

## MARKETING MARGINS AND MARKET EFFICIENCY FOR VEGETABLES IN MALAYSIA

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### ABSTRACT

*The vegetable industry of Malaysia plays an important role in meeting the food requirements of the domestic population. The per capita consumption of vegetables has increased from 54.1 kg in 2008 to 57.3 kg in 2013, and the self-sufficiency level of the country has increased to an estimated 91.3% in 2014 compared with 58.4% in 2012. However, the efficient distribution of food is an important consideration toward ensuring food security. This study examined the marketing costs, margins, and returns for ten types of vegetables. Primary data were collected from five states that represented the various regional zones of Malaysia. Face-to-face interviews were carried out with 215 respondents consisting of farmers, wholesalers, and retailers. The study obtained mixed results, which indicated the existence of marketing efficiency for five of the ten vegetable types studied. The farmers' share of the consumer dollar ranged from 32% to 60%, the wholesalers' margin varied from 17% to 29%, and the retailers' margin was between 18% and 30%.*

**Keywords:** Marketing margins, food marketing, food security, market efficiency, agricultural marketing

### INTRODUCTION

The vegetable industry is an important contributor to food security in Malaysia. However, the industry faces various challenges toward the achievement of food sufficiency, including small-scale production, high production cost, an ageing farmer population, and intensified competition from imported vegetables from lower-cost producers, such as China and Thailand.

The National Agro-Food Policy 2011-2020 (Ministry of Agriculture and Agro-based Malaysia, 2011) envisages the transformation of the vegetable industry through an increase in productivity, expansion of commercial planting, reduction of post-harvest losses, and strengthening of marketing. According to the Ministry of Agriculture and Agro-based Malaysia (2011), the annual per capita consumption of vegetables is expected to go up by 2.6% each year, increasing from 55 kg in 2010 to 70 kg in 2020. Meanwhile, there was an estimated overall increase of 5.9% in the per capita consumption of vegetables, from 54.1 kg in 2008 to 57.3 kg in 2013 (Federal Agricultural Marketing Authority Malaysia, 2014). The self-sufficiency level for vegetables stood at 91.3% in 2014 compared with 58.4% in 2012, an impressive increase of 32.9% over a two-year period (Ministry of Agriculture and Agro-based Malaysia, 2014).

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The vegetable production area increased by 27% from 53,582 ha in 2012 to 68,053 ha in 2014, whereas production increased by 48% from 973,536 tonnes in 2012 to 1,439,478 tonnes in 2014 (Ministry of Agriculture and Agro-based Malaysia, 2014). The vegetables that had the highest production in 2014 included cabbage at 129,820 tonnes, chillies at 59,989 tonnes, and spinach at 56,935 tonnes (Department of Agriculture Malaysia, 2014). There were 1,677,000 people employed in the agricultural sector in 2014 (Ministry of Agriculture and Agro-based Malaysia, 2014), comprising 12.4% of the national labour force. The Department of Agriculture Malaysia (2014) reported that there were 46,040 vegetable farmers in Malaysia in 2013.

Food security is an important issue in the world today. The World Food Summit of 1996 defined food security as existing “when all people at all times have access to sufficient, safe, and nutritious food to maintain a healthy and active life” (FAO, 1996). The Food and Agriculture Organization (FAO) defines food security as existing when people have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2015). This definition places emphasis on consumption, i.e., the demand side, and the issues of access by vulnerable people to food. Whereas availability is determined by food production, stock holding, and food marketing (Von Braun, J., Bouis, H., Kumar, S. & Pandya-Lorch, R., 1992), the efficient distribution of food is an important aspect to consider toward ensuring continuous availability (Babatunde, R., & Oyatoye, E., 2005).

According to Aidoo, R., Nimoh, F., Bakang, J. E. A., Ohene-Yankyera, K., Fialor, S. C., Mensah, J. O., and Abaidoo, R. C. (2012), many development agencies and governments recognize that efficiency in agricultural markets would improve the bargaining position and increase the income of farmers. Improved efficiency in markets would also have the benefits of lower transaction costs, increased trade volume, lower food prices, and increased food security (FAO, 2003).

