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Research Article

Factors Affecting Export Performance of Thai Rice Exporter in the Chinese Market

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Abstract

Background and Objective: Rice production and export, an important sector in Thailand's economy, has been threatened by Vietnam as the major competitor. This study was undertaken with the aim of comparing the competitive advantage of Thai and Vietnamese rice exporters in the Chinese rice import market, in order to provide suggestions to improve the competitive advantage of the Thai rice exporters. The main research question of this study is what factors contribute to the competitiveness of Thai rice exporters in the Chinese market? **Materials and Methods:** Mixed methods design was used to answer the main research question. Data, collected through a quantitative producer survey and qualitative interviews with industry experts is analyzed using multiple regression, revealed comparative advantage indexes and brand switching analysis. **Results:** The results indicated that two important facets of the problem of Thailand's position in the Chinese rice export market as compared to its most important competitor at the international level, Vietnam. First, Thailand is not competitive in this market, particularly in the high quality segment where it dominates. Second, however, Thailand is gradually losing competitiveness in the Chinese market to Vietnam. **Conclusion:** There are undoubtedly many reasons for this, including higher labor costs and increased costs associated with logistics and transport as well as comparatively discouraging and encouraging government policies toward the export market. Therefore, Thai government policy makers need to seriously consider revising or even discontinuing the paddy pledging program. The move to increase the price paid to farmers is laudable. However, it could eventually drive down production and eliminate the competitiveness of the Thai rice market.

Key words: Competitive advantage, Thai rice exports, Vietnamese exports, Chinese market

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Thailand has a thriving rice export sector. One of its major customers is China, the world's largest importer of rice in 2012¹. However, Vietnam's production of rice is now rather higher than Thailand's. As Vietnam's rice prices are also lower, this could have a major influence on the competitiveness of the Thai rice industry². Furthermore, the global rice market is likely to have excess supply in the future, as crop production across many rice-exporting and importing countries is estimated to be significantly above average at present³. Thailand will thus face fierce competition from other countries for a reduced level of demand. China, however, is an exceptional case, with increasing domestic demand outstripping increasing domestic supply, even though it is one of the largest rice producers in the world⁴. Thus, China is one of Thailand's main strategic markets for rice, despite the current low penetration of Thai rice into the Chinese import market.

The growing presence of Vietnam in the global rice export sector and in China especially, poses a substantial challenge to Thailand's position in the Chinese import market. Vietnam solidified its position as a supplier of Chinese rice imports in 2012 by establishing ties to the official trading system for high-quality rice, including some fragrant rice varieties that compete directly with the Hom Mali (jasmine) rice produced by Thailand⁵. This is in addition to increases in informal imports of lower-quality rice (including broken rice), which have been considerable for some time⁶.

However, Vietnam also faces some challenges that could influence its effectiveness at exporting rice to China. For example, the Vietnamese government controls rice export stocks, which could potentially limit the supply of rice available for the export market⁷. This is a reasonable position to ensure domestic food security, given the high reliance of the Vietnamese diet on rice: The International Rice Research Institute (IRRI) estimates that rice makes up 40% of the protein and 80% of the carbohydrates consumed by the average Vietnamese person⁸. However, the policy could still potentially impact the rice export sector, particularly during poorer production years. Additionally, the Vietnamese government sets rice export prices centrally⁹. To date, this has not resulted in a loss of market share because Vietnam's rice production costs are still lower than those of competing countries. In fact, Vietnam has recently taken some of the Chinese rice market share from Pakistan, based on lower costs and higher quality¹⁰. The Vietnamese rice export sector thus has both current strengths and potential long-term weaknesses; as Thailand tries to compete, it must cope with these factors.

This study aims to compare competitive advantages between Thai rice exporters and Vietnamese rice exporters in the Chinese market as well as to provide suggestions for enhancing competitive advantage of Thai rice exporters. In order to accomplish this research objective, the central research question has been developed:

What factors contribute to the competitiveness of Thai rice exports in the Chinese market?

In order to answer this central research question, this research will be examined: (1) Whether there is a competitive advantage of Thai rice exporters as compared to Vietnamese rice exporters in the Chinese market, (2) What factors have contributed to the competitiveness of Thai rice exports and (3) How to improve the competitiveness of Thai rice exporters in the Chinese market?

MATERIALS AND METHODS

A mixed-methods approach: This study uses an explanatory mixed methods design, as summarized in Fig. 1. Mixed methods research, which combines aspects of qualitative and quantitative data collection and analysis in the inquiry process, has a number of advantages over using a single research method¹¹.

