Australian Academy of Business and Economics Review
Volume 1 • Issue 1 • July 2015

www.aabl.com.au/aaber, www.aaber.com.au

An Analysis of Marketing Channel Choice Decisions by Smallholder Citrus Growers

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Abstract
Citrus fruit is a perishable and seasonal agricultural produce and requires effective and efficient management to market it. The citrus supply chain is multifaceted and complex due to the presence of a large number of intermediaries. Therefore, the selection of an appropriate marketing channel by growers involves a complex decision making process. Despite of the fact that citrus industry is growing in Pakistan where production is dominated by small scale citrus growers, no research has been done to evaluate and analyse the marketing channel choice decision making process of these citrus growers .A number of transaction costs, scocio-economic, demographic and psychological factors are involved in this decision making process. This paper reviews the existing factors affecting decision making of small size citrus growers in citrus supply chain in Pakistan and also measures and analyses the factors that affect the marketing channel decisions of these small size growers. A multivariate decision analysis technique, conjoint analysis, has been used to analyse and evaluate the major factors affecting marketing channel choice decisions of small size citrus growers. The research would provide valuable information about citrus grower's marketing decision making process and thus would contribute to improving the efficiency and effectiveness of citrus industry in Pakistan.

Keywords: decision making, marketing channel, factors, supply chain, multivariate decision analysis

1. Introduction

Like many other developing countries where farming is dominated by small size growers, in Pakistan farmers also possess small agricultural land and its size has been reducing in successive generations when it is distributed among the heirs. Nearly all agricultural land (agricultural farms) is owned and cultivated by private individuals in the country. According to Pakistan Bureau of Statistics(2015), nearly 90 percent of the total agricultural farms have less than 5 ha (12.5 acres) of land and only 10 percent farms have more than 5 ha of agricultural land. The average farm size for citrus in Punjab was estimated at 12.3 hectares (30.3 acres) which is quite big as compared to other crops in the area(Chaudry, 2004). However, the size of citrus orchard ranges from 0.4 ha (1 acre) to more than 64.7 ha (160 acres) in different citrus producing areas of Pakistan. Small and medium size farmers dominate citrus production in the area, although, some big farmers are also producing citrus (Ali, 2004).

Citrus fruit is leading among all fruits produced in Pakistan and constitutes about 30% of total fruit production (Pakistan Bureau of Statistics, 2014). More than 90 percent citrus fruit is produced and marketed in Punjab province. In Punjab, fresh Citrus fruit marketing has three broad scopes i.e., domestic marketing, marketing for processing and juice extraction and export

marketing (Ali, 2000). Marketing of citrus fruit starts with the involvement of pre-harvest contractor in the marketing chain. The pre-harvest contractor purchases an orchard at the flowering stage, hence called a pre-harvest contractor, on an annual basis after estimating the possible returns from the orchard. The other citrus marketing channel members include commission agents, wholesalers, and retailers and exporters. The rapid increase in a number of different intermediaries in the marketing chain of citrus fruit in Pakistan not only decreases the profit of the citrus grower but also makes marketing decisions difficult. This involves fairly complex decision making on the part of functionaries of the citrus supply chain in the country. According to Sharif et al. (2005), the citrus marketing channels choice decisions have composite nature and depend upon price and non-price factors. Being small in size and wholly dependent on the produce of their orchards for their subsistence, citrus growers need to decide efficiently among the available marketing channels that can produce a maximum profit to them. These small size citrus growers account for a number of different transactional cost, socio-economic, demographic and psychological factors before opting a marketing channel. There is a dearth of research which analyses the factors affecting these small size citrus growers marketing channel choice decisions. The prime focus in only on the evaluation of marketing margins, marketing problems, opportunities and constraints in production, marketing system and export potential of citrus (Ali, 2004; Aujla et al., 2007; Bashir et al., 2006; Chaudry, 2004; Ghafoor et al., 2010; Khushk & Shaikh, 2004; Sabir et al., 2010; Sharif et al., 2005).

Therefore, this study identifies and evaluates the major factors that influence the small size citrus grower's marketing channel choice decisions in the Pakistan citrus industry. In order to identify the factors affecting the growers/farmers marketing channel choice decisions from the earlier studies, a literature review is carried out, and logical framework is established. This is followed by a research design and method and procedure for collection and analysis of data is described. Finally, an empirical analysis is carried out, and the results are presented and discussed along with the key findings of this research.

2. Review of Literature

A number of researchers found different transaction costs, socioeconomic and demographic variables which were considered important in the selection of marketing channels by the farmers. Transaction costs can be divided into three types for the purpose of ease: information costs (costs before the transaction), negotiating costs (costs during the transaction) and monitoring costs (costs after the transaction (Hobbs, 1996, 1997). In an attempt to measure the effect of transaction costs on the choice of supply channel by beef processors in the United Kingdom, Hobbs (1996) found that monitoring costs arising from the traceability of cattle were important to the selection of beef supply channel. In order to measure the effect and influence of transaction costs, socioeconomic and farm characteristic variable son slaughter cattle marketing, Hobbs (1997) found that different transaction costs (risk of non-sale, time spent at the auction, role of procurement staff and grade uncertainty) and socioeconomic and farm characteristic variables (lot size, producing bulls and member of Farm Assured Scotch Livestock scheme) significantly affected the producer's choice of marketing channel when selling slaughter cattle. Similarly, Gong et al. (2006) also evaluated that farmer's cattle marketing channel choice was

influenced by both transaction costs and socioeconomic characteristics. Transaction costs variables include payment delay after selling cattle, bargaining power, farm specialization, grade uncertainty and farm services received. Among the socioeconomic variables, level of investment in cattle, number of cattle sold, education level, feed conversion ratio, the age of farmer and ownership structure were considered to be most important that influenced farmers to choose forward contract sales. Ouma et al. (2010) evaluated the smallholder farmer's banana market participation decisions of buying and selling in Rwanda and Burundi. They found that both transaction costs and non-price related factors significantly influenced the farmer's decisions in banana markets in Central Africa. The transaction costs related factors included the geographical location of the household, market information sources and travel time to the nearest urban centre. Security of land tenure, labour availability, off-farm income, the gender of the household head and years of experience were the non-price related factors which influenced the banana farmer's market channel choice decisions. Woldie & Nuppenau (2011) investigated factors affecting the farmer's selection of marketing channels in Ethiopian banana markets and found that farmer's choice between cooperative and regional traders was influenced by a number of transaction costs and farm characteristics variables. Transaction cost factors included time spent searching market price information, time spent while trading with wholesalers, difficulty of assessing price information, availability of contractual agreement and trust in wholesale traders while access to credit and area cultivated for banana were the socioeconomic factors. Shiimi et al. (2012) analysed different transaction costs and socio-economic variables to determine factors that affect cattle marketing decision of cattle producers in the Northern Communal Areas (NCAs) of Namibia. They found that transportation to MeatCo (transaction cost), marketing experience and the age of cattle producers (socioeconomic characteristics) were the factors which significantly affected the decision whether or not to sell through the formal markets. The decision to sell a proportional number of cattle to formal market was governed by both transaction costs (the accessibility of marketing related information, accessibility of new information technology, and a lack of improved productivity) and socioeconomic (the age of the respondents) variables. Mabuza et al. (2014) used the cross-sectional data from mushroom producers in Swaziland to investigate the effects of transaction costs and socioeconomic characteristics variables on producer's choice of marketing channels and the quantity of mushrooms supplied. They found that different socioeconomic (household labour endowment, production capacity, access to cooling facilities) and transaction costs (market information, and producers' bargaining position) variables were the key determinant factors which affect the producer's decisions of where to sell their mushrooms. Similarly, the transaction costs variables that include difficulty in accessing reliable transport and producers' level of uncertainty in meeting buyers' quality requirements were the major determinant factors which affected the quantities of mushrooms sold.

3. Methodology

Depending upon the research problem and nature of the study, both qualitative (exploratory) and quantitative (descriptive and inferential) research methods were used for this study. It has already been described that it is the research question, problem and its purpose

which help to decide the suitable research methods (Ary et al., 2009; Ghauri & Grønhaug, 2005).

Primary data was collected through surveys using semi-structured questionnaires for pilot study (exploratory research) and structured questionnaires (Profiles) for final data collection (descriptive and inferential research). Secondary data was obtained from published documents, reports, journals and government publications that provide basis for the development of research instrument for the present study.

The population under study was comprised of small citrus growers involved in the overall supply chain of citrus fruit in Pakistan. In the citrus marketing supply chain, the selling decisions of the small size citrus growers play a pivotal role in the selection of ultimate supply channel because they comprise the majority of the growers. Therefore, the present study identified and analysed the factors (variables) that affect the selling decisions of these citrus growers. A total of 67 small size citrus growers were interviewed for this study.

Convenience sampling technique was employed for the selection of sample size for the citrus growers in this study. The reasons of choosing convenience sampling techniques included unavailability of population size (sampling frame) and secondary information showing the total number of citrus growers, time constraint, and budget constraint.

A survey of citrus growers using semi-structured interviews was designed for pilot study to identify and understand the relationship among the factors identified from the descriptive study and actually used or considered relevant by these citrus growers in the marketing decision making process. For final data collection, a structured questionnaire (profiles/decision cards) was developed on the basis of exploratory/secondary data and pilot study results. All the citrus growers placed more than 50% importance on nine factors that include sale price per 40kg, urgent need of money, advance payment, mode of payment, certainty of payment, delay in payment, number of fruit pickings, time of complete fruit picking and harvesting fruit loss and considered these factors accountable for citrus marketing channel decisions. These nine factors produced twenty-seven profiles or decision cards to be included in the final data collection from citrus growers.

