The effect of export tax rebates on export performance: Theory and evidence from China

Chien-Hsun CHEN\textsuperscript{a}, Chao-Cheng MAI\textsuperscript{b,*}, Hui-Chuan YU\textsuperscript{c}

\textsuperscript{a} Chung-Hua Institution for Economic Research, 75 Chang-Hsing St., Taipei 10671, Taiwan
\textsuperscript{b} Graduate Institute of Industrial Economics, Tamkang University and Research Center for Humanities and Social Sciences, Academia Sinica, 128 Sec. 2, Academia Rd., Nankang, Taipei 11529, Taiwan
\textsuperscript{c} Graduate Institute of Industrial Economics, Tamkang University, Tamsui 25137, Taiwan

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Abstract

This paper develops a Cournot quantity competition model to examine the effect of export tax rebate policy on export performance. The main conclusions drawn are as follows: (i) when a government raises the export rebate rate, the output of final goods for export by the domestic firm increases, while the output of the foreign competitor decreases; (ii) when a government raises the export rebate rate, the profit of the domestic firm increases, while that of the foreign competitor decreases; and (iii) the optimum export rebate rate is positive and greater than 1, indicating that the domestic government not only refunds fully the custom duties paid by the domestic firm on imported intermediate goods, but also offers export subsidies for its export of final goods.

To corroborate the conclusions drawn based on the theoretical model, empirical analysis was carried out using the statistical data of China from 1985 to 2002. The test results of Spearman rank correlation coefficient show that China’s export tax rebate policy has significant positive correlation with its exports, final domestic consumption, and foreign exchange reserve.

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\* Corresponding author. Tel.: +886 2 2782 1693x130; fax: +886 2 2785 4160.
\textit{E-mail address: ccmai@gate.sinica.edu.tw} (C.-C. Mai).
1. Introduction

Export tax rebates are an important trade policy tool for promoting exports. They entail the refund of value-added tax and consumption tax already paid on exported goods during production, circulation and sales. The aim is to let the exported goods enter the international markets at tax-excluded prices without being subject to double taxation, so as to promote export trade. Export tax rebates are allowed by the rules of the World Trade Organization and are commonly adopted by many countries.

China began implementing export tax rebate policy in 1985. In its 1994 tax system reform, the zero tax rate policy for exported goods has been declared. China’s Provisional Statute for Value-added Tax also stipulates a zero tax rate for exported goods; its Provisional Statute for Consumption Tax stipulates a consumption tax exemption for taxable consumer goods designated for export. The Chinese government also drafted relevant provisions and measures, including the Regulations Governing Export Tax Rebates (Exemption), which specifies the refund or exemption of value-added tax and consumption tax for exported goods. Presently the export tax rebate in China applies mainly to the refund of value-added tax (VAT) and consumption tax already levied during the domestic production or sales of exported goods. In light of the fact that the consumption tax applies to only a few consumer goods, the export tax rebate predominantly covers VAT paid. Value-added tax in China is levied by three categories: a 17% basic rate applied to general goods, processing and repair service; a lower 13% rate applied to farm produce, feeds, chemical fertilizers, medication, household water consumption, printed books, and newspapers; and a 0% rate applied to exported goods. Moreover, China adopts the production-type VAT, where VAT in relation to fixed assets purchased for the production of the exported goods is not deductible. Thus the prices of exported goods actually contain tax levied.

China’s export tax rebate system is defective to some extent. Some unlawful enterprises bilk the government out of rebate money with fake VAT invoices, while law-abiding enterprises are faced with convoluted tax rebate procedures or have to wait for the refund for a considerable period of time due to the tax rebate quota. China’s accumulated approved export tax rebate that has not been refunded to enterprises totaled 144 billion renminbi (RMB) in 2001, 200 billion RMB in 2002, and 277 billion RMB in 2003. The export tax rebate payable is owed predominately to enterprises along the southeast coast of China. In the case of Zhejiang province, it amounted to 4.725 billion RMB in 1999 and escalated to 40.8 billion RMB in 2002.

