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CONSTANT MARKET SHARE AND PRICE SPREAD ANALYSIS

Shyam S. Salim, Ramees M. Rahman and Athira P. Rethnakaran

Introduction

A market share is something defined on the basis of the total share of a company out of total segment sales, which can be either through the volume or value dealt by the company. Market share is much significant as it indicates the consumers' preference for a product over other similar products. A higher market share announces the strength of the company, higher sales, lesser efforts to win the market and strict barriers for the competitors to entry.

The constant market share (CMS) analysis, formerly referred to as the change caused by the changes in competitiveness, demonstrates the development of the competitiveness and the structure of market share of a country. It compares the actual export growth performance of a country with the performance that would have been achieved if the country had maintained its exports relative to some standard. The analysis is usually carried out to quantify the export performance of a country compared to the rest of the world. A country which exports to market that is growing slower than the world average or a product which has its demand growing slowly than average, can have a decrease in its aggregate market share even if it maintains its market share. Hence, according to constant market shares analysis the exports should oriented towards the most dynamic markets and products in the world trade.

Theoretical background

Tyszynski in 1953 had done pioneering works by using the constant market share (CMS) analysis which made it popular in applied international economics. The analysis is based on the assumption that a country's share in world markets should remain constant over time. The basic identity of the CMS analysis is:

$$q^t = \sum_p q_p^t = \sum_p s_p^t \; Q_p^t \qquad (1)$$

or alternatively:

$$s^t = \sum_p s_p^t \, S_p^t \qquad (2)$$

Where q^t = aggregate exports of the focus country

q_p^t = exports of the p-th commodity of the focus country

Q_p^t = world exports of the p-th commodity

s^t = aggregate exports share of the focus country in total world exports

$s_p^t = \frac{q_p^t}{Q_p^t}$, share of the p-th commodity of the focus country in the p-th commodity of world exports.

$S_p^t = \frac{Q_p^t}{\sum_p Q_p^t}$, share of the p-th commodity of world exports in the total world exports.

t = time.

The simplest formulation of CMS analyses can be obtained by differentiating Identity 2 with respect to time:

$$\frac{ds^t}{dt} = \sum_p s_p^t \frac{ds_p^t}{dt} + \sum_p S_p^t \frac{ds^t}{dt} \qquad (3)$$

In Identity 3 the growth of the aggregate export share of the focus country ($\frac{ds^t}{dt}$) is decomposed into two elements: a structural effect due to changes in commodity shares in the world trade ($\sum_p S_p^t \frac{ds^t}{dt}$), and the competitiveness effect ($\sum_p s_p^0 \Delta s_p \Delta S_p$), which measures the changes of the focus country's exports due only to export share changes in each commodity. Tyszynski suggested to use year 0 weights to measure the structural effect at constant market shares and year 1 weights to compute the competitiveness component, whereas Baldwin in 1958 employed year 0 weights to compute both the competitive and the structural effect which leaves a residual1 interacting between the structural and the competitive term.

In 1971, Richardson interpreted the residual term ($\sum_p s_p^0 \Delta s_p \Delta S_p$) as a second measurement of competitiveness, since it would indicate whether the country was increasing its export shares in rapidly growing commodities and markets. He combined Laspeyres- and Paasche-type systems of weights in order to assure consistency in the accounting for changes in the total exports.

In 1988, Milana applied the discrete-time decomposition in the case where the CMS analysis is expressed in terms of absolute changes of the country's exports. The system of weights in this version is calculated using an average of the weights of the initial and final year. This choice reflects the fact that a country's export structure and total world trade are changing over time, but that there is no reason to believe that either the structure at the beginning- or end-of-period was dominant throughout the period.

The structural term of the CMS analysis was formulated by Merkies and van der Meer in 1988. Later various eminent personalities used the technique to compare the competitiveness. In 2000, Simonis analyzed the Belgium foreign sector by comparing the country's competitiveness with its main trading partners. Fagerberg and Sollie applied the same in 2002, over a sample of 20 industrialized countries between 1961 and 1983. The study done by Holst and Weiss in 2004 was also based on the same analysis by focusing on the export rivalry of the ASEAN members and China.

