geese theory is tested in numerous studies, which consider the shifts in comparative advantage from Japan to the rest of Asia and from Newly Industrializing Economies to other less developed Asian countries (e.g., Dowling & Cheang, 2000). To evaluate the dynamics of comparative advantage in the region, Yue & Hua (2002) uses Spearman rank correlation coefficients between changes in RCA vectors for the recipient countries/groups of NIEs and Indonesia, Malaysia, Philippines, and Thailand (ASEAN4) and the corresponding RCA changes in the ''source'' country/groups of countries such as Japan and the NIEs for a certain period. Lee (1995) applied RCA to analyze the determinants of industrialization in South Korea and he found that starting at the early stage of South Korean industrialization, heavy- or medium-industry products rapidly gained RCA. Therefore he argued that South Korea gained competitive in these industries through an anti-neoclassical political behavior. Also Lin et al. (1996) argued that a comparative advantage strategy is the best option for economic growth, even if an economy is autarkic. Because different goods require different combinations of factor inputs, each economy should choose the most advantageous industrial structure based on its resource endowments. Meanwhile Arastou Khatibi (2008) examines Kazakhstan's competitiveness vis-à-vis world exports to the EU-27 and intra-exports between the EU-27 member countries and found that although Kazakhstan shows a revealed comparative advantage in a number of sectors; its competitiveness has a falling trend in almost all sectors.

3. MODELING

3.1. Research Methodology

Empirical evidence will be used for this work and data will be drawn from China statistical year book, Ministry of commerce, IMF, World bank, UNCTAD's statistical database, working papers from the National Bureau of Economic Research (NBER), and textbook of Thomas A.Pugel (Business Administration Classic, International Trade (14th edition). This study uses ordinary least squares "OLS". Firstly, GDP will be estimated in order to determine the influence of total merchandise export on GDP, and then will estimate growth accounting using Cobb-Douglass production function to investigate the contributions of labor intensive and capital intensive product on total export before using the RCA to find out China's competitive power in the global market. The rationale underlying the RCA principle is that the latter will determine export performance under the principle of factor endowment.

Gross Domestic Product Expenditure Approach

GDP=FC+ GCF+ (EX-IM)   (1)

Growth Accounting

Cobb Douglas production function

Y=Af (N, K)   (2)

Revealed Comparative Advantage

Even though, competition power in a sector can be measured in several ways, and all have different meanings, this study will focus on two methods to measure the competition power of Chinese merchandise export: i) RCA and ii) Least Square Regression (LSR) Approach. Even though both methods measure similar things, the first method provides information about competition power specifically, while the latter technique determines internal and external variables affecting the competition power. In the second approach, the competition power is measured using export level as dependent variable, which is the most suitable variable to measure competitive power of the industry.

$$RCA_{China} = \frac{Chexp / Ctexp}{Wllexp / Wtexp}$$

(3)

3.2   Model Specification

3.2.1 Gross domestic product

GDP = β_0+ β_1*FC + β_2*GCF+ (β_3*EX - β_4*IM) + U

β_0 = Autonomous consumption

β_1 = parameter measuring the influence of Final Consumption (FC)

β_2 = parameter showing the changes of Gross Capital Formation (GCF) and its contribution to GDP

β_3 = parameter measuring the influence of Export (EX)

β_4 = shows the effect of Import (IM) on GDP

U = error terms

3.2.2 Growth accounting

Cobb-Douglass production function

$$Y = AL^{\alpha}K^{\beta}$$

We assume that α ‹1 and β ‹1, so that China has decreasing marginal products of labor and capital. If α + β =1, China has constant returns to scale, because doubling K and L doubles Y. If α + β › 1, China has increasing returns to scale, and if α + β ‹ 1, it has decreasing returns to scale.

By applying econometric tools to our Cobb-Douglas production function, we can try to obtain estimates of the parameters A, α and β to be:

$$\ln(Y) = \ln(A) + \alpha \ln(L) + \beta \ln(K)$$

Y=total output, L=labor intensive, K=capital intensive, A=Total Factor Productivity[5]

α=parameter measuring the influence of labor

β = parameter measuring the influence of capital

U=error terms

3.2.3 Revealed comparative advantage "augmented"

$$RCA_{China} = \frac{Cliexp/Ctexp}{Wliexp/Wtexp}$$

In econometric application it will be customized to:

RCAChina = β 0+ β 1Cliexp + β 2Ctexp + β 3Wliexp + β 4Wtexp

Where Cliexp is China labor intensive export, Ctexp is China total export, Wliexp is World labor intensive export and Wtexp is World total export.