This research follows an explanatory design: It aims to explain a certain situation using a number of different perspectives and analytical tools¹². As the research is quantitative-led, the quantitative analysis will be performed first; its outcomes will then be among the inputs into the qualitative research design, particularly in terms of determining research questions. Though the main elements of the research will come from the quantitative analysis, valuable information will also be provided by the qualitative portion. However, this data will only be partially embedded. Instead, data will be connected but not necessarily fully integrated¹¹. The research will not use triangulation, instead addressing research questions using either qualitative or quantitative approaches. This maximizes the strengths of mixed methods research by allowing the researcher to answer questions that may not be readily answerable using a single type of analysis.

Sampling strategy and procedure: The sampling strategy and procedure are different for the qualitative and quantitative portions of the research, since different populations were examined. Each approach is given in detailed.

Quantitative sample: For the quantitative research, the sampling unit is the firm-specifically, Thai rice exporting firms.

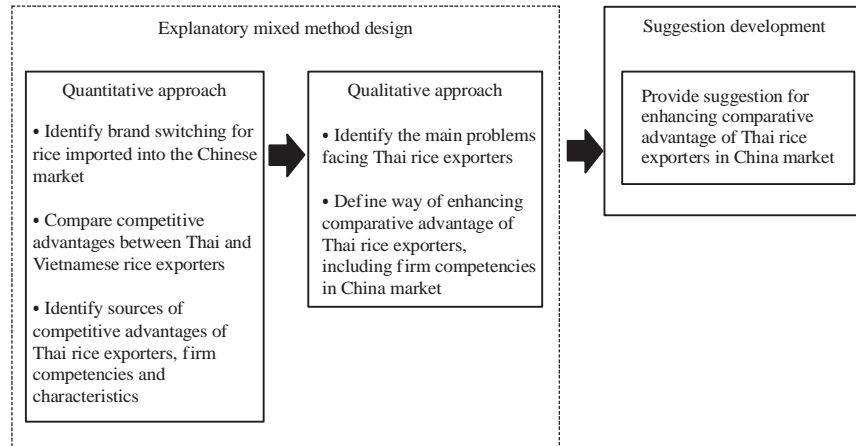


Fig. 1: Explanatory mixed methods design

The Thai Rice Exporters Association estimated that, in 2011, there were 188 Thai companies who exported rice to China. Given this relatively small population, census sampling i.e., simply asking all known members of the population to participate is efficient¹³. This approach was thus taken in order to maximize the number of study participants. However, only 74 of the firms returned the surveys to the researcher, yielding a 39.4% response rate. This is relatively high for mail-in questionnaire-based quantitative studies, which more commonly see response rates¹⁴ of 10-15%. As this represents nearly half of the total population of interest, it can be considered satisfactory. However, the small sample size does somewhat limit the statistical techniques that can be used.

One potential problem with the quantitative sample may be a certain level of “Survivorship bias” and exclusion of new entrants, given that the most recent available sampling list was 2 years old at the time of the study. As such, very new firms that have just entered the Chinese market are not represented. Similarly, firms that have gone out of business since the 2011 data was collected are not likely to participate. While, it is difficult to estimate the impact of these potential problems on the survey results, they should be kept in mind.

Qualitative sample: The qualitative sample was selected from the same population as well as Thai government officials. This was done using purposive selection based on knowledge of the research topic, as is usually used in qualitative research¹². Five interviewees were selected: Four from among the Thai rice exporters who responded to the survey and two representatives of the Thai government who dealt with the rice export market and its issues. Selecting these interviewees enabled gaining a deeper understanding of the survey responses as well as of policy problems.

Data analysis: Four methods of data analysis were used: Brand-switching analysis, revealed comparative advantage (RCA) analysis, multi variate regression and thematic analysis.

Brand-switching analysis: Brand-switching analysis, a quantitative technique is used to uncover preference changes for products and brands in the consumer base for comparable products¹⁵. The key focus of brand-switching analysis is on identifying trends in market share in order to determine the competitive position of various competitors within a defined market¹⁶. The assumptions of brand-switching analysis include that: The market size does not change during the period of analysis; all customers have access to all brands analyzed each time they make a purchase and a fixed quantity of the product is purchased by each customer¹⁷. This makes it a relatively limited form of analysis, but it can be useful in uncovering the brand preferences and switching behaviors of a given set of consumers for a particular commodity. In this research, brand-switching analysis will be conducted using information from secondary sources, as described in the data collection section. Marketing Manager for Excel (MM4XL) software has been specifically designed to undertake brand-switching analysis and is thus used in this research¹⁸.

