Competitiveness Analysis of Agricultural Products in Mekong River Delta: Implications for Vietnam Agriculture on Accession to WTO[*]

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Revised 30 April 2008
Please do not quote

Abstract

Vietnam's accession to the World Trade Organization (WTO) brings about opportunities as well as challenges to domestic producers among which farmers are considered as the most vulnerable. Mekong River Delta is the region with highest percentage of people easily to fall back into poverty when there are abrupt changes in economic conditions. With a majority of population living on agriculture, the competitiveness of agricultural products in the Mekong River Delta is always a critical issue when Vietnam integrates into the world market. The objective of this research is to answer: (1) How competitive are Mekong River Delta agricultural products? (2) How does competitiveness vary according to farm's characteristics? (3) What are factors enhance or constrain the competitiveness of Mekong River Delta agricultural products? To answer these questions, Domestic Resource Cost (DRC) ratio is calculated for rice, fruits and shrimp at farm level using data from Vietnam Household Living Standards Survey. In addition, focus group discussion is also utilized to identify factors enhancing or constraining the competitiveness of Mekong River Delta agricultural products in long-run. For the results, while DRC ratios are favorable for rice and shrimp, evidence from focus group discussion imposes challenges on how to sustain the competitiveness in the future. To overcome these challenges, especially with market orientation and quality control, the cooperation among farmers, scientists and businesses should be stimulated through a more active role from government.

Keywords: Domestic Resource Cost Ratio, Focus Group Discussion, Mekong River Delta.

1.   Introduction

In the process of transition from central planning to market-orientation, the contribution of agriculture to Vietnam's GDP declined from about 40 per cent in late 1980s to 20 per cent in 2004 while the share of agricultural exports also felt from 60 per cent to 30 per cent (World Bank, 2005). However, with about 75 per cent of the population living in rural area and about two-thirds of labor force participating in agricultural activities, agriculture should receive great concerns from policy-makers to alleviate poverty and improve living standards for people in the nation. During 1998 – 2002, the growth rate of agriculture stayed at about 4 per cent annually which is high by international standards (World Bank, 2005). The process of trade liberalization and Vietnam's accession to WTO are offering agricultural sector new opportunities as well as imposing challenges. As a low-income country, together with the instability of the world market for agricultural products, the competitiveness of agricultural products has been a critical problem for Vietnam's agriculture.

The Mekong River Delta consists of thirteen provinces located in the south-west of Vietnam. In 2004, the area for growing paddy accounts for about fifty-one per cent that of the country, making this region the largest supplier of rice for domestic consumption and export. In addition, Mekong River Delta is also the largest producer of fruits and aqua-cultural products among eight major economic region of the country (Vietnam News Agency, 2006 and Hung Anh, 2007). Despite the fact that this region is the biggest supplier of agricultural products for both domestic and international market, poverty is still a big problem in Mekong River Delta though the number of people in poverty has declined significantly because this is the region where the highest percentage of people easily to fall back into poverty when there are abrupt changes in economic conditions (AusAID, 2004). One of the threats for Vietnam agriculture is the high production cost of some products (Cong Phien, 2006). The threats become much more serious with FAO's warning of one billion tons of agricultural products from other Asian countries is waiting to enter Vietnam market after the accession to WTO (ICARD, 2006). Therefore, it is necessary to study the competitiveness of agriculture in the Mekong River Delta in the process of economic integration. This research aim at answering the following questions:

- How competitive are Mekong River Delta agricultural products?
- How does competitiveness vary according to farm's characteristics in Mekong River Delta?
- What are the key success factors and the constraints impacting on the competitiveness of Mekong River Delta agricultural products?