China’s export tax rebate system has not stayed steady since 1994. The rebate amount has been rising continuously as exports grow. In the span from 1985 to 2002, the rebate amount rose 69 times from 1.795 billion RMB to 125.8 billion RMB. The central government slashed the rebate rates a couple of times, for example, in 1995, 1996 and 2004, to alleviate its fiscal burden. In some other years, prompted by the macroeconomic situation, the government raised the rebate rates to encourage exports, as in the case of 1997, 1998, and 1999.

During 1997, when the Asian financial crisis broke out, China was faced with steep challenges in exports. The simplest and most direct measure to boost exports is to depreciate the country’s currency. But renminbi depreciation at that juncture would have produced a serious impact on the world economy, and China reiterated on many occasions its resolve not to depreciate its currency. Faced with the dilemma of declining export competitiveness and the inability to depreciate the renminbi, raising the export tax rebate rate became the best alternative to China at

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1 China’s central government budget deficit reached 309.687 billion RMB in 2002, while the export tax rebate amounted to 115 billion RMB, 15% over the allocated budget.
that time. Thus from 1997 on, China lifted the rebate rates several times and implemented a
four-tiered rebate system from July 1, 1999 (17%, 15%, 13%, and 5%) with an average rate of
15% in the hopes of boosting exports and easing the pressure of renminbi depreciation.

But in October 2003, the Chinese government implemented an average 3% reduction of
export tax rebate rates, from 15.11% to 12.11%, and further announced that a five-rate system,
i.e., 17%, 13%, 11%, 8%, and 5%, would be implemented starting in 2004. The rates of 5% and
13% applied to farm produce remained unchanged, while the rate for farm produce that were
depth processed, such as wheat powder and corn powder was raised from 5% to 13%. The rate for
some mechanical and electrical products, apparel and cotton textile products dropped from 17%
to 13%. The rebate for some natural resource products, e.g., crude oil and log was cancelled, and
the rebate rate for some other natural resources fell from 8% to 5%. Export goods affected most
in this latest round of export tax rebate reform are the home appliance, mechanical/electrical, and
cotton textile sectors. Furthermore, the rebate is split between the central and local governments
in the ratio of 75% to 25%. This new measure aims to alleviate the fiscal burden of the central
government and the renminbi appreciation pressure.

Currently available literatures on export tax rebate policies are scarce. Liu and Weng (1998)
utilized a partial equilibrium model to analyze the effect of export tax rebates and found that
rebates could expand domestic output, promote exports, and enhance the ability of foreign
suppliers to price intermediate goods. But their study did not take into account the
interdependency between domestic firms and foreign suppliers in the final goods market. Chao,
Chou, & Yu (2001) used a general equilibrium approach to build a theoretical model and
concluded that an export tax rebate policy could boost exports and help expand upstream and
downstream industries, but would lead to rising unemployment, lower tax revenues, and a lower
level of consumer surplus. Chao et al. also used partial analysis to generate an export demand
equation for empirical study, in which China’s statistical data (1985–1998) and error correction
model (ECM) were employed to examine the correlation between long-term export demand and
the export tax rebate, real foreign income, and relative price index. But the short time series,
small degree of freedom of data, and the relatively small sample size (n = 14) made the empirical
results lacking in interpretability. Moreover, the two papers mentioned above did not touch upon
the issue of optimum export tax rebate rate. To remedy these shortcomings, this study aims to
develop a Cournot quantity competition model to examine the effect of lower export tax rebate
rates on export performance and derive the optimum rebate rate, and based on the theoretical
model constructed, carry out empirical analysis using the statistical data of China.

In the following sections, this paper will develop a Cournot duopoly model to explore the
theoretical effect of export tax rebate, followed by examining the effect of the rebate policy on
exports with Spearman rank correlation coefficient in a nonparametric test. In the last section of
the paper, conclusions drawn from the study are presented.