β 0 = Intercept

β 1 = parameter measuring the influence of China's labor intensive export

β 2 = parameter showing the changes of China's total export

β 3 = parameter measuring the contribution of World's labor intensive export

β 4 = parameter showing the World's total export

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5 The portion of output growth that cannot be explained by growth in inputs.

3.3. Empirical Analysis

Before conducting Granger causality tests, variable must be found stationary individually or, if both variables are non-stationary, they must be cointegrated. This means that the test for stationarity and the cointegration test must precede the Granger causality test and the Kwiatkowski-Phillips-Schmidt-Shin (1992) will be used.

3.3.1. Unit root test for stationarity

This is to test if the relevant variables in the 3 equations are stationary or non-stationary and to determine their orders of integration. This study uses the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to find the existence of unit root in each of the time series[6]. The three results are jointly reported in Table 1.

Table 1: Unit root test

Variables	GDP	FC	GCF	EX	IM	CTEXP	CLIEXP	CKIEXP	RCA	WLIEXP	WTEXP
KPSS	0.163	0.185	0.19	0.169	0.176	0.163	0.158	0.162	0.159	0.157	0.158
Critical Value	0.216	0.216	0.216	0.216	0.216	0.216	0.216	0.216	0.216	0.216	0.216
Result	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)	I(0)

Notation: Significance at 1 % level. Figures within parenthesis indicate critical values.

Kwiatkowski-Phillips-Schmidt-Shin test statistic (1992) critical value for rejection of hypothesis of unit root applied.

Exogenous: Constant, Linear Trend

Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

Source: Author's Estimation using EViews 7.0 and data from the National Bureau of Statistics of China.

http://www.stats.gov.cn

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6 Stationarity tests are for the null that yt is I(0). The most commonly used stationarity test, the KPSS test, is due to Kwiatkowski, Phillips, Schmidt and Shin (1992). They derive their test by starting with the model

$y_t = \beta_0 D_t + \mu_t + u_t$

$\mu_t = \mu_{t-1} + \varepsilon_t, \varepsilon_t \quad W N(0, \sigma^2_\varepsilon)$

Where Dt contains deterministic components (constant or constant plus time trend), ut is I(0) and may be Heteroskedasticity. Notice that μ_t is a pure random walk with innovation variance σ^2_ε. The null hypothesis that yt is I(0) is formulated as

H0: $\sigma^2_\varepsilon = 0$, which implies that μ_t is a constant. Although not directly apparent, this null hypothesis also implies a unit moving average root in the ARMA representation of Δy_t. The KPSS test statistic is the Lagrange multiplier (LM) or score statistic for testing $\sigma^2_\varepsilon = 0$ against the alternative that $\sigma^2_\varepsilon > 0$

The result in table 1 shows that all the variables were not stationary in levels. This can be seen by comparing the observed values (in absolute terms) of Kwiatkowski-Phillips-Schmidt-Shin test statistics with the critical values (also in absolute terms) of the test statistics at the 1 %, level of significance. Result from table provides strong evidence of stationarity. Therefore, the null hypothesis is accepted and it is sufficient to conclude that there is no presence of unit root in the variables at levels, following from the above result.[7]

3.3.2. Granger causality tests

Granger causality tests are conducted to determine whether the current and lagged values of one variable affect another. One implication of Granger representation theorem is that if two variables, X_t and Y_t are co-integrated and each is individually 1(1), then either X_t must Granger-cause Y_t or Y_t must Granger-cause X_t.

Table 2 : Pairwise Granger Causality Tests

Date: 03/10/12   Time: 14:54

Sample: 1995 2010

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.	Responds
CLIEXP does not Granger Cause RCA	14	3.26826	0.0857	Accept
RCA does not Granger Cause CLIEXP		10.2163	0.0048	Reject
CTEXP does not Granger Cause RCA	14	3.35835	0.0814	Accept
RCA does not Granger Cause CTEXP		9.70677	0.0057	Reject
WTEXP does not Granger Cause RCA	14	3.54114	0.0734	Accept
RCA does not Granger Cause WTEXP		8.86377	0.0075	Reject
WLIEXP does not Granger Cause RCA	14	3.65123	0.0690	Accept
RCA does not Granger Cause WLIEXP		7.88381	0.0105	Reject
CTEXP does not Granger Cause CLIEXP	14	32.7552	7.E-05	Accept

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7 If two variables are trending over time, a regression of one on the other could have a high R2 even if the two are totally unrelated. If the variables are not stationary, then it can be proved that the standard assumption for asymptotic analysis will not be valid.