2.   Analytical Framework

Competitiveness theory has a long history of development, evolving from Adam Smith's comparative advantage to Michael Porter's competitive advantage (Cho and Moon, 2002). However, little agreement on the definition of the term "competitiveness" can be found although the literature on competitiveness is developing in both economics and business (Esterhuizen, 2006). The survey of concepts shows that competitiveness literature surprisingly focuses mainly on industrial-based and technology-based economies rather than agricultural sector, the most important economic sources of developing countries' welfare. (Coy,

2006). This study does not aim at developing a definition of competitiveness for agricultural products. Rather, the primary concern is place on measurement of competitiveness at farm level. Domestic Resource Cost ratio is used as a quantitative approach to measure competitiveness of agricultural products. Focus group discussion, through in-depth interview, helps to find factors that may enhance or constrain the competitiveness in the future. For their popularity, rice, citrus and shrimp are selected as representatives for Mekong River Delta agricultural products. The conversion ratio between rice and paddy is 0.65 (Agrifood Consulting International, 2002).

2.1. Domestic Resource Cost (DRC) Ratio

The DRC of a commodity compares the opportunity cost of domestic resources used in production of that commodity to the value added it generates at international prices (Bajramovic et al, 2006).

$$DRC_i = \frac{\sum_{j=k+1}^{n} a_{ij} V_j}{P_i - \sum_{j=1}^{k} a_{ij} P_j}$$

in which

a_{ij} (j = k +1 to n): technical coefficients for domestic resources and non-tradable inputs.

V_j : shadow prices or social prices of domestic resources and non-tradable inputs.

P_i : border price of traded output.

a_{ij} (j=1 to k) : technical coefficients of tradable inputs

P_j : border prices of tradable inputs.

Domestic production of a nation is potentially competitive if DRC is smaller than 1, because the opportunity cost of domestic resources is smaller than the net foreign exchange gained from exports or saved by substituting imports (Bajramovic et al, 2006). However, it should be taken into account that DRC is sensitive to the selection of shadow prices for non-tradable inputs, exchange rate and international prices (Gorton et al, 2006).

Although there are several approaches to measure the competitiveness of a commodity, DRC is widely used in agricultural sector as found in studies by Gorton et al (2001), Gorton and Davidova (2001), Agrifood Consulting International (2002), Bajramovic et al (2006) and Gorton et al (2006). In addition, the versatility and intuitive interpretation of DRC make it become the dominant indicator in structural adjustment programs financed by World Bank and in the analysis of transition economies (Bajramovic et al, 2006).

The DRC calculations for agricultural products in Mekong River Delta are based on the following assumptions:

a. Prices are valued in VND with reference to year 2004.
b. Tradable and non-tradable inputs, private costs and yields are extracted from Vietnam Household Living Standards Survey (VHLSS) 2004. Following the approach suggested in Brent (2006), social prices for tradable inputs are calculated by deducting private costs by 15 per cent (commodity tax plus import tariff) and by 10 per cent (commodity tax) in the case of non-tradable inputs.
c. Border prices for outputs are taken from FAOSTAT and Center for Aquaculture Informatics, Vietnam (FICen) with reference to Thailand for rice and shrimp and China for citrus. Adjustment is made with port costs and transportation cost.
d. The social cost of labor[**] is measured using average wage paid in manufacturing industry in urban area of Mekong River Delta.
e. Farmers often grow both food crops and fruits in their land. Returns and degree of risk also vary according to type of plant. Thus, social price of land is measured by taking average of land rent for rice and citrus. This approach assumes that social land values would fall somewhere within the range of these alternatives (Gorton et al, 2006). For shrimp, measuring social cost of land is still problematic since environmental effects should be taken into account. In reality, certain model of shrimp farming can deteriorate land completely after several years.
f. Social price of capital is approximated by the interest rate that would be earned if the amount were deposited in the bank plus depreciation.

