SELLER AND BUYER SATISFACTION AND PARTICIPATION IN TURKEY'S WHEAT EXCHANGES

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Abstract

      This study uses data from a survey of wheat sellers and buyers in five different exchanges in Turkey to gain a better understanding of seller and buyer satisfaction with the current exchange system and factors that influence exchange participants' decisions to choose exchanges over other ways of selling wheat. The descriptive and econometric results indicate that most sellers and buyers have a few problems with the current system. The major dissatisfaction with exchanges are prices and fees. The Tobit model results suggest that there is a great potential for accepting a new grading system and accepting legally enforceable warehouse receipts because sellers and buyers most concerned about warehouse receipts use the exchanges the least.

Keywords: Turkey, wheat exchanges, grading, warehouse receipt, Tobit

Introduction

Turkey has been experiencing a significant change in the marketing environment in terms of political, economic and technological aspects. The main purpose of marketing modernization is lower marketing margins. The high marketing costs seem to be caused mostly by poor efficiency in marketing functions, including loading, unloading, transportation, storage, grading, processing, information and government intervention.

Turkey has a long history of government intervention in the domestic markets for agricultural commodities. Domestic producers prices have been supported through two main mechanisms, government support purchasing and border protection. The government usually acts through a state economic enterprise, Turkish Grain Board (Toprak Mahsulleri Ofisi, TMO). TMO went from buying 1,355,463 ton in 1994 to 4,207,884 tones in 1999 which results in controlling market prices (TMO).

Commodity exchanges also play a role in grain marketing in Turkey. There are about 19 exchanges engaged in trading wheat. The most active exchanges in the grain markets are located in Edirne, Eskisehir, Konya, Polatli and Sanli Urfa. Eskisehir and Polatli trade about 200,000 tons of wheat annually (TMO).

The commodity exchanges are nonprofit organizations. They are quasi-government agencies in that they have considerable independence yet they are essentially owned by the Turkish government. They were established through a government-mandated registration fee program that allows them to operate as exchanges performing agricultural spot-trading cash auctions.

Exchanges function as a spot market where the commodity is brought to the location and, upon sale delivered to the purchaser for payment. Producers bring their wheat by truck or wagon to be auctioned at the exchange before and during the day's trading session. The wheat is hand-probed in several locations to obtain a 2-kg sample. Since the exchange does not provide grading and testing of wheat before trading, the sample is brought to the processing area of the exchange. The producer goes to the area overlooking the trading floor to wait for the wheat to be auctioned. The sample is divided with a portion retained and the remainder placed in a sample pan with a copy of the form. The sample pan is carried around by exchange assistants to the trading tables for traders to take a portion and examine it visually before starting the bidding. The buyer judges the quality of the wheat by looking, smelling and/or biting the wheat. Each buyer has a subjective quality estimate that is less accurate than what modern technology can provide. When bidding is completed, producers are contacted (in the producer area), and the offer is accepted or rejected and the documents taken to the clearing area. If the producer rejects the offer, there is no transaction and they take the wheat elsewhere to be sold. If the producer accepts, the trade is posted on the exchange board. The purchaser contacts the seller and gives directions to the warehouse location where the wheat is to be unloaded. There can be several methods of payment for this transaction, but immediate cash is the most preferred. Any disputes are handled by the exchange through an established procedure. The proposed marketing system would project a grade of sample on the screen. Such a system would provide more accurate information and save the time of distributing handfuls of wheat to buyers.

Absence of uniform grades and standards, warehouse receipts and legal procedures in the exchanges has hampered market development and resulted in materialized trade that increased marketing costs. Deficiencies in the existing legal procedures would be a major problem for organized trading. Absence of adequate warehouses and the lack of negotiable warehouse receipts and grades and standards may have limited commodity trading.

The primary goal of this study was to provide wheat industry participants, the World Bank and the Turkish government with insight regarding the problems of the current exchange system. With this information, exchanges and Turkish government agencies may modify the exchanges to improve market efficiency.

To achieve this goal, the survey and the Tobit analysis concentrated on the two objectives. The first was to determine sellers and buyers satisfaction with the current exchanges trading system. The second was to determine the key factors that influence sellers and buyers decisions to sell and buy wheat through the exchanges.

Survey Procedures

A baseline survey conducted in late 1998 elicited buyers and sellers' opinions about the current system of wheat exchanges. This survey was conducted as a part of a marketing development project funded by the World Bank and the Turkish Ministry of Trade and Industry. The survey was not designed on a random sampling basis. Thus the characteristics of this sample may not be representative of all farmers and traders in these areas.

The survey was conducted in five commodity exchanges: Konya, Eskisehir, Edirne, Polatli and Sanli Urfa. Via personal interview, each of 256 buyers and sellers was asked questions about economic, institutional and personal characteristics.