2. The effect of an export tax rebate system

From a strategic perspective, Brander and Spencer (1985) incorporated an international
Cournot duopoly into a “third market” model in which one domestic firm and one foreign firm
produce a homogeneous product and compete in a third country market. They found that an
export subsidy is optimal by shifting part of the foreign firm’s profits to the domestic firm and
therefore raising the national welfare. Based on the theoretical framework of Brander and
Spencer (1985), this study builds a simple model to examine the effect of an export tax rebate on
export performance.
2.1. A theoretical model

Assuming there are two downstream firms—a domestic firm and a foreign firm—that produce a homogeneous product, the domestic firm processes the imported intermediate goods to produce final goods which are supplied to the domestic market and exported to a third market, and the foreign firm uses imported intermediate goods to make final goods and exports all to a third market. Assuming the domestic government imposes custom duties on imported intermediate goods, but to encourage exports adopts an export tax rebate policy in which all import duties paid on the exported goods by the domestic firm will be refunded proportionally.

The output of final goods by the domestic firm includes that for domestic sales and exports. Denote $D$ the output of final goods by the domestic firm to the domestic market and $E$ the output of final goods to export. Assume final goods produced by the foreign firm are entirety exported, and let $Y$ be its output of final goods. To simplify the analysis, the inverse demand functions in the domestic market and in the third market are assumed to be in the linear form, respectively, as follows:

$$P_1 = a - bD$$
$$P_2 = x - \beta(E + Y)$$

where $a, b, x, \beta > 0$; $P_1$ and $P_2$ denote, respectively, the prices of final goods in the domestic market and the third market, respectively, and the domestic market and the third market are segregated. For analysis purpose, we assume one unit of intermediate goods produces one unit of final goods.\(^2\) The profit function of the domestic firm is then expressed as:\(^3\)

$$\Pi_d = (a - bD - c)D - (1 + t)mD + \{x - \beta(E + Y) - c\}E - (1 + t)mE + \gamma tmE$$

where $\Pi_d$ is the profit function of domestic firm, $c$ is the marginal cost incurred from using inputs other than intermediate goods in the production of final goods, $t$ is the import duties for intermediate goods, $m$ is the import price of intermediate goods, and $\gamma$ is tax rebate rate. In $\Pi_d$, the first and the third terms are, respectively, the income of domestic firm from domestic and export sales less the production cost; the second and the fourth terms denote the import costs of the final goods sold in the domestic and export markets, respectively, which include the purchase cost and taxation cost of intermediate goods; the last term of the equation is the amount of export tax rebate.\(^4\)

The profit function for the foreign firm is expressed as:

$$\Pi_f = [x - \beta(E + Y) - c^* - m]Y$$

where $c^*$ is marginal cost incurred from using inputs other than intermediate goods in the production of final goods.

Under the assumptions described above, the process through which the domestic government comes to the decision of using export tax rebates to subsidize the exports of domestic firms is

\(^2\) For the sake of simplifying analysis, such an assumption is commonly made in the literature. See Spencer and Jones (1991, 1992), for example.

\(^3\) This paper considers the case that a domestic firm can produce a good that is used for domestic and foreign sales. As pointed out by one of the referees, another approach in the empirical literature is to consider a dual production structure that separates export processing activities from domestic production.

\(^4\) It is worthwhile to mention that Eqs. (1a) and (1b) imply that the effective prices, i.e., $P_1$ for domestic sales and $P_2 + \gamma t$ for foreign sales, must be equalized by the arbitrage condition.
described as a two-stage game. In the first stage, the domestic government determines the export tax rebate rate with knowledge about the firms’ production strategies to maximize social welfare. In the second stage, knowing the export tax rebate rate offered by the government, the domestic firm determines not only the output for domestic sales \(D\), but also the optimum output of itself and its foreign competitor under the Cournot quantity competition in a third market, which are denoted as \(E\) and \(Y\), respectively. As usual, the equilibrium is characterized by subgame perfection and should be solved in a backward induction fashion.