Ho: null Hypothesis "unit root" ø=1

Ho: alternative Hypothesis "stationary" ø<1

CLIEXP does not Granger Cause CTEXP		28.6824	0.0001	Reject
WTEXP does not Granger Cause CLIEXP	14	1.91571	0.2027	Accept
CLIEXP does not Granger Cause WTEXP		2.52142	0.1351	Accept
WLIEXP does not Granger Cause CLIEXP	14	7.15515	0.0138	Reject
CLIEXP does not Granger Cause WLIEXP		8.02683	0.0100	Reject
WTEXP does not Granger Cause CTEXP	14	0.58356	0.5777	Accept
CTEXP does not Granger Cause WTEXP		0.57786	0.5806	Accept
WLIEXP does not Granger Cause CTEXP	14	3.36355	0.0811	Accept
CTEXP does not Granger Cause WLIEXP		3.95138	0.0587	Accept
WLIEXP does not Granger Cause WTEXP	14	10.5792	0.0043	Reject
WTEXP does not Granger Cause WLIEXP		9.57609	0.0059	Reject

Source of data: National Bureau of Statistics of China. http://www.stats.gov.cn

This table reports the result of the Granger Causality tests which includes 2 lags on the adjusted RCA, Cliexp, Ctexp, Wliexp and Wtexp.

According to the results obtained, Cliexp does not granger cause RCA and Ctexp does not granger cause RCA either; Meanwhile RCA is an explanatory variable for both Cliexp and Ctexp which shows that causality is one sided from (RCA →Cliexp) and (RCA →Ctexp) proving this study's hypothesis that China's factor abundance (labor) increases export productivity. Column 5 revealed a uni-directional causality running from (Cliexp →Ctexp); meaning that Ctexp does not granger because Cliexp rather Cliexp does granger cause Ctexp which is the proxy for China's economy growth. Also bidirectional causality exist between Cliexp and Wliexp which means causality runs from both sides (Cliexp ↔ Wliexp); The implication is that either an increase or decrease in Cliexp or Wliexp will have a direct implication on both parties.[8]

3.4. Estimation of Parameters

The estimation procedure is the one of Ordinary Least Squares estimate. Through this method, the estimators are obtained using EViews 7.0 software and the findings are as follows:

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8 Intuition: if x→y then perturbing x (Δx) leads to later changes in y(Δy)

Asymmetry: if x→y then perturbing y (Δy) has no effect on future values of x.

Definition: A series x may be said to cause a series y if and only if the expectation of y given the history of x is different from the unconditional expectation of y.(x causes y : if y can be predicted of history of (x & y) which implies(Δx→Δy))

3.4.1. Gross domestic product

β_0= -54.93, β_1= 1.04, β_2= 0.91, β_3= 7.36, β_4= - 6.52

The Substituted Coefficients is then written as:

GDP = -54.94 + 1.04*FC + 0.91*GCF + 7.36*EX   − 6.52*IM

(44.39)   (0.02)   (0.02)   (0.29)   (0.33)

R2 = 0.99   Adjusted R2 = 0.99   n = 21

3.4.2. Growth accounting

Cobb-Douglass production function

A= 0.29,   α= 0.75, β = 0.30

The Substituted Coefficients is then written as:

LOG (TEXP) = 0.29 + 0.75*LOG (LIEXP) + 0.31*LOG (KIEXP)

(0.17)   (0.05)   (0.03)

R^2= 0.99   Adjusted R^2 = 0.99   n = 21

3.4.3. Revealed comparative advantage

β_0=1.02, β_1=5.97, β_2= - 6.61, β_3= - 1.23, β_4= 1.11

The Substituted Coefficients is then written as:

RCA = 1.02 + 5.97*CLIEXP - 6.61*CTEXP - 1.23*WLIEXP + 1.11*WTEXP

(0.03)   (2.27)   (1.40)   (3.33)   (2.56)

R^2 = 0.94   Adjusted R^2= 0.91   n=16

4. INTERPRETING THE COEFFICIENTS

4.1. Gross Domestic Product

From 1989 to 2009, China's Gross Domestic Product grew by 9.8% annually on average from $343.97billion to $4.99trillion (Table 3-Annexes). GDP per capita also increased dramatically at an annual rate of 13.8% from $281 to $3748.71. While some might question the accurateness of Chinese statistics, few would doubt that China has indeed achieved impressive growth since late 1980s.