2.2. Focus group discussion

Salinger (2001) and Tewari (2006) argue that, though important, the analysis of competitiveness based on cost comparison is not enough. In the study on productivity, comparative advantage and competitiveness in Africa, Salinger (2001) suggests that future research needs to consider qualitative approach, i.e. micro case studies, aspects of product development and industry management and that micro case studies can help to gain a better understanding of competitiveness factors. And Tewari (2006) also believes that, in addition to price, several non-price and institutional factors are keys to the competitiveness of an industry, especially in an environment of volatility and intensified competition where customers increasingly emphasize on variety, quality, and timely delivery. Cuevas (2004) suggest several factors as determinants for competitiveness in small food industry system, including *technological development*, *absorption of technology*, *technology transfer*, *innovation*, *production process*, *market and consumer-oriented plan*, *total quality control*, *financial management and managerial capacity*. This study applies focus group discussion as an qualitative approach to understand the competitiveness of agricultural products based on the factors listed above.

[**] Hired labors only. This version of paper has not decomposed family labors from VHLSS 2004.

3.   Research Design

Rice, citrus and shrimp are selected as representatives for agricultural exports. Data to calculate DRC mainly comes from VHLSS 2004 for Mekong River Delta while focus group discussion is conducted in four provinces including Tien Giang, Tra Vinh, Vinh Long and Soc Trang to obtain in-depth information on rice, citrus and shrimp. For every product, at least three groups are interviewed, one group consists of "below average" farmers, the other for "average" farmers and the remaining group for "above average" farmers. The classification of below or above average is based on the condition of the survey area.

To calculate DRCs for rice and citrus, only households with cultivation area ranging from 3000 m^2 to 20,000 m^2 are selected. According to Tien Giang Department of Science and Technology (2007), the area is normally found from 0.3 to 2.5 hectares at most for farmers in Mekong River Delta. However, those possessing over 2 hectares account for only 5 per cent of farmers in this region (Cong Phien, 2008), so they should be excluded to eliminate outliers. In case the area is measured in terms of the number of trees, observation will be dropped if the number is below 100. According to cultivation technique, the number of trees per 1000 m^2 should be around 33 for grapefruit and more for orange and tangerine. Data from VHLSS 2004 classify grapefruit, orange and tangerine into the group of citrus, so 33 is the number selected as the benchmark. For shrimp, households with output quantity at least 300 kilos are selected. Shrimp farming can be found in various types ranging from extensive, semi-intensive, intensive to industrial model but data from VHLSS 2004 does not indicate whether an observation belongs to which model. According to Hai Trieu (2003), among different models, the lowest productivity is 300 kilos per hectare while the average area of agricultural land in Mekong River Delta is just over 0.8 hectare per farm. So 300 kilos is the number selected as the benchmark.

For the focus group discussion, provinces to be included in the survey are Tien Giang and Vinh Long for paddy and citrus, Tra Vinh and Soc Trang for shrimp. In each province, the selection of farmers to participate in the focus groups as following:

▪   Discussion with local experts (from Service of Planning & Investment, Service of Agriculture & Rural Development and Statistical Office) to select a district for conducting the interview.
▪   In the selected district, three groups of farmers will be interviewed, one for below average farmers, one for average farmers and the remaining for above average farmers. Each group should contains five or seven farmers depending on the condition, but odd number is at priority.

4.   Results

4.1.   For DRC

Rice and shrimp are potentially competitive with DRC is 0.51 for rice and 0.20 for shrimp while citrus, with DRC of 1.45, can be explained as not so competitive potentially (see Table 1). However, the result may be different if grapefruit, orange and tangerine are surveyed separately in VHLSS 2004. It should also be noted that the perceived costs of producing shrimp do not include losses due to disease or pollution which can push farmers to bankruptcy.

Table 1: DRCs for Mekong River Delta's major agricultural products in 2004

Commodity	*Rice*	*Citrus*	*Shrimp*
DRC	0.51	1.45	0.20

Source: Own calculations

Chemical fertilizers, land rental or contracting, rental of assets and hired labor account most for cost of production of rice. For citrus, chemicals (fertilizers and pesticides), saplings, depreciation of fixed assets, hired labor and loan interest account for major costs of production. Feeds, breeds, energy, hired labor and loan interest are important costs for shrimp farming.

To see how potential competitiveness varies according to farm's characteristics, DRCs are calculated for different group of farmers classified by area of cultivation (see Table 2).