Practical Utility

The constant market share (CMS) analysis is meant to shed light upon the export performance of a country and thereby to reveal the underlying reasons of the comparative export performance. The export performance is analyzed by allowing achieved export growth to be separated into commodity, market-distribution, and competitiveness effects. The method can be well used to evaluate whether the country's comparative performance have grown in line with its competitors as well as to figure out the exporting level of the country with relatively favorable or unfavorable growth rates. The analysis can be considered as a technique figure out pattern and trend of trade for the purpose of policy formulation.

Keywords: *Constant market share, international trade, applied economics, market share, export performance.*

Software support

The analysis can be done in MS Excel.

Data requirement

- Export details of the selected product of the selected country, over the years
- Export details of other countries, in case comparison is needed.
- Import details of the selected product of the importing country.

Methodology

The export growth under CMS analysis is considered as co-impact of four factors namely global market growth effect, commodity composition effect, market share effect and change in competitiveness. The export data of the country can be decomposed into structural, competitive and second order effects according to the following formula;

$$\Delta Q_{kij} = S^0_{kij} \times \Delta Q_{kij} + Q^0_{kij} \times \Delta S_{kij} + \Delta S_{kij} \times \Delta Q_{kij}$$

Where,

$S^0_{kij} \times \Delta Q_{kij}$ is structural effect

$Q^0_{kij} \times \Delta S_{kij}$ is competitive effect

$\Delta S_{kij} \times \Delta Q_{kij}$ is second order effect.

'D' is the changeover period, '0' is the base period, '1' is the final period, 'Q' is the value of product exports, 'S' is the share of exports in value terms.

The decomposition formulae and definitions of different components of growth of exports under constant market share analysis is presented in Table 1. The analysis covers the export details over a period of time in order to figure out the export performance and changes in competitiveness

Table 1. Decomposition Formulae and Definitions of Different Components of Growth of Exports Under Constant Market Share Analysis

Main component	Sub component	Formula	Definition
Structural effect	Growth effect	$S^0_K \times \Delta Q$	Δ in total product exports of country 'k' due to changes in the world's total exports
	Market effect	$S^0_{kij} \times \Delta Q_{kij} - S^0_{ki} \times \Delta Q_{ki}$	Δ in exports of country 'k' of product 'i' to country 'j' due to change in market distribution of exporting country.
	Commodity effect	$S^0_{kij} \times \Delta Q_{kij} - S^0_{kj} \times \Delta Q_{kj}$	Δ in exports of country 'k' of product 'i' to country 'j' due to change in commodity composition of exporting country.
	Interaction effect	$(S^0_{kij} \times \Delta Q_{kij} - S^0_{ki} \times \Delta Q_{ki}) - (S^0_{kij} \times \Delta Q_{kij} - S^0_{kj} \times \Delta Q_{kj})$	Δ in exports of country 'k' of product 'i' to country 'j' due to interaction in market and commodity effects.
	Sub total	$S^0_{kij} \times \Delta Q_{kij}$	Δ in exports of country 'k' of product 'i' to country 'j' due to change in export value to export destination 'j'.
Competitive effect	General competitive effect	$Q^0 \times \Delta S_k$	Δ in exports of country 'k' of product 'i' to country 'j' due to a change in competitiveness of country 'k' for total exports to the world.
	Specific competitive effect	$Q^0_{kij} \times \Delta S_{kij} - Q^0 \times \Delta S_k$	Δ in exports of country 'k' of product 'i' to country 'j' due to a change in competitiveness of country 'k' in export of product 'i' to destination 'j'.

	Sub-total	$Q^0_{kij} \times \Delta S_{kij}$	Δ in exports of country 'k' of product 'i' to country 'j' due to a change in exporting country's market share of product 'i' in a export destination 'j', i.e., competitiveness.
Second order effect	Pure second order effect	$(\frac{Q^3}{Q^0} - 1) \times \Delta S_{kij} \times \Delta Q_{kij}$	Δ in exports of country 'k' of product 'i' to country 'j' due to interaction of specific competitive effect and structural effect.
	Dynamic structural residuals	$\Delta S_{kij} \times \Delta Q_{kij} - (\frac{Q^3}{Q^0} - 1) \times \Delta S_{kij} \times \Delta Q_{kij}$	Δ in exports of country 'k' of product 'i' to country 'j' due to interaction of specific competitive effect and market effect
	Sub-total	$\Delta S_{kij} \times \Delta Q_{kij}$	Δ in exports of country 'k' of product 'i' to country 'j' due to interaction of structural effect and competitive effect.
Total		ΔQ_{kij}	Δ in value of exports of country 'k' to destination 'j' of product 'i'.