Revealed comparative advantage (RCA) index: Second, the RCA index is used to compare the advantages of Thailand and Vietnam in exporting rice, specifically for the Chinese market. The RCA is an indexing method for understanding international trade, first derived by Balassa¹⁹ and later refined by a number of other researchers²⁰. The RCA is based on the observation that, due to differences in factor ownership and

allocations, it is insufficient to merely interpret a high or low share of the export market as indicating that a given country is comparatively advantaged or disadvantaged^{20,21}. Instead, factors and export outcomes must be standardized between countries and compared to some average or median level of production in order to determine which countries are relatively advantaged or disadvantaged based on their own factor allocations and involvement in the market^{20,21}. The current form of the RCA index, as described by Gorton *et al.*²⁰ can be expressed as:

$$RCA_{in} = (x_{in}/X_{iw})/(x_{mn}/X_{mw}) \quad (1)$$

Where:

RCA_{in} = Revealed comparative advantage of country n in commodity i

x_{in} = Export value of commodity i from country n

X_{iw} = Total export value of commodity i from all countries in the world

x_{mn} = Export value of all commodities m from country n

X_{mw} = Total export value of all commodities m from all countries in the world

This calculation yields an index that can be interpreted as follows. If $RCA_{in} > 1$, then country n has a comparative advantage in commodity i compared to other producers in the market²⁰. In contrast, if $RCA_{in} < 1$, then country n has a comparative disadvantage in commodity i compared to other producers. If $RCA_{in} = 1$, then the country is operating at the mean level of comparative advantage and is neither advantaged nor disadvantaged-in practice, this is rare.

This study aims to explore comparative advantage in a particular commodity (rice) in a particular market (China) rather than undertaking a general analysis of commodities overall. Thus, the general form of the RCA index (Eq. 1) has been modified in order to reflect the expected conditions of the market. The modified RCA index used in this study is given by:

$$RCA_{jkf} = (m_{jkf}/M_{jf})/(m_{wkf}/M_{wf}) \quad (2)$$

Where:

RCA_{jkf} = Revealed comparative advantage for commodity k of country j in country f

m_{jkf} = Import values of commodity k by country f from country j

M_{jf} = Total import values by country f from country j

m_{wkf} = Import values of commodity k by country f from the world

M_{wf} = Total import values by country f from the world

In these equations, commodity k is rice, target country f is China, source countries j are Thailand and Vietnam and w continues to represent the world market. This modified equation can be used to calculate the RCA indexes of Thailand and Vietnam as they compete to export rice to China.

The RCA is calculated using data extracted from the UN Food and Agriculture Organization database, which includes data on imports and exports by country and at regional and global levels³. The analysis was conducted using Microsoft Excel.

Regression analysis: Regression analysis is a flexible set of approaches for uncovering causal or predictive relationships between variables, including linear, non-linear and stepwise relationships²². Regression analysis can uncover relationships between one predictor variable and one outcome variable (single regression) or multiple predictors and one outcome (multiple regression) and can use these relationships to predict future outcomes.

Regression analysis is based on the F-value²³. A higher F-value implies a stronger relationship between the variables; variables that are not highly correlated do not shift the F-value and appear insignificant in the regression equation. Those that are highly correlated alter the F value as well as the R^2 value, which encapsulates the model's predictive power. A higher R^2 means that the variation in the predictor variable(s) is responsible for a higher proportion of the variation in the outcome variable²³. In this study, a best-fit approach is used to identify the model. This approach does not attempt to find the highest R^2 value but instead the most explanatory power with multiple variables included²³. The goal is to include all identified predictor variables and to determine the overall relationship between the predictor and outcome variables.

Regression is not appropriate for all of the hypotheses proposed. However, it is appropriate for uncovering the relationships between predictor and outcome variables proposed in the relationships between firm characteristics and firm competency as independent variables and competitive advantage as dependent variable. Because of this, multiple regression analysis will be used as the main technique for testing these hypotheses. The predictor variables will include firm competency factors (technology, distribution, brand loyalty and labor) and firm characteristic factors (including firm size, firm strategy, firm experience and quality). The outcome variable will be comparative advantage of the firm (specifically exporting marketing). These variables will be tested together in order to identify the full model associated with comparative advantage at the firm level.

Statistical analysis: To determine the validity and reliability of the questionnaires and validity of the measurement items, a pretest was carried out. Ten questionnaires were distributed to TREA members with the assistance of the Great Ocean Rice Company. The resulting reliability test was based on Cronbach's Alpha coefficient, which ranges from 0 (wholly unreliable) to 1 (wholly reliable). A score of 0.70 is the cutoff value for acceptability and reliability.

