The Role of Foreign trade on Rural Income in China
-- Based on Data from Shandong Province

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Abstract: Improving rural people’s income has always been a critical task of Chinese governments. Whether foreign trade has made contribution to the income of people residing in rural area is a research worthy issue. Based on the data of Shandong province in china over the 1984–2016 periods, the impact of foreign trade on rural per-capita income dynamics is examined. The cointegration equation indicates that foreign trade export has caused increase on rural per-capita income, but import has caused decrease on rural per-capita income. As foreign trade export brings more advantages than the disadvantages brought by import, foreign trade is beneficiary to the income of people residing in rural area. At last, relevant suggestions are given.

1. Introduction
The “Three Dimensional Rural Issues” in China are namely these problems of farmers, the countryside and Agriculture and which have got great attention from the central and local governments. Beijing has launched an ambitious ”New Deal” for China's farmers, aimed at lifting stagnant rural incomes through a combination of crop subsidies, tax cuts and infrastructure spending, etc. The core of the “Three Dimensional Rural Issues” is continuously promoting farmers' income. With the advance of global economic integration, foreign trade has played more and more important roles in promoting economy development and improving residents’ income.

Under the conditions that the different levels governments are trying to find more efficient ways to improve net income of people residing in the rural area, whether foreign trade has made contributions to the rural income is a research worthy issue. The research on the relationship between foreign trade and the rural income has important practical significance on the promotion of agricultural economic development and rural income improvement.

2. Literature Review
Foreign and domestic scholars have made great research on the relationship between foreign trade and income. Frankel and Romer (1999) constructed measures of the geographic component of countries' trade, and uses those measures to obtain instrumental variables estimates of the effect of trade on income. The results provide no evidence that ordinary least-squares estimates overstate the effects of trade. Further, they suggest that trade has a quantitatively large and robust, though only moderately statistically significant, positive effect on income[1].

ZHAO Wei, ZHAO Xiao-xia (2008) analyzed the roles of foreign trade to income and income in-equality in Chinese rural areas, by adopting the quarterly data in the comprehensive open period. The empirical results indicate that international trade reduces the income and increases the inequality in rural areas[2]. But Wang xue-zhen and Wang ji-peng (2011) believed no evidence shown that
produce exports contribute to the farmers’ income in China’s middle area, but in the eastern and the western area, the produce export has positive relationship with farmers’ income[3].

HUANG Ji-kun; JUN Yang; etc. (2007) examined the impacts of trade liberalization on China’s agriculture, in general, and poverty, in particular. The results lead to the conclusion that the positive impacts of trade liberalization are greater than the negative ones and that the net impact is positive for the average farm household in China[4].

From the above review, we can find that different experts and scholars do not all have got the similar conclusions on the relationship between foreign trade and income and some of them are even contradictory. The main reasons lie possibly on different research scopes, different research methods and different data applied, etc. China is a big country with complicated geographical features, natural endowments, and different economic development levels, so studying the relationship between rural income and foreign trade within a specific area will make more sense.

3. Data choose

The standard time series during 1984-2016 of Shandong Province of China has been used and all original data comes from Shandong Provincial Bureau of Statistics net. In order to maintain comparability, the specific data on foreign export and foreign import have been transferred into RMB according the prevailing conversation rate. To eliminate influence brought by price, all data have been adjusted based on 1990 constant price index.

As the natural logarithm transform on economic variables can eliminate heteroscedasticity likely existed without affecting the relationship between variables, the logarithmic transformation of the initial variables has been applied to this analysis. Finally, we got the time series EX, IM and INCOME donating export, import and rural per-capita income respectively. The software applied is Eviews5.0.

4. Cointegration test of variables and equation estimation

4.1 Unit Root Test

In order to avoid spurious regression in the analysis of non-stationary time series, the unit root test is made before Cointegration analysis with the commonly used Augmented Dickey-Fuller Test method and the result shown in Table 1. From table 1, the first three rows show the result of test for unit root at level and the last three rows present the result of test for unit root in 1st difference.