Profiles or Decision Cards

"Profiles or decision cards are the different combinations of all the factors and their levels displayed on a hard sheet of paper."

For this study with a full-profile combination of factors, a ranking scale from most preferred to least preferred was used for data collection. According to Hair et al., (2010), profiles can be presented in written description, physical or pictorial models to be effectively used in data collection procedure. In order to make profiles attractive, understandable and easy to evaluate, respondents were presented with cards showing factor levels with appropriate signs and pictures. For example, different levels of factor 'price' were supported with different sizes of the sign 'Rs' (which is commonly used for the price in Pakistan). In addition, considering the target audience these cards were also presented in local language (Urdu), where necessary.

A multivariate survey based decision analysis technique, conjoint analysis, has successfully been used to identify and quantify transaction cost, socioeconomic and psychological factors affecting decision making in agribusiness (Ferto & Szabo, 2002; Hobbs, 1996; McDermott et al.,

2004; Smidts, 1990; Tano et al., 2003). However, these studies only measured the significance of various factors which affect the farmers marketing channel choice decisions except Hobbs, who measured the impact of various factors on the selection of marketing channel by beef processors. There is a dearth of using conjoint analysis (a multivariate decision analysis technique) in marketing channel choice decision making by all members of any supply chain in the agribusiness sector. This multivariate decision analysis technique has an advantage that it measures the value of all factors good or bad, tangible or intangible considered relevant in the decision-making process. Therefore, the conjoint analysis was used in this study for the identification and assessing the factors that affect citrus growers selling decisions in the citrus supply chain (Know).

Depending upon the number of categories of factors (2x2 or more than 2x2 cross tables) used in the analysis, the most appropriate test chi-square was used to test the significance among different demographic (age, education, experience) and transactional cost variables used in this research.

Apart from the selection of larger sample size; correction of the questionnaires through pilot testing; and data collection through face-to-face interviews, both qualitative, and quantitative research methods were used to increase the reliability and validity of the data as well as the whole research.

4. Results and Discussion

4.1 Characteristics of Small Size Citrus Growers

a) Total Farm Size

Nearly 46% (31 out of 67 respondents) of the growers had less than 10 acres of total farm land including a citrus orchard. About 27% (18 out of 67 respondents) growers owned a farm having a total size of 10.1-20 acres. The remaining 27% (18 out of 67 respondents) growers had a total farm size of 20.1-40 acres as shown in Table 1. This showed that majority of the growers owned less than 10 acres of total farm size in the area. However, growers do not use all the available land for growing of citrus fruit only. A part of land is used for the cultivation of other cereal crops and fodder for the animals.

Table 1: Total Farm Size

Total Farm Size (acres)		
Acres	**Frequency**	**Percentage**
1-10 acres	31	46
10.1-20 acres	18	27
20.1-40 acres	18	27
Total	**67**	**100**

b) Area under Citrus Orchards

Regardless of total farm area, citrus growers having orchard size less than 10 acres constituted 59.7% (40 out of 67 respondents) of total respondents as shown in Table 2.

Nearly 40.3% (27 out of 67 respondents) of growers had citrus orchards having a size of 10.1-20 acres. The results clearly showed that majority of the respondents were very small citrus

growers in the area.

Table 2: Area under Citrus Orchards

Area Under Citrus (acres)		
Acres	**Frequency**	**Percentage**
1-10 acres	40	59.7
10.1-20 acres	27	40.3
Total	**67**	**100**

c) Age of the Respondents

The majority of the citrus growers, nearly 77.6% of the total respondents, were 31-60 years of age. Only 7.5% (5 out of 67 respondents) of the growers were below 30 years of age while 14.9% (10 out of 67 respondents) were more than 60 years old as shown in Table 3. It can be concluded from the results that majority of the citrus growers were elderly people.

Table 3: Age of the Respondents

Age of the Respondents (Years)		
Years	**Frequency**	**Percentage**
≤ 30	5	7.5
31-60	52	77.6
≥ 61	10	14.9
Total	**67**	**100**

d) Education of the Respondents

Only 4.5% (3 out of 67 respondents) of the respondents were illiterate as shown in Table 4. Majority of the respondents, nearly 88% (59 out of 67 respondents) of the respondents were undergraduate while only 4.5% (3 out of 67 respondents) of total respondents had graduation qualification.

Table 4: Education of the Respondents

Education of the Respondents (Education Years)		
Qualification	**Frequency**	**Percentage**
Illiterate	3	4.5
Undergraduate	59	88.0
Graduate	3	4.5
Postgraduate	2	3.0
Total	**67**	**100**

It was interesting to know that literacy rate is improving among growers than previous years (Ministry of Finance, 2014). The high literacy rate is one of the reasons which providing a basis to citrus growers to become progressive and more market oriented. Only 3% (2 out of 67 respondents) of the total respondents had the highest qualification.

e) Experience of the Respondents

The majority of the respondents 74.6% (50 out of 67 respondents) of the total respondents had 1-25 years of business experience as shown in Table 5. It was very interesting to know that nearly 25.4% (17 out of 67 respondents) of the respondents had more than 25 years of experience which shows that citrus production has become a family business.

Table 5: Experience (Years) of the Respondents

Citrus Grower's Experience (Years)		
Years	**Frequency**	**Percentage**
≤10	15	22.4
11-25	35	52.2
≥26	17	25.4
Total	**67**	**100.00**

4.2 Analysis of the Data

The primary data was analysed using the statistical package PASW-21 (Predictive Analytics Software – version 21) previously known as SPSS (Statistical Product and Service Solutions). A total of 67 citrus growers who owned a citrus orchard less than 20 acres were interviewed using convenience sampling method. According to the number of factors and their corresponding levels, all the citrus grower were asked to rank 27 profile cards (decision card) from the most preferred one to the least preferred one.

The part-worth utilities of all the levels of different factors were calculated from the preference data obtained from citrus growers in the field. Moreover, all factors with their appropriate levels are discussed one by one for each type of grower. A Chi square test for significance was employed to measure the relationship between any two variables/factors followed by the explanation of all the significant relationships. Lastly, the percentage importance along with the part worth utility values of all levels of each factor is discussed. This section also threw light on the highest and lowest part worth utility combinations of different levels of all factors (profiles) and concluded which was the best combination (profile) in citrus marketing channel choice decision making for the small size citrus growers.

(a) Part-worth Utility Values of All Levels and their Ranges

The overall results of the part-worth utility values of the levels of all the factors along with the utility ranges calculated from the respondents preferences for each factor used are shown in Table 6.

Table 6: Part-worth Utility Ranges

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest- Lowest)
Sale Price/40Kg	$7-$9	-8.3330	-1.0000	7.3330
	$9.1-$11	-1.0000	2.4440	3.4440
	$11.1-$13	2.0000	8.1110	6.1110
Urgent Need of Money	Yes	-1.0000	0.9170	1.9170
	No	-0.9170	1.0000	1.9170

Advance Payment	15%	-4.6670	0.7780	5.4450
	25%	-0.3330	2.4440	2.7770
	35%	-2.0000	3.4440	5.4440
Mode of Payment	Cash	-1.5560	4.6670	6.2230
	Cash & Cheque	-1.6670	0.4440	2.1110
	Cheque	-4.8890	1.4440	6.3330
Certainty of Payment	Personal Guarantee	-0.8330	1.4170	2.2500
	Post Dated Cheques	-1.4170	0.8330	2.2500
Delay in Payment	< 1 Week	-2.2220	1.4440	3.6660
	1-2 Week	-2.2220	1.6670	3.8890
	≥ 3 Week	-0.2220	2.1110	2.3330
No. of Fruit Pickings	One	-5.7780	9.0000	14.7780
	Two	-1.2220	1.4440	2.6660
	Three	-8.4440	5.4440	13.8880
Time of Complete Fruit Picking	January	1.3330	8.1110	6.7780
	February	-0.8890	3.5560	4.4450
	March	-7.3330	-1.4440	5.8890
Harvesting Fruit Loss	Low	-1.1670	1.0000	2.1670
	High	-1.0000	1.1670	2.1670

Table 7 showed the percentage importance of each factor that was calculated on the basis of ranking of all the factors by the respondents. It showed that the higher the percentage preference of a factor, the more was its utility for the respondents and vice versa.

Table 7: Overall Percentage Importance of Factors

Rank	Factor	Percentage Importance
1	Sale Price/40Kg	34.50
2	Time of Complete Fruit Picking	27.10
3	NO. of Fruit Pickings	11.00
4	Mode of Payment	6.20
5	Advance Payment	6.10
6	Delay in Payment	5.80
7	Certainty of Payment	3.50
8	Harvesting Fruit Loss	3.40
9	Urgent Need of Money	2.50

The detailed description of the utilities of all the factors with their appropriate levels is discussed one by one for small size growers (less than 20 acres of citrus orchard).