2.2. Comparative static analysis

In seeking the optimum output of final goods for domestic and export markets by the domestic firm and the foreign firm in the second stage, the first-order conditions for profit maximization may be obtained from (2a) and (2b):

\[
\frac{\partial \Pi^d}{\partial D} = \Pi^d_D = a - 2bD - c - (1 + t)m = 0
\]

\[
\frac{\partial \Pi^d}{\partial E} = \Pi^d_E = \alpha - \beta(2E + Y) - c - (1 + t - \gamma t)m = 0
\]

\[
\frac{\partial \Pi^f}{\partial Y} = \Pi^f_Y = \alpha - \beta(E + 2Y) - c^* - m = 0
\]

The second-order conditions require:

\[
\frac{\partial^2 \Pi^d}{\partial D^2} = -2b < 0
\]

\[
\frac{\partial^2 \Pi^d}{\partial E^2} = -2\beta < 0
\]

\[
\frac{\partial^2 \Pi^f}{\partial Y^2} = -2\beta < 0
\]

Moreover, we also use the following stability conditions:

\[
\frac{\partial^2 \Pi^d}{\partial Y \partial E} = -\beta < 0, \quad \frac{\partial^2 \Pi^f}{\partial E \partial Y} = -\beta < 0
\]

\[
\frac{\partial^2 \Pi^d}{\partial D^2} < \frac{\partial^2 \Pi^d}{\partial D \partial E}, \quad \frac{\partial^2 \Pi^d}{\partial E^2} < \frac{\partial^2 \Pi^d}{\partial Y \partial E}, \quad \frac{\partial^2 \Pi^d}{\partial Y^2} < \frac{\partial^2 \Pi^f}{\partial E \partial Y}, \quad \frac{\partial^2 \Pi^f}{\partial Y^2} < \frac{\partial^2 \Pi^f}{\partial D \partial Y}
\]

\[
H = \begin{vmatrix}
-2b & 0 & 0 \\
0 & -2\beta & -\beta \\
0 & -\beta & -2\beta \\
\end{vmatrix} = -6b\beta^2 < 0
\]

It is seen from Eq. (5a) that the margin profit of a firm in a country decreases as the output of a firm in another country increases, which conforms to the standard regularity condition in non-
cooperative models. Eq. (5b) represents that the own effects of output on margin profit dominate
the cross effects. Eq. (5c) indicates that \( H \) (the Hessian determinant associated with the system of
(3a)–(3c)) is negative definite and also the Routh–Hurwitz condition for reaction function
stability (see Dixit, 1986).

Total differentiation of Eqs. (3a), (3b), and (3c) above yields comparative static effects. By
Cramer’s rule, the following comparative static results are obtained:

\[
\frac{dD}{d\gamma} = 0 \quad (6a)
\]

\[
\frac{dE}{d\gamma} = \frac{2tm}{3\beta} > 0 \quad (6b)
\]

\[
\frac{dY}{d\gamma} = \frac{tm}{-3\beta} < 0 \quad (6c)
\]

The economic intuition behind Eq. (6a) may be provided as follows. Because of the
assumption of constant marginal costs incurred from using inputs as well as intermediate goods,
a rise in the export tax rebate has no effect on domestic sales.

Based on Eqs. (6a), (6b), and (6c), the following proposition is derived:

**Proposition 1.** Raising the export tax rebate rate would increase the output of final goods for
export by domestic firms and decrease the output by foreign competitors, but produces no effect
on the output by domestic firms for domestic sales.