Worked out example

By making use of the CMS analysis, here we are analyzing the growth rate of export value of Thailand's Catfish in the United States over the period 1987-2008. The decomposition is carried out in Table 2.

Table 2: Decomposition of Growth rate of Export Value of Thailand's Catfish in the United States

Main component	Sub-component	1993-1996 Over 1989-1992	1997-2000 Over 1993-1996	2001-2004 Over 1997-2000	2005-2008 Over 2001-2004
Structural effect (% change in export value)		29	165	282	3
	Growth effect (% to structural effect)	-2702527	2803929	1398337	435800
	Market effect (% to structural effect)	835	146	-2588	-2242
	Commodity effect (% to structural effect)	401585	-3882886	-605063	-99436
	Structural interaction effect (% to structural effect)	2300207	1078911	-790586	-334021
Competitive effect (% to change in export value)		93	-41	-72	12
	General competitive effect (% to competitive effect)	-481853	5879165	6364692	-9387
	Specific competitive effect (% to competitive effect)	481953	-5879065	-6364592	9487
Second order effect (%change in export value)		-22	-24	-109	85
	Pure second order effect (% to second order effect)	33	10	17	41
	Dynamic structural residuals (% to second order effect)	67	90	83	59
Change in export value %		100	100	100	100
Absolute change in export value ('000 $)		-109	9	18	14073

Interpretation of results

The growth effect and the specific competitive effect indicate an increase in market share of Thailand's Catfish in the United States America (US.) market and thus a substantial growth is recorded in the catfish exports of Thailand. A comparison of the export details of similar products of other major countries to the U.S., using the same technique, could give a clear picture of the more competitiveness enjoyed by Thailand.

Price spread analysis

1. **Definition**

Marketing is the performance of business activities that direct the flow of goods and services from producer to consumer or user. Marketing is the social process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others.

2. **Theoretical back ground**

Marketing Functions:

Any single activity performed in carrying a product from the point of its production to the ultimate consumer may be termed as a marketing function. It may have anyone or combination of three dimensions, viz., time, space and form.

E.g.- The marketing of fish may involve carrying, price determination, selling, buying, grading, processing, packing, storage, etc.

Marketing Channels:

Marketing channels are routes consisting of intermediaries through which commodities move from producers to consumers.

E.g. - Fish marketing channels -

(i) Fisherman - Auctioneer - Retailer - Consumer
(ii) Fisherman - Auctioneer - Processor - Wholesaler - Retailer – Consumer
(iii) Fishermen- Auctioneer- Commission agents-Processor(Fish meal plants)-Exporter
(iv)Fishermen- Local traders- Retailers- Consumers
(v) Fishermen-Local traders- Wholesalers- Commission agents- Retailers- consumers
(vi) Fishermen- Assemblers- Wholesalers-- Exports

Price Spread:

The difference between the price paid by consumer and the price received by the producer for an equivalent quantity of product is known as price spread. Marketing system is efficient when price spread is minimum. The price spread includes –

(i) Marketing Cost (MC): The costs or expenses incurred in moving the product or service from producers to consumers.
E.g. - Transportation, packing, processing, etc.

(ii) Marketing Margin (MM): Profits or income earned by various market intermediaries involved in moving the produce from the production to the ultimate consumption.
E.g. - Commission, retailer's profit, etc.
So, Price Spread(PS) = Consumer's Price (CP) - Producer's Price (PP)
= Marketing Cost + Marketing Margin.

3. **Practical utility**

- Countries can appropriate added value from fish by expert marketing.
- Consumers are mainly benefitted due to improved marketing such as they get fresh fish at lower prices
- Producers gets benefitted as if their profits rise as a result of greater prices - attained from improvements in quality, or lower costs following from improvements in productivity.
- Analysis of market structure would enhance the efficiency of fish marketing system and offer valuable information for developing policy framework.
- Price spread analysis help to find the share of fishermen in the consumer's rupee.
- Analysis of price at the landing centers and in retail markets would help to measure the efficiency of the marketing system

4. **Keywords**

Marketing, Price, Marketing functions and Marketing cost

5. **Software support**

Ms. Excel

6. **Data requirements**

Data on the total quantity and species of fish, transportation cost, price of fish sold to the consumers, auction rate and retailers price was collected.