In this analysis, the surveys were divided into "buyers" and the "sellers" across the exchanges. To identify statistically significant differences in buyers and sellers' response patterns across the exchanges, a chi-square "contingency" test was used. The chi-square test of independence is a test of statistical significance used to assess the likelihood that an observed relationship differs significantly from that which could have occurred by chance.

The Tobit Model

To perform their duties in marketing, wheat buyers and sellers have to make numerous decisions. Some of these decisions relate to the adoption of new marketing alternatives. One of the appropriate models to analyze this type of decision problem is the qualitative response model.

Just and Zilberman suggest that an appropriate technology adoption model should incorporate both the discrete decision of whether or not to adopt (out of exchange market use) and the continuous decision of how much of total resources (measured here as percentage of total amount of wheat sold) to allocate to the adoption activity. Thus, the dependent variable (Y) is the percentage of wheat sold out of the exchanges that can not take on values below zero. Many farmers in the sample did not sell their wheat outside the exchanges; thus, Y has a truncated normal distribution and a Tobit Maximum Likelihood estimation is required (Tobin, 1958; Amemiya, 1973; McDonald and Moffitt, 1980). The dependent variable in this sample also has an upper limit of 100.

Tobit coefficients are estimated by maximum likelihood. Unlike the OLS case, the value of a Tobit coefficient does not represent the expected change in the dependent variable given a one-unit change in an explanatory variable. The Tobit model measures both seller and buyer's probability of adoption to off-exchange market (the decision to adopt) and the intensity of use (the effort to continue using the off-exchange market once adopted). McDonald and Moffitt (1980) explain the Tobit effects can be decomposed into a) changes in the probability of being above the limit, and b) changes in the value of the dependent variable if it is already above the limit. Given such a decomposition, we can use the means of the explanatory variables to calculate the elasticity of adoption and elasticity of intensity once adoption occurs.

Adopting the notation of McDonald and Moffitt, the model is:

$$Y_i = X_i\beta + \varepsilon_i \quad \text{if } X_i\beta + \varepsilon_i > 0$$

$$= 0 \qquad \text{if } X_i\beta + \varepsilon_i \le 0$$

$$i = 1, ..., N \qquad\qquad (1)$$

where

X = a vector of explanatory variables,

β = a vector of unknown coefficients (Tobit coefficients),

ε = a vector of independent and identically distributed normal random variables
    assumed to have zero mean and constant variance, and

N = number of observations.

The expected value of Y in the model is given as:

$$E(Y) = X\beta\, F(z) + \sigma f(z),$$

where $z = X\beta / \sigma$, $f(z)$ is the unit normal density, and $F(z)$ is cumulative normal distribution function.

The expected probability of being above a certain value once adoption occurs is given as:

$$E(Y^*) = X\beta + f(z)/F(z)$$

The relationship between the expected value of all observations $E(Y)$, the expected value conditional on being the limit $E(Y^*)$, and the probability of being above the limit $F(z)$ is represented as:

$$E(Y) = F(z) E(Y^*).$$

Empirical Model Specification

To find why sellers (buyers) tend to sell (buy) wheat in the off-exchange market, several factors were hypothesized to influence their decisions. The models for sellers and buyers were respectively specified in equation (2) and (3) as follows:

$$
\begin{aligned}
OUTEXCHUSE = \beta_0 &+ \beta_1 \ ESKISEHIR \ + \beta_2 \ KONYA + \beta_3 \ EDIRNE + \beta_4 \ URFA \\
&+ \beta_5 \ TRANSPORT \ + \beta_6 \ CREDITUSE \ + \beta_7 STORAGE \\
&+ \beta_8 PRICEDIFF \ + \beta_9 \ WARECEIPT \ + \beta_{10} \ QUALITYDIFF \qquad (2) \\
&+ \beta_{11} \ GRADING \ + \beta_{12} \ LEGAL \ + \beta_{13} \ EDUCATION \\
&+ \beta_{14} \ AGE \ + \varepsilon
\end{aligned}
$$

$$
\begin{aligned}
OUTEXCHUSE = \beta_0 &+ \beta_1 \ ESKISEHIR + \beta_2 \ KONYA + \beta_3 \ EDIRNE + \beta_4 \ URFA \\
&+ \beta_5 \ TRANSPORT \ + \beta_6 \ CREDITUSE \ + \beta_7 \ PRICEDIFF \\
&+ \beta_8 \ WARECEIPT \ + \beta_9 GRADING \ + \beta_{10} \ LEGAL \qquad (3) \\
&+ \beta_{11} EDUCATION + \beta_{12} \ AGE + \varepsilon
\end{aligned}
$$

The dependent variable, OUTEXCHUSE (percentage of wheat sold bought outside the exchanges), was obtained as the response to the question, "What percentage of your purchase/sales are completed at exchanges?" The percentage amount of wheat sold and bought outside the exchanges were calculated by subtracting the wheat sold in

exchanges from 100. Polatli exchange is eliminated from the exchange group for dummy variable estimation purposes.

