

Perceptions toward transaction costs: Aspect of hiring the agricultural machinery services by rice farmers in Iraq

Ismail b Abd Latif¹, Zuhail Rdhaiwi Kadhim^{2*}

¹Associate Professor (PhD), Department of Agribusiness and Bio resources Economic, Faculty of Agriculture, University Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

²Assistance Professor (PhD), University of Baghdad, College of Agriculture, Department of Agricultural Economics, Iraq

*Corresponding author: zuhal_khadim@yahoo.com

Abstract

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The option of market or outsourcing for buying different agricultural services and access to them includes extra costs. These costs are called transaction costs, for instance search and information, negotiation and monitoring costs. With the purpose of ensue a transaction, farmers obligate seek information and observe the continuing procedure to certify a confident contract. Thus, the resulting transaction cost should be considered. This article reports investigations into the rice farmers' perceptions toward different types of transaction costs in the hiring aspect of agricultural machinery services in Iraq. The theoretical framework was based on transaction costs concept. The data of study were collected by using farm survey in rice production farms in Alnajaf province, and about 391 respondents were interviewed. A five-point Likert scale from "strongly disagree" to "strongly agree" was used to measure the level of farmers' perception towards transaction costs. A descriptive statistics and Mann-Whitney test were used to analyze the data collected. Results showed that more than half of farmers have a perception and understanding about three types of transaction costs. Around 60% of the farmers have awareness to ensure the acceptable agreement with the other party, and drawing up an appropriate contract, while around 63% of them agree that the monitoring costs are important element in the hiring decision making. Moreover, the results also indicated that some socio-economic factors such as education level, income and size of farm have a strong relationship with the rice farmers' perception towards adopt hiring option. The findings can oblige various agricultural services providers to provide appropriate services and products in agricultural machinery aspect to ensure their confidence at hiring these services.

Keywords: perception level; transaction costs concept; hiring option; agricultural machinery; rice farms

Introduction

Market economy is defined by several economists as a system wherein production and price are limited by the result of the convergence of demand and supply of buyers and sellers. Hence, the market is where buyers and sellers meet (Hasona et al., 2012). From this definition, it may seem that the convergence of vendors and buyers is without cost or

burden; however, the buyer pays, whereas the vendor is paid. Thus, buying and selling, or transactions are achieved without extra costs borne by the buyer or seller, or both. However, the transactions are not free, and their costs may increase or decrease depending on how farm owners deal with vendors.

For some, transaction costs ultimately increase, perhaps because a farmer tried to avoid purchasing appropriate machinery earlier, thereby decreasing economic activity in

the farm. Meanwhile, more developed farms may have less transaction costs as a result of constant interaction with individual producers, which also imply increased volume of economic activity (Albblauy, 2003). Transaction costs are not only limited to the effort, time and finance given by farmers (buyers). They also include the confidence of farmers to look into the future with certainty. Farmers do not normally decide in light of present situations, but from what is expected in the future (Alshaer, 2008).

According to the new concepts of institutional economics, outsourcing options like hire and buy can be represented as a transaction specifically, if the good/service transaction can be shifted through mechanically independent frontiers (Williamson, 1985; Diho, 2014), and if the contract can be organized in such a way that the final whole costs (i.e., transaction costs and production costs) can be minimized.

With the intention of ensue a transaction, ranchers obligate seek information and observe the continuing procedure to certify a confident contract (Wander and Zeller, 2004). The question is: do Iraqi rice farmers have any information and knowledge about transactions cost and do they make their decision to buy or sell in the light of the expectation of the future outline? Previous studies on rice production in Iraq have not addressed rice farmers' perception toward transaction costs. Hence, there is a need to understand how rice farmers positively or negatively view transaction costs and their types. This study aims to explore rice farmers' perceptions and awareness toward different types of transactions costs in the hiring aspect of agricultural machinery services.

Materials and Methods

Transaction costs theory and its basic assumptions

The terminology "transaction cost" is mostly considered to have been developed by Ronald Coase (1937), who applied it to develop a theoretical framework for making a prediction on when firms would undertake some economic undertakings, and the time they would be carried out the market. In 1937 the economist Coase introduced the concept of transaction costs in his famous paper "the nature of the firm", he suggested that the alternative of the market involves extra costs, for instance costs searching for and obtaining information, negotiation costs, and monitoring costs. These expenses can be eliminated or decreased by organizing these activities under the firm's management (Fig. 1).