Table 1. Unit Root Test Result (ADF test).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test Type (C,T,K)</th>
<th>ADF Test Statistic</th>
<th>5% Critical Value</th>
<th>10% Critical Value</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX</td>
<td>C,T,1</td>
<td>-1.3812</td>
<td>-3.5578</td>
<td>-3.2124</td>
<td>0.8473</td>
</tr>
<tr>
<td>IM</td>
<td>C,T,8</td>
<td>-1.61185</td>
<td>-3.6122</td>
<td>-3.2431</td>
<td>0.7578</td>
</tr>
<tr>
<td>INCOME</td>
<td>C,T,1</td>
<td>-1.8448</td>
<td>-3.5629</td>
<td>-3.2153</td>
<td>0.6583</td>
</tr>
<tr>
<td>DEX</td>
<td>C,T,0</td>
<td>-6.5942</td>
<td>-3.5629</td>
<td>-3.2153</td>
<td>0.0000*</td>
</tr>
<tr>
<td>DIM</td>
<td>C,T,0</td>
<td>-7.0953</td>
<td>-3.5629</td>
<td>-3.2153</td>
<td>0.0000*</td>
</tr>
<tr>
<td>DINCOME</td>
<td>C,T,1</td>
<td>-3.7742</td>
<td>-3.5875</td>
<td>-3.2292</td>
<td>0.0341*</td>
</tr>
</tbody>
</table>

Note: C, T and K in test type (C, T, K) denotes intercept, trend and the lagged difference included in the test equation respectively. Test for unit root in level and 1st difference respectively. Prob.* donates MacKinnon (1996) one-sided p-values.

Test result shows: at 5% significance level, the ADF Test Statistics of first-order difference of time series DEX, DIM and DINCOME are lower than their critical values. Comprehensively, all the series are all stationary I (1) process.
4.2 Cointegration test of variables and equation estimation

The cointegration result is highly sensitive to lag length. Johansen (1991) proposed the use of appropriate information criterion or a sequence likelihood ratio test for the determination of lag length[6]. The VAR model of INCOME, EX, IM is constructed and based on the effective VAR model, VAR Lag Order Selection Criteria can be obtained (the results are shown in table 2). From Table2, according to LR, FPE, SC and HQ criterions, the optimal lag order length is 4.

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-29.772</td>
<td>NA</td>
<td>0.002275</td>
<td>2.42756</td>
<td>2.57155</td>
<td>2.47038</td>
</tr>
<tr>
<td>1</td>
<td>71.736</td>
<td>172.9357</td>
<td>2.42e-06</td>
<td>-4.4247</td>
<td>-3.84878</td>
<td>-4.253</td>
</tr>
<tr>
<td>2</td>
<td>116.369</td>
<td>66.12698</td>
<td>1.78e-07</td>
<td>-7.0644</td>
<td>-6.05652</td>
<td>-6.7647</td>
</tr>
<tr>
<td>3</td>
<td>132.797</td>
<td>20.68694</td>
<td>1.11e-07</td>
<td>-7.6146</td>
<td>-6.17479</td>
<td>-7.1865</td>
</tr>
<tr>
<td>4</td>
<td>150.761</td>
<td>18.62879*</td>
<td>6.61e-08</td>
<td>-8.27857</td>
<td>-6.4068*</td>
<td>-7.7220*</td>
</tr>
<tr>
<td>5</td>
<td>161.333</td>
<td>8.614388</td>
<td>7.74e-08</td>
<td>-8.3950*</td>
<td>-6.09132</td>
<td>-7.710</td>
</tr>
</tbody>
</table>

Notes: LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion. * indicates lag order selected by the criterion.

Johansen and Juselius test method is used to test the cointegration relationship of INCOME, EX and IM, the proper lag length is 3 (4-1=3). The test result shown in Table 3.