Explanatory variables expected to influence buyers and sellers decisions about marketing alternatives are economic, social and institutional factors and these are defined as follows:

ESKISEHIR   : 1 if individual is in the Eskisehir exchange; 0 otherwise;

KONYA   : 1 if individual is in the Konya exchange; 0 otherwise;

EDIRNE   : 1 if individual is in the Edirne exchange; 0 otherwise;

URFA   : 1 if individual is in the Urfa exchange; 0 otherwise;

TRANSPORT   : Transportation to the exchange limits my ability to use it

                 (1 = Strongly disagree, 2 = Disagree, 3 = Uncertain,

                 4 = Agree, 5 = Strongly agree);

CREDIT   : Credit use (1 = yes, 0 = otherwise);

STORAGE   : Use of storage (1 = yes, 0 = otherwise);

GRADING   : An accurate grading system would encourage me to use

                 exchanges (1 = Strongly disagree, 2 = Disagree,

                 3 = Uncertain, 4 = Agree, 5 = Strongly agree);

PRICEDIFF   : I receive (pay) higher (lower) price by selling (buying)

                  outside of exchanges, sellers (buyers) (1 = Strongly

                 disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree,

                 5 = Strongly agree);

QUALITYDIFF   : My wheat is higher quality than wheat traded in the

                 exchanges (1 = Strongly disagree, 2 = Disagree,

3 = Uncertain, 4 = Agree, 5 = Strongly agree);

WARECEIPT : A legally enforceable warehouse receipt system

encourage me to use exchanges (1 = Strongly disagree,

2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly

agree);

LEGAL : Adequacy of legal arrangements in exchanges

(1 = Adequate. 2 = No idea, and 3 = Inadequate);

EDUCATION : To what degree educational level of respondents' affects

exchange use (1 = Illiterate, 2 = Read and write,

3 = Primary school, 4 = Secondary school, 5 = High

school, 6 = University);

AGE : Age of respondents

1 if ages between 1-30

2 if ages between 31-40

3 if ages between 41-50

4 if ages between 51-60

5 if ages between 61-70

Producers growing high-quality wheat and having the ability to deliver to a choice of markets will favor the flourmill, if the base price is relatively close to TMO's intervention price. This is because of potentially higher cash payment if the wheat meets the mill's quality requirements. Farmers who produce higher quality wheat are expected to be less likely to participate outside the exchanges than producers who sell their wheat to TMO.

The difference between exchange and outside prices can alter farmers' decision on out of exchange market use. If an outside price, such as TMO intervention price is higher (lower) than the price established in exchanges, there is a tendency for farmers to increase (reduce) the amount of wheat they sold outside the exchanges.

Since young buyers and sellers tend to be more flexible in their decisions, and adapt new marketing alternatives more readily, it is expected that they will be less willing to use out of the exchange markets than their older counterparts.

The higher the education level of a person the greater the probability of the use of exchanges rather than outside market. A person who has higher education understands the benefits of using exchanges and creating opportunities by exercising trading practices.

The availability and condition of a transportation system has positive or negative impacts on farmers and buyers incentives to use outside of exchanges. Improved transportation may increase buyers and sellers' exchange use, and reduce their off-exchange participations.

Existence of a legal system is necessary for execution of contracts between parties and to safeguard buyers and sellers. A well-defined legal system may encourage people to switch from outside markets to exchanges in trading of commodities.

Because of limited financial resources of farmers, the need for credit becomes very important for farmers' use of exchanges. Farmers mostly sell their commodity to TMO or middlemen immediately after harvest because of immediate cash needed to cover expenses for wheat production and individual expenses.

On farm storage facilities allow producers greater flexibility in marketing. After harvest, producers may use on-farm storage facilities to participate in exchanges rather

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than selling outside the exchanges. Short-term storage also can be used to capture an expected seasonal price increase that is greater than storage cost.

Availability of a grading system will provide greater information and help producers and buyers communicate. Sellers and buyers who are concerned about the nonexistence of a uniform grading system are expected to reduce their participation in the exchanges.

Being able to use warehouse receipts in this manner improves efficiency in marketing and financing commodities. Non-existence of warehouse receipt system may cause seller and buyer who are concerned about the lack of a warehouse receipts system to participate less in the exchange and more outside the exchanges.