Table 2: DRCs for groups of farms classified by area of cultivation

Area of cultivation	*Rice*	*Citrus*
Below 0.5 hectare	0.54	1.75
From 0.5 to 1 hectare	0.51	1.13
From 1 hectare	0.49	-

Source: Own calculations

Table 2 indicates that farms with larger area of cultivation are more competitive. DRCs does not vary so much in the case of rice. But for citrus, there is a remarkable difference in DRCs between two groups of farms. Farms with bigger area of cultivation are more competitive with DRC close to 1. Although data from VHLSS 2004 does not record farms with area of cultivation from 1 hectare for citrus, it may not be too optimistic to infer that this group of farms is potentially competitive with DRC not greater than 1. Since VHLSS 2004 does not indicate the model of farming for each household (i.e. intensive or extensive farming), so DRC can not be calculated for each model.

What would happen to DRCs in the case of economic integration? The answer may come from sensitivity analysis. Factors projected for change include price of labor, capital, land and outputs.

Table 3: Sensitivity analysis with changes in prices of factors

	Scenario	Rice	Citrus	Shrimp
	Base	0.51	1.45	0.20
Labor	+30%	0.54	1.52	0.21
Capital	+30%	0.59	1.79	0.25
Land	+30%	0.54	1.48	N/A[a]
Labor, Capital and Land	+30%	0.66	1.89	0.26[b]

a: As mentioned in the assumptions, estimation of social price for land in shrimp farming is still problematic.
b: Only changes in price of labor and capital.

Source: Own calculations

Table 3 shows that price of labor does not affect much on DRCs. This is true since labor cost is still low for most of labors in agriculture are unskilled. Even if family labors are decomposed from VHLSS 2004, the effect may not be so much when other factors remain unchanged.

4.2. For focus group discussion

Results from the group interviews suggest factors that may enhance or constrain the competitiveness of agricultural products in Mekong River Delta.

4.2.1. Enhancing factors

- Sharing information. This is a cultural feature in the rural area where people are willing to share information to neighbors and relatives. In production, people often pay attention to "key farmers" who are experienced or earn high income in the village. So, these "key farmers" can help to spread out positive externalities.
- The role of extension officers. Extension officers act as a link from farmers to knowledge on techniques, policies and market information. Although extension officers are not always as expert as expected, farmers still appreciate their role.
- Mass media. Information from mass media, especially television programs on farm issues significantly attract farmers' awareness.
- The perception of the importance to change into better production practice. Shrimp farmers gradually perceive intensive and industrial farming can help to reduce cost, enhance shrimp quality and preserve the water supply.

4.2.2. Constraining factors

- The indifference to Vietnam's accession to WTO, especially farmers of small scale. Ones may argue that such issue should be concerned by businesses and government, not farmers. However, it is farmers, the most vulnerable among producers, who determine quantity, quality and specification of agricultural products. Therefore, farmers' unawareness of upcoming competition would negatively affects the competitiveness of agricultural products.

- The relationship among farmers, traders and businesses. A paradox exists in the transaction between farmers and processing companies. Farmers selling shrimp directly to companies often receive lower price than doing business with traders, the intermediary. The reason, according to farmers, is the ambiguous procedure to valuate shrimp which may result from the collusion between traders and companies. This collusion makes almost all farmers sell their products to traders rather than companies. The collusion also exists between trader and trader because each trader occupies a certain "territory" where he or she is the sole buyer in that area. When buying shrimp, traders do not set up any clear requirements. This issue, on one hand, seem to be beneficial for farmers since they can enjoy an "easy transaction". In fact, the negative impact outweighs the gain on the other hand. Traders may change their behavior when the market for shrimp is going down, imposing low price or reluctant to buy farmers' products. The unclear requirements also result in doubtful price setting and even more serious effect in long-term: the habit not to follow any stable set of standards since standards may vary among traders. All of these problems, together with the surprised uncooperativeness in selling among farmers, not only increase transaction cost but also make farmers become even more vulnerable.