(i) Sale Price per 40 Kg

The overall preference for factor "Price" was ranked the highest amongst all the factors. The percentage importance of price factor in all factors was 34.50%. However, a great variation

of part-worth utilities between different levels as well as within each level of all factors can be observed in Table 8

Table 8: Part-worth Utility Range for Price

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest- Lowest)
Sale Price/40Kg	$7-$9	-8.3330	-1.0000	7.3330
	$9.1-$11	-1.0000	2.4440	3.4440
	$11.1-$13	2.0000	8.1110	6.1110

For minimum price level of $7-$9 of the price factor, part-worth utility range was 7.3330 with a minimum value of -8.3330 and maximum of -1.0. This level has no positive utility for either of the extremes showing that it's a least preferred level in citrus marketing decision making. This great variation was because of the value trade-off within the three levels and also between price and other factors. The minimum part-worth utility for this level showed that the overall utility of price factor was very high as compared to the other factors (sum of the part-worth utility of all levels of one factor is always zero). For example, the respondent having minimum part-worth utility (-8.3330) for this level placed higher values for the other levels of price factor as 7.8890 and 0.4440. This level had the least importance for the respondents and was evident from this fact that the maximum part-worth utility for this level had a negative value as compared to other two levels as shown in Table 8.

For the price level of $9.1-$11, the part-worth utility range was 3.4440 which were nearly half of the value than $7-$9 price level as shown in Table 8. This shows that this level had more importance for respondents and was not as easily traded off as the preceding level. However, the minimum part-worth utility of -1.0000 indicated that this level could be traded off with other relatively important factors, for example, the number of fruit pickings. It also reflected that for this particular respondent of very low part-worth utility, the importance of price factor was less as compared to other factors. The maximum part-worth utility of 2.4440 reflected that this level was important for the decision-making and was easily traded off with the preceding level having a low price range.

For the price level of $11.1-$13, the part-worth utility range was 6.1110 with the minimum utility of 2.0 and maximum of 8.1110 as shown in Table 8. This was the highest preferred level among all levels of price and other factors and confirmed the universal truth of seller's inclination to get the high price of his produce. Both minimum and highest values were positive that indicated this level was highly important in citrus growers marketing choice decision-making process. It was interesting to know that all the respondents preferred $11.1-$13 price level for making marketing channel choice decision.

(ii) Time of Complete Fruit Picking

The overall preference for factor "Time of Complete Fruit Picking" was ranked second highest amongst all the factors. The percentage importance of this factor in all factors was 27.10%.

Similar to the price factor, a great variation of part-worth utilities between different levels as

well as within each level can be observed in Table 9.

Table 9: Part-worth Utility Range for Time of Complete Fruit Picking

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest- Lowest)
Time of Complete Fruit Picking	January	1.3330	8.1110	6.7780
	February	-0.8890	3.5560	4.4450
	March	-7.3330	-1.4440	5.8890

For January, the part-worth utility range for the time of complete fruit picking factor was 6.7780 with a minimum value of 1.3330 and maximum of 8.1110. The highest utility value, as well as the highest utility range among all the three levels of this factor, showed that it was highly preferred level for decision making. It was also observed that greater the range of a level for a particular factor, greater were the chances of its trade off with other levels. Both lowest and highest utility values were in positive figures indicating the importance of this level for respondents.

As the minimum utility of this level increased to its maximum value, the chances of trading off of this level with other levels as well as with other factors decreased. From these part-worth utilities, it can be concluded that respondents wanted to clear their orchards from fruit within this month of January, and it was highly important for them. Nearly 94% of the total respondents preferred to accept January for the complete fruit picking. The underlying reason was that trees in the orchard start flowering in the month of February and March. If fruit picking was delayed for one or the other reason, trees bore fewer flowers and hence produced less fruit in the following season. Therefore, respondents ranked this factor second in importance to price factor. However, some respondents did not compromise with the health/growth of orchard and accepted the low price and ranked this factor to first place. From the percentage importance, it can also be stated that respondents traded off time of complete fruit picking with price and vice versa.

For February, the part-worth utility range was 4.4450 and it was lower than the level 'January'. This showed that this level had less importance for respondents and was easily traded off with other levels. The minimum part-worth utility of -0.8890 indicated that this level could be traded off with other relatively important levels. It also reflected that for this particular respondent of very low part-worth utility, the importance of this factor was less as compared to other levels of this factor as well as to other factors. The maximum part-worth utility of 3.5560 reflected that this level is preferred to some extent for the decision making. Only 4% of the total respondents of this small size group of citrus growers accepted February for the complete fruit picking.

For March, the part-worth utility range was 5.8890 with the minimum utility of -0.7330 and maximum of -1.4440 as shown in Table 9. This was the lowest preferred level among all levels of this factor and confirmed that no respondent wanted to extend fruit harvest until the month of March. Both minimum and highest part-worth utilities were negative values that indicated this level was highly unimportant and irrelevant level in citrus growers marketing choice decision-making process. None of the respondents preferred March for the time of

complete fruit picking. This level was easily and frequently traded off with the other factors even when it had the highest part-worth utility of -1.4440. The reason was the unfavourable conditions of the citrus fruit and orchard in the month of March. It was believed that if fruit stayed on the trees until the month of March it affected the next flowering and growth of the citrus tree.

(iii) Number of Fruit Pickings

The overall percentage importance of this factor was ranked third according to the respondent's preference, but it is very low as compared to the first two factors as discussed above. This showed that only two factors, price and time of complete fruit picking, were the most important factors and thus highly ranked by all the respondents. However, the percentage importance of this factor in all factors was 11.00% which is 3rd highest amongst all the factors.

However, a considerable variation of part-worth utilities between different levels as well as within each level of this factor can be observed in Table 10.

Table 10: Part-worth Utility Range for Number of Fruit Pickings

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest- Lowest)
NO. of Fruit Pickings	One	-5.7780	9.0000	14.7780
	Two	-1.2220	1.4440	2.6660
	Three	-8.4440	5.4440	13.8880

For one number of picking, the part-worth utility range was 14.778 with minimum value of -5.778 and maximum of 9.0. This was the highest part-worth utility range among all the three levels of this factor and clearly showed that it was highly preferred level and factor for decision making. In addition, this level had maximum utility range amongst all the other factors and their levels in the analysis showing its flexibility to trade off with other factors.

The highest utility value of 9.0 reflected that this level had maximum importance for the respondent than any other level. It also showed that overall importance of this factor was also very high in the mind of this particular respondent. As this utility gradually decreased towards zero the overall percentage importance of this factor as well as this level also decreased. Again for the lowest utility value of -5.7780, the overall percentage importance of this factor was still considerable (according to zero-sum rules) but this level was not acceptable to the respondent. Instead, respondents would trade off this level with other levels of this factor or with other factors. Most of these small size growers preferred to allow only one picking to clear completely out their orchards from fruit. As the number of pickings increased from two to three, the chances of fruit and tree damage increased which affected the health of the orchard.

For two pickings, the part-worth utility range was 2.666 with the lowest part-worth utility of -1.222 and the highest 1.444. This indicated that this level was not as important as the previous one and was easily traded off. A very low value of the highest utility (1.444) as compared to other two levels of this factor reflected that this level was weakly preferred by all respondents of this small size citrus growers group.

For three pickings, the part-worth utility range was 13.888 with the lowest part-worth

utility of -8.444 and the highest 5.444. The part-worth utility range was the second highest amongst all the factors, and their levels indicated its importance in the decision-making process. Some of the small-scale citrus growers preferred three pickings due to the following reasons;

- During the first picking, also known as 'Topping', only mature and ripened fruit were picked from the trees. It lessened the burden of fruit trees and also permitted enough time for the remaining fruit to ripen. It was believed that remaining fruit on trees gets good size and colour after topping.
- In second picking, again the ripened fruit was picked from the trees leaving behind the immature and unripe fruit.
- In third picking, all the remaining fruit which had now developed good size and colour was picked.

Some of the respondents preferred three numbers of pickings which were clearly evident by the maximum part-worth utility value of 5.444 for this level. However, most of the respondents preferred one or two pickings at the best level and was reflected from the minimum part-worth utility value of -8.444 for this level. The importance of this level was clearly evident from the large values of minimum and maximum part-worth utilities.

(iv) Mode of Payment

The overall percentage importance of this factor was ranked fourth amongst all the nine factors according to the respondent's preference and was 6.20%. However, a considerable variation of part worth utilities between different levels as well as within each level of this factor can be observed in Table 11.

For cash as a mode of payment, the part-worth utility range was 6.2230 with a minimum value of -1.5560 and maximum of 4.6670. Although utility range of this level was second to the level 'cheque' but highest utility value for this level as compared to all other levels clearly showed that it was highly preferred level for decision making. It is also noticeable that some respondents have no positive utility for this level.

Table 11: Part-worth Utility Range for Mode of Payment

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest-Lowest)
Mode of Payment	Cash	-1.5560	4.6670	6.2230
	Cash & Cheque	-1.6670	0.4440	2.1110
	Cheque	-4.8890	1.4440	6.3330

The highest utility value of 4.6670 reflected that this level had considerable importance to the respondent than any other levels. It also showed that overall importance of this level was also high in the mind of this particular respondent(s). As this utility gradually decreased towards zero the overall percentage importance of this level also decreased. At a minimum utility of -1.5560, the overall importance of this level was dropped to its minimal level and the respondents traded off this level with other levels of this factor. However, the highest utility value of 4.6670 for

level 'cash' of the 'price' factor confirmed the importance of this factor in the mind of respondents.

For cheque as a mode of payment, the part-worth utility range was 6.330 (slightly more than the 'cash' level) with the lowest part-worth utility of -4.8890 and the highest 1.444. The highest part-worth utility of 1.444 indicated that this level was not as important as that of cash level, but the range of this level showed that it was frequently traded off with other levels as well as with other factors. Nearly 59.7% of the total respondents preferred to accept payment through cheque, 31.3% of the total respondents preferred cash payment while only 9% of the total respondents accepted both cash and cheque as mode of payment.