Empirical Results

Descriptive Results

Tables 1 and 2 report the chi-square test results for each selected question by exchange category. Chi-square tests rejected the null hypothesis that there are no differences across locations of the sellers and buyers' responses. All of the questions resulted in different patterns of agreement across the exchanges. The null hypothesis that there are no differences among responses across the exchanges is rejected for sellers, but not for buyers (Table 3). The results, reported in Table 4 indicate that the responses across the exchanges about government intervention are not different for buyers but different for sellers. While the differences across locations are statistically significant, there does not seem to be any clear pattern.

Currently, exchange users are satisfied with many aspects of the exchanges. For example, as reported in Table 6, 89% of buyers and 69% of sellers agreed that buyers and

sellers are treated fairly at the exchanges. Other aspects of the exchanges with which users have few problems are storage costs, availability of parking facilities, weight of their commodities, and storage space availability (Table 6).

The major source of dissatisfaction is price. Most sellers do not think that prices reflect the true value of their product. For example, as reported in Table 5, 68% of sellers agreed that the prices they receive from outside markets are higher than exchange prices. Most buyers also agreed that they find better prices when they buy directly from farmers. The finding of sellers thinking prices are too low and buyers thinking prices are too high may be more psychological than real. If better prices were available elsewhere, why were they buying and/or selling at the exchange that day? Many users are also concerned that large buyers or large sellers have too much influence on exchange price determination. Transportation costs and distance to the exchanges are also concern of many sellers.

Sellers currently sell 66% of their wheat through the exchanges. Buyers buy 79% of their wheat through the exchanges. Many aspects related to exchanges and outside markets influenced choices of affiliating with exchanges versus TMO. As reported in Figure 1, currently, 52.2% of buyers and 57.9% of sellers prefer TMO to exchanges in their marketing activities. Figures 2 and 3 show that 66.2% of sellers and a large number of buyers, 23.3% indicated that price difference is most important in affecting the degree of satisfaction with exchange use versus TMO.

The answers to several questions in Table 5 and 6 suggest the likely acceptance of both grading and warehouse receipts. The first requirement for success is that present institutions must be able to preserve property rights. Figure 4 shows that the most frequent response was that legal procedures were sufficient. Sellers have little fear of not

being paid. Table 6 reports that about half of buyers are concerned about not receiving the product they purchase. While there is still room for improvement, the legal institutions necessary to preserve property rights do seem to be present.

Tables 5 and 6 report that a successful warehouse receipt system may encourage sellers and buyers to increase exchange use. The vast majority of buyers and sellers agreed that a warehouse receipt system and uniform grading would encourage them to use the exchanges. Thus buyers and sellers appear to desire a fair and accurate grading system and legally enforceable warehouse receipts.

Figure 5 reports that most of the sellers, 81.9%, favor government control of exchanges. As seen in Figure 6 and the majority of sellers indicated that the state should control exchanges in terms of price.

Figure 7 reports that trading activities for wheat mostly occur immediately after harvest. As seen in Figure 8, the need for money and supply and demand conditions are main reasons to purchase wheat after harvest for sellers and buyers, respectively.

Tobit Estimation Results

Columns 1 of Tables 7 and 8 present the estimated coefficients from equations (2) and (3) to explain sellers and buyers' preference of out of exchange market. Based on statistically significant coefficients, the results indicate that economic, institutional, and personal-characteristic variables are important in explaining the sellers and buyers' choice of out of exchange market and exchanges as a marketing channel.

In terms of the exchange differences, sellers at Eskisehir, Konya and Urfa are less likely to adapt and use off-exchange market than sellers in Polatli. Sellers at Edirne are more likely to use off-exchange market than those in Polatli. The results reported in

Table 8 indicate that the buyers in the exchanges at Eskisehir, Edirne and Konya are less likely to use off-exchange market than those in Polatli while buyers at Konya use more out of exchange market.

Variables credit use (CREDITUSE), desirability of warehouse receipt system (WARECEIPT), quality differences between wheat sold in exchanges and off-exchange markets (QUALITYDIFF), transportation (TRANSPORT), and education levels (EDUCATION) have significant effects on sellers' probability of adoption and intensity of off-exchange use. Although price difference (PRICEDIFF) was hypothesized to affect sellers' affiliation with the exchanges, the results showed that price difference is not a significant factor.

The results of the Tobit model may be used to identify the effects of changes in an explanatory variable on the adoption and intensity of off-exchange use. McDonald and Moffitt (1980) present a Tobit decomposition approach to separate two effects. The two effects are: changes due to likelihood of new adoption, and expected changes in intensity of adoption by those who have already adopted. In this study the total adoption, 0.686, is decomposed to give probability of 0.337 and 0.349 for new adoption and intensity of outside of exchange use, respectively. The decomposition of the effects is important to identify the influence of adoption determinants on the sequential stages of adoption, i.e., to adopt or not to adopt and then to continue using the outside of exchange markets.