By substituting Eqs. (3a), (3b), (6a), (6b), and (6c) into the profit function of the domestic
firm, \( \Pi^d \) is a function of \( D(\gamma), E(\gamma), Y(\gamma) \) and \( \gamma \) under known export rebate rate, that is,
\( \Pi^d = \Pi^d(D(\gamma), E(\gamma), Y(\gamma), \gamma) \). Thus total differentiation of \( \Pi^d \) with respect to \( \gamma \) yields the
margin profit produced by export tax rebate for the domestic firm:

\[
\frac{d\Pi^d(\gamma)}{d\gamma} = \frac{\partial \Pi^d}{\partial D} \frac{dD}{d\gamma} + \frac{\partial \Pi^d}{\partial E} \frac{dE}{d\gamma} + \frac{\partial \Pi^d}{\partial Y} \frac{dY}{d\gamma} + \frac{\partial \Pi^d}{\partial \gamma} = \frac{4tmE}{3} > 0 \quad (7a)
\]

In Eq. (7a), the first and the second terms are zero, and the third term is positive, suggesting
when export tax rebate rate rises, domestic profit increases indirectly through changes in foreign
output, which could be viewed as the indirect profit-shifting effect. The fourth term of the
equation is also positive, which could be construed as the direct effect of export tax rebate on
domestic profit.

Similarly, by substituting Eqs. (3c), (6a), (6b), and (6c) into the profit function of the foreign
competitor, \( \Pi^f \) is also a function of \( D(\gamma), E(\gamma), Y(\gamma) \) and \( \gamma \) under a known export tax rebate rate.
Thus total differentiation of \( \Pi^f \) with respect to \( \gamma \) yields the margin profit produced by the export
tax rebate for the foreign firm:

\[
\frac{d\Pi^f(\gamma)}{d\gamma} = \frac{\partial \Pi^f}{\partial D} \frac{dD}{d\gamma} + \frac{\partial \Pi^f}{\partial E} \frac{dE}{d\gamma} + \frac{\partial \Pi^f}{\partial Y} \frac{dY}{d\gamma} + \frac{\partial \Pi^f}{\partial \gamma} = -\frac{2tmE}{3} < 0 \quad (7b)
\]

In Eq. (7b), the first and the third terms are zero, and the second term is negative, suggesting
that when the export tax rebate rate rises, the profit of the foreign firm decreases indirectly as a
result of changes in the export output of the domestic firm, an indirect profit-shifting effect; the
fourth term is also negative, which could be viewed as the direct effect of the export tax rebate on the profit of the foreign competitor.

Based on Eqs. (7a) and (7b), we can derive:

**Proposition 2.** Raising the export tax rebate rate would increase the profit of the domestic firm, while decreasing the profit of the foreign firm.

Based on Proposition 2, it is known that raising the export tax rebate rate produces an effect similar to increasing export subsidies as obtained by Brander and Spencer (1985) and Mai and Hwang (1987). In other words, a government can use this policy to shift part of the profit of a foreign firm to the domestic firm, generating the profit-shifting effect.

### 2.3. Optimum export tax rebate rate

We now turn to the first-stage decision where the optimum export tax rebate rate is determined to maximize social welfare. Social welfare includes consumer surplus (CS) in the domestic market, producer surplus (indicated by the profit of the domestic firm) and the government’s tax revenue, which are expressed below, respectively:

\[
CS(\gamma) = \frac{b}{2}D^2 
\]  

\[
II^d = [a - bD - c\gamma]D - (1 + t)mD + [x - \beta(E + Y) - c\gamma]E - (1 + t)mE + \gamma tmE
\]  

\[
TR(\gamma) = tmD + tm(1 - \gamma)E
\]

In summary, the social welfare function is defined as:

\[
W(\gamma) = CS + II^d + TR = \left(a - \frac{b}{2}D - c - m\right)D + [x - \beta(E + Y) - c - m]E
\]

The first-order condition for welfare maximization is:

\[
\frac{dW(\gamma)}{d\gamma} = \frac{tm}{3\beta} [2tm(1 - \gamma) + \beta E] = 0 
\]

The second-order condition requires:

\[
W_{\gamma\gamma} = \frac{d^2 W(\gamma)}{d\gamma^2} = -\frac{2(tm)^2}{9\beta} < 0
\]

From Eq. (10), the optimum export tax rebate rate is derivable as:

\[
\gamma^* = 1 + \frac{\beta E}{2tm} > 1 \left(\frac{\beta E}{2tm} > 0\right)
\]