For cash and cheque, the part-worth utility range was 2.110 with the lowest part-worth utility of -1.6670 and the highest 0.444. The small highest utility value of 0.444 showed that this level had very little importance in the process of decision making. It was easily traded off with other levels as well as with other factors in the process of final decision making by the respondents. Only 9% of the total respondents preferred this level while deciding for the price of their citrus fruit.

(v) Advance Payment

The overall percentage importance of this factor was ranked fifth amongst all the nine factors according to the respondent's preference and was 6.10%.However, a considerable variation of part-worth utilities between different levels as well as within each level of this factor can be found in Table 12.

For advance payment of 15%, the part-worth utility range was 5.4450 with a minimum value of -4.6670 and maximum of 0.7780. Although utility range of this level was higher than any other level, but the value of highest utility for this level as compared to all other levels clearly showed that it was not highly preferred level for decision making. Only about 10.4% of the total respondents preferred to accept contracts with 15% of total advance payments. It also affirmed that this level was easily traded off with other higher advance payment levels as it was clearly indicated by larger lowest utility value as compared to highest utility value.

Table 12: Part-worth Utility Range for Advance Payment

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest- Lowest)
Advance Payment	15%	-4.6670	0.7780	5.4450
	25%	-0.3330	2.4440	2.7770
	35%	-2.0000	3.4440	5.4440

For advance payment of 25%, the part-worth utility range was 2.7770 with the lowest part-worth utility of -0.3330 and the highest 2.4440. The small utility range of this level showed that it was not frequently traded off with other levels of this factor, and the highest part-worth utility of 2.444 indicated that it was more highly preferred than the preceding level. Nearly 71.6% of the total respondents preferred to accept 25% advance payment which showed the importance and preference of this level in marketing decision-making process.

For 35% advance payment level, the part-worth utility range was 5.4440 with the lowest part-worth utility of -2.0 and the highest 3.444. The wide range and highest utility values for this

level showed that this level had a high preference for the respondents in their marketing decision making. However, only 17.9% of the total respondents agreed to sign the contract with 35% of advance payment. The reasons of such a low number of respondents who accept the high advance payments included fear of fraud, uncustomary offer of more than one-fourth advance payment and exploitation by the tycoons of industry who offer high advance payments.

(vi) Delay in Payment

The overall percentage importance of this factor was ranked sixth amongst all the nine factors according to the respondent's preference and was 5.80%. A considerable variation in part-worth utilities between different levels as well as within each level of this factor can be found in Table 13.

Table 13: Part-worth Utility Range for Delay in Payment

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest- Lowest)
Delay in Payment	< 1 Week	-2.2220	1.4440	3.6660
	1-2 Week	-2.2220	1.6670	3.8890
	≥ 3 Week	-0.2220	2.1110	2.3330

For delay in payment for less than one week, the part-worth utility range was 3.666 with a minimum value of -2.222 and maximum of 1.444. The highest utility value of this level clearly showed that it was not highly preferred level for decision making. Therefore, it was easily traded off with other levels of this factor or with other factors. This fact was also verified from the wide range of utility for this level.

For delay in payment for 1-2 week, the part-worth utility range was 3.8890 with the lowest part-worth utility of -2.222 and the highest 1.667. Although, the range of the utility for this level was the highest among the three levels, the small highest utility value of this level shows that it was also considered less preferable for decision making. It was surprising to note that respondents did not expect to receive their payments in a short time as it was clearly evident from the results as shown in Table 13.

For more than 3 weeks delay in payment, the part-worth utility range was 2.3330 with the lowest part-worth utility of -0.222 and the highest 2.1110. The smaller utility range indicated that this level was less frequently traded off with other levels of this factor, and the highest part-worth utility value of 2.110 indicated that it was highly preferred level than the preceding levels. Once delay in payment is inevitable or agreed, it is customary to accept at least 3 or more than three weeks delay in payment. Nearly 56.7% of the respondents accepted more than 3 weeks delay in payment while about 34.3% of the total respondents liked to accept a delay in payment less than one week. Only 9% of the total respondents preferred to accept 1-2-week delay in payment.

(vii) Certainty of Payment

The overall percentage importance of this factor was ranked third lowest amongst all the nine factors according to the respondent's preference and was 3.50%.

A considerable variation of part-worth utilities between different levels as well as within each

level of this factor can be found in Table 14.

Table 14: Part-worth Utility Range for Certainty of Payment

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest-Lowest)
Certainty of Payment	Personal Guarantee	-0.8330	1.4170	2.2500
	Post Dated Cheques	-1.4170	0.8330	2.2500

The results revealed that there exist a difference in the highest and lowest utility values of both levels for the certainty of payment which reflected the importance of each level in the decision making. The part-worth utility range for personal guarantee was 2.25 with a minimum value of -0.8330 and maximum of 1.4170. Whereas the part-worth utility range for post-dated cheque was also 2.25 with a minimum value of -1.4170 and maximum 0.8330. The highest utility value for personal guarantee clearly showed that it was highly preferred level for decision making. Therefore, it was not easily traded off with another level of this factor or with other factor's levels.

The small highest part-worth utility value (0.8330) for post-dated cheque as compared to personal guarantee reflected that it was less important in marketing decision making. The result also showed that overall this factor was less importance in the process of decision making by the citrus growers as compared to other factors as indicated by its low overall percentage preference of 3.5%.

(viii) Harvesting Fruit Loss

The overall percentage importance of this factor is ranked second lowest amongst all the nine factors according to the respondent's preference and is 3.40%.

A considerable variation of part-worth utilities between different levels as well as within each level of this factor can be found in Table 15

Table 15: Part-worth Utility Range for Harvesting Fruit Loss

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest-Lowest)
Harvesting Fruit Loss	Low	-1.1670	1.0000	2.1670
	High	-1.0000	1.1670	2.1670

The results revealed that there exists a difference in the highest and lowest utility values of both levels for harvesting fruit loss which reflected the importance of each level in the decision making. The part-worth utility range for low harvesting fruit loss was 2.1670 with a minimum value of -1.1670 and maximum of 1.0. Whereas the part-worth utility ranges for high fruit loss was also 2.1670 with a minimum value of -1.0 and maximum 1.1670. The highest utility value for high harvesting fruit loss clearly showed that it had a high preference for decision making. It seemed irrational to select a high level of harvesting fruit loss while making a marketing decision. In reality, this was not true and all the fruit lost or damaged during harvesting belonged to the buyer(s). Therefore, citrus growers did not pay prime importance to

this factor while making a marketing decision.

(ix) Urgent Need of Money

The overall percentage importance of this factor was ranked lowest amongst all the nine factors according to the respondent's preference and was 2.50%.

A considerable variation of part-worth utilities between different levels as well as within each level of this factor can be found in Table 16.

Table 16: Part-worth Utility Range for Urgent Need of Money

Factor	Factors Levels	Lowest Utility Value	Highest Utility Value	Range (Highest-Lowest)
Urgent Need of Money	Yes	-1.0000	0.9170	1.9170
	No	-0.9170	1.0000	1.9170

The results revealed that there exists a difference in the highest and lowest utility values of both levels for urgent need of money which reflected the importance of each level in the decision making. The part-worth utility range for urgent need of money (Yes) was 1.9170 with a minimum value of -1.000 and maximum of 0.9170. Whereas the part-worth utility range for 'No' urgent need of money was also 1.9170 with a minimum value of -0.9170 and maximum of 1.0000. The highest utility value for 'No' urgent need of money clearly showed that it had a high preference for decision making. However, it seemed irrational because the majority of the respondents needed money urgently for various activities like fertilizers, pesticides and urgent domestic needs, etc.

The result also showed that overall this factor was least importance in the process of decision making by the citrus growers as compared to other factors as indicated by its low overall percentage preference of 3.0%.

(b) Factors Relationship

A suitable statistical technique (Chi-Square Test for significance) was used to find out the relationship or interdependence between any two given qualitative or quantitative factors. These significance test results showed interesting significant and non-significant relationships between any two given factors (Appendix A&B).

It was very interesting to know that all the respondents only preferred the highest price level of $11.1-13. As the variable 'Sale price per 40 Kg' was a constant, therefore, there existed no relationships of this variable with any other variable in the analysis. Despite the fact that there was no statistics relationship between age of the respondents and price, a clear trend can be observed from the results. None of the respondents from all age groups preferred the other two levels of lower price than price level $11.1-13 of price factor as shown in figure 1.

However, the level $11.1-$13 was either traded off with the number of fruit picking or with the time of complete fruit picking factors according to their importance but only in rare cases. As the minimum utility of this level increased to its maximum value, the chances of trading off of this level with other levels as well as with other factors decreased. Nearly 31% of the total respondents traded off this level factor with either number of fruit picking or time of

complete fruit picking.

All the respondents preferred the highest price level of $11.1-13 irrespective of their education, farm experience and size of the citrus orchard (Appendix C, D &E).

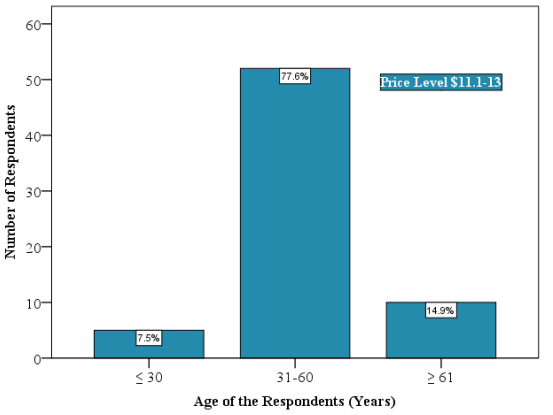

Figure 1: A Cross-tabulation Between Age of the Respondents and Price

There was a strong evidence of a relationship between delay in payment and time of complete fruit picking (p-value = 0.017*). The results revealed that majority of the citrus growers; 56.7% of the respondents showed their intention to accept more than three weeks delay in payment. It was interesting to note that all of these respondents preferred this delay in payment only when complete fruit picking was in January. It seemed rational because the citrus fruit season lasted until the month of March-April and by accepting more than 3 weeks delay with January was the final time of orchard picking, citrus growers could recover their remaining amount during the season. It was also interesting to note that none of the respondents liked the time of complete fruit picking in March. Again it was a rational decision as already discussed and was according to the nature of the fruit and orchard physiology.