Table 7 also presents the elasticity of decomposition for changes in the explanatory variables. Total elasticity of a change in the level of any of the variables consists of two effects: elasticity of expected use intensity (E_1) and elasticity of adoption probability (E_2).

Adding the two effects will give us the total elasticity. The computed elasticities indicate that marginal changes in the independent variables listed increase the probability of adoption more than intensity of exchanges use (E_1). Elasticites of adoption probabilities (E_2) are relatively larger than E_1. Overall the elasticity estimates in Table 7 reflect inelastic ($E < 1$) response to changes in the adoption variables.

Education has the highest impact on off-exchange use intensity and probability of adoption with total elasticity values of – 0.300. This value is divided into – 0.128 and - 0.172 for elasticity of intensity and probability of adoption, respectively. A negative sign indicates that a 10 percent change in education level of sellers are expected to result in about a 3 percent decrease in off-exchange use intensity and adoption. Since the percentage of wheat sold in the off-exchange markets was derived from the percentage of wheat sold in the exchanges, this also indicates an increase in adoption and intensity of exchange use. The implications of these estimates are useful to evaluate proposed policy changes affecting economic and institutional variables used in this study. For instance, as shown in Figure 9, most sellers and buyers attended only primary schools. If the education level of buyers and sellers can be improved, they might be more willing to use exchanges. There could also be a need to target sales programs to award people with little education.

A legally enforceable warehouse receipt system also significantly affects off-exchange market use intensity and probability of adoption. The positive signs for elasticities of adoption and intensity indicate that those most concerned about warehouse receipts use the exchanges the least. Other variables, transportation, credit use, and

quality difference between the wheat sold in exchanges and off-exchanges are also important.

For buyers, as shown in Table 8, the variable price difference between the wheat sold in exchanges and that in off-exchange market (PRICEDIFF), transportation (TRANSPORT), and age of respondents (AGE) affect buyers' decision on participating in the off-exchange markets. Elasticites of adoption probabilities (E_2) are relatively smaller than elasticity of expected use intensity E_1. Although the variable, price difference is not a significant factor affecting sellers' participation in off-exchange market, it has an impact on buyers' incentives to use off-exchange market. It has a total elasticity of 0.711. This elasticity can be divided into 0.429 for elasticity of intensity of use and 0.282 for elasticity of probability of adoption, respectively. The total elasticity of 0.711 indicates that a 10 percent increase in the price difference between the exchanges and off-exchange market in favor of the off-exchange market is expected to result in a 7.11 percent increase in use of off-exchange market and decrease the exchange uses.

Transportation is an important factor affecting buyers' decision to use off-exchange market with a total elasticity of 0.366. A positive coefficient indicates that transportation to the exchange limits their ability to use exchanges and increase the percentage of wheat they sold in the off-exchange market. Age also affects buyers off-exchange use. A negative total elasticity of –0.204 indicates that a 10 percent increase in a respondent' age is expected to result in a 2 percent decrease in buyers' off-exchange use.

Summary and Conclusions

This study sought to gain a better understanding of seller and buyer satisfaction with the current exchange system and factors that influence exchange participants' decisions to choose exchanges or off-exchange market such as TMO. The data are from a survey of wheat sellers and buyers in five different exchanges in Turkey.

The major dissatisfaction with exchanges is prices. Both sellers and buyers indicate that they find better prices by exercising trading activities outside of exchanges. Most sellers and buyers indicated that a uniform grading and legally enforceable warehouse receipt system would encourage them to use exchanges. Unlike buyers, mostly sellers are not opposed to government intervention. Results also indicate that immediate cash needs of sellers is the main reason for them to sell wheat without waiting for a better price that they might find by storing their wheat.

Tobit model results also confirm the results of descriptive statistics indicating that price difference, transportation, legally enforceable warehouse receipt system, educational level, and ability to use credit affect buyers and sellers' affiliation with the exchanges versus off-exchange markets.

The results of both descriptive statistics and the Tobit model suggest that there is a great potential for accepting a new grading system and accepting legally enforceable warehouse receipts. Unlike many developing countries, Turkey appears to have a sufficient legal system and trust in exchanges necessary to implement such changes.

Before spending a significant amount of money on marketing development projects for grains, the information in this study may allow producers, processors, traders, and the Turkish government to have more knowledge about the existing problems in the

current exchange system and factors that impact participants' decision to choose

exchanges or off-exchange market as a marketing channel.