Thematic analysis: Thematic analysis, less complex than the methods above, is used to examine the qualitative data. Thematic analysis is a process through which qualitative inputs (in this case, interview transcripts) are analyzed for meaning and reflection on a particular area of research concern²⁴. Themes, or overarching elements within the qualitative findings, are then extracted from the data and discussed. Themes can include contradictory or conflicting elements as long as they all relate to the same central category of analysis¹². Following the standard approach to thematic analysis of qualitative data, this study thematic analysis begins with coding the interview transcripts and using the interview notes to flag nonverbal communication and researcher thoughts and notes taken during interviews¹². The codes derived from this process will then be organized and reorganized into categories until the categories are consistent and reflect only a single construct. Finally, categories are organized into themes, which are discussed based on their relevance to the research question.

RESULTS

Retention and switching rates in 2012: The quadratic programming software model is used to calculate retention (i.e., loyalty) rates. This approach is based on a matrix of transition probabilities, which in this study refers to retention and switching rates. This is estimated with transition probabilities between 0 and 1. The method minimizes the sum of squared residuals, subject to the constraints set on the transition probabilities. The 2012 retention and switching rates for Thai rice as opposed to Vietnamese rice in China are illustrated in the percentage matrix in Table 1. The results can be interpreted as follows:

- Diagonal values (retention rates, indicating the retained sales) show that in 2012 Vietnamese rice had the higher retention rate of 100%, with Thai rice at 97%
- Row values (switch-to rates, indicating outgoing sales) show that in 2012 Thai rice lost 3% of total sales volume to Vietnam and Vietnamese rice lost no sales to Thailand

- Column values (switch-from rates, indicating incoming sales) show that in 2012 Thai rice gained no sales from Vietnam. Vietnamese rice, however, gained 3% of sales from Thailand

Considering retention and switching rates, it is apparent that in 2012, Vietnam had a higher retention rate than Thailand, suggesting that Vietnamese rice currently has more loyal customers in the Chinese market than does Thai rice.

Revealed comparative advantage of Thai rice in China: The RCA index is calculated based on China's values of total imports and rice imports from Thailand and Vietnam between 1995 and 2012. The results show that, from 1995-2012, Thai rice imported into China had an RCA index greater than one; therefore, Thailand had a comparative advantage in this market. Vietnam had a comparative advantage (RCA>1) from 1995-1996, 2004-2007 and 2010-2012. From 2010-2012, Vietnam had a higher comparative advantage than did Thailand.

Thailand's RCA index showed a large negative growth rate, with an 89.3% decrease between 1995 and 2012, from 60.8-6.5: Thai rice has lost considerable comparative advantage in the Chinese market. Vietnam's RCA index fell by 27.3% between 1995 and 2012, from 93.4-67.9, suggesting that it is also losing RCA, though not as rapidly as Thailand.

Vietnam's RCA index had an average annual rate of change of 25.8%, while Thailand's RCA index showed a negative average annual rate of change of -0.3%. From 1996 to 2010, Thailand's RCA index was higher than that of Vietnam, but from 2011-2012, Thailand's RCA index was lower than Vietnam's. This is probably because Thailand's rice is priced higher. The change in Thailand's RCA index is negative, whereas that for Vietnam is positive: Thailand lost comparative advantage in the Chinese market while Vietnam gained it.

It is also evident that, from 1995-2012, Thailand's RCA index experienced a higher total growth rate than that of Vietnam, but Vietnam's RCA index had a higher average annual growth rate. Vietnam's RCA index increased continuously over this period, suggesting that Vietnamese rice exports were able to gain a comparative advantage. Thai rice

Table 1: Percentage matrix of rice imports from Thailand and Vietnam into China in 2012

Country	Thailand (%)	Vietnam (%)	Total (%)
Thailand	97.0	3.0	100.0
Vietnam	0.0	100.0	100.0

Calculated using Marketing Manager for Excel (MM4XL) software, source: Global Trade Atlas⁴

exporters should thus closely observe the trends in Vietnamese rice in the Chinese market, as shown in Table 2.

Considering sales gained or lost in 2012, the best strategy for Thai rice appears to be increasing its market share (competitive position) in the Chinese market and trying to reduce sales from Vietnam. To inform such a process, this study will now evaluate the competitive position in China of Thai rice as compared to Vietnamese rice, including market share, market share forecast, retention rates and sales gains or losses. In addition to the RCA index, a measure of the comparative advantage or disadvantage, market share is a major means of determining competitive position and customer loyalty/retention is an important measure of market competitiveness.

