

## DETERMINANTS AND MARGINS OF EXPORTING MANGO FROM PAKISTAN TO UAE MARKET

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### ABSTRACT

Mango is one of the most important fruit crops and Pakistan is the world's fourth largest producer and exporter of mango. The major objectives of this study were to conduct export margin analysis of Pakistani mango to UAE market and estimate impact of major variables on export of mango from Pakistan to UAE market. Data were collected from a representative sample of forty mango exporters selected randomly for this purpose using pre-tested questionnaire containing both structured and unstructured questions employing personal interview method. Data (average purchase prices, different elements of marketing cost and sale prices) were analyzed to estimate margins in export of mango to UAE market. The impact of major variables (experience and education of exporters, average purchase price, average marketing cost, average sale price, ISO certificate and government policy) on mango export was quantified employing double log form of regression analysis. According to findings, gross margin was calculated as Rs.31333/ton, whereas percent and net export margins were found 52.3 percent and Rs.11228/ton respectively. The estimated regression model revealed that education, professional experience of mango exporters, average marketing cost and ISO certificate were the significant determinants of mango exports. It may be suggested that marketing cost of exporting mango from Pakistan should be economized and quality improved to fetch premium prices in UAE market.

**Keywords:** Mango, Gross and Net Margins, Double Log Regression Analysis

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### INTRODUCTION

Agriculture occupies pivotal position in the economy of Pakistan. Despite structural shift towards industrialization, agriculture still contributes 21.8 percent to GDP. It is a source of livelihood of about 45 percent of total employed labour force and contributes significantly in the export earnings (Pakistan, 2009). Total value of agriculture at constant factor cost (1999-2000) was estimated as 1148.871 billion rupees in 2007-08. Major crops (wheat, rice, cotton and sugarcane) contribute 34 percent as against minor crops which share 11 percent of the agricultural GDP. The share of horticultural crops (fruits, vegetables & condiments) stands around 76 percent in the category of minor crops. Major fruits dominate in horticulture crops, sharing about 59 percent of its total value (Pakistan, 2008).

Fruits constitute an important component of agricultural economy in Pakistan. The country is producing and exporting a large variety of fruits which mainly includes citrus, mango, apple and dates. Among major fruit crops, mango has got a supreme position regarding its area, production and export. Mango exports are an important source of valuable foreign earnings for Pakistan. Exports of mango increased from 1.16 thousand tones in 1975-76 to 105.21 thousand tons in 2006-07. The last five years witnessed massive increase in the mango exports from Pakistan. An increase in mango exports from Pakistan is generally attributed to increased access to traditional markets through improved shipping facilities, increasing number of Pakistani immigrants and policy of the government (Pakistan Horticulture Development and Export Board, 2005). Despite an increase in its exports, share of mango exports remains about 6 percent of the total mango production which is lower than other leading mango exporting countries like Mexico and Brazil exporting 14 percent and 12 percent of their total production respectively (Food and Agriculture Organization of United Nations, 2007).

Export of mango from Pakistan is highly concentrated in few markets. Major markets for Pakistani mango include United Arab Emirates and Saudi Arabia where expatriate Pakistanis and Indians, constitute major segment of customers base. Increased shipping facilities at cheaper rates, relatively flexible and less stringent food safety requirements are some other factors contributing major share of exports to these markets. For the year 2006-07, 46 percent of mango was exported to UAE alone

whereas Saudi Arabia, Oman, Kuwait, and Bahrain accounted for 17.61 percent, 12.79 percent, 1.55 percent and 1.22 percent respectively of the total exports of mango from Pakistan (see table 1.4). Almost 76 percent of Pakistani mango was exported to three markets (UAE, Saudi Arabia and Oman). United Kingdom is the biggest market in Europe constituting about 11.46 percent whereas France and Germany share about 1.48 percent and 1.22 percent respectively of total exports from Pakistan (Pakistan, 2007). UAE and Saudi Arabia are the favorite markets for Pakistan due to less stringent importing requirements but at the same time these markets are considered as low price markets as compared to UK and other European markets.