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Appendixes
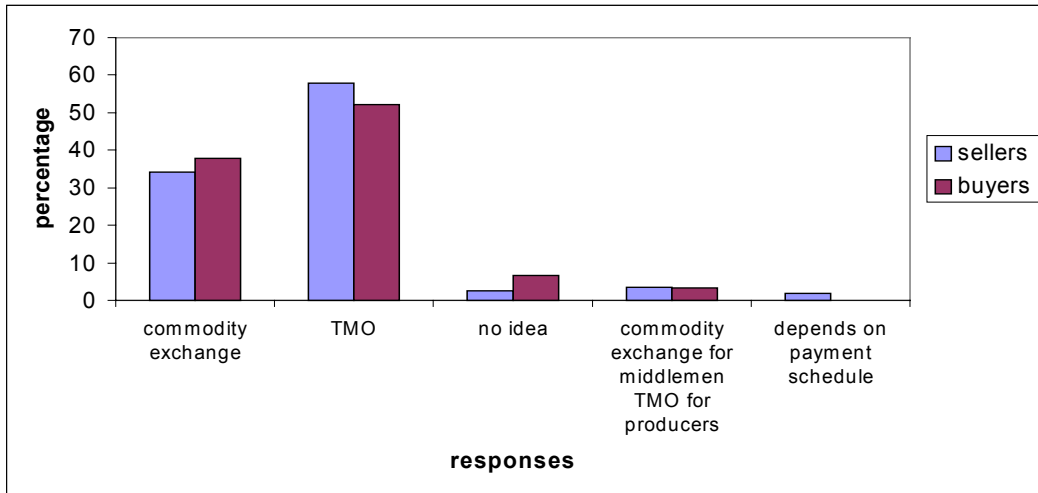
Figure 1. Buyers and sellers' preferences of the exchanges versus TMO
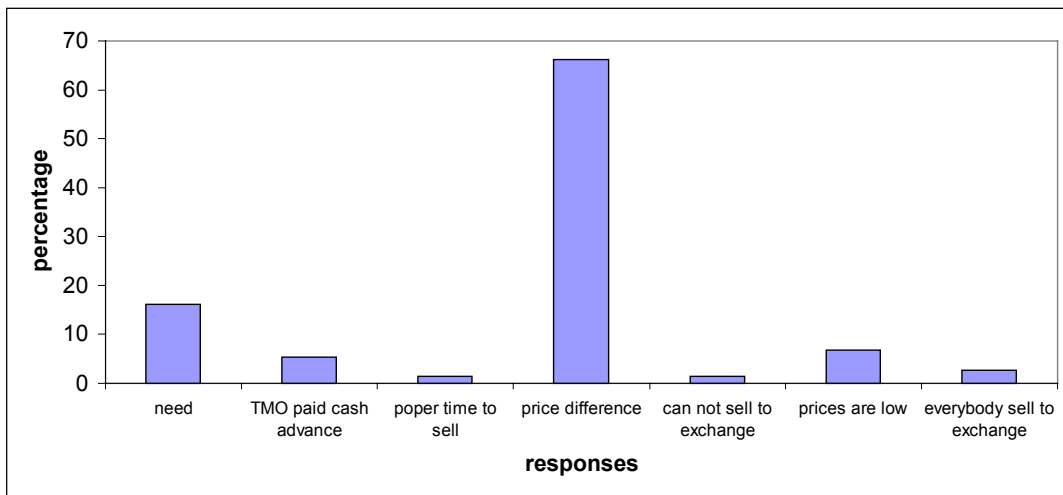
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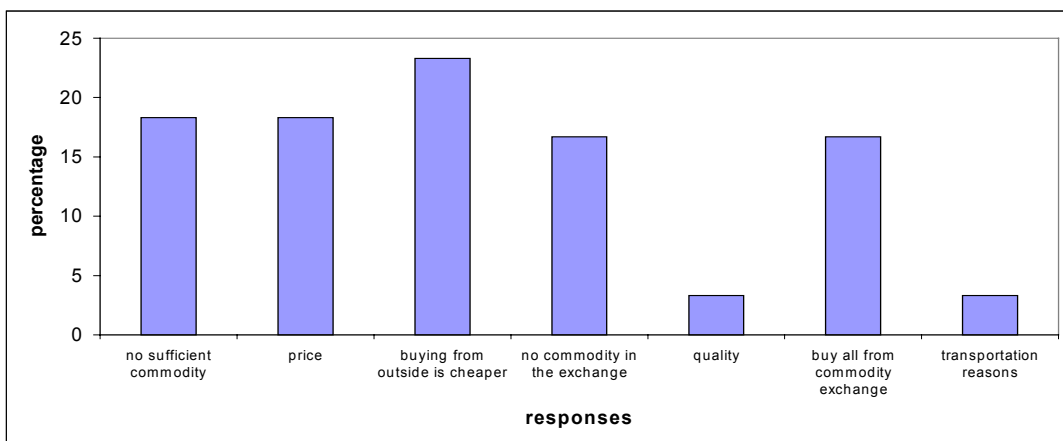
Figure 3. Buyers' responses about why they do not buy from the exchanges