Food marketing is a very important aspect of agricultural development; however, it is often given little emphasis because countries usually focus on policies to increase food production. As a result, there is not much consideration of efficient food distribution to encourage improved productivity (Olayemi, J.K., 1982). In Malaysia, almost 30% of food is lost through poor post-harvest practices. Thus, reducing post-harvest losses could be an important means to improve food security.

## LITERATURE REVIEW

Previous studies on marketing margins have found that the marketing system for fresh produce is inefficient. Onyemauwa, C.S. (2010) analysed the net margin of marketers of watermelon in the Niger Delta of Nigeria and found that the watermelon marketing system is inefficient, with a net margin of about 42% in the area. The statistically significant variables that were found to have a positive relationship with the net marketing margin were marketing experience, depreciation, cost of marketing equipment, produce cost, and

marketing cost. The study also reported that the marketing in Nigeria was ineffective and inefficient due to inadequate infrastructure and social amenities, such as transportation facilities, communication systems, good storage facilities, and good pricing systems.

Aidoo et al. (2012) found that yam marketing among producer-sellers was inefficient, with an efficiency ratio of about 86%. The main constraints that affected yam marketing were identified as poor road network, limited financial resources, poor storage facilities, and high cost of transportation.

Hassan, S. , Hussain, A. , Khan, M.A. and Mahmood, I. (2012) reported that the producer's share of the consumer price for the majority of fruits and vegetables was around 25% and that there was a need to bring reform into marketing operations and networks in the country to transfer the real benefits to farmers.

Pokhrel, D.M. and Thapa, G.B. (2007), in their study on mandarin marketing in Nepal, found that although the farmers in the study area were receiving a fair share of the benefit accruing from the marketing of mandarin, market intermediaries were harassing and cheating them in other ways by taking advantage of their weak bargaining position and poor economic condition.

Fatimah (2010) pointed out that in Malaysia, small farmers were in danger of being marginalised because the marketing at the farm level had not kept pace with the rapid growth of food retailing in the country. The vegetable and fruit industries in Malaysia were reported to be lagging on issues such as productivity and value-added creation, partly due to institutional and structural constraints.

The marketing of vegetables in Malaysia is usually carried out in a traditional way and involves several market intermediaries, resulting in high marketing costs (Norsida, M. , Nolila, M.N. & Mansor, I., 2009). In addition, the producers are usually at a considerable distance from the marketing centres and lack market information. Inadequate marketing infrastructure also aggravates their marketing problems.

According to Kohls, R.L. and Uhl, J.N. (1998), the marketing margin is the portion of the consumer's food dollar that accrues to food marketing firms. It can also be defined as the difference between what the consumer pays and what the farmer receives. The cost of carrying out a multitude of functions and the profits accruing to the firms are usually included in this price.

The size of the marketing margin is often misconstrued to relate to the efficiency of food marketing (Kohls, R.L. & Uhl, J.N., 1998). A small margin is often regarded as desirable because it denotes greater marketing efficiency. In many developing countries, high retail prices and low farm prices have often been attributed to excessive profits, inefficiency, unnecessary services, and high marketing costs.

In Malaysia, the Ministry of Agriculture and Agro-based Industry had embarked on a campaign to reduce the role of middlemen. With the tagline *Jihad Memerangi Orang Tengah* (War against Middlemen) (Ismail, S., 2014), the campaign aimed to reduce the manipulation of middlemen in the marketing chain and to ensure remunerative returns to producers and fair prices to consumers. Ismail, S. (2014) pointed out that the returns to farmers were often below 40% of the consumer dollar and, together with high post-harvest losses, resulted in the returns to farmers not being commensurate with their efforts.