- Application of better production practices is still limited. Farmers growing paddy find it difficult to follow the Integrated Pest Management (IPM) program especially when diseases spread out, while Good Agricultural Practices (GAP) has not been implemented widely for fruits. If these practices are utilized, then chemicals are reduced, so DRC could be improved for citrus.

- Quality of breeds is problematic. This is also a great concern of farmers since breeds is one of the major input costs. Low quality breeds often lead to high death rate and big loss is inevitable. However, not many farmers can afford the testing service or be experienced enough to distinguish good or not bad breeds.

- The awareness to preserve the water from contamination. The willingness to share information is not always accompanied by the willingness to cooperate in production. When there is no agreement on the time to release breeds, water contamination is an most obvious outcome.

- Lacking of information about customers and competitors. Though informed about the products of competitors, most of farmers do not have a chance to see real samples. Mostly passed down orally, information can be distorted resulting in either underestimation or overestimation of the potential competitiveness. Many farmers also wish to be updated with feedbacks from domestic and foreign customers on their products to make further adjustment in production.

- The hesitation to adopt new technology. Experience still plays a dominant role in production. Farmers can be informed of new technology but they will not adopt until profitable outcome is witnessed. This behavior partly comes from the limitation of capital stock available while access to official credit is not always easy.
- Workshops on farming techniques are not so effective as expected. Not-for-profit workshops are assessed as low quality since many presenters are not experienced or knowledgeable about local conditions. Workshops organized by companies aiming at advertising are often attractive since farmers are offered with lunch and gifts.

5. Tentative conclusions

This paper addresses the competitiveness of agricultural products in Mekong River Delta using both quantitative and qualitative approaches. DRCs are favorable for rice and shrimp, and larger farms possess smaller DRCs. However, we can not be so confident about the competitiveness of Mekong River Delta's agricultural products in long-term since constraining factors do exist. The competition can take place in both price and quality. The cost of production and quality can be improved through the adoption of better production practice, but how to help farmers to change their habits is an unsolved problem. Another unsolved problem is the relationship among farmers, traders and businesses in which the role of traders can be seen in both positive and negative aspects while farmers are not so cooperative as they wish. Such unsolved problems impose challenges for Mekong River Delta as well as Vietnam agriculture to sustain competitiveness in the context of economic integration.

REFERENCES

Agrifood Consulting International (2002) *Rice Value Chain Study: Viet Nam. A Report Prepared for the World Bank,* Ha Noi, Vietnam.

AusAID (2004) *MeKong Delta Poverty Analysis – Final Report*. http://www.ausaid.gov.au/research/pdf/mekong_poverty_report_04.pdf, accessed on 26 March 2006.

Bajramovic S., Davidova S., Gorton M., Ognjenovic D., Pettersson M. and E. Rabinowicz (2006) *Competitiveness in the Agricultural Sector of Bosnia and Herzegovina*, Livsmedelsekonomiska institutet. http://www.sli.lu.se/pdf/SLI_Rapport_20065.pdf, accessed on 11 February 2007.

Brent, R.J. (2006) *Applied cost–benefit analysis, second edition*, Edward Elgar, Cheltenham, UK.

Cho, D.S. and H.C. Moon (2002) *From Adam Smith to Michael Porter: Evolution of Competitiveness Theory*, World Scientific, Singapore.

Cong Phien (2006) Gia nhập WTO – Những vấn đề đặt ra, *SGGP Online*. http://www.sggp.org.vn/wto/2006/7/52628/, accessed on 25 August 2006.

Cong Phien (2008) ĐBSCL: Liên tục được mùa, trúng giá - Người trồng lúa vẫn chưa giàu, *SGGP Online*. http://www.sggp.org.vn/kinhte/2008/3/145977/ , accessed on 20 March 2008.