Export is an important element in China's reform and economic growth. Export increase from a

very low level of US$ 52.54billion in 1989 to more than US$ 1.2 trillion in the year 2009. From the regression, export shows to be more influential to Chinese GDP than any other variables. As presented in (Table 2-Annexes) a $1 increase in export will bring about approximately $7.36 increase in GDP, while a $1 increase in Final Consumption, Gross Capital Formation and Import will lead to an increase of $1.04, $0.91 and approximately -$6.82 respectively to China's GDP; Also, since export contribution to GDP is higher, a $1 increase in export raises GDP output by approximately $7.04 increase of Final Consumption and/ or $8.09 increase of Gross Capital Formation. Even when Final Consumption and Gross Capital Formation are weights together, a $1 increase in both will only be equal to $0.27 increase in Export.

4.2. Growth Accounting: Cobb-Douglass Production Function

Since the output elasticity measures the responsiveness of output to a change in levels of either labor or capital used in production (ceteris paribus), it can be concluded from the growth accounting regression that China has increasing marginal product of labor and capital; Therefore, it has increasing returns to scale; since we assume that if $\alpha < 1$ and $\beta < 1$, China has decreasing marginal products of labor and capital. If $\alpha + \beta = 1$, China has constant returns to scale, because doubling K and L doubles Y. If $\alpha + \beta > 1$, China has increasing returns to scale, and if $\alpha + \beta < 1$, it has decreasing returns to scale. The coefficient shows that $\alpha + \beta > 1$ (0.75 + 0.31 = 1.06). A 1 point increase in labor share will lead to a raise of approximately 0.75 point export output while an increase of 1 point raises in capital share will only raise export output by approximately 0.31% point and vis-à-vis, meanwhile since labor share is higher, a 1 point increase in labor raises export output by approximately 2.45 point change of capital. Because the weights add together, if capital and labor both grow by an extra 1% point, export output would rise by approximately 1.06 points which is greater than 1.

4.3 Revealed Comparative Advantage

Based on the RCA analysis (Table 1-Annexes), the average for the years under review is 1.07 and yearly findings are also greater than 1, so we can see that China has comparative advantage over countries under review between the time period of 1995-2010; as aforementioned, if China's RCA takes a value of less than 1, it indicates that the share of product i (labor intensive product) of exports is less than the corresponding world share. This implies that China has a revealed comparative disadvantage in labor intensive product. Similarly, an RCA index greater than 1 implies that China has an advantage in labor intensive product. The result from the 3rd regression show that a 1 point increase in Cliexp will lead to

5.97 point in RCA$_{china}$ [9], however 1 point increase of Ctexp reduces RCA$_{china}$ by 6.61 point; this is as a result of the recent growth rate of China capital intensive export (Ckiexp) from 2005-2010 due to its improvement in Total factor productivity (TFP) which invariably stimulated Ckiexp growth rate. Because the growth of Ckiexp and the share of Ckiexp in output were both increasing, the contribution of Ckiexp is appreciating; therefore, if TFP growth is interpreted as technological change, Solow based growth accounting results indicate that the growth of technology advances increases in recent years. This result is consistent with literature which emphasizes the role of physical capital input and TFP; see Sai Ding, John Knight 2008 and Scott et al (2002) in their quest to find out how important are capital and TFP for economic growth, reveal that variation in aggregate input growth per worker could account for as much as 35% of the variance of the growth of output per worker across countries, and variation in TFP growth could account for as much as 87% of that variance. Meanwhile, this study finds that 1 point increase in Wliexp decreases RCA$_{china}$ by 1.23 point, and 1 point increase in Wtexp will increase RCA$_{china}$ by 1.11 point which is due to the increasing growth rate of Wkiexp.

The important implication of the results reported in this section is that labor intensive export exerts a major impact on China's economy growth. These results support the claim that margins for these goods are large, and thus that a decrease in export arising from decrease in labor intensive export will cause a large drop in China's GDP. It indicates that the concerns of the Chinese government that shifting China from export oriented economy to consumption based will harm exporters of labor intensive product which is the bedrock of the economy. The results also support the claim that fear of losing competitiveness relative to other labor intensive exporting nations may have prevented China from allowing Ckiexp to overtake Cliexp and the social unrest the unemployment of unskilled and middle skilled worker will cost the economy.