Table 2: Revealed comparative advantage index of rice imports into China from Thailand and Vietnam from 1995-2012

Years	Thailand	Vietnam
1995	60.8	93.4
1996	61.2	56.6
1997	70.3	0.0
1998	57.7	0.03
1999	59.3	0.0
2000	51.2	0.0
2001	51.5	0.0
2002	52.3	0.0
2003	46.8	0.09
2004	47.3	5.8
2005	45.2	10.7
2006	42.6	9.5
2007	40.6	9.5
2008	43.4	0.6
2009	39.0	1.1
2010	37.6	17.6
2011	29.5	50.1
2012	6.5	67.9
Average annual growth rate (%)	-0.3	25.8

Source: Global Trade Atlas⁴

Table 3: RCA, competitive position and sales volume of rice imports to China from Thailand and Vietnam in 2012

Description	Thailand	Vietnam
Competitive position in China		
Market share in 2012 (%)	10.2	89.8
Market share forecast at time t+1 (2013) (%)	9.9	90.1
Retention (Loyalty) rate in 2012 (%)	97	100
Sales gain or loss in 2012 (t)	-5.256	5.256
Revealed comparative advantage in China		
RCA index in 2012	6.5	67.9

Source: Global Trade Atlas⁴

Table 4: Basic information on Thai rice exporters, by firm category (N = 74 firms)

Characteristic	Small firms (33 companies)	Mid-sized firms (35 companies)	Large firms (6 companies)
Years of company existence	1-5	6-20	>20
No. of employees	1-50	51-200	>200
No. of destination countries	1-5	6-20	>20
Average annual production (t)	1-10,000	10,001-1,000,000	>1,000,000
Average annual sales volume (t)	1-10,000	10,001-1,000,000	>1,000,000

Table 3 summarizes these competitive conditions for the 2012 export year. Overall, from 1995-2012, Thai rice lost its strong competitive position to Vietnam. From 1995-2012, Vietnam increased in competitiveness and from 2011-2012 it was more competitive than Thailand in China's rice market. This can be seen from the fact that Vietnam had a higher retention rate and market share than Thailand.

Regression analysis

Basic information on the studied companies: The Thai Rice Exporters Association (TREA), which plays an important role in promoting rice exports, provided information on exporters for this study. Using this information, a Thai-language questionnaire was mailed to 188 rice-exporting companies in Thailand. Descriptive statistics were first collected about date of establishment, size, production capacity, quality assurance and company suppliers, using questions adapted from Jie²⁵ questionnaire. The second part of the questionnaire included questions on the company's distribution network, technology, product loyalty and labor force.

Data collection was carried out from August-November 2011. Questionnaires were first distributed in person at a monthly meeting of TREA then mailed to the rice exporters. In total, 74 valid questionnaires were returned, including 15 collected at the meeting and 59 from the mail-in sample, yielding a response rate of 39.4%.

The final sample included medium-sized firms with 50-200 employees (47.29%), small firms with under 50 employees (44.59%) and large firms with over 200 employees (8.1%) as shown in Table 4. Table 4 also presents company profiles for the 74 respondents. About 42% were established more than ten years before the survey. Forty one percent of sampled rice exporters process more than 100,000 t annually and the same portion exports more than 100,000 t of rice per year. Forty three percent of responding firms export rice to 15-20 countries.

Survey results: The survey also asked respondents for their own evaluations of the influence on export performance of firm characteristics and competencies, including firm size, strategy, experience, quality, technology and distribution services. Table 5 presents data on these factors; those with

mean ratings higher than 2.5 were noted as important issues affecting export performance. Distribution is considered by the sample companies to be the most important factor in gaining competitiveness, followed by technology, strategy and labor. In addition to these, brand loyalty and the quality of the exported rice are also taken very seriously by firms when measuring their export performance. Experience and the size of the firm, however, are perceived as only of moderate influence.

Regression results: The pre-test Cronbach’s Alpha for firm characteristics is 0.705 and that for firm competencies is 0.755. The values for the full sample (N = 74) are higher: 0.712 for firm characteristics and 0.7687 for firm competencies. The scales can thus be considered reliable.

This study defines firm competencies in terms of labor, distribution, brand loyalty and technology and certain elements of firm’s competencies and characteristics are considered vital for export performance. This study thus examines the relationship between these factors on export performance via regression analysis. Table 6 shows the results for the impact of aspects of firm competency on export performance. Labor and technology are not significantly related to export performance, with significance levels above >0.05. The significance levels for distribution, quality and loyalty, however, are all below 0.05, indicating that these factors have a significant impact on the performance of Thai rice exporters.