**Table 1. Major Markets for Pakistani Mango**

Country	Export Quantity (000 tons)	Percentage Share
United Arab Emirates	48.47	46.06
S. Arabia	18.53	17.21
Oman	13.46	12.79
United Kingdom	12.05	11.46
Bahrain	1.64	1.55
France	1.56	1.48
Kuwait	1.29	1.22
Germany	1.28	1.22
Others	6.93	6.59
Total	105.21	100

Source: Pakistan 2007; Fruit, Vegetable and Condiments Statistics of Pakistan

Given the importance of UAE market in mango exports from Pakistan, this study was conducted to pursue the following objectives.

- To conduct export margin analysis of mango from Pakistan to UAE market.
- To identify and analyze major variables influencing export of mango from Pakistan to UAE market.

The paper is organized into four sections. Section II describes some conceptual issues and empirical methodology whereas section III discusses the major findings and section IV concludes and outlines major suggestions for improving mango exports from Pakistan to UAE market.

## MATERIALS AND METHODS

### *Data Sources*

This study attempted to identify and analyze variables that affected export of mango from Pakistan to UAE market. Almost one hundred exporters exported mango from Pakistan for season 2007-08. Sampling frame for the study consisted of sixty mango exporters from the total population, who mainly exported mangoes to UAE market. After discussing with officials from Pakistan Horticultural Development and Export Company (PHDEC), a sample of forty (40) mango exporters was selected using systematic random sampling technique (with a sampling interval of 2, every third exporter on the list was selected and this process was repeated to get sample of 40 exporters) to seek an in-depth information/ data on determinants of mango exports to this market. Sindhri and Chounsa mango varieties from Pakistan dominate exports. As such, information from exporters was collected about these two varieties using a pre-tested questionnaire containing both structured and unstructured questions. Personal interview method was adopted to collect information from exporters.

### *Rationale and Specification of Variables used in Data Analysis*

The variables used in the analysis were taken after review of literature and discussion with the experts in this field. Exporting agricultural commodities often revolves around profitability which is estimated by capturing insight on cost and returns. Average purchase price is an important element of cost of exporting as high purchase prices may enhance cost of exporting thus reducing profitability. Average marketing cost works in the same dimensions, as any mishandling or weak monitoring may enhance chances for cost escalation and profitability reduction. Sale price, in addition to above mentioned two factors, may give an estimate about returns from export ventures. If the export commodity successfully fetches good price in export markets, it becomes easier to earn higher returns. Thus sale price bears crucial implication in export business. Export business involves many complexities and requires sophisticated and disciplined work, which may become easier if the stakeholder is educated and experienced. Education and professional experience provides necessary insight and expertise which are required to handle export matters and thus probability of success in this business enhances. National macro-economic and policy framework is also responsible for success in export business. Government policies which are more focused and supportive, give exporters a better working environment

enhancing the chances for their success in export business. In the same way, compliance to international standards including ISO-9000 is another important factor. So in order to delineate effect of major factors on export of mango the effect of above mentioned factors need to be evaluated. The specification of these variables is provided below;

#### ***Average Purchase Price***

The composition of mango purchases for export purposes was calculated from exporter's total seasonal purchases. Percentage share of each variety (chounsa and sindhri) was calculated and average prices were estimated for each exporter. Average purchase prices were calculated as Rs./ ton.

#### ***Average Marketing Costs***

Marketing cost included charges for different marketing practices from preparation of mangoes to their sale in the UAE market. It includes average charges on transportation, processing, packaging, storage, clearing agent, custom clearance, phytosanitary certificate, physical losses, use of pellets and international freight. Total charges on these marketing activities were calculated as Rs./ ton.

#### ***Average Sale Prices***

Average sale prices of mangoes for sampled exporters in UAE market were investigated and converted into Pakistani rupees at prevailing official exchange rates. These prices were measured as Rs./ton.

#### ***Professional Experience of Exporters***

Experience of mango exporters referred to number of years in export business. The variable would reflect level of maturity of exporters in export business. It was hypothesized that experienced exporters would perform well as compared to budding exporters due to better insight and skills in trading practices learned overtime.