7. **Methodology**

The methodology adopted for determining the efficiency of the marketing system

Step 1: Quantifying the marketing cost
Step II: Quantifying the marketing margin
Step III: Estimation of the price spread
Step IV: Estimation of the efficiency of the marketing system

Price spread

Price spread or Gross Marketing Margin(GMM) is the difference between the net price received by the fishermen at landing centre (Price at first sales) and price paid by the consumer (Retail price or Price at last sales) for any given commodity at a particular point of time in a market.

Marketing Cost (MC):

The costs or expenses incurred in moving the product or service from producers to consumers.

E.g. - Transportation, packing, processing, etc.

Marketing Margin (MM):

Profits or income earned by various market intermediaries involved in moving the produce from the production to the ultimate consumption.

E.g. - Commission, retailer's profit, etc.

Price Spread = Consumer's Price (CP) - Producer's Price (PP)

= Marketing Cost + Marketing Margin.

Efficiency of the marketing system

An efficient marketing system is the one, where the primary producer gets maximum benefit. In an efficient

marketing system, the marketing cost will be at minimum. The efficiency of the marketing is assessed by working out the following indicators.

Fishermen's share in the consumer's rupee and Gross Marketing Margin (GMM) were used for analysing the trends in landings and studying the price behaviour.

1. *Gross Marketing Margin (GMM)*
   GMM=RP-LP
   RP is Retail Price, LP is Landing centre Price
   Where Landing centre Price (LP) is the net price received by the fishermen at landing centre (first sales) after deducting the auction charges and RP is the price paid by the consumer

2. *Percentage Share of Fishermen in the Consumer's Rupees (PSFCR)*
   PSFCR = (LP/RP)*100

3. *Percentage Share of Marketing Margin in Consumer's Rupee (PMMCR)*
   PMMCR = (1-LP/RP)*100
   Where RP = retail centre price
   LP = landing centre price

8. **Worked out example:**

Case I:

A fisherman, Mr. Moosa comes to Alapuzha Fish Landing Centre, with 100 kg of Sardine fish. The transportation charges to bring the fishes to the landing centre are @ Re. 0.70/kg. He takes the fishes to an auctioneer, Mr. Ravi and the fishes are auctioned and one wholesaler Mr. Koya purchases the lot @ Rs. 50/kg. Mr. Ravi takes auction rate @ Rs.0.35/kg from Mr. Moosa. Mr. Koya brings the fishes to palayam market with transportation cost @ Re.0.85/kg and sells the lot to a retailer, Mr. Kumar @ Rs.55/kg. Mr. Kumar sells the fishes to consumers @ Rs.60/kg in the same market. It is assumed that there is no loss in transit and no significant time lag.

Case II:

A fisherman, Mr. Iqbal comes to Chaliyam Fish Landing Centre, with 100 kg of sardine fish. The transportation charges to bring the fishes to Chaliyam landing centre is @ Re. 0.60/kg. He takes the fishes to an auctioneer-cum-retailer, Mr. Maanu and sells the lot @ Rs.50/kg. Mr. Maanu then sells the fishes to consumers @ Rs.55/kg at ramanattukara market and he provides the transportation charges from chaliyam to ramanattukara market @ Re. 0.70/kg and icing charges @ Re. 0.50/kg.

Work out MC, MM, Price Spread, and Producer's share in consumer's rupee and interpret for both the cases.

9. **Computation technique**

Case - I:

(A) Transportation cost paid by Mr. Moosa, fisherman
= 100 x 0.70 = Rs.70.

(B) Transportation cost paid by Mr. Koya, wholesaler
= 100 x 0.85 = Rs.85
∴ Total Marketing Cost (MC) = A + B = 70 + 85 = Rs.155

(C) Commission taken by Mr. Ravi auctioneer from Mr. Moosa
= 100 x 0.35 = Rs.35.

(D) Profit earned by Mr. Koya
= 100 x {55 - (50+ 0.85)} = 100 (55 – 50.85)
= Rs.415.

(E) Profit earned by Mr. Iqbal, retailer

= 100 (60-55) = 100 x 5 = Rs.500.