Costs linked to search and information includes costs incurred to ascertain if the needed commodity is accessible on the market, which commodity has the lowest price, among other expenses. Costs of bargaining are the costs required to arrive at a collective agreement with the alternative party

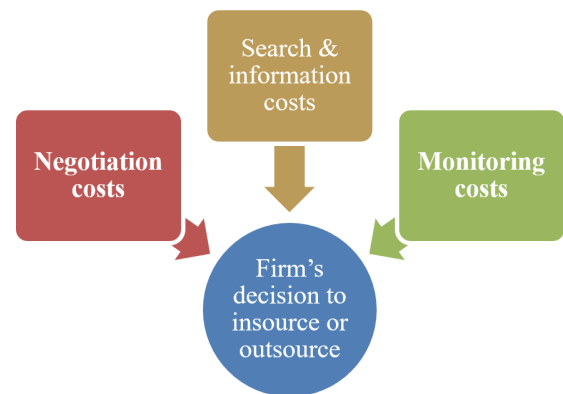


Fig. 1. Transaction costs types and firm's decision to use its sources

to the transaction, drawing a suitable contract, among other costs. Monitoring expenses are the costs of ensuring that the other side adheres to the contract terms, and undertaking the necessary action (mostly through the legal) if this happens not to be the scenario (Coase, 1937).

Possibly, transaction cost theory come to be most broadly acknowledged through Oliver Williamson's analysis of transaction cost economics, with Williamson most likely taking the greatest effect. The assumption of Williamson in 1981 was that companies follow profit maximization, and that maximizing profits entail minimization of costs. Unreservedly, transaction cost economics is an equilibrium theory that makes the assumption of rationality on the side of managers and owners.

Williamson (1981) asserts that organizations want to reduce their costs for undertaking a transaction. Under some circumstances, the cost of carrying out an operation may be lesser if the transaction occurs in a free bazaar, while in other circumstances, the cost of a transaction may be minimal if organizers organize the transaction. Two suppositions underlie the decision between bazaar and firm. They are limited rationality and opportunism. Figure 2 displays basic assumptions of transaction costs theory based on Williamson's analysis.

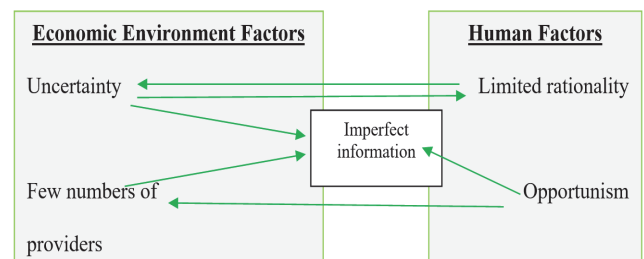


Fig. 2. Basic assumptions of transaction costs theory

Source: Diho, 2014

The concept of transaction costs, which is the origin of analysis at Williamson, includes the total costs that result from contracts relating to the transfer of ownership between individuals or between organizations. These costs result from many factors: behavioral and non-behavioral. The basic concepts of transaction cost economics based on the subsequent criteria (Williamson, 1993, 1996):

1. The transaction is the underlying element of investigation.
2. The core attributes about which transactions differ include behavioral uncertainty frequency of transaction and specifically transaction specificity.
3. Each broad manner of control is defined by various elements, producing physical differences of together costs and abilities.
4. Organizers decide on among governance structures are performing in a way towards minimizing transaction costs.
5. A unique structure of transaction rule serves all general governance forms.

Relationship of some external factors and research hypotheses

In the domain of agricultural economics studies, some empirical studies suggested that a significant relationship can be observed in different subjects between external variable like socio-economic profiles such as farmer's age, size of farm, income level, education level and etc. and outsourcing phenomenon (Vernimmen et al., 2000; Gong et al., 2006). These factors increase or decrease the farmer's perception and knowledge toward transaction costs leading to the positive behavior of hiring agricultural machinery services.

The decision of farmers to hire agricultural machinery services is made up of their perception towards types of transactions costs which are search and information, bargaining, and monitoring costs, hence the following hypotheses (Greener, 2008) were put to examine the correlation between the groups of selected socio-economic variables and three types of transaction costs which affect farmers' decision to hire agricultural machinery services:

1. Null hypothesis (H₀): there is no significant relationship between the group of socio-economic factors and farmers' perception towards the transaction costs types;
2. Alternative hypothesis (H₁): there is a significant relationship between the group of socio-economic factors and farmers' perception towards the transaction costs types.