#### ***Education of Exporters***

Education referred to number of schooling years. Education facilitates in undertaking any business activity efficiently. This can also help exporters to adopt innovative ideas and new business trends which may be instrumental in enhancing their business volume. This is particularly important in those businesses where exporters interact with buyers overseas.

#### ***Response of Exporters about Government Policies***

It was considered necessary to capture effect of the government policy on mango exports from Pakistan. The variable was difficult to measure in quantitative terms. As such, a dummy variable was used. Exporter's response was captured in form whether they thought the government policy favorable for export purpose or not. A value of 1 was assigned to exporters who considered government policies favorable to their export business.

#### ***ISO Certificate***

The variable was taken as dummy variable in order to capture effect of compliance by exporters to international standards such as ISO on mango export from Pakistan. A value of 1 was assigned to those exporting firms which were endorsed with ISO certificate.

#### ***Analytical Techniques***

In order to analyze data collected from sampled exporters, following techniques were employed.

#### ***Export Margin Analysis***

The export margin analysis was undertaken to check profitability of mango exporters to UAE market. The following techniques were used.

$$Mm = \frac{Ps}{Sp} \times 100 \quad (1)$$

Where "Mm" indicates marketing margin earned by mango exporter, "Ps" stands for price spread availed by him and "Sp" represents sale price of the mango exporter. The net margin of mango exporters is the net earnings obtained after paying all costs. In the case of mango, net margin was computed using following formula.

$$Nm = Ps - Mc \quad (2)$$

Where, “Nm” stands for net margins, “Ps” indicates price spread availed by mango exporter and “Mc” represents marketing costs incurred by him. These costs were computed on per Kg basis using following formula.

$$Mc = \frac{Ac}{Oh} \tag{3}$$

where “Mc” stands for marketing cost per unit quantity, “Ac” means actual amount spent and “Qh” represents quantity in Kilograms handled.

**The Empirical Model**

The main objective of research was to quantify impact of major variables, which directly or indirectly affected mango exports from Pakistan to UAE market. This model was estimated for both the chounsa and sindhri mango varieties collectively as common determinants were identified for these two varieties from Pakistan. Considering data properties, double log form of regression was used to estimate the model. Double log form of regression is also preferred as it yields elasticities which are more useful in economic analysis to interpret results (Gujarati, 1995). Following functional form was used.

$$X_m = f(S, B, D) \tag{4}$$

The specific form of this relationship is

$$X_m = A S_i^{\alpha_i} B_j^{\alpha_j} e^{\alpha_k D_k} e^{\epsilon} \tag{5}$$

Where

Si = is a vector of socio economic variable of mango exporters, i = 1

Bj = is a vector of business variables of mango exporters, j = 2 . . . 5

Dk = is a vector of qualitative (dummy) variables, k = 6 . . . . 9

As such, equation (5) can be rewritten as

$$X_m = A S_i^{\alpha_1} B_1^{\alpha_2} B_2^{\alpha_3} B_3^{\alpha_4} B_4^{\alpha_5} B_5^{\alpha_6} e^{\alpha_6 D_1} e^{\alpha_7 D_2} e^{\epsilon} \tag{6}$$

Where

X<sub>m</sub> = Mango Exports (tons)

S<sub>1</sub> = Education of the exporters (schooling years)

B<sub>1</sub> = Experience in export business (years)

B<sub>2</sub> = Purchase price of mango (Rs./ton)

B<sub>3</sub> = Marketing cost (Rs./ton)

B<sub>4</sub> = Sale price of mango (Rs./ton)

D<sub>1</sub> = Dummy for Govt. Policy; if favorable then D<sub>1</sub>= 1, otherwise=0

D<sub>2</sub> = Dummy for ISO certification; if endorsed with ISO certification then D<sub>2</sub>=1, otherwise=0

The specific form of the equation (6) is

$$\ln X_m = \ln A + \alpha_1 \ln S_1 + \alpha_2 \ln B_1 + \alpha_3 \ln B_2 + \alpha_4 \ln B_3 + \alpha_5 \ln B_4 + \alpha_6 D_1 + \alpha_7 D_2 + \epsilon \tag{7}$$