A significant relationship was found between number of fruit pickings with delay in payment (p-value = 0.000*), mode of payment (p-value = 0.003*) and certainty of payment (p = value 0.000*). It was interesting to note that the number of pickings was directly associated with the factors related to payments (payment delay, payment mode and payment certainty).

There was very strong evidence of a relationship between certainty of payment and a number of fruit pickings (p = 0.000*) and between mode of payment and number of fruit pickings (p = .003*). The results revealed the fact that payment through cheque was the most preferred mode of payment against any number of pickings. There was also a very strong evidence of a relationship between a number of fruit pickings and harvesting fruit loss (p = 0.000*).

A significant relationship had been found between the advance payment and mode of payment (p value= 0.000*), between delay in payment and mode of payment (p-value = 0.000*), between the certainty of payment and mode of payment (p value= 0.000*), between the urgent need of money and mode of payment (p value= 0.001*) and between harvesting fruit loss and

mode of payment (p-value = 0.000*). The results also revealed that for low fruit loss cash mode of payment is preferred over other two modes of payment; however, for high fruit loss 'cheque' mode of payment is highly preferred over 'cash'. A significant relationship had also been found between mode of payment and education of the respondents (p-value = 0.01*). It was also evident from the results that illiterate respondents preferred to accept 'cash & cheque' over 'cheque' payments while graduate respondents accepted 'cash' instead of 'cheque' payments. It was very interesting to note that respondents with the highest qualification in the sample only preferred 'cheque' payments and considered it the best way of money transaction. There also existed a significant relationship between mode of payment and area under citrus (p-value = 0.04*).

A significant relationship has been found between advance payment and certainty of payment (p-value = 0.000*) and between Advance Payment and Harvesting Fruit Loss (p-value = 0.003*).

There was a statistically significant relationship between delay in payment and urgent need of money (p-value = 0.000*). Usually, citrus growers needed money for fertilizers, pesticides, for the wedding of their son/daughter and the construction of their houses. It had been clear from the results that in case of the urgent need of money, the majority of the respondents accepted a delay in payments only for two weeks.

On the contrary, if there was no urgent need of money, delay in payment was acceptable for more than three weeks and it seemed logical. Usually, those citrus growers who did not need urgent money had enough financial sources to meet their agricultural (fertilizers, pesticides) and non-agricultural expenses. Therefore, these citrus growers offered more relaxation in receiving payments from the buyers as compared to other growers who required urgent money to meet their expenses.

A significant relationship was also found between delay in payment and certainty of payment (p-value = 0.000*). It was interesting to note the fact that with personal guarantee respondents frequently accepted more than three weeks delay in payment, whereas, majority of the respondents who preferred post-dated cheque preferred a maximum of 2 weeks delay in payment. There also existed a significant relationship between delay in payment and harvesting fruit loss (p-value = 0.000*) and between the education of the respondents and delay in payment (p-value = 0.005*). It was interesting to note that with the increased level of education, the preference for the minimal delay in payment increased. The respondents with no education at all preferred to accept any delay in payment while the respondents with higher education level only accepted less than one week delay in payment. There also existed a significant relationship between delay in payment and area under citrus (p-value = 0.025*)

There existed a significant relationship between urgent need of money and certainty of payment (p-value = 0.03*), between certainty of payment and harvesting fruit loss (p-value = 0.000*), between certainty of payment and experience of the respondents (p-value = 0.01*) and between certainty of payment and area under citrus (p-value = 0.003).

The results clearly reflected a trend that irrespective of the farm size, respondents preferred personal guarantee more than that of post-dated cheque as a security measure. However, this scenario was different for post-dated cheques were very small growers are having

a citrus area less than 10 acres preferred post-dated cheques more than the growers having citrus area 10.1-20 acres. But within the group of respondents who owned an area of 1-10 acres, the personal guarantee was still more preferred than the post-dated cheques. This was also true for respondents having 10.1-20 acres of the citrus area where the majority of the respondents preferred personal guarantee.

There was a statistically significant relationship between harvesting fruit loss and age of the respondents (p-value = 0.006*), education of the respondents (p-value = 0.007*), experience of the respondents (p-value = 0.01*) and area under citrus orchard (p-value = 0.003). It was very interesting to note from the results that regardless of the age, education, experience and area under citrus orchard, the overall trend exhibited by respondents was to prefer the high harvesting fruit loss situation.

There was a statistically significant relationship between education of the respondents and urgent need of money (p-value = 0.005*). The results also revealed that illiterate, graduate and postgraduate respondents preferred to accept the pre-harvest contract terms which can satisfy their immediate emerging needs by providing them with urgent money, hence, these respondents preferred to accept 'Yes' level of this factor.

(c) Part-worth Utility Estimates and Percentage Importance of Factors in the Overall Preference

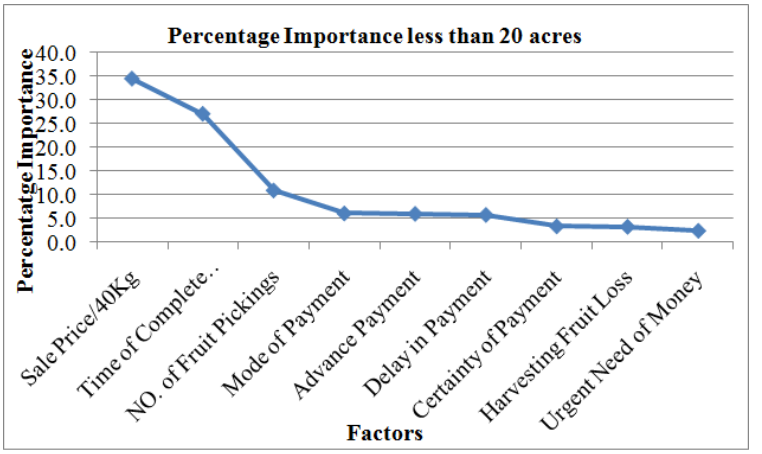

Figure 2: Factors Averaged Importance Values of all the Factors

The percentage importance of factor 'sales price per 40kg' showed that it had the highest influence in determining the overall preference as shown in figure 2. The results revealed that this factor alone had more than a one-third contribution on the overall citrus marketing channel choice decision process. This means that there was a large difference in preference between decision profiles having the highest price and those having the lowest price (Soutar & Turner, 2002). The factor 'time of complete fruit picking' had the second highest influence on the overall preference and it contributed over one-quarter of all the factors in the decision process. The results showed a decrease of almost 21% in the overall preference of this factor as compared

to the preceding factor. A further decrease of almost 59% in the overall preference of decision process was observed in the factor 'No. of fruit picking' and this factor contributed only 11% in the citrus marketing channel choice decision process.

Table 17: Accumulated Percentages of All Factors

Factor	Percentage Importance	Accumulated Percentage
Sale Price/40Kg	34.5	34.5
Time of Complete Fruit Picking	27.1	61.6
No. of Fruit Pickings	11.0	72.6
Mode of Payment	6.2	78.7
Advance Payment	6.1	84.8
Delay in Payment	5.8	90.7
Certainty of Payment	3.5	94.1
Harvesting Fruit Loss	3.4	97.5
Urgent Need of Money	2.5	100.0

It can be observed from the results that first two factors influenced 61.6% in determining the overall preference in the final decision as shown in Table 17. Therefore, it can be concluded that these two factors were considered relatively highly preferred factors as compared to the other factors in the final decision making by the small size citrus growers.

The respondents showed an almost equal preference for the 'mode of payment', 'advance payment' and 'delay in payment' and it was 6.2%, 6.1% and 5.8% respectively. A decrease of nearly 44%, 45% and 48% in the overall preference from the preceding factor can also be observed for 'mode of payment', 'advance payment' and 'delay in payment' respectively.

There was a decrease of nearly 41% in the percentage preference of 'certainty of payment' from the preceding factor showing that this factor and all the remaining factors were of lesser importance in the final decision process of marketing channel choice. However, the respondents put nearly equal preferences for 'certainty of payment' and 'harvesting fruit loss' as shown in Table 17. The results also showed that 'urgent need of money' played the least important role in determining the overall preference and this factor only contributed 2.5% in overall preference.

In order to clearly understand the small citrus grower's factor preferences, all the nine factors can be divided into different groups/tiers on the basis of percentage importance of each factor as follows:

The first group is comprised of two factors namely 'price' and 'time of complete fruit picking' which contributed 61.6% in the overall preference of decision process.

The second group is comprised of only one factor namely 'number of fruit pickings' which alone contributed 11% in the overall choice preference.

The third group is composed of three factors namely 'mode of payment', 'advance payment' and 'delay in payment' which contributed 18.1% in the overall preference. All these three groups together contributed nearly 90.7% in the overall preference of channel choice.