Sample and questionnaire

A randomized sample (Bishmani, 2014) was made to test the rice farmers' perceptions toward three types of transactions costs. A total of 391 respondents from 3,898 rice farms in Alnajaf province (located in the southern central region

of Iraq) were interviewed using a standardized questionnaire during the 2015 planting season. In this Province, several small-scale farmers engaged in undertaken transactions to hire agricultural machines services, mainly for the use of tractors and soil preparation machineries, farm sprayers and combine harvesters for rice production. The ratio of farmers who hire agricultural machinery services was 96% of the selected sample (survey, 2015).

The questionnaire was divided into three sections. Section "A" asked for the socio-demographic profiles of the farmers, such as age, occupation in rice farming, education level, years of experience, and the desire to use agricultural machinery in rice planting. Section "B" asked for the economic characteristics of farms, such a cultivated area with rice, and annual farm income. Finally, section "C" was comprised of questions that measured the farmers' perception toward different types of transaction costs. This section asked about transaction cost types. A five-point Likert scale from "strongly disagree" to "strongly agree" was used to assess the agreement or disagreement level with 12 statements that reflected these types of costs. These statements were derived from related past studies (Teo and Yu, 2005), and some questions were modified to be consistent with the aspect of agricultural machinery services. The statements were classified into three major categories:

1. Statements that measure the farmer's perception toward search and information costs;
2. Statements that measure the farmer's perception toward negotiation costs;
3. Statements that measure the farmer's perception toward enforcement and monitoring costs.

Methods of analysis

The data collected was analyzed using SPSS program version 2.0. In order to achieve the objective of this study, a descriptive statistic was given as well as a nonparametric test which is two independent samples. Mann-Whitney test (Mohamed, 2015) was used because the information of the study is non-parametric data transferred to the categorical variables (coded zero or one). Mann-Whitney test is used to compare the mean values between two unrelated groups on the same selected socio-economic factors and farmers' perception towards transactions costs which affect their decision to hire.

Results and Discussion

Analyses of respondents' socio-economic factors

Descriptive examinations for example frequency distribution tables were used to refer to the results of the social and

economic factors of respondents (Table 1). As can be displayed in Table 1, most farmers are males (98%) and 2% are females. the highest age of the farmers was 90 years and the youngest age was 22 years with an average of 51 years. The education level of the respondents is categorized into four categories. 41% of the respondents never went to school, 31.5% have completed primary school, 17.5% are secondary school graduates, and 10% of the respondents completed their diploma or graduated with a bachelor degree. As shown in Table 1, the maximum family size was 26 persons per family and the minimum family size was 1 person per family with an average of 8 persons. In this study, since some of the respondents were government/private sector employees, the specialization in rice farming factor is divided into two groups: full time (80%) and part time respondents (20%). The results of the analysis indicate that the highest number of years of rice growing for the respondents was 45 years and the lowest number was 15 years with an average of 28 years. Regarding to the farm ownership structure, the percentage of respondents who own their farm was 44%, followed by contract with the government (40%), hiring (9%), and other cases (7%). The result in table 1 shows that the highest holding of the agricultural land

was 125 hectares and the less possession was 2.25 hectares with an average of 7 hectares. On the topic of cultivated area with rice, more than half of the sample's respondents are small scale respondents (60%). About 31% of the respondents have cultivated area with rice between 3-8 hectares, while only 5% of the respondents have cultivated area between 8.25-12.5 hectares. The result of the analysis also indicated that the highest holding of the agricultural land for the rice plant was 112.5 hectares and the less possession was 0.5 hectares with an average of 4.5 hectares. In terms of income distribution, as can be presented in Table 1, a very smaller percentage of the respondents (2%) have incomes equal or above \$84 000, while 3% of respondents have an income between \$44 000 and \$72 000. Finally, about 53% of the farmers have a strong desire in using the agricultural machinery of rice planting, while 47% of them have a normal desire in using these services.