**RESULTS AND DISCUSSION**

This study estimated and evaluated profitability and major determinants of mango exports from Pakistan to UAE market. Discussion with exporters during the survey highlighted some qualitative findings about this export market for Pakistani mangoes. Majority of the exporters opined that UAE market was one of the most important and traditional markets for Pakistani mango exports. There were many reasons which may be projected to justify the importance and domination of this market in mango exports from Pakistan, which mainly include presence of a large number of Pakistani immigrants, no strict quality requirements and transportation through sea. Mango export efforts from Pakistan were scattered and individual based with very little utilization of central platforms like mango exporters associations. This particular framework provided open opportunity for any person, who had resources and wanted to export mangoes to this market irrespective of his reputation in domestic market or proper identity. Exploiting this opportunity, many seasonal and scrupulous exporters entered in this business in order to earn short term profit. They followed minimum rules, regulations and business ethics, thus bringing a bad name to Pakistan by their misconduct.

Most of the export consignments to UAE were going through sea. Packaging and grading standards were nominal, even exporters were sending their mangoes in wooden packages which had been banned

in most of the importing countries. Sometimes mangoes were exported in bulk without any packaging in open launches. These marketing practices resulted in more transportation losses and deterioration of quality as well. In UAE wholesale market, mangoes were sold by commission agents who sold on behalf of exporters, deducted charges for their services and remitted balance to exporters. As such, exporters were not sure of the price they might get for their product.

Export price is a major factor which affects export of any product especially the perishable commodities. In case of mango exports to UAE, most of the exporters stated that export price did not matter a lot in determining the level of export quantity as exporters were not sure of price they would get for their product. This price uncertainty in UAE market mainly came due to glut supply in the market by Pakistani exporter which was due to absence of central controlling and regulatory authority which might otherwise regulate supply. This situation aggravated further in absence of adherence to quality and packaging standards which resulted in product losses and deterioration of quality. As such, prices for Pakistani mangoes were significantly lower as compared to its major competitors in this market i.e. India, Thailand and Philippines. Some of the multinational firms exploited this opportunity by repacking Pakistani mangoes in quality packages, improving its appearance and selling further at higher prices with their brand names.

UAE is a favorite market for mango exporters from Pakistan. It alone contributed the major share in the total mango exports from Pakistan. Aujla *et al.* (2007) also declared Middle Eastern markets as lucrative and profitable due to larger quantity of exports to these markets. Average purchase prices for UAE market were calculated as Rs. 28667 per ton. As far as the average marketing cost was concerned, it was estimated as Rs. 20104 per ton. According to findings of this study, freight charges accounts for almost 15% of total marketing cost. The dominant method of sale in this market was commission based where exporter himself was not sure of sale prices because commission agents sold the produce of exporter on his behalf and remitted the balance after deducting charges for their services. Concerned exporters in our study mentioned that they could not claim or verify the additional cost element mentioned by the foreign commission agents for losses and unsold part of exported consignment. So exporters calculated their sale price to this market for overall season. For this market, average sale prices were calculated as Rs. 60000 per ton.

**Table 2. Export Margin Analysis for UAE Market (Rs./ ton)**

Activity	Average Charges (Rs. per ton)
Purchase Price	28666.67
Transportation Charges	4200
Processing Charges	3750
Packing Charges	6400
Storage Charges	477.5
Clearing Agent Charges	625
Custom Clearance Charges	75
Phytosanitary Certificate Charges	25
Certificate of Origin Charges	7.5
Transportation Losses Charges	435
Pellet Charges	425
Freight Charges	3000
Value of Rejected Quantity	684.4
Total Marketing Cost	20104.4
Unit Marketing Cost	20.104
Sale Price	60000
Gross Export Margin (Rs./Ton)	31333.33
Percent Export Margin	52.22
Net Export Margin (Rs./Ton)	11228.93

Source: Author's own calculations from survey findings

The analysis revealed that gross margin for exporting mangoes to this market was Rs. 31334 per ton. The percent export margin was 53% and net export margin was Rs. 11229 per ton. Net margin/profit of exporters constitutes 19% of sale price. Although these figures did not show very attractive picture of exporting mangoes to this market, but still it was preferred by Pakistani mango exporters due to the volume of business they had with this market, less stringent quality requirements and presence of a large number of Pakistanis who constitute the major share of customer base (table 2).