Considering the impact of firm characteristics on export performance, the firm’s experience and strategy were insignificant ($p > 0.05$) predictors of export performance, with t-values of 1.13 and 1.11, respectively. The overall R-value is 0.36, indicating that 36% of variance in the dependent variable, export performance, can be explained by the independent variables, the components of firm’s competencies and characteristics are also described.

Thematic analysis

Interview results: Experts who provided valuable information for this study via their interviews include five Managing Directors of rice-exporting companies and two government officials from the Office of Agricultural Economics. The interviewees suggested that superior technology and the production of higher-quality rice are sources of competitive advantage for Thailand. This is particularly the case for the premium rice segment, in which Thailand is a much stronger competitor than Vietnam. Other advantages mentioned, though by fewer interviewees, include a larger area under cultivation and brand loyalty. The regression analysis

performed on the survey data partially agrees with these results; it indicates two firm capabilities and two firm characteristics that bolstered competitive advantage in the Chinese rice market. Capabilities included distribution and loyalty (but not labor or technology), while characteristics included firm size and product quality (but not experience or strategy).

One of the biggest weaknesses in the competitiveness of Thai rice is product cost, particularly in the low-quality rice market. This is particularly important because there is no perceived difference in quality between low-quality Thai and Vietnamese rice. However, it could also affect high-quality rice segments, particularly if the practice of post-import mixing of Thai and Chinese rice continues. Reasons for higher prices include higher costs for labor and production and lower yields. The shipping cost is also a factor, since Vietnam uses higher-volume and lower-cost sea transport both internally and from Vietnam to China, while Thailand relies on higher-cost road transport. Another cause of high costs is Thailand’s paddy-pledging program. This program was meant to increase rice farmer’s incomes by increasing their price per metric ton, but it also increases the price associated with Thailand’s rice exports. This is a serious problem for the competitive positioning of Thailand in the Chinese rice market, especially when compared to Vietnam’s policy of fixing lower prices for export rice.

In the interviews, suggestions for improving the competitive advantage of Thai rice companies exporting to

Table 5: Importance of firm factors in competitiveness

Firm factors	Maximum	Minimum	Mean	Standard deviation
Size	5	1	2.17	1.33
Strategy	5	2	3.63	0.69
Experience	5	1	2.82	1.48
Quality	5	1	3.01	1.39
Technology	5	1	3.67	0.95
Distribution	5	1	3.77	1.00
Loyalty	5	2	3.43	1.07
Labor	5	2	3.62	0.90

Table 6: Regression results considering the impact of firm competency factors and firm characteristics factors on export performance (N = 74)

Factors	Unstandardized Coefficient		Standardized		Significant
	coefficient	standard error	coefficient	t	
Constant	4.75	0.39	-	11.82	0.00
Labor	0.06	0.06	0.07	1.15	0.25
Distribution	-0.12	0.06	-0.14	-2.07	0.03
Loyalty	-0.17	0.06	-0.17	-2.39	0.03
Technology	0.07	0.06	0.06	1.13	0.27
Size	-0.117	0.06	-0.12	-2.04	0.02
Experience	0.05	0.06	0.06	1.13	0.26
Strategy	0.04	0.06	0.07	1.11	0.24
Quality	-0.151	0.06	-0.15	-2.36	0.02

R: 0.36, adjusted R²: 0.084, standard error: 0.66, F-value: 6.29, significant: 0.00

China largely followed from the competitive weaknesses identified in the analysis. The main suggestion of all three interviewees was either redesigning or discontinuing the paddy-pledging program in order to reduce the price demanded and increase available export volume. One interviewee pointed out that, since rice is a perishable commodity, stockpiling it (as the Thai government is currently doing) would not significantly improve food security or the availability of rice for future export-volume smoothing. It could instead damage the reputation for quality that Hom Mali rice currently holds if the market is later flooded with poor-quality aging rice. It is also possible that the decrease in export competitiveness since 2010, when the RCA analysis indicates that Vietnam became the market leader, is an outcome of the paddy-pledging program. This possibility was not directly assessed in this study, but it could have serious implications for future penetration into the Chinese market, which is one of the growth areas of Thai rice. Thus, a program redesign may be necessary in order to reduce the price of rice and increase its availability for export while protecting quality.

Another suggestion is that changing the firm's logistical approaches could improve competitive advantage by reducing transport costs. Finally, improved use of technology could potentially increase the competitive advantage of Thai firms. Factors such as firm size, government programs designed to prevent quality deterioration, labor cost and firm's levels of experience are less important (the quantitative research also showed that some of these were not significant). These factors need to be explored in more depth because they are complex issues that involve ethical concerns outstand economic restructuring in addition to simple improvement of competitive advantage.