Analysis of farmers' perceptions toward types of transaction costs

The farmers' perceptions about different types of transactions costs and their decision towards hiring of agricultural machinery services were measured by using Likert scale and

Table 1. Respondents' socio-economic characteristics

Characteristic	Number	Stats		Characteristic	Number	Stats	
		%	Mean			%	Mean
Gender:			-	Experience years:			28
Male	382	98		≤ 35 year	316	81	
Female	9	2		> 35 year	75	19	
Marital status:			-	Farm ownership structure:			-
Single	2	0.5		Own	170	44	
Married	388	99.2		Rent	36	9	
Widow	1	0.3		Contract with Government	155	40	
				Others	30	7	
Age:			51	Total farm area:			7
22-34 year	40	10		< 12.5 hectare	354	90.5	
35-50 year	156	40		12.5-42.25 hectare	34	8.7	
≥ 51 year	195	50		≥ 42.5 hectare	3	0.8	
Education level:			-	Cultivated area with rice:			4.5
Uneducated	160	41		< 3 hectare	232	60	
Primary	123	31.5		3-8 hectare	121	31	
Secondary	69	17.5		8.25-12.5 hectare	21	5	
Diploma or Bachelor	39	10		≥ 13 hectare	17	4	
Household number:			8	Rice annual income:			12
< 2	2	0.5		4-32 \$	371	95	
2-10	317	81		44-72 \$	12	3	
11-19	69	17.7		≥ 84 \$	8	2	
≥ 20	3	0.8					
Occupation in rice farming:			-	The desire in use of agricultural machinery:			-
Full time farmer	311	80		Strongly like	206	53	
Part time farmer	80	20		Normally like	185	47	

Source: Prepared by the researchers based on the data of the survey, 2015

descriptive analysis. The farmer was asked four sentences for each type of transactions costs about his perception and knowledge towards these types of costs which include search and information costs, bargaining costs, and monitoring costs (Table 2). Generally, the results in Table 2 show that most farmers have perception and understanding about three types of transactions costs.

With respect to the search and information costs, the results in Table 2 displayed that out of the four relevant statements with search and information costs, the second item occupies the first rank based on its mean vale (3.48) followed by first item (3.26), third item (2.92), and fourth item (2.81). Hence these statements point out that the search about the contractor party and information about the good characteristics of the hired service encourages the farmer to become percept of transaction costs. The farmers were asked about time and effort used to search for relevant services information and compare prices and other attributes among different farmer contractors.

Regarding the bargaining costs, the results in Table 2 clarified that out of the four relevant statements with bargaining costs, the fourth item occupies the first rank with value of mean 4.07 followed by third item (3.52), second item (3.45),

and first item (3.37). Hence these statements show that the negotiation process with the other party about different items of contract and unexpected changes pushes the respondent to become more knowledge about the transaction costs. The farmers were asked about time and effort related to changes and buyer service and support during the period of contract.

Relating to the monitoring costs, the results in Table 2 also explained that out of the four relevant statements with policing and enforcement or monitoring costs, the second item occupies the first rank based on its mean vale (3.90) followed by fourth item (3.70), first item (3.60), and third item (3.48). Hence these statements indicate that the followed up of carry out all terms of signed contract guides respondents to become responsive of transaction costs. The respondents were asked about time and efforts used to ensure that the terms of the contract have been met.

In short, the results in Table 2 display that the greater part of the farmers were responsive about search and information costs (average percentages of farmers' answers was 43%). Around 60% of the farmers have awareness about the negotiation costs, and about 63% of the farmers agree that the monitoring costs are important factors in hiring decision make process.

Table 2. Respondents' perception around different types of transactions costs

Types of transaction costs	*Percentage %					Mean of items	S.D
	1	2	3	4	5		
Search and information costs:							
1. I spend a lot of time looking for information about a contracting party before the machinery hiring.	2.8	14.8	37.9	42.7	1.8	3.26	0.86
2. I usually find myself pressed for time in searching for information before the machinery hiring.	3.1	10.5	27	54.5	4.9	3.48	0.89
3. I will find the information such as market or new technology before the machinery hiring.	13.6	24.3	27.6	26.1	8.4	2.92	1.2
4. I will find the appropriate brand and price of machineries before the machinery hiring.	17.4	23.3	27	25.1	7.2	2.81	1.21
Average percentages	9%	18%	30%	37%	6%	3.12	-
Bargaining costs:							
1. I spend a time and effort to do changes for services that have been sent to another party.	2.8	10	39.9	41.9	5.4	3.37	0.87
2. I spend a time and effort to arrange another time to receive the service if it is not physically delivered on time as promised.	2.3	15.6	24.5	50.4	7.2	3.45	0.95
3. I spend a time and effort to deal with any unexpectewd changes.	2.3	9.5	30.4	49.1	8.7	3.52	0.90
4. I always expect there is an arriving delay of hired service at specific time to deliver.	0.5	4.1	19.4	39.9	36.1	4.07	0.92
Average percentages	2%	10%	28%	45%	15%	3.60	-
Policing and enforcement costs:							
1. I always contacting the contractor to check whether the service ordered is in provided or not.	1	5.1	35.3	50.4	8.2	3.60	0.80
2. I spend a time to monitor the service given by machinery contractor.	0	3.8	19.2	59.8	17.2	3.90	0.76
3. I will make sure the technical support and information assistance provide for me.	3.3	11.3	35.5	33.8	16.1	3.48	1.03
4. I usually concerned about the grade of uncertainty when the machinery hiring.	0.3	28.6	7.4	28.4	35.3	3.70	1.25
Average percentages	1%	12%	24%	43%	20%	3.67	-