In order to quantify determinants of mango exports from Pakistan to UAE market, regression model was estimated using Ordinary Least Square Estimates (OLS) method employing double log form of the regression analysis. Export of mango was regressed against its independent variables including

education of the respective exporters (number of schooling years), professional experience (years in mango export business), average purchase prices of mango (Rs. per ton), average marketing costs (Rs. per ton) and average sale prices for exported mangoes (Rs. per ton). In addition to above-mentioned quantitative variables, certain qualitative variables were also used in the form of dummy variables. These variables included exporter's perceptions about support of government policies and endorsement of exporting firms with ISO certificate. The description of data used in mode estimation is presented below (table 3).

**Table 3. Description of Data used to Estimate Export Model**

Variables	Minimum	Maximum	Mean	Std. Deviation
Export Quantity (tons)	175.00	1150.00	569.75	287.92
Education of Exporter (years)	10.00	16.00	13.40	1.82
Experience of Exporter (years)	5.00	35.00	14.25	6.64
Average Purchase Price (Rs/ton)	26833.33	31000.00	28666.16	1160.96
Average Marketing Cost (Rs/ton)	18267.92	22649.71	20104.37	1037.92
Average Sale Price (Rs/ton)	56000.00	65000.00	60000.00	2261.72
Support of Govt. Policies	.00	1.00	.47	.50
ISO Certificate	.00	1.00	.42	.50

Source: Author's own estimation

Overall significance of estimated regression model can be tested through a joint hypothesis that all coefficients are equal to zero. This can be done through analysis of variance (ANOVA). In this estimated model for mango export to UAE market, F-value was 10.17, which was highly significant. This showed that estimated model was correctly specified and independent variables included in this empirical investigation did have explanatory power to explain variation in the dependent variable i.e. export of mango to UAE market.

Coefficient of determination ( $R^2$ ) explains proportion of total variability in the dependent variable that can be accounted for by the set of independent variables. In the cross sectional data its better to use adjusted  $R^2$  [(Chattarjee and Price, 2000), (Gujarati, 1995)]. In our estimated model for mango exports to UAE market, value of adjusted  $R^2$  was 0.67 which stated that all the independent variables in our estimated model explained 67% variation in the dependent variable i.e. mango exports for UAE market whereas rest of the 33% variation in the dependent variable was caused by some other factors which these independent variables could not capture (table 4). These factors may include some qualitative factors like size, shape and color of mangoes. In addition some promotional campaigns and requirements of UAE may also bear important implications for export of mango from Pakistan to UAE. Although these factors are important but could not be used in this research due to non-availability of data.

The coefficient of education showed a positive sign with mango export to UAE market, which is consistent with observation from the survey as most of the progressive exporters were well educated. The impact of education on mango exports was significant at 1% significance level. The value of this coefficient stated that keeping all other factors constant, for every one percent increase in education might cause 0.75 percent increase in mango export to UAE market (table 4).

The coefficient for professional experience of exporters was found significant at 1% significance level with a value of 0.84, which explained that keeping all other factors constant, for every one percent increase in professional experience there might be 0.84 percent increase in mango exports to UAE market. This finding is also consistent with economic theory and logic as it is presumed that more experienced exporters may perform their business affairs in better way (table 4).

The coefficient of average purchase prices showed negative sign with mango exports but was found insignificant. The value of this coefficient stated that keeping all other factors constant, for every one percent increase in average purchase prices there might be 0.83 percent decrease in mango exports to UAE market. Comparing with sale price of mango in this market, average prices of mango in local market is comparatively low which might be a cause of its insignificant impact on mango export to UAE market (table 4).