5. CONCLUSION AND POLICY RECOMMENDATION

We already know China has being experiencing huge trade surplus for almost two decades. Statistics revealed an unprecedented trade surplus for miscellaneous manufactured articles which employs meanly unskilled labors (the cheapest labor); 2008 statistics shows this figure which is the highest China ever imported ($335.96 billion worth of export to $97.641 billion import). As at 2003, more than 20% of the world's refrigerators, 30% of air conditioners and TVs, and 50% of cameras are produced in China (Asian Development Bank, 2004) – this certainly makes China an important player in the world market for these goods. Huge exports in light manufacturing and electronics lead to the emergence of China as a world "workshop". In this case the question is, should China stop or change it pattern of trade? I guess not

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9 RCA should be $< = > 1$

because the explosive growth in China's trade with the rest of the world has been one of the hallmark events for globalization over the last decade.

Even as China is experiencing an improvement in TFP of about 29%, it does not have any comparative (let alone absolute) advantage in high-tech products. Foreign invested firms capture almost all of the values of high-tech exports. Does China have any immediate incentives in climbing the technology ladder? No, invariably China will be better off concentrating more on labor intensive product where it comparative advantage is revealed.

Huge labor supply and cheap labor cost is China's greatest advantage. Its labor will remain cheap for decades. Statistics tends to show that Chinese manufacturers were more productive and made more profits if they reduced the technology used in production and returned to more people-heavy processes. While at the meantime, labor-intensive industries can generate the millions of new jobs needed each year to maintain social stability sought by the leadership in Beijing. Robert Mundell, Nobel Laureate in economics, argues that "China can compete for the next 200 years on labor costs" (from his Speech in the 38th annual meeting of Canadian Economics Association, June 2004, Toronto.) He might want to emphasis China's competitiveness in low labor cost in a much exaggerated way, while Arther Kroeber, managing editor of China Economic Quarterly, has a similar argument. The Economist (12/20/2003, pp. 99-101) quotes him arguing that "China has no real incentive to develop high-tech processes since… China can compete for the next 50 years on labor costs."

While the above argument might be exaggerated, catching up the gap with its top trading partners in capital intensive product is a very long-term process. China's physical capital endowment only accounts about 2 % of that of the world (Yanling Wang, 2008, p. 13). And there are reasons to argue that Chinese skilled labor is not as skilled as that of the United States, though China and the United States had about the same skilled shares in the world in 1995. Actually, in the case of human capital, China is far behind its top economic partners. For example, in year 1990, educational enrollment at third level per 1,000 populations was 3.31 for China, 29.95 for France, and 53.95 for the United States (United Nations database). Averaged from 1980 to 1996, government spending on education as a percentage of Gross National Product (GNP) was 2.345 for China, 5.657 for France, and 5.188 for the United States, and China actually experienced a negative growth rate of –0.4%, while it was 0.5% for France, and 0.7% for the United States. Thus, any significant structural change of the composition of trade in high-tech exports is a long-term process.

The comparison of endowments of labor and capital among China and its top trading partners does reveal that China has a comparative advantage in labor- intensive products: a huge trade surplus with each one of them. However, China continues to have a trade deficit in high-tech products, and foreign firms capture almost all of the rents from high-tech exports. As much as Chinese government currently

puts more emphasize on the development of national high-tech products, its indigenous firms still lacks the technological proficiency to compete. In the near future, it is not likely, and technologically impossible that China would shift from its advantageous labor- intensive goods to capital- intensive goods.

Meanwhile there is a need to say that the robust health of China's economy stands in sharp contrast with the weak and uncertain economy recoveries of other major countries. While China is concerned about reining in economic activity to ensure that it is under control, the developed countries struggle in keeping their economies growing. In these diverse circumstances, the authorities in developed countries are coming to see China's exchange rate policy as an imperative distortion in the world economy that will hold back adjustment of global imbalances and slow the recovery of other world economies. Gradually, many developing countries from East Asia are coming to a similar view as they face strong competitive pressures from China.

However the claim is true from a narrow statistic point of view. As the second world largest economy, if China grows faster, then that would of course raise the average growth rate of the world economy. But that does not imply China's growth is adding significantly to the improvement of other countries. That impact solely depends on how much rise is Chinese demand contributing to stimulating growth in other countries. The reality is that China sells substantially more to the rest of the world than it purchases which is the source of its large trade surplus; consequently, it carries on to subtract significantly from net world demand. Thus, the rest of the world is not benefitting much from China's robust prosperity.