DISCUSSION

The key findings of this study can be considered in two aspects, including the quantitative study (the producer survey) and the qualitative study (the rice industry experts). Four areas of concern include brand switching, comparative advantage (RCA), firm sources of competitive advantage and enhancing competitive advantage.

The study showed that Thai rice did experience some brand switching in China, with 3% of consumer loyalty lost to Vietnam (and with no loss from Vietnam to Thailand). This amounts to 5,246 t lost to Vietnam. This trend is forecasted to continue in the near future and that Vietnam will continue to dominate Thailand in the Chinese market through 2022. Brand switching is seen in the interviews as a serious problem because of cost and quality issues.

There is a number of reasons why consumers might choose to switch brands, including price differences, availability, changes in quality or dissatisfaction with quality and increased perceived risk^{26,27}. The most obvious reason why consumers would choose to switch to Vietnamese rice, particularly for low-quality white rice, is that there is a price difference between Thai and Vietnamese rice.

The impact of quality and increased perceived risk should not be ignored, particularly given the problem of Chinese and Thai rice mixtures, which could reduce quality perceptions. This may be particularly problematic because rice, as a commodity product, is not likely to encourage much brand loyalty except in premium segments. As already discussed, most rice exported to China is low-quality white rice, with premium rice being a minority. This leaves the product open to a high potential for brand switching²⁸. Although, Lamb *et al.*²⁹ suggested that brand switching is likely to go both ways, in this analysis it did not. This suggests that Thailand could have an increasing problem in future if it does not control costs in order to prevent brand switching.

The RCA analysis revealed that from 1995-2012, Thailand had steady average growth, while Vietnam was patchier. However, Vietnam's comparative advantage grew stronger during this period (driven by high market share and retention rates), while Thailand did not grow as fast. By 2010, Vietnam was more competitive in the Chinese market than Thailand (though both are absolutely competitive).

The RCA analysis is ideal for comparing two competitors in the market, predicting future competitiveness and determining whether producers are absolutely competitive in a given market³⁰. This analysis has, as Hu³⁰ and Balassa¹⁹ have argued it can, shown that Vietnam has comparatively stronger production strength in the Chinese market. This would not necessarily hold in a different market, since competitive conditions may be easier or different in other markets. However, it does not show that Thailand is uncompetitive in the Chinese market. This is consistent with other studies, which have shown that Thailand (and Vietnam) do have comparative advantage^{30,31}. Thus, the findings of this analysis are consistent with previous findings. It should be noted that Atisook and Scannell³¹ already found problems with the export strategies being encouraged by the Thai government, which they predicted would erode Thailand's competitive advantage. It is clear that this has occurred, as noted above. The findings of this study, which show that improvements in production costs, quality and logistics costs are desirable in order to improve competitive advantage, follow a tradition of identifying opportunities for industrial change associated with the RCA³². It also showed changes in export patterns, which

was also done by Yue³³. Thus, procedurally, this study's use of RCA was consistent with previous studies and their use of the tool.

The questionnaire showed that factors affecting export performance included strategy, experience, quality, technology, distribution, loyalty and labor. Size was not a factor. Firm competency factors associated with export performance in the multiple regression analysis showed that distribution and loyalty have a significant impact on performance, but that labor and technology do not. Firm characteristics including firm size and product quality were associated with export performance, but experience and strategy were not.

Some of the findings in this part of the study appear to be surprising, but actually may not be. For example, the use of technology is known to be a factor in the competitive advantage of firms in the export market, especially logistics and information systems technologies³⁴. However, in order for technology to be a competitive advantage, two conditions must be met. First, the firm must recognize the value of the technology, which can be a problem in small firms³⁵. Second, simply adopting technologies in a market-following pattern is not sufficient; firms must adopt technologies early and choose the right technologies in order to leverage them into competitive advantage³⁶. Labor can be a competitive advantage³⁷, but given the structure of the rice industry (with a large number of small farms relying on household labor) that may not be the case here. Thus, even though these issues have not been shown to have a competitive advantage, this is reasonable given the conditions of the market. Firm size and product quality were important, in that higher size means reduced cost and increased capacity³⁸ and production of appropriate quality can increase competitive advantage³⁹. Firm strategy was shown to be important in the literature review⁴⁰. The same can be said for firm experience⁴¹. However, this was not the case in this study. This could be attributed to the fact that most small rice firms do not export directly and thus export strategy and experience is not strongly relevant to them.

The qualitative findings showed that Thai exporters struggle in the Chinese market because of quality problems (mixing Jasmine rice with lower-quality Chinese rice), government regulations and issues and production problems. Competitive advantages included technology, production capacity and premium rice quality and weaknesses included low yield and high labor and logistics costs, as well as problems with quality perception. These areas highlight opportunity for improvement.