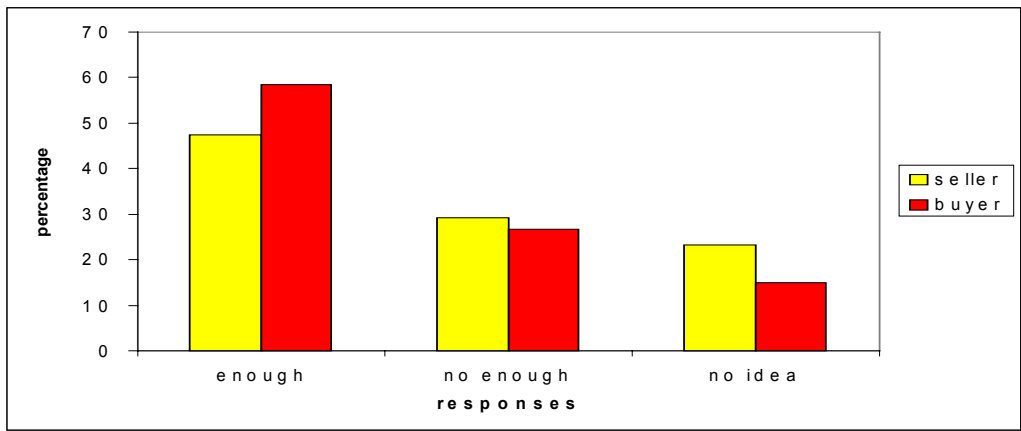
Figure 4. Buyers and sellers responses about the sufficiency of the legal procedures in the exchanges
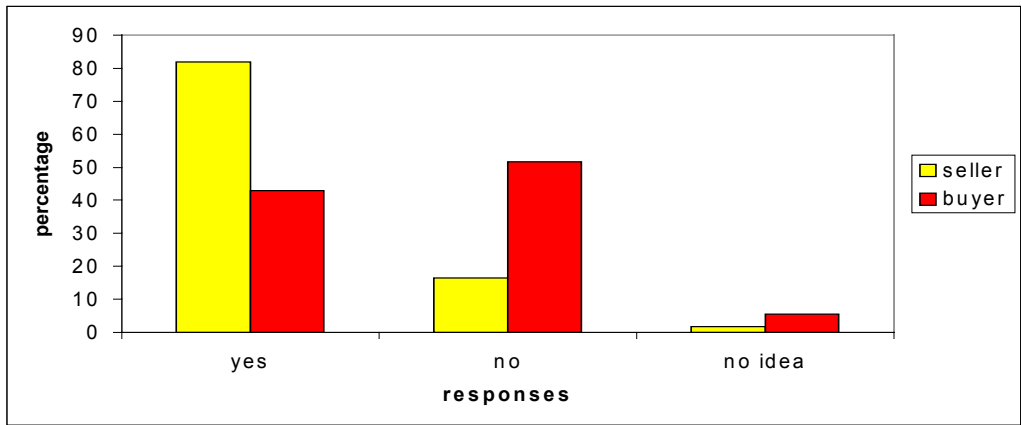
Figure 5. Buyers and sellers' responses about the government control in the exchanges
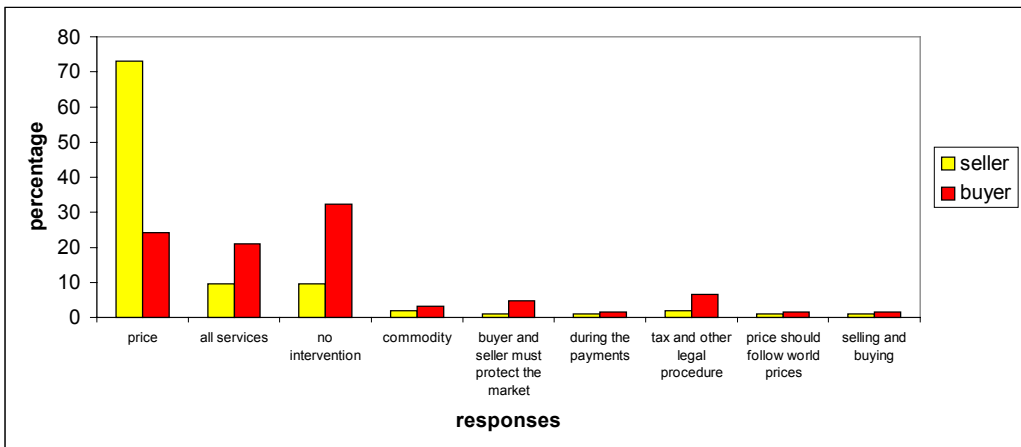