Note that when rebate rate \(\gamma < 0\), it means the domestic government would levy tax again on exported final goods; if \(0 < \gamma < 1\), the domestic government would refund \(\gamma^*\) proportion of tax paid on the exported final goods; if \(\gamma > 1\), the domestic government refunds not only 100% of the tax paid on the exported final goods, but also provides export subsidies. Thus, when optimum rebate rate \(\gamma^* > 1\) as shown in Eq. (12), a domestic firm receives not only 100% refund of taxes paid on its export goods, but also export subsidies from the government.
By substituting optimum rebate rate $\gamma^*$ into Eqs. (8c) and (9), we can obtain:

$$TR(\gamma = 0) > TR(\gamma = \gamma^*)$$

(13)

$$W(\gamma = 0) < W(\gamma = \gamma^*)$$

(14)

Eqs. (12)–(14) lead to the following proposition:

**Proposition 3.** When a government adopts the export tax rebate system and the optimum rebate rate is greater than 1 (i.e., $\gamma^* > 1$), indicating that the government not only refunds fully the duties previously levied on the imported intermediate goods, but also offers export subsidies. The government’s tax revenue would drop as a result, but the social welfare increases.

The economic meaning of Proposition 3 is that to help domestic firms gain greater market share and encourage exports, a government would opt for export tax rebate and export subsidies.

### 3. Empirical analysis

So far, we have drawn an important conclusion from the theoretical analysis above. That is, decreasing the export tax rebate rate would result in a decline in export quantity. To verify this proposition, we will carry out empirical analysis using the statistical data of China.

In light of the fact that China’s export tax rebate rates and export volume of various products are not directly observable from publicly available statistics over the period of 1985–2002, and the time series data have shorter duration and small sample size ($n = 18$) with a small degree of freedom, we have to employ proper statistical techniques for analysis in order to render the interpretation of empirical results more credible, therefore, the Spearman rank test rather than regression method can be used to conduct empirical assessment. Given that empirical data in this study do not provide available data on the export tax rebate rate and export volume of individual products, we use “total export tax rebate” to represent the changes in the export tax rebate rate and use total export tax rebate and total exports to test the correlation between export tax rebate rate and export performance, and carry out assumption testing. Also under such circumstances in which statistical distribution of the population cannot be determined and the sample size is quite small ($n = 18$), ordinary correlation coefficients are not suitable for measuring the degree of correlation between total export tax rebate and total exports. Thus the data should first be transformed into sequential data (ranked from high to low) before computing the correlation coefficients, and a rank correlation coefficient in nonparametric test is used for testing. Rank correlation is a technique used to test the direction and strength of the relationship between two variables. In other words, it is used to test whether two data series with unknown population distribution are correlated. When the data have a sequential dimension, the Spearman rank correlation coefficient has more interpretive power than other rank coefficients. Generally, the equation for estimating rank correlation coefficients may be set as follows (Hogg & Craig, 1995):

$$r_s = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$$

(15)

where $d = X_r - Y_r$; $X_r$ is the rank of observed value $X$, $Y_r$ is the rank of observed value $Y$, and $n$ is the sample size.
To test whether there is positive correlation between the two variables, we establish the following two assumptions:

**H0.** $H_0: \rho_s = 0$ (There is no correlation between total export tax rebate and total exports)

**H1.** $H_1: \rho_s = 0$ (There is a positive correlation between total export tax rebate and total exports)

The observation period for the empirical analysis lasts from 1985 to 2002 with data obtained from various issues of the *Statistical Yearbook of China (2000–2003)* and *Finance Yearbook of China (2002)*. The empirical results as shown in Table 1 indicate significant positive correlation between export tax rebate and total exports, which supports the theoretical hypothesis discussed above, that is, raising the export tax rebate rate increases export quantity.