However, the size of the marketing margin cannot be used as the sole criterion to judge efficiency (Kohls, R.L. & Uhl, J.N., 1998). Marketing margins may vary widely among different agricultural commodities, and these variations have been attributed to differences in processing, perishability, bulkiness, and the seasonality of production (Adekanye, T.O., 1988). It is not possible to conclude that high marketing margins mean that marketers are taking advantage of producers or consumers. Similarly, low marketing margins may not mean greater marketing efficiency (Eze, C. C., 2007). A comparison of marketing margins with the marketing services provided is necessary for any deduction to be drawn. Marketing efficiency is said to exist if the marketing margin is commensurate with the marketing services provided and the value added (Leftwich, A.C., 1979).

Another aspect to consider is whether producers are better off when the farmer's share of the consumer dollar is increased. The increased farmer's share of the retail price could result from increased production costs rather than from improved returns to farmers. Farmers would be better off only if their production costs decline and their net profit margins improve (Zainal Abidin, M. & Mad Nasir, S., 1986).

The present study was done to examine the marketing costs, margins, and returns for vegetables in Malaysia. This work also aimed to compare the net returns to marketers and the value of services provided to determine whether marketing efficiency exists in the sector.

## METHODOLOGY

This research was carried out in five states that represented the various regional zones of Malaysia: Penang (north), Pahang and Terengganu (east), Perak (central), and Malacca (south).

Primary data for the market survey were obtained through face-to-face interviews with selected respondents consisting of farmers, wholesalers, and retailers by using structured questionnaires. Respondents at the farm level were selected from major producing areas based on the criteria that they had been involved in cultivating vegetables for at least two years and that their planted area exceeded one acre. Meanwhile, at the wholesale and retail levels, respondents were selected from the major wholesale markets and wet markets, respectively, in each state capital. Convenience sampling was applied by using a list of farmers, wholesalers, and retailers supplied by the Federal Agricultural Marketing

Authority (FAMA) state offices. A total of 215 respondents were interviewed in the survey, comprising 75 respondents each at the farm and wholesale marketing levels and 65 respondents at the retail level (Table 1).

**Table 1: Regional Distribution of Respondents for the Study on Vegetables**

Level/Region	Penang (North)	Perak (Central)	Melaka (South)	Pahang (East)	Terengganu (East)	Total
Farm	11	12	20	12	20	75
Wholesale	15	10	15	10	25	75
Retail	10	18	10	12	15	65
Total						215

The survey was carried out by trained research officers from the FAMA headquarters, assisted by FAMA field officers at the state level. Two questionnaires were designed: the first for farmer respondents, and the second for wholesalers and retailers. The questionnaire comprised three parts: Part A consisted of information on the profile of the respondent, Part B collected data on transactions for the varieties of produce handled, and Part C included details of the marketing costs.

The focus of the study was on 10 types of commonly consumed vegetables in Malaysia: leaf mustard (*Brassica chinensis* L. var. *oleifera* Makino), Chinese spinach (*Amaranthus* spp.), cabbage (*Brassica oleracea* var. *capitata* L.), red chillies (*Capsicum annuum* var. *acuminatum* L.) (Kulai variety), long beans (*Vigna sinensis* L.), French beans (*Phaseolus vulgaris* L.), cucumber (*Cucumis sativus* L.), tomatoes (*Lycopersicon esculentum* Mill), brinjals (*Solanum melongena* L.), and pumpkin (*Cucurbita maxima* Duch ex. Lam). Table 2 presents the classification of vegetables based on the parts that are eaten.

**Table 2: Classification of the Vegetables Sampled in the Survey**

Classification	Common Name	Scientific Name
Leaves	Leaf Mustard	<i>Brassica chinensis</i> L. var. <i>oleifera</i> Makino
	Chinese Spinach	<i>Amaranthus</i> spp.
	Cabbage	<i>Brassica oleracea</i> var. <i>capitata</i> L.
Fruits	Red Chillies	<i>Capsicum annuum</i> var. <i>acuminatum</i> L.
	Cucumber	<i>Cucumis sativus</i> L.
	Tomatoes	<i>Lycopersicon esculentum</i> Mill
	Pumpkin	<i>Cucurbita maxima</i> Duch ex. Lam
Seeds	Brinjals	<i>Solanum melongena</i> L.
	Long Beans	<i>Vigna sinensis</i> L.
	French Beans	<i>Phaseolus vulgaris</i> L.