Figure 6. Buyers and sellers' responses about in which areas should the government have control in the exchanges
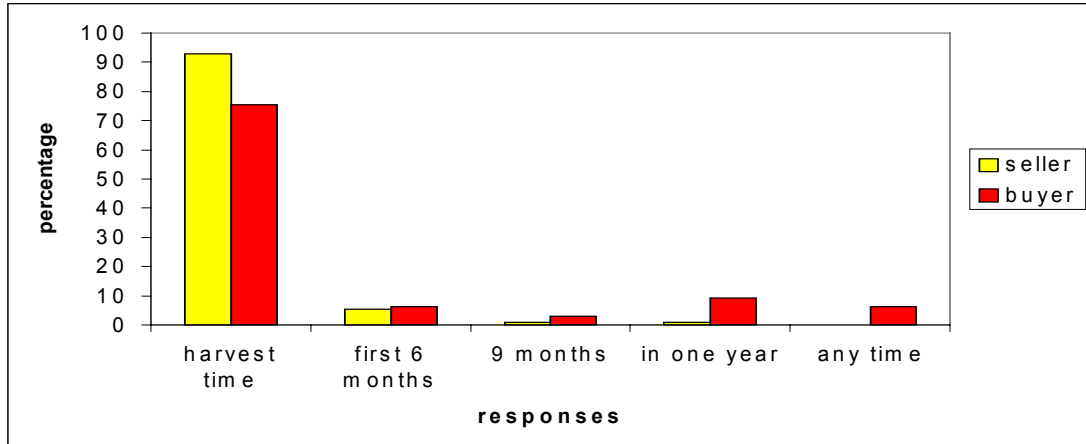
Figure 7. Buyers and sellers' purchasing time of wheat
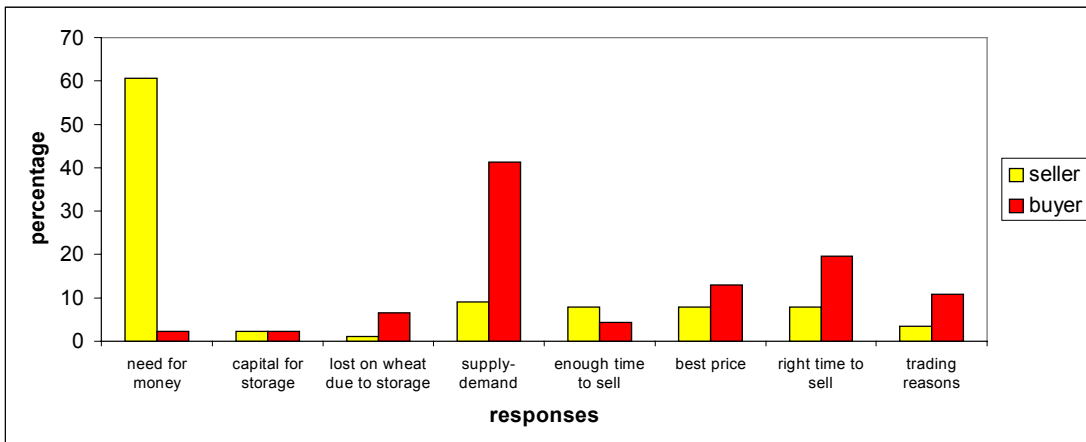
Figure 8. Buyers and sellers' reasons for choosing the purchasing time of wheat
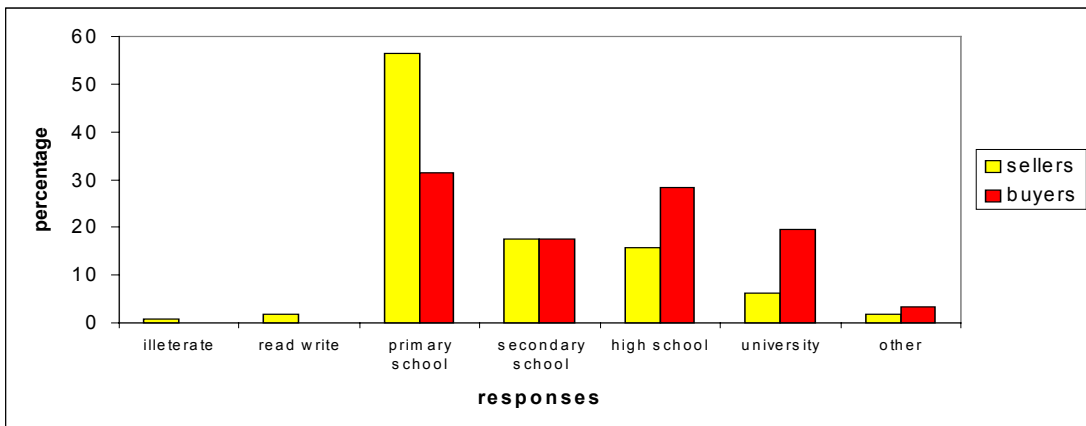
Figure 9. Education levels of