Finally this paper revealed to us that trade is very important to Chinese economy development but the main policy challenge is trade protectionist pressures from Europe and North America that is continuing to grow with the echoes of the 2008 financial crisis, and both demand ever-expanding Chinese market penetration. Add to this the point of view of trade protectionist measures linked to global climate change policy initiatives, and the position for China's future export growth is severe. While a central challenge for China is how to enhance its future trade and FDI flows further, nonetheless, China cannot afford not to maintain its current trade and FDI flows. If competitiveness is really what The Global Competitiveness Report of the World Economic Forum defines "the set of institutions, policies, and factors that determine the level of productivity of a country" (World Economic Forum, 2010), then China will put mechanism in place to remain productive as productivity is the key to long-term economic growth, and to maintaining competitiveness in the context of globalization. Furthermore, to achieve world economy rebalancing, China needs to improve its image abroad through quality assurance .i.e. by improving supervision of quality inspection of exporting merchandise before leaving China, and pay more attention to safety assures. Also China need to strengthen and promote trade in service, increase import in capital intensive merchandise, which is in-line with it consumption based policy. In addition, China should

diversify and find new market like in Africa and Latin America with a win-win strategy, and also strengthen relationship with it Asian partners. Finally, fiscal reform should further narrow income gaps between urban and rural areas.

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TABLE ANNEXES

TABLE 1:   Revealed Comparative Advantage for China (1995-2010)

year	Ctexp	Cliexp	Wtexp	Wliexp	RCA
1995	148779500	122849554	379056878	300659165	1.041023
1996	151047462	125130510	403712748	313877153	1.065522
1997	182791585	151055578	431966201	335270121	1.06472
1998	183808988	153311105	413330684	328340508	1.049978
1999	194930779	161049683	451387031	348666458	1.069593
2000	249202551	200468584	534367894	398397750	1.07899
2001	266098209	210606785	491047691	370459346	1.049092
2002	325595970	254536940	528170663	385972427	1.069768
2003	438227767	340703095	602251560	432731794	1.08202
2004	593325581	450577914	736935226	522728153	1.070607
2005	761953410	569103762	845921524	588834333	1.073001
2006	968935601	710857147	995783591	688784720	1.060642
2007	1220059668	878130798	1149896002	792101467	1.044855
2008	1430693066	1004396304	1316898802	916914498	1.008282
2009	1201646758	842537573	1102611790	758207090	1.019641
2010	1578193001	1095473955	1410019567	963455652	1.015863

Source of data: UNCTAD, UNCTADstat, 2010

TABLE 2: TEXP

LOG (TEXP) as Dependent Variable

Dependent Variable: LOG(TEXP)

Method: Least Squares

Date: 01/23/12   Time: 14:02

Sample: 1989 2009

Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.286527	0.171475	1.670956	0.1120
LOG(LIEXP)	0.746196	0.054259	13.75248	0.0000
LOG(KIEXP)	0.304891	0.033410	9.125611	0.0000

R-squared	0.999606	Mean dependent var	7.834358
Adjusted R-squared	0.999562	S.D. dependent var	1.039868
S.E. of regression	0.021764	Akaike info criterion	-4.685599
Sum squared resid	0.008526	Schwarz criterion	-4.536381
Log likelihood	52.19879	Hannan-Quinn criter.	-4.653215
F-statistic	22820.57	Durbin-Watson stat	0.257809
Prob(F-statistic)	0.000000		

Source of data: UNCTAD, UNCTADstat, 2010

Table 3: GDP

GDP as Dependent Variable

Dependent Variable: GDP

Method: Least Squares

Date: 03/10/12   Time: 17:47

Sample: 1989 2009

Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-54.93555	44.39066	-1.237548	0.2337
FC	1.044711	0.016946	61.64997	0.0000
GCF	0.908961	0.017299	52.54361	0.0000
EX	7.357434	0.285321	25.78655	0.0000
IM	-6.518655	0.327359	-19.91284	0.0000

R-squared	0.999982	Mean dependent var	15907.86
Adjusted R-squared	0.999977	S.D. dependent var	13304.34
S.E. of regression	63.35292	Akaike info criterion	11.33958
Sum squared resid	64217.48	Schwarz criterion	11.58827
Log likelihood	-114.0655	Hannan-Quinn criter.	11.39355
F-statistic	220503.4	Durbin-Watson stat	1.874391
Prob(F-statistic)	0.000000		

Source of data: UNCTAD, UNCTADstat