∴ Total Marketing Margin (MM) = C + D + E = 35 + 415 + 500
= Rs. 950

∴ Price Spread for 100 kg Sardine here
= MC + MM
= 155 + 950 = Rs.1,105.

∴ Total price received by Mr. Moosa, fisherman
= (100 x 50) - (70 + 35) = 5000 - 105
= Rs.4,895

∴ Total price paid by the consumers = 100 x 60 = Rs.6,000

∴ Producer's share in consumer's rupee

$$= \frac{4895}{6000} \times 100 = 81.5 \text{ percent}$$

Case II:

(A) Transportation cost paid by Mr. Iqbal, fisherman
= 100 x 0.60 = Rs.60

(B) Transportation cost paid by Mr. Maanu auctioneer-cum-retailer
= 100 x 0.70 = Rs.70

(C) Costs for icing paid by Mr. Maanu
= 100 x 0.50 = Rs.50

∴ Total Marketing Costs (MC)
= A + B + C
= 60 + 70 + 50
= Rs.180

Profit earned by Mr. Maanu
= 100 {55 -(50 + 0.70 + 0.50)}
= 100 (55-51.2)
= Rs.380

∴ Total Marketing Margin (MM) = Rs.380

∴ Price spread for 100 kg sardine
= MC + MM
= 180 + 380
= Rs.560

∴ Total price received by Mr. Iqbal, fisherman
= (100 x 50) - 60
= 5000-60
= Rs.4,940

∴ Total price paid by the consumers
= 100 x 55
= Rs.5,500

∴ Producer's share in consumer's rupee = $\frac{4940}{5500} \times 100 = 89.8$ percent

Case 1	
Name of fish	Sardine
Marketing cost (MC)	155
Marketing margin (MM)	950
Price spread	1105
Producers share	81.5
Percentage Share of Marketing Margin in Consumer's Rupee	18.5
GMM	1105
Case 2	
Name of fish	Sardine
Marketing cost (MC)	180
Marketing margin (MM)	380
Price spread	560
Producers share	89.8
Percentage Share of Marketing Margin in Consumer's Rupee	11
GMM	560

10. Interpretation of results

Marketing system in Case-II is more efficient than that of Case-I, because price spread is less in Case-II than Case-I. The producer's share in consumers rupee is more in Case-II than that of Case-I. These are because of less number of intermediaries involved in Case-II than Case-I. So, the marketing efficiency will be more where the intermediaries are minimum in the marketing system.

Suggested reading

- Aswathy, N and Sathiadhas, R and Narayanakumar, R and Shyam, S Salim (2012) *Marketing and utilization of marine by catch: Problems and prospects. Journal of Fisheries Economics and Development*, 12 (2). pp. 1-8.
- Aswathy N. and Abdu Samad E. M. Price behaviour and marketing efficiency of marine fish in Tuticorin, Tamil Nadu
- Balassa, B. (1965) Trade liberalization and revealed comparative advantage. Manchester School of Economic and Social Studies, 33, 99–123.
- Fredoun Ahmadi-Esfahani and Glenn Michael Anderson (1999) Constant Market Shares Analysis: Uses, Limitations and Prospects. In 43rd Annual Conference of the Australian Agricultural and Resource Economics Society held on 20-22 January 1999.
- Gopal, Nikita and Shyam, S Salim and Krishnan, M and Biradar, R S and Katiha, Pradeep K and Barik, N and Kumar, Rakesh and Sharma, Arpita and Ponnusamy, K (2014). *Marketing and processing.* In: Livelihood Status of Fishers in India. Central Marine Fisheries Research Institute, Kochi, pp. 247-279
- Kehar Singh & Madan Mohan Dey (2011): International Competitiveness Of Catfish In The U.S. Market: A Constant Market Share Analysis, Aquaculture Economics & Management, 15:3, 214-229
- Mohd. Shahwahid Haji Othman and Zakarjah Abdul Rashid(1993) Constant Market Share Analysis of the ASEAN Timber Trade. PenanikaJ. Soc. Sci. & Hum. 1(1): 71-80.
- Sathiadhas, R. Narayanakumar, R. and Aswathy, N. (2012). Marine Fish Marketing in India, Central Marine Fisheries Research Institute, Kochi, 276 pp.