The fourth group is also comprised of three factors namely 'certainty of payment', 'harvesting fruit loss' and 'urgent need of money' which contributed only 9.3% in the overall preference as shown in Table 17.

It can be inferred from the results that there would be little effect on percentage importance, hence, on the utility of the overall decision, in moving among the factors within multiple factors groups. However, this effect would be high when moving from one group of factors to another group as shown in Table 17. For example, moving from one factor to another factor in the first group would cause a decrease in percentage importance by only 21%. Whereas, if citrus growers move from the first group of factors to second group this decrease in percentage importance would be 59%.

The part-worth utility estimates for all the levels of each factor along with the percentage importance of each factor in the overall percentage preference is exhibited in table 18. The part-worth utilities were estimated using the ordinary least square (OLS) analysis by the conjoint procedure in SPSS. If any factor or level was preferred over another one, it had larger part-worth utility value. For example, for the factor sale price per 40 kg all the respondents preferred level '$11.1-$13' over other levels and factors, therefore, it had the highest part-worth utility estimate of 5.579 as shown in Table 18.

As described earlier, the overall worth or utility of the decision is the sum of all part-worth utility of different levels of all factors. Therefore, this can be written as;

(Total worth of the decision) $_{ij}...n_{ij}$ = Part-worth of level i for factor 1 + Part-worth of level j for factor 2 + ...+ Part-worth of level n for factor m

The dependent variable in the above equation was the total worth of the respondents marketing decision. The independent variables were the levels of all the factors involved and were treated as dummy variables. The explanatory variables or levels of factors were defined as P = 1 if price was $7-$9, P = 2 if price was $9.1-$11 and P = 3 if price was $11.1-$13; U = 1 if respondents showed that they need money urgently and U = 2 if they did not need money for urgent purposes; A = 1 if respondents accepted 15% advance payment, A = 2 for 25% advance payment and A = 3 for 35% advance payment; M = 1 for cash payments, M = 2 for cash & cheque payments and M = 3 for only cheque payments; S = 1 for personal guarantee as a security of payment and S = 2 for post-dated cheques; D = 1 for less than one week delay in payment, D = 2 for 1-2 week delay in payment and D = 3 for greater than three weeks delay in payment; N = 1 for one picking, N = 2 for two number of pickings and N = 3 for three number of pickings; T = 1 for the time of complete fruit picking in January, T = 2 for February and T = 3 for March picking; L = 1 for low harvesting fruit loss and L = 2 for high fruit loss.

Table 18: Part-worth Utility Estimates of Factors

Factors	Levels	Part-worth Utility	Percentage Importance of Factors
Sale Price/40Kg	$7-$9	-6.285	34.5
	$9.1-$11	.706	
	$11.1-$13	5.579	

Urgent Need of Money	Yes	-.200	2.5
	No	.200	
Advance Payment	15%	-.851	6.1
	25%	.708	
	35%	.143	
Mode of Payment	Cash	.237	6.2
	Cash & Cheque	-.511	
	Cheque	.274	
Certainty of Payment	Personal Guarantee	.271	3.5
	Post Dated Cheques	-.271	
Delay in Payment	< 1 Week	-.227	5.8
	1-2 Week	-.496	
	> 3 Week	.723	
NO. of Fruit Pickings	One	.285	11.0
	Two	.041	
	Three	-.327	
Time of Complete Fruit Picking	January	4.202	27.1
	February	.925	
	March	-5.128	
Harvesting Fruit Loss	Low	-.189	3.4
	High	.189	
(Constant)		14.039	

The regression equation is, therefore,

$TW = C + a_1P + a_2U + a_3A + a_4M + a_5S + a_6D + a_7N + a_8T + a_9L + \mu$

Where TW = Total worth of the decision, C = Constant term, μ = *error term*

The part-worth utility estimates in Table 18 can be summed up to give a total worth for any combination of factor levels. Therefore, profile or decision 1 would have a total worth of 20.205 as shown below which represents the sum of the factor level part-worth and the constant term;

Profile 1:

Sale Price/40Kg	Urgent Need of Money	Advance Payment	Mode of Payment	Certainty of Payment	Delay in Payment	NO. of Fruit Picking	Time of Complete Fruit Picking	Harvesting Fruit Loss
$11.1-$13	Yes	15%	Cash & Cheque	Personal Guarantee	≥ 3 Week	Two	February	High

$(TW)_1$ = (14.039) + (5.579) + (-0.200) + (-0.851) + (-0.511) + (0.271) + (0.723) + (0.041) + (0.925) + (0.189) = 20.205

In a similar fashion, the total worth of all the 27 profiles or decisions were estimated and subsequently transformed into predicted rankings from highest total worth to the lowest (Appendix F&G). The result showed that the profile/decision 20 had the maximum utility of 24.027 among all the 27 profiles/decisions as follows:

Profile 20:

Sale Price/40Kg	Urgent Need of Money	Advance Payment	Mode of Payment	Certainty of Payment	Delay in Payment	NO. of Fruit Picking	Time of Complete Fruit Picking	Harvesting Fruit Loss
$11.1-$13	NO	35%	Cash	Personal Guarantee	1-2 Week	Two	January	Low

and

$(TW)_{20}$ = (14.039) + (5.579) + (0.200) + (0.143) + (0.237) + (0.271) + (-0.496) + (0.041) + (4.202) + (-0.189) = 24.027

The predicted total worth for each decision showed how small size citrus growers traded off between the factors and their levels while making the final decision for the selection of a marketing channel. For example, profile 20 and 1 had in common the price, certainty of payment, the number of fruit pickings. They differ in urgent need of money, advance payment, mode of payment, delay in payment, time of complete fruit picking and harvesting fruit loss. The predicted total worth for profile 20 and 1 are 24.027 and 20.205 placing them first and seventh, respectively, in the rankings of profiles. This explained how small size citrus growers traded off different factors and their levels to come up with the highest utility. It implied that small size citrus growers were willing to give up high utility value of 0.723 for ≥ 3 Week delay in payment with the low utility value of -0.496 for 1-2 weeks delay in payment thus moving towards maximizing total worth of the decision.

As already described, the higher the percentage importance of the factor, the greater would be its impact towards total estimated worth of the profiles/decisions. If small size citrus growers select the first two groups of factors (only three factors), their decision would be 72.6% true and its utility increases as they select the other factors. In other words, if small size citrus growers focus on the third group (3 more factors) and make the right choice while making citrus marketing decision, they would be 90.7% accurate in their decision.

Table 19 shows two statistics, Pearson's R and Kendall's tau, which provide measures of the correlation between the observed and estimated preferences. According to Field (2009), statistics closes to 1.0 display that the model is a good fit. The Pearson's R correlation coefficient (0.977) which is close to 1.0 measures the positive correlation but not perfectly positive correlated between all observed and estimated preferences. The Kendall's tau (τ) correlation coefficient reports the extent of this correlation and confirms the validity of the model. Its value is in the range $-1 \leq \tau \leq 1$ showing the two extremes and it is very rare to get these values. However, models having tau value of ± 0.50 or more are considered good fit and models having τ value below ±0.50 are considered a fair fit (Burns & Burns, 2008; Field, 2009;

Gustafsson et al., 2007).

Table 19: Correlations between Observed and Estimated Preferences

	Value	Sig.
Pearson's R	0.977	0.000
Kendall's tau (τ)	0.850	0.000

The value of Kendall's tau (0.850) also indicates the agreement between two rankings is not perfect (i.e., the two rankings are not the same), instead, the two rankings are nearly the same. However, it can be inferred from the values of Pearson's R and Kendall's tau that the model is a good fit.

5. Conclusion

Conjoint Analysis was used to evaluate and analyse the factors that affect the citrus growers and contractors channel choice decision in the supply chain of citrus fruit in Pakistan. The key findings of the analysis are:

- A total of nine factors namely sale price per 40kg, urgent need of money, advance payment, mode of payment, certainty of payment, delay in payment, number of fruit pickings, time of complete fruit picking and harvesting fruit loss were identified as major factors which affect marketing channel choice decision making of small size citrus growers.
- The small size citrus growers had different percentage importance for all these nine factors while making a particular marketing channel choice decision.
- The small size citrus growers highly preferred the first two factors 'price' and 'time of complete fruit picking' and placed percentage importance of 34.5% and 27.1% respectively for both these factors. These two factors contributed 61.6% in determining the overall preference and were considered relatively highly preferred factors as compared to the other factors in the final decision making by the small size citrus growers.
- The small size citrus growers showed almost equal preference for the 'mode of payment', 'advance payment' and 'delay in payment' and it was 6.2%, 6.1% and 5.8% respectively.
- Six factors namely 'price', 'time of complete fruit picking', 'number of fruit pickings', 'mode of payment', 'advance payment', and 'delay in payment' together contributed 90.7% in the overall preference of channel choice.
- The total worth of profile or decision card 14 was the lowest and was 1.942 showing that the combination of factors involved had the lowest utility for small size citrus growers.
- The total worth of profile or decision card 20 was the highest and was 24.027 showing that the combination of factors involved had the maximum utility for small size citrus growers.