Descriptive and inferential statistics were used to analyse the data collected during the field survey. The descriptive statistics were expressed as frequency distributions, means, and percentages.

The marketing margins were obtained by using the definition given by Kohls, R.L. and Uhl, J.N. (1998). Therefore, the formula for marketing margin, net marketing margin, whole margin, and retail margin, respectively, can be expressed as follows:

$$MM = RP - FP \quad (1)$$

$$NMM = MM - MC \quad (2)$$

$$MM = WM + RM \quad (3)$$

$$WM = WP - FP \quad (4)$$

$$RM = RP - WP \quad (5)$$

Where:

MM = marketing margin

NMM = net marketing margin

RP = retail selling price

WP = wholesale selling price

FP = farm selling price

MC = marketing cost

WM = wholesale margin

RM = retail margin

In Eq. 2, the net marketing margin is the difference between the total marketing margin and the marketing cost. Assuming that wholesalers buy directly from farmers and that retailers buy directly from wholesalers, the marketing margin can then be apportioned between the wholesale margin and the retail margin, as given in Eq. 3.

## RESULTS AND DISCUSSION

Table 3 presents the average marketing margins and producers' share of the consumer dollar for the ten types of vegetables studied. The analysis showed that the farmers' share of the consumer dollar ranged from 32% to 60%, with the highest share for red chillies at 60%, followed by leaf mustard at 59%, and brinjal and French beans at 58%. The lowest farmers' share was for pumpkin at 32%. The wholesalers' margin varied from 17% to 29%, whereas the retailers' margin was between 18% and 30%.

Table 4 shows the marketing costs that are frequently incurred at the various marketing levels, as obtained in the survey.

**Table 3: Marketing Margins for Vegetables in Malaysia**

Vegetable Type	Farm-gate Selling Price (RM/kg)	Wholesale Selling Price (RM/kg)	Retail Selling Price (RM/kg)	Farmers' Share of the Consumer Ringgit (%)	Wholesale Margin (%)	Retail Margin (%)
Leaf Mustard	2.35	3.25	3.95	59	23	18
Chinese Spinach	1.65	2.65	3.8	43	26	30
Cabbage	1.5	2.5	3.5	43	29	29
Long Beans	2.2	3.35	4.65	47	25	28
French Beans	4.3	5.8	7.45	58	20	22
Red Chillies	5.15	6.9	8.65	60	20	20
Cucumber	1.2	1.85	2.4	50	27	23
Brinjal	2.9	3.75	5	58	17	25
Tomatoes	2.65	3.8	5	53	23	24
Pumpkin	0.8	1.45	2.5	32	26	42

Note: Prices refer to the average prices from 11 to 24 November 2013.

Source: Field Survey, FAMA, 2013

**Table 4: Components of the Marketing Costs at Wholesale and Retail Levels**

Components	Examples of Activities Carried Out
Labour Costs	Loading and unloading, cleaning, grading, packaging, labelling, and selling.
Packaging Costs	Plastic, cartons, netting, styrofoam, string, rubber band, old newspapers, plastic and rattan baskets, weighing machines, trolleys, and machines.
Storage Costs	Freezers, chillers, cold rooms, stores, and warehouses.
Transportation Costs	Purchase or rental of lorries, four-wheel drive vehicles, vans, and motorcycles; fuel, tolls, insurance, road tax, and maintenance.
Administrative Costs	Business license, rental, utilities, communication, workers' levies, and visa charges.
Post-Harvest Losses	Weight loss, damage during handling, and unsold quantities.