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.703905</td>
<td>49.8703</td>
<td>29.7971</td>
<td>0.0001</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.428217</td>
<td>15.7922</td>
<td>15.4947</td>
<td>0.0451</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.004998</td>
<td>0.14029</td>
<td>3.84147</td>
<td>0.7080</td>
</tr>
</tbody>
</table>

Notes: Test lags interval (pair) in VAR is 1,3. Test allows for linear deterministic trend in data, intercept and trend in CE, no intercept in VAR. * denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values. Trace test indicates 2 cointegrating equation(s) at the 0.05 level.

The test results show: At 5% significance level, the hypothesis that there is at most one CE is rejected, so there are at least two CEs exited among time series INCOME and EX, IM. The three time series have long-term cointegration relationship. The following is the normalized cointegrating equation:

\[
\text{INCOME} = 0.960036 \times \text{EX} - 0.086289 \times \text{IM} \\
(0.09375) \quad (0.20399)
\]

The adjustment coefficients (standard error in parentheses) are -0.012467, 1.520594, and 0.044223 respectively and meeting the requirement that there is at least one adjustment coefficient is negative. So the cointegrating equation is effective. The result shows evidence that the changes in international trade indicators hold a long-term relationship with rural per-capita income. Foreign trade export increases 1%, rural per-capita income will increase 0.960036%. Foreign trade import increases 1%, rural per-capita income will decrease 0.086289% accordingly.

5. Data Analysis

The positive coefficient of EX in the cointegrating equation of INCOME, EX and IM indicates that rural per-capita income and foreign trade export are positively correlated, that is, export has promoted rural per-capita income. This conclusion is consistent with that of Wang xue-zhen and Wang Ji-peng(2011). The coefficient of IM in the cointegrating equation is negative, which means that foreign trade import has caused decrease on rural per-capita income. This conclusion is consistent with that of ZHAO Wei, ZHAO Xiao-xia (2008). Furthermore, the positive coefficient is 0.960036 and much bigger than the negative coefficient 0.086289, which means foreign trade brings more
advantages than disadvantages on rural per-capita income. Comprehensively, foreign trade is beneficiary to the income of people residing in rural area. This conclusion is similar to that of HUANG Ji-kun; JUN Yang; etc. (2007)

6. Conclusion and Suggestions

Based on the data of Shandong province in china over the 1984-2016 periods, this paper examines the impact of foreign trade export and import on income dynamics of the people residing in rural area. The cointegration equation indicates that foreign trade import has caused decrease on rural per-capita income, foreign trade export has caused increase on rural per capita income. As foreign trade export brings more advantages than disadvantages brought by import, foreign trade is beneficiary to the income of people residing in rural area.

To expand export, especially the export of produce, is an effective way to keep promoting rural income. Export influence rural income through direct effect and indirect effect. The export of produce and the related primary processed agricultural products influence rural income directly, and the export of some industrial products which use produce as material directly or indirectly can influence rural income by backward correlation effect and technical demonstration effect. As the overall international competitiveness of produce in China are showing a downward trend, so it’s critical to encourage those labor-intensive and technology-intensive agriculture products which are showing a relatively strong comparative advantage in international markets.

To adjust the structure of import goods will help boost economy development and rural income. Imports influence rural income through market squeeze effect mainly. China is one of the lowest countries on the average agricultural import tariffs, and the average import tariff of 15.2% is much lower than the world average level of 62%. Since the establishment of China-ASEAN Free Trade Area, large quantity of produce including grains and fruits are imported into Chinese market, which brought negative effect on domestic farmers. Large imports of produce have enriched people's living, but it will not increase rural income and will be negative to farmer’s enthusiasm. The import of resource-intensive and technology-intensive products should be enhanced instead of the produce which can be provided by our farmers.

Continue to expand the opening to the world, and deepen China's integration into the world economy. From the above analysis, import is negative to rural income, but the overall effect of foreign trade has brought more advantages than disadvantages on per-capita income for the people living in rural area. In the context of some Western countries tending to anti-globalization, we should, just like Premier Li Ke-qiang said, adhere to the innovative, invigorated, interconnected, inclusive and win-win principles[6] and continue to follow and energize the prevailing trend of globalization, which will be beneficial to the world.

References