6. Limitations of the Research Study

This study used both qualitative as well as quantity methods to analyse and explain the results and focused on the analysis of major factors affecting small size citrus growers marketing channel choice decision. However, it implies few limitations:

- Due to the unavailability of the population size of small size citrus growers it was not possible to draw sample size statistically. Therefore, the sample for small size citrus growers was drawn by convenience sampling method which is not statistically true representative of the population.
- The creation of orthogonal design for the conjoint analysis is used as a remedy against the issue of multicollinearity for the creation of realistic profiles in this research. However, among all the three remedies, the creation of super attribute is the conceptually superior and direct approach.
- In chi square test for significance, majority of the contingency tables have more than 20% cells that have expected cell count less than 5 which affect the validity and generalizability of the results (Burns & Burns, 2008; Cooper & Schindler, 2014; Saunders et al., 2012).
- At occasions, respondents perceived that researcher was from some government or private agent to benefit them. At times respondents supposed that researcher was official and had come to collect monetary information in order to apply or increase the tax. Sometimes respondents, while looking at the profiles, thought about a researcher a new buyer in the town and wanted to buy orchards and therefore collecting information. A few of the respondents believed that researcher was planning to establish his own business as their competitor; hence, they were reluctant to share the information or gave wrong information.
- Two factors namely urgent need of money and advance payment seems to contradict each other. On one hand, citrus growers show their consent they are not in urgent need of money but on the other hand they prefer to accept higher levels of advance payments.

7. Contributions of the Research Study

This study investigates and analyse the marketing channel choice decision making of small size citrus growers in the citrus supply chain of Pakistan. A detailed assessment and discussion of the results provide a foundation pillars on which the contribution of this study can be recognized towards the progressing citrus industry of Pakistan. This study also magnifies the priority areas for future research in the citrus industry of Pakistan. The main contributions of this study include:

- This study analyses the major factors affecting the small size citrus growers channel choice decisions making process in depth. On one hand, it helped to study an industry that is subsistence in its nature and on the other hand, it lends a hand to explore the decision-making process of small size citrus growers particularly in a country that is progressing. In short, it can be said that this study would provide a better understanding of decision-making process in the citrus supply chain of Pakistan.

- Using Conjoint Analysis in the context of citrus grower's marketing channel choice decisions in the citrus industry of Pakistan is relatively a new approach. According to Chaudry (2004) and Sharif et al. (2005), both price and non-price factors played a role in the selection of buyers by the citrus growers. However, there was a lack of research in this particular area which focused different factors used in the selection of marketing channel by the citrus growers and other supply chain members. Most of the studies revolved around in identifying the citrus marketing channels and estimating the margins of different marketing intermediaries, describing existing fruit marketing system, identifying constraints in fruit marketing systems and promoting exports, examining the citrus production system, factors affecting citrus production and marketing problems faced by the citrus growers (Aujla et al., 2007; Bashir et al., 2006; Ghafoor et al., 2010; Sabir et al., 2010; Sharif et al., 2005). This study helps to identify and evaluating the major factors (both price and non-price factors) which are considered important by the citrus growers in the citrus supply chain of Pakistan while making marketing channel choice decisions.
- This study uses the purposive sampling technique and conducts face-to-face interviews of citrus growers to get the in-depth understanding of the citrus industry due to limited availability of secondary data. In doing so, this research provides the immediate information and deep understanding of the current scenario of the citrus industry in the Pakistan.
- Agricultural products, particularly, fruit and vegetables are seasonal and perishable in nature and require more efficient and effective marketing practices. This involves the rationale decision making while marketing agricultural products by the stakeholders in order to sell their products in good condition, with better price and to combat the competition in the market. Therefore, this study helps citrus growers to decide rationally and make efficient marketing decision through which they can earn a good profit as well as increase the efficiency of the whole citrus supply chain.
- This study is the re-contextualization of an existing technique, conjoint analysis, and showing the applicability of this technique to a new situation of citrus grower's marketing channel choice decision-making process.

8. Future Research

- In future similar study can be executed using the probability sampling or representative sampling technique subject to the availability of the sampling frame. This would help to generalize the results and finding of the research and help all the stakeholders improving their marketing decision making.
- Reconsidering the number and nature of factors and their levels may help other researchers to explore other dimensions of citrus growers marketing channel choice decisions. It may increase the statistical basis of the study by combining different factors and their levels.
- In order to fulfil the two essentials assumptions of chi-square test for significance (Burns & Burns, 2008; Cooper & Schindler, 2014; Saunders et al., 2012), particularly

getting expected cell count equal to or greater than 5 in each cell, a larger sample can be used in future for measuring the correlation among the demographic and transactional cost factors or variables.

- A conceptually superior and direct approach of creating super attributes for the creation of believable or realistic profiles would open the new directions for the research and remove the limitation of this research study. This may also solve the problem of factor's contradictions to each other.
- In future this study can be extended to analyse the decision making process of other groups of citrus growers (who own greater than 20 acres of citrus orchards) and/or other players of the citrus supply chain and/to other areas (districts and provinces) of citrus production in Pakistan.
- The similar study can be extended to other fruit, vegetables and other agricultural commodities for the study of decision-making process in the respective supply chains of these products in Pakistan. This would help all the stakeholders involved in citrus as well as in other fruit and vegetable supply chains to make effective and efficient decisions and it would be a major contribution in literature.

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Appendix A: Significance Test Results between Qualitative and Quantitative Factors for Small Size Citrus Growers

S. No.	Factors	p-Value	Relationship
1	Age of the Respondents (Years) / Sale Price/40Kg	No statistics	Sale Price/40Kg is a constant
2	Education of the Respondents (Education Years) / Sale Price/40Kg	No statistics	Sale Price/40Kg is a constant
3	Citrus Grower's Experience (Years) / Sale Price/40Kg	No statistics	Sale Price/40Kg is a constant
4	Area Under Citrus / Sale Price/40Kg	No statistics	Sale Price/40Kg is a constant
5	Area Under Citrus / Urgent Need of Money	0.93	Non-significant
6	Education of the Respondents (Education Years) / Time of Complete Fruit Picking	0.90	Non-significant
7	Citrus Grower's Experience (Years) / Delay in Payment	0.88	Non-significant
8	Education of the Respondents (Education Years) / Advance Payment	0.83	Non-significant
9	Area Under Citrus / Time of Complete Fruit Picking	0.68	Non-significant
10	Age of the Respondents (Years) / Time of Complete Fruit Picking	0.54	Non-significant
11	Citrus Grower's Experience (Years) / Mode of Payment	0.47	Non-significant
12	Citrus Grower's Experience (Years) / NO. of Fruit	0.44	Non-significant

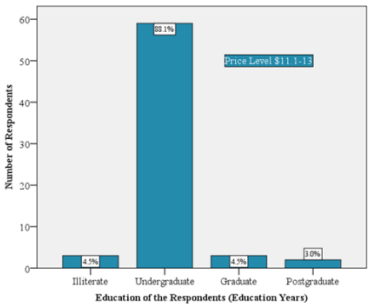
	Picking		
13	Citrus Grower's Experience (Years) / Urgent Need of Money	0.40	Non-significant
14	Education of the Respondents (Education Years) / NO. of Fruit Picking	0.37	Non-significant
15	Age of the Respondents (Years) / Delay in Payment	0.28	Non-significant
16	Education of the Respondents (Education Years) / Certainty of Payment	0.24	Non-significant
17	Citrus Grower's Experience (Years) / Time of Complete Fruit Picking	0.23	Non-significant
18	Age of the Respondents (Years) / NO. of Fruit Picking	0.21	Non-significant
19	Age of the Respondents (Years) / Mode of Payment	0.20	Non-significant
20	Age of the Respondents (Years) / Advance Payment	0.16	Non-significant
21	Age of the Respondents (Years) / Urgent Need of Money	0.15	Non-significant
22	Area Under Citrus / NO. of Fruit Picking	0.12	Non-significant
23	Citrus Grower's Experience (Years) / Advance Payment	0.11	Non-significant
24	Age of the Respondents (Years) / Certainty of Payment	0.10	Non-significant
25	Area Under Citrus / Advance Payment	0.07	Non-significant
26	Area Under Citrus / Certainty of Payment	0.00	Significant
27	Area Under Citrus / Harvesting Fruit Loss	0.00	Significant
28	Education of the Respondents (Education Years) / Urgent Need of Money	0.01	Significant
29	Education of the Respondents (Education Years) / Delay in Payment	0.01	Significant
30	Citrus Grower's Experience (Years) / Certainty of Payment	0.01	Significant
31	Citrus Grower's Experience (Years) / Harvesting Fruit Loss	0.01	Significant
32	Age of the Respondents (Years) / Harvesting Fruit Loss	0.01	Significant
33	Education of the Respondents (Education Years) / Harvesting Fruit Loss	0.01	Significant
34	Education of the Respondents (Education Years) / Mode of Payment	0.01	Significant
35	Area Under Citrus / Delay in Payment	0.03	Significant
36	Area Under Citrus / Mode of Payment	0.05	Significant

Appendix B: Significance Test Results between Two Quantitative Factors for Small Size Citrus Growers