Coy J.E.L. (2006) Competitiveness and Trade Policy Problems in Agricultural Exports: A Perspective of Producing/Exporting Countries in the case of Banana Trade to The European Union, *PhD Dissertation,* University of Göttingen. http://deposit.ddb.de/cgi-bin/dokserv?idn=982418833&dok_var=d1&dok_ext=pdf&filename=982418833.pdf, accessed on 14 February 2007.

Cuevas R. (2004) Food Engineering, quality and competitiveness in small food industry systems – with emphasis on Latin America and the Caribbean, *FAO Agricultural Services Bulletin*, FAO.

Esterhuizen D. (2006) An Evaluation of the Competitiveness of the South African Agribusiness Sector, *PhD Dissertation*, University of Pretoria. http://upetd.up.ac.za/thesis/available/etd-12082006-144349/unrestricted/00front.pdf, accessed on 02 January 2007.

FAOSTAT (2007) *Avg. Unit Value of Primary Commodity Export (US $/tonne)*, FAO Statistics Division.

FICen (2007) *International price in US market*, Center for Aquaculture Informatics, Vietnam.

Gorton M., Danilowska A., Jarka S., Straszewski S., Zawojska A. and E. Majewski (2001) *The International Competitiveness of Polish Agriculture*, http://www.staff.ncl.ac.uk/matthew.gorton/polfull.pdf, accessed on 03 August 2006

Gorton M., Davidova S., Banse M. and A. Bailey (2006) The International Competitiveness of Hungarian Agriculture: Past Performance and Future Projections, *Post-Communist Economies*, Vol. 18, No. 1, March.

Gorton M. and S. Davidova (2001) *The International Competitiveness of CEEC Agriculture*, Paper presented to the British Association of Slavonic and East European Studies (BASESS) Conference, Cambridge, 7th – 9th April 2001.

Hai Trieu (2003) <u>Nuôi tôm cần phải qui hoạch bền vững,</u> *Tuoi Tre Online*, 08 September.
http://www.tuoitre.com.vn/Tianyon/Index.aspx?ArticleID=745&ChannelID=11, accessed on 25 January 2008.

Hung Anh (2007) <u>Nuôi thủy sản ở ĐBSCL: Loay hoay phát triển,</u> *Tuoi Tre Online*, 23 July.
http://www.tuoitre.com.vn/Tianyon/Index.aspx?ArticleID=211823&ChannelID=119, accessed on 14 January 2008.

ICARD (2006) *WTO Accession, what farmers gain and lose?* (in Vietnamese), Center for Informatics and Statistics, 14 June.
http://ppd.gov.vn/loadasp/tn/tn-spec-nodate-detail.asp?tn=tn&id=1389377, accessed on 20 July 2006.

Salinger B.L. (2001) <u>Productivity, Comparative Advantage, and Competitiveness in Africa,</u> *African Economic Policy Discussion Paper Number 35*, June.

Tewari M. (2006) <u>Is Price and Cost Competitiveness Enough for Apparel Firms to Gain Market Share in the World after Quotas? A Review,</u> *Global Economy Journal*, Volume 6, Issue 4, Article 5.

Tien Giang Department of Science and Technology (2007) *Tồn tại chính của việc phát triển cây ăn quả ở đồng bằng sông Cửu Long & các giải pháp*, Tien Giang Department of Science and Technology website, No. 1.
http://www.tiengiangdost.gov.vn/tsan/ndung_tsan.aspx?ma=160 , accessed on 01 March 2008.

Vietnam News Agency (2006) *ĐBSCL sẽ có 266,430 ha cây ăn quả đặc sản, 13 April.*
http://www.vnagency.com.vn/TrangChu/VN/tabid/58/itemid/142238/Default.aspx, accessed on 10 February 2008.

World Bank (2005) *Accelerating vietnam's rural development: Growth, Equity and Diversification – Volume I: Overview*, East Asia and Pacific Region Rural Development and Natural Resources Sector Unit, World Bank.
http://siteresources.worldbank.org/INTVIETNAM/Resources/vn_rsu_vol_1_en.pdf, accessed on 24 March 2006.