Source: Field Survey, FAMA, 2013

To come up with a measure of marketing efficiency, a comparison of the net margins and marketing costs is necessary (Olukosi, J.O. & Isitor, S.V., 1990). Accordingly, the following formula was applied:

$$\text{Marketing efficiency} = \frac{\text{Net Margin}}{\text{Marketing Costs}} \times 100\% \quad (6)$$

The average prices during the survey period were obtained from the respondents at the various levels and, when necessary, were converted to their RM/kg equivalent to obtain the marketing margins and marketing efficiency calculations.

Table 5 presents the estimates of the marketing margins and marketing efficiency for the ten varieties of vegetables during the study period. The estimates are based on the simple averages of the prices and costs in the five states surveyed.

The net marketing margin ranged from RM0.43 per kg for brinjals to RM2.17 for red chillies. The marketing cost ranged from RM0.42 per kg for pumpkin to RM1.67 per kg for brinjals. The marketing efficiency was found to be highest for pumpkin at 305%, followed by long beans at 166% and Chinese spinach at 159%.

**Table 5: Marketing Margins and Marketing Efficiency for Vegetables in Malaysia**

Vegetable Type	Farm Selling Price (RM/kg)	Retail Selling Price (RM/kg)	Marketing Cost (RM/kg)	Marketing Margin (RM/kg)	Net Marketing Margin (RM/kg)	Marketing Efficiency (%)
Leaf Mustard	2.35	3.95	0.93	1.60	0.67	72
Chinese Spinach	1.65	3.80	0.83	2.15	1.32	159
Cabbage	1.50	3.5	1.18	2.00	0.82	70
Long Beans	2.20	4.65	0.92	2.45	1.53	166
French Beans	4.30	7.45	1.44	3.15	1.71	119
Red Chillies	5.15	8.65	1.33	3.50	2.17	163
Cucumber	1.20	2.40	0.67	1.20	0.53	79
Brinjals	2.90	5.00	1.67	2.10	0.43	26
Tomatoes	2.65	5.00	1.26	2.35	1.09	87
Pumpkin	0.80	2.50	0.42	1.70	1.28	305

Note: Prices refer to the average prices from 11 to 24 November 2013.

Source: Field Survey, FAMA, 2013

A marketing efficiency rate exceeding 100% is considered to be efficient based on the definition (Olukosi, J.O. and Isitor, S.V. (1990) because the value addition (as represented by the net marketing margin) exceeds the marketing costs incurred. Five of the vegetables studied have marketing efficiency ratios exceeding 100% and thus are considered efficient; these are pumpkins, long beans, red chillies, Chinese spinach, and French beans.

In contrast, five vegetables have marketing efficiency ratios below 100% and thus are considered inefficient; these are brinjals, cabbage, leaf mustard, cucumbers, and tomatoes. The differences in results for the different vegetables may be due to the intricacies in the handling of each vegetable type.

## CONCLUSION

This study analysed the marketing margins and marketing efficiency for vegetable marketing in Malaysia. Based on a comparison of the marketing costs and net marketing margins, the marketing was efficient for five types of vegetables but was inefficient for five other vegetable types. The analysis showed that the farmers' share of the consumer dollar ranged from 32% to 60%, the wholesalers' margin varied from 17% to 29%, and the retailers' margin was between 18% and 30%. The net marketing margin showed a wide range, from RM0.43 per kg for brinjals to RM2.17 for red chillies. There were also big differences in the marketing costs, which ranged from RM0.42 per kg for pumpkin to RM1.67 per kg for brinjals.

For the sake of simplicity, the present study assumed the existence of a single marketing chain involving producers, wholesalers, and retailers. In reality, the marketing chain may consist of many more layers. Further research is needed to examine the marketing efficiency when different marketing chains are involved, e.g., when producers market their own produce, when local collectors and agents are involved, and when selling is done through farmers' markets. Also, the distribution of the marketing margin among the various players could be analysed in greater detail to find reasons for the differences in marketing margins at each level.

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