Figures 3, 4 and 5 illustrate the percentages of mean of rice farmers' answers in the study region around their perception and knowledge toward three types of transactions costs based on Likert scale.

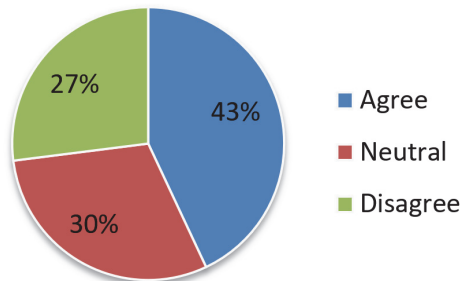


Fig. 3. Percentages of mean of respondents' perception towards search and information costs

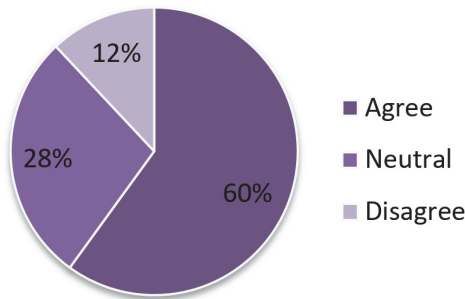


Fig. 4. Percentages of mean of respondents' perception towards bargaining costs

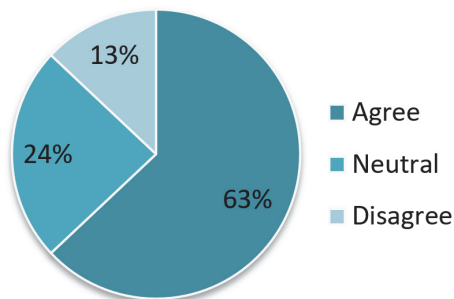


Fig. 5. Percentages of mean of respondents' perception towards monitoring costs

Statistical hypotheses testing

Table 3 summarizes the Mann-Whitney tests which were used to test whether there are significant differences between selected socio-economic factors and rice farmers' perception towards the types of transaction costs in Iraq.

The results indicate that some of the selected socio-economic factors have significant relationships with rice farmers' perception towards the types of transaction costs in Iraq and their decision to hire the agricultural machinery services. The socio-economic factors that were chosen in this study included farmer age (categorized into less than 50 years old and more than 50 years old), education level (low or high level), occupation in rice farming (full time farmer and part time farmer), experience years (categorized into less than 35 years and more than 35 years), cultivated area with rice (categorized into less than 3.75 hectares and more than 3.75 hectares), income level (less than \$8000 or more than \$8000), finally, farmer's desire in using the agricultural machinery (strongly like or normally like). The results in Table 3 display that a significant interaction was found between the education level, farm area, and income level and the perception of the negotiation and monitoring costs in Iraq. It shows that farmers who received high education (secondary and above) were more responsive of these costs than farmers who received low level of education ($p = 0.01$; 0.000). This is due to the fact that the educated farmers possess more knowledge and investigations about different types of science and follow-up the dominate conditions in the markets than low education farmers. Farmers who have a middle and higher income level (above \$8000) were more aware of these costs than farmers who have a low level of income ($p = 0.04$; 0.000) because the prices of hired machinery services make up more than 60% of total costs of rice production. Thus, agricultural machinery services providers should use their marketing skills to attract middle and high income level of farmers who can will to hire these services at the specified prices. Similarly, farmers who have farm area equal or above 3.75 hectares were more understanding towards negotiation and monitoring costs than farmers who have farm area less than 3.75 hectares ($p = 0.04$; 0.000), although the hiring option of agricultural machinery services is exactly the same for each farm area category in the study region. The reason of this result can be explained as following: farmers who have middle and large farm area tend to use more external help (outsourcing) because the fixed cost comparative to the variable cost of some agricultural machinery services is too high for the small farms area, where these costs include transaction costs. In terms of experience years, farmers who have experience in rice farming below or equal to 35 years were more aware of the monitoring costs ($U = 10365$; $p = 0.05$). Furthermore, farmers who are below or equal to 50 years old and farmers who have a normal desire in using the agricultural machinery in rice planting were more responsive of the negotiation costs than the other categories ($p = 0.009$; 0.003). Unlike, there is no significant relationship between occupation in