The coefficient of average marketing cost showed negative sign with exports and was significant at 1% level of confidence. The coefficient of average marketing cost was 1.73 which stated that keeping all other factors constant, for every one percent increase in average marketing cost there might be 1.73 percent decrease in mango exports (table 4). Comparing with sale prices, average marketing cost is large enough to have significant impact on mango export to UAE market.

The coefficient of average sale prices for mango showed a positive relationship with exports but was found insignificant. Value of this coefficient was 0.43 which stated that keeping all other factors constant, for every one percent increase in average sale prices increased mango export to UAE market by 0.43 percent (table 4). There is no fixed mechanism of determining the level of sale prices in UAE market and sale prices were also not significantly higher than marketing cost which might be a cause of its insignificant impact on mango export to UAE market.

**Table 4. Summary of Estimated Export Model for UAE Market**

Model Variables	Coefficients	T-Value	Significance
Constant	18.896	1.207	0.236
LnS <sub>1</sub> (log of Education)	0.752	2.838	0.008***
LnB <sub>1</sub> (log of Experience)	0.844	8.473	0.000***
LnB <sub>2</sub> (log of Average Purchase Price)	-0.830	-0.869	0.391 <sup>NS</sup>
LnB <sub>3</sub> (log of Average Marketing Cost)	-1.737	-2.520	0.017**
LnB <sub>4</sub> (log of Average Sale Price)	0.439	0.456	0.651 <sup>NS</sup>
D <sub>1</sub> (Dummy for Govt. Policies)	0.0072	0.073	0.942 <sup>NS</sup>
D <sub>4</sub> (Dummy for ISO Certificate)	0.163	1.794	0.082*
R <sup>2</sup>	0.69		
Adjusted R <sup>2</sup>	0.67		
F-Value	10.17		
Durbin Watson Statistics	2.46		

Source: Author's own estimation

\*\*\* Significant at 1%, \*\* Significant at 5%, \* Significant at 10% level of confidence

Results of dummy variable used to capture effect of exporter's response about government policies, suggested a positive impact of favorable government policies on mango export to UAE market but this variable was found insignificant. Coefficient of this variable stated that keeping the effect of other variables constant, government policies, if favorable, might enhance mango exports by 0.007 times more as compared to unfavorable government policies (table 4).

The second dummy variable was used to check the status of standardization in Pakistan's mango industry and its effects on mango exports to UAE market. Aujla *et al.* (2007), Ghafoor (2007), Mustafa *et al.* (2006), World Bank and UNIDO (2006), Pirzada (2006) and Sharif (2004) also pinpointed in their studies that lack of compliance to international standards is major problem in expanding the scope of fruit exports from Pakistan whereas same was reported by Reddy (2005) for Indian mango and by FAO (2005) which stated that in tropical fruit exports price premiums had been replaced by quality premiums. This variable showed positive sign with mango exports and was found significant at 10% level of confidence. The value of this variable suggested that there were 0.16 times more exports for firms having an ISO certificate as compared to those who did not have such certificates (table 4). ISO certificate is a sign of quality production which is enough for UAE market. In a market which does not require any certificates, having ISO certificate is an additional advantage which shows a significant impact on mango exports to this market.

## CONCLUSION AND RECOMMENDATIONS

UAE is one of the most important export markets for Pakistani exporters. Pakistani immigrants in this market are the main consumers. These consumers are not concerned much with quality of mangoes rather they are more conscious about availability of mangoes. Flexible importing requirements and less stringent standards have made this market a favorite export market for Pakistani exporters. Education, professional experience, average marketing cost and ISO certificate were found significant determinants of mango exports to this market whereas average purchase prices, average sale prices and government policies were found insignificant variables. It was also observed and concluded during the survey that Pakistani mango is considered as a low quality low price product in UAE market. In this context, more proactive and integrated diplomatic efforts are required to promote a good image of Pakistani mango in UAE market. Seminars and mango festivals may be arranged in Pakistan and UAE to enhance awareness of consumers in UAE about Pakistani mangoes.

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