S. No.	Factors	p-value	Relationship
1	Urgent Need of Money / Advance Payment	0.77	Non-significant
2	NO. of Fruit Picking / Time of Complete Fruit Picking	0.25	Non-significant
3	Time of Complete Fruit Picking / Harvesting Fruit Loss	0.27	Non-significant
4	Urgent Need of Money / NO. of Fruit Picking	0.16	Non-significant
5	Urgent Need of Money / Time of Complete Fruit Picking	0.23	Non-significant
6	Urgent Need of Money / Harvesting Fruit Loss	0.14	Non-significant
7	Advance Payment / Delay in Payment	0.43	Non-significant
8	Advance Payment / NO. of Fruit Picking	0.29	Non-significant
9	Advance Payment / Time of Complete Fruit Picking	0.21	Non-significant
10	Mode of Payment / Time of Complete Fruit Picking	0.74	Non-significant
11	Certainty of Payment / Time of Complete Fruit Picking	0.21	Non-significant
12	Advance Payment / Mode of Payment	0.00	Significant
13	Mode of Payment / Certainty of Payment	0.00	Significant
14	Certainty of Payment / Delay in Payment	0.00	Significant
15	Delay in Payment / NO. of Fruit Picking	0.00	Significant
16	Urgent Need of Money / Delay in Payment	0.00	Significant
17	Advance Payment / Certainty of Payment	0.00	Significant
18	Mode of Payment / Delay in Payment	0.00	Significant
19	Mode of Payment / Harvesting Fruit Loss	0.00	Significant
20	Certainty of Payment / NO. of Fruit Picking	0.00	Significant
21	Certainty of Payment / Harvesting Fruit Loss	0.00	Significant
22	Delay in Payment / Harvesting Fruit Loss	0.00	Significant
23	NO. of Fruit Picking / Harvesting Fruit Loss	0.00	Significant
24	Urgent Need of Money / Mode of Payment	0.00	Significant
25	Advance Payment / Harvesting Fruit Loss	0.00	Significant
26	Mode of Payment / NO. of Fruit Picking	0.00	Significant
27	Delay in Payment / Time of Complete Fruit Picking	0.02	Significant

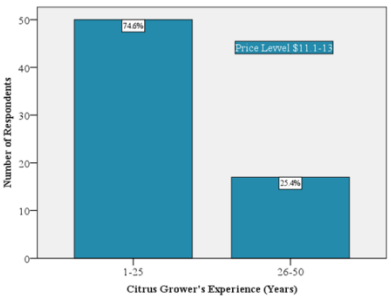
28	Urgent Need of Money / Certainty of Payment	0.03	Significant

Appendix C



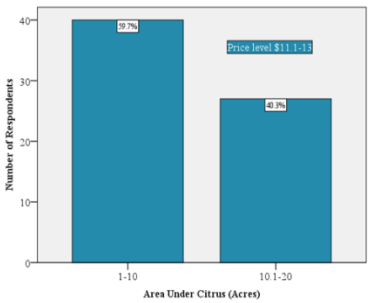
A Cross-tabulation Between Education of the Respondents and Price for Small Size Citrus Growers

Appendix D



A Cross-tabulation Between Experience of the Respondents and Price for Small Size Citrus Growers

Appendix E



A Cross-tabulation Between Area under Citrus and Price for Small Size Citrus Growers

Appendix F: All Profiles/Decisions for Small Size Citrus Growers

Profile ID	Sale Price/40Kg	Urgent Need of Money	Advance Payment	Mode of Payment	Certainty of Payment	Delay in Payment	NO. of Fruit Picking	Time of Complete Fruit Picking	Harvesting Fruit Loss
1	$11.1-$13	Yes	15%	Cash & Cheque	Personal Guarantee	≥ 3 Week	Two	February	High
2	$9.1-$11	No	35%	Cash & Cheque	Personal Guarantee	< 1 Week	Three	February	High
3	$7-$9	No	35%	Cheque	Personal Guarantee	≥ 3 Week	One	March	Low
4	$9.1-$11	Yes	35%	Cheque	Personal Guarantee	≥ 3 Week	Two	January	High
5	$11.1-$13	Yes	35%	Cash & Cheque	Personal Guarantee	< 1 Week	One	March	Low
6	$9.1-$11	Yes	25%	Cash	Personal Guarantee	≥ 3 Week	Three	January	Low
7	$9.1-$11	Yes	35%	Cash	Post Dated Cheques	1-2 Week	One	March	High
8	$7-$9	Yes	25%	Cash & Cheque	Personal Guarantee	1-2 Week	One	February	High
9	$7-$9	No	25%	Cash	Post Dated Cheques	≥ 3 Week	Two	March	High
10	$7-$9	Yes	25%	Cheque	Personal Guarantee	< 1 Week	Three	January	High
11	$9.1-$11	Yes	25%	Cash & Cheque	Personal Guarantee	1-2 Week	Two	March	Low
12	$11.1-$13	Yes	15%	Cash	Post Dated Cheques	< 1 Week	Three	March	High
13	$11.1-$13	No	25%	Cash & Cheque	Post Dated Cheques	1-2 Week	Three	January	Low
14	$7-$9	No	15%	Cash & Cheque	Personal Guarantee	≥ 3 Week	Three	March	Low
15	$7-$9	Yes	15%	Cheque	Post Dated Cheques	1-2 Week	Two	February	Low
16	$11.1-$13	Yes	35%	Cheque	Post Dated Cheques	≥ 3 Week	Three	February	Low
17	$9.1-$11	Yes	15%	Cheque	Personal Guarantee	1-2 Week	Three	March	Low
18	$9.1-$11	Yes	15%	Cash & Cheque	Post Dated Cheques	≥ 3 Week	One	January	Low
19	$11.1-$13	No	15%	Cheque	Personal Guarantee	1-2 Week	One	January	High
20	$11.1-$13	No	35%	Cash	Personal Guarantee	1-2 Week	Two	January	Low
21	$9.1-$11	No	15%	Cash	Personal Guarantee	< 1 Week	Two	February	Low
22	$7-$9	Yes	35%	Cash	Personal Guarantee	1-2 Week	Three	February	Low
23	$7-$9	Yes	15%	Cash	Personal Guarantee	< 1 Week	One	January	Low
24	$11.1-$13	Yes	25%	Cash	Personal Guarantee	≥ 3 Week	One	February	Low
25	$7-$9	Yes	35%	Cash & Cheque	Post Dated Cheques	< 1 Week	Two	January	Low

26	$11.1-$13	Yes	25%	Cheque	Personal Guarantee	< 1 Week	Two	March	Low
27	$9.1-$11	No	25%	Cheque	Post Dated Cheques	< 1 Week	One	February	Low

Appendix G: Predicted Rankings of all Profiles/Decisions for Small Size Citrus Growers

Profile ID	Constant	Sale Price/40Kg	Urgent Need of Money	Advance Payment	Mode of Payment	Certainty of Payment	Delay in Payment	NO. of Fruit Picking	Time of Complete Fruit Picking	Harvesting Fruit Loss	Total Worth
20	14.039	5.579	0.200	0.143	0.237	0.271	-0.496	0.041	4.202	-0.189	**24.027**
19	14.039	5.579	0.200	-0.851	0.274	0.271	-0.496	0.285	4.202	0.189	**23.692**
13	14.039	5.579	0.200	0.708	-0.511	-0.271	-0.496	-0.327	4.202	-0.189	**22.934**
24	14.039	5.579	-0.200	0.708	0.237	0.271	0.723	0.285	0.925	-0.189	**22.378**
16	14.039	5.579	-0.200	0.143	0.274	-0.271	0.723	-0.327	0.925	-0.189	**20.696**
4	14.039	0.706	-0.200	0.143	0.237	0.271	0.723	0.041	4.202	0.189	**20.351**
1	14.039	5.579	-0.200	-0.851	-0.511	0.271	0.723	0.041	0.925	0.189	**20.205**
6	14.039	0.706	-0.200	0.708	0.237	0.271	0.723	-0.327	4.202	-0.189	**20.170**
18	14.039	0.706	-0.200	-0.851	-0.511	-0.271	0.723	0.285	4.202	-0.189	**17.933**
27	14.039	0.706	0.200	0.708	0.274	-0.271	-0.227	0.285	0.925	-0.189	**16.450**
2	14.039	0.706	0.200	0.143	-0.511	0.271	-0.227	-0.327	0.925	0.189	**15.408**
26	14.039	5.579	-0.200	0.708	0.274	0.271	-0.227	0.041	-5.128	-0.189	**15.168**
21	14.039	0.706	0.200	-0.851	0.237	0.271	-0.227	0.041	0.925	-0.189	**15.152**
5	14.039	5.579	-0.200	0.143	-0.511	0.271	-0.227	0.285	-5.128	-0.189	**14.062**
12	14.039	5.579	-0.200	-0.851	0.237	-0.271	-0.227	-0.327	-5.128	0.189	**13.040**
10	14.039	-6.285	-0.200	0.708	0.274	0.271	-0.227	-0.327	4.202	0.189	**12.644**
23	14.039	-6.285	-0.200	-0.851	0.237	0.271	-0.227	0.285	4.202	-0.189	**11.282**
25	14.039	-6.285	-0.200	0.143	-0.511	-0.271	-0.227	0.041	4.202	-0.189	**10.742**
7	14.039	0.706	-0.200	0.143	0.237	-0.271	-0.496	0.285	-5.128	0.189	**9.504**
11	14.039	0.706	-0.200	0.708	-0.511	0.271	-0.496	0.041	-5.128	-0.189	**9.241**

8	14.039	-6.285	-0.200	0.708	-0.511	0.271	-0.496	0.285	0.925	0.189	**8.925**
22	14.039	-6.285	-0.200	0.143	0.237	0.271	-0.496	-0.327	0.925	-0.189	**8.118**
17	14.039	0.706	-0.200	-0.851	0.274	0.271	-0.496	-0.327	-5.128	-0.189	**8.099**
15	14.039	-6.285	-0.200	-0.851	0.274	-0.271	-0.496	0.041	0.925	-0.189	**6.987**
9	14.039	-6.285	0.200	0.708	0.237	-0.271	0.723	0.041	-5.128	0.189	**4.453**
3	14.039	-6.285	0.200	0.143	0.274	0.271	0.723	0.285	-5.128	-0.189	**4.333**
14	14.039	-6.285	0.200	-0.851	-0.511	0.271	0.723	-0.327	-5.128	-0.189	**1.942**