Table 3. Results of two independent samples Mann Whitney test

Socio-economic factors	Transactions costs types	Categories	Mean rank	Mann Whitney value (U)	Sig. level
Age	Searching costs	≤ 50	196.1	19091 16674 18927	0.98 0.009* 0.85
		> 50	195.9		
	Negotiation costs	≤ 50	209		
		> 50	184		
	Monitoring costs	≤ 50	197		
		> 50	195		
Education	Searching costs	Low education	209	11293 10406 8508	0.21 0.01* 0.000*
		High education	193		
	Negotiation costs	Low education	172		
		High education	202		
	Monitoring costs	Low education	148		
		High education	208		
Occupation in rice farming	Searching costs	Full time farmer	187	11715 12297 11161	0.38 0.85 0.11
		Part time farmer	198		
	Negotiation costs	Full time farmer	194		
		Part time farmer	196		
	Monitoring costs	Full time farmer	212		
		Part time farmer	192		
Experience	Searching costs	≤ 35	198	11350 11018 10365	0.53 0.26 0.05*
		> 35	189		
	Negotiation costs	≤ 35	199		
		> 35	185		
	Monitoring costs	≤ 35	201		
		> 35	176		
Farm size	Searching costs	< 3.75	192	15857 15111 13311	0.28 0.04* 0.000*
		≥ 3.75	204		
	Negotiation costs	< 3.75	189		
		≥ 3.75	210		
	Monitoring costs	< 3.75	182		
		≥ 3.75	224		
Income level	Searching costs	< 8000	197	18356 16771 14776	0.80 0.04* 0.000*
		≥ 8000	194		
	Negotiation costs	< 8000	188		
		≥ 8000	207		
	Monitoring costs	< 8000	179		
		≥ 8000	219		
Farmer's desire in using the agricultural machinery	Searching costs	Strongly like	188	17544 16272 18481	0.14 0.003* 0.56
		normally like	203		
	Negotiation costs	Strongly like	181		
		normally like	210		
	Monitoring costs	Strongly like	193		
		normally like	199		

* Significant

rice farming factor and rice farmers' perception towards the types of transaction costs in Iraq ($p = 0.38; 0.85; 0.11$). Full time farmers did not influence their perception towards three types of transactions costs to make hiring decision; also part time farmers did not have significant affecting towards three types of transactions costs and adopt the hiring option. This result is probably due to the lack of accuracy of related data with this factor.

Conclusions

This research aims to investigate rice farmers' perceptions toward different types of transaction costs in the aspect of agricultural machinery services hire in Iraq. According to the answers of the interviewed farmers, the results indicated that most farmers have a perception and understanding about three types of transaction costs. As a conclusion to the responses on

the perceptions toward search and information costs, the results indicated that the greater part of the farmers (43%) was responsive about search and information costs. This is to ensure that the required machine is available on the market, which has the lowest price, good quality, high brand, and so on of the desired properties. The results pointed out that around 60% of the farmers have awareness about the negotiation costs. This is to ensure the acceptable agreement with the other party to the transaction, and drawing up an appropriate contract. The results showed that about 63% of the farmers agree that the monitoring costs are important factors in hiring decision make process. This is to ensure that the other party sticks to the terms of the contract, and take appropriate action if this turns out not to be the case.

Regarding Mann-Whitney tests, the results indicated that some of the selected socio-economic factors have a significant relationship with rice farmers' perception towards the types of transactions costs in Iraq. Socio-demographic and economic variables such as education level, income level and farm area have a strong relationship with the farmers' decision to hire agricultural machinery services. Farmers who have a high level education are more perception towards transaction costs. Farmers who have a middle and higher income level were more aware of transaction costs than farmers who have a low level of income as well as farmers who have farm area equal or above 3.75 hectares were more knowledge towards transaction costs than farmers who have farm area less than 3.75 hectares.

These findings can oblige various agricultural services providers to provide fitting services and products in agricultural machinery aspect to confirm the confidence when these services are hired.

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