The correlations between export tax rebate and final consumption, and between export tax rebate and foreign exchange reserve, are tested based on the same assumption testing. The test results as shown in Table 1 indicate significant positive correlation between export tax rebate and final consumption as well as foreign exchange reserve. Based on the empirical results, it is found that when China implemented higher export tax rebate rates, the increase in export tax rebate drove the increase in export quantity, which earned for China more foreign exchange reserve. Such result concurs with the theoretical finding. As for the relationship between export tax rebate and final consumption, consumption also increases when economy grows as spurred by increase in exports.

Next, the total exports are classified into two major categories: primary products and manufactured products. Primary products are further classified into foodstuffs, cigarettes and liquor, non-dietary raw materials, minerals, and animals and plants; manufactured products are also classified into chemicals, light textiles, machinery, miscellaneous and others. To discern the relationship between export tax rebate and each category of products, a Spearman rank correlation test is conducted on five categories of primary products and five categories of manufactured products to see whether the results are consistent with that of total exports.

As shown in Table 1, the export tax rebate is significantly positively correlated with primary products and manufactured products, and the export tax rebate has a significant effect on export promotion.

### Table 1
Spearman rank correlation test results

<table>
<thead>
<tr>
<th></th>
<th>Total exports</th>
<th>Final consumption</th>
<th>Foreign exchange reserve</th>
<th>Primary products</th>
<th>Manufactured products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export tax rebate</td>
<td>0.9773***</td>
<td>0.9649***</td>
<td>0.9690***</td>
<td>0.9732***</td>
<td>0.9773***</td>
</tr>
<tr>
<td>$P$-value</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Primary products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export tax rebate</td>
<td>0.9690***</td>
<td>0.7874***</td>
<td>0.5955***</td>
<td>0.6078***</td>
<td>0.2363</td>
</tr>
<tr>
<td>$P$-value</td>
<td>&lt;0.0001</td>
<td>0.0001</td>
<td>0.0091</td>
<td>0.0075</td>
<td>0.3451</td>
</tr>
<tr>
<td>Manufactured products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export tax rebate</td>
<td>0.9711***</td>
<td>0.9732***</td>
<td>0.9773***</td>
<td>0.9814***</td>
<td>-0.4659</td>
</tr>
<tr>
<td>$P$-value</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>0.0001</td>
<td>0.0091</td>
<td>0.0513</td>
</tr>
</tbody>
</table>

*** indicates 1% significance level.
Of the five subcategories under primary products, except for animals and plants where the correlation coefficient is not significant, the coefficients of foodstuffs, cigarettes and liquor, non-dietary raw materials, and minerals all show significant positive correlations with the export tax rebate. The export tax rebate is also found to be positively and significantly correlated with the subcategories of chemicals, light textiles, machinery and miscellaneous under manufactured products. The correlation with the subcategory of “others” is negative, but not significant.

In summary, the empirical results indicate that the export tax rebate significantly boosts the export quantity, which upholds our theoretical propositions, that is, raising the export tax rebate rate increases export quantity.

4. Conclusions

This paper aims to develop a Cournot quantity competition model to explore the economic effect of export tax rebate policy and find the optimum export tax rebate rate, and then carry out empirical analysis using the statistical data of China. The conclusions drawn based on the theoretical model are as follows: (i) when a government raises the export rebate rate, the output of final goods for export by the domestic firm increases, while the output of the foreign competitor decreases; (ii) when a government raises the export rebate rate, the profit of the domestic firm increases, while that of the foreign competitor decreases, suggesting a profit-shifting effect where the profit of the foreign competitor is shifted in part to the domestic firm; and (iii) the optimum export rebate rate is greater than 1, indicating that the government not only refunds fully the custom duties paid by the domestic firm on imported intermediate goods, but also offers export subsidies for the export of final goods.

To corroborate the conclusions drawn based on the theoretical model, empirical analysis was carried out using the statistical data of China from 1985 to 2002. The test results of Spearman rank correlation coefficient show that China’s export tax rebate policy has significant positive correlation with its exports, final domestic consumption, and foreign exchange reserve. For an economy in transition, export tax rebate policy is apparently an effective policy tool for China to manage its balance of payments.

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