This is one of the most important areas of this research because it addresses multiple levels of strategy, including government, industry and firm level strategies. The literature review suggested that firm competency factors (including technology, distribution and logistics, brand loyalty and labor force) could be important factors in building competitive advantage. However, in order to be a competitive advantage, a firm competency must be an aspect of the firm that can be used appropriately and it must be unique within the industry^{41,42}. There actually is nothing to suggest that the technology and labor force in use in the Thai rice industry is different from the Vietnamese rice industry and as such these may not be areas for improvement. This suggests that brand loyalty and logistics, which are competitive advantages, is a viable target for improvement of the Thai rice industry. However, labor and technology are not necessarily areas that are off limits, since if these could be improved then Vietnamese producers would not face such a strong competitive advantage^{41,42}. This would significantly improve Thailand's position in the Chinese rice market.

Firm characteristics are based on the resource-based view of the firm, which holds that resources available to the firm can be used to build competitive advantage⁴³. Firm size is one area for obvious improvement. Firm size is known to be an advantage because it increases the resources available and reduces costs through vertical integration and economies of scale⁴⁴. However, it could be problematic because the current structure of the market is based on small farms. This could be alleviated somewhat, for example by introduction of regional grower's cooperatives to share resources and increase resource utilization. An increased effective firm size could also help increase use of TQM⁴⁵, which could reduce quality issues. However, it should be noted that many quality issues emerge not from production, but from post-export adulteration or admixtures of rice varieties. Thus, improving product quality may not directly impact the firm's competitive advantage, at least for exports into markets like China where this product mixture occurs.

CONCLUSION AND FUTURE RECOMMENDATIONS

This study has provided a comprehensive overview of Thailand's position in the China's rice market when compared to its most important competitor, Vietnam. It has highlighted two important facets of this problem. Thailand is not uncompetitive in this market, particularly in the high-quality segment, which it dominates. However, Thailand is gradually losing competitiveness in the Chinese market to Vietnam.

There are undoubtedly many reasons for this, including Thailand's higher costs for labor, logistics and transport, as well as the Thai government's policies toward the export market. Some issues, such as higher labor costs, may not be issues that Thai rice producers want to rectify, since reducing the wages of rural agricultural workers could be both ethically problematic and politically unpopular. However, many of these factors could be improved upon, leading to an increase in the competitiveness of the Thai rice export sector in China. Given the potentially high value of the Chinese market, this must be seriously considered in order to ensure that Thailand retains its competitive advantage and increases its market share in China, rather than continuing to gradually lose market share over time. Given the importance of the rice export sector to the Thai economy, it is vitally important that the government and industry managers take this study's findings into account and improve the conditions under which the rice export sector operates in order to increase its competitive advantage.

There are some clear recommendations for future research that can be performed that will improve the knowledge of the Thai rice export position and provide additional foundation for increasing its operational strength. One of these areas for research is exactly as outlined above. Economic research into industry structure, efficiency and technological and production capabilities of different sizes of rice farms and milling plants would help provide a comprehensive understanding of where efficiencies could be gained. By studying all factors of production (including labor), an expanded economic study would allow for a better description of how the Thai rice export market could be enhanced, as well as its import market. While, some of the issues identified by the participants in the qualitative study included high use of chemicals, low rice yields and inefficient logistics, there could be a number of other cost factors at work. However, this analysis should also balance ethical issues (such as the appropriateness of cheaper labor or the cultural effects of creating larger farms), in order to remain sensitive to the Thai way of life as well as economic demands. This research would provide information for farmers of all sizes on how to increase yields and lower production costs, rather than just the insight that they should do so.

A second opportunity for research is determining how the Thai rice brand can be protected, particularly its premium Hom Mali and new developed varieties. The report that premium grade rice from Thailand is mixed with inferior Chinese rice before distribution in China suggests that this could also happen elsewhere, eroding the value of the

exported brand. By strengthening the branding of Thai rice, this could improve the position of the rice in the market as well as protect it from adulteration. A research project that addresses how this strengthening could be done would be a benefit for the industry as well as for government policymakers. By conducting ethnographic or market research in export destinations, a researcher could help identify how consumers currently view Thai Jasmine rice and provide insights into what improvements could be made. This type of research could then be used to formulate test products that could be sold into high-value markets, observing the effects of improved branding on sales and customer satisfaction rates. This would be a detailed program of product development that may be best performed by government rice marketing department or large industry group, rather than a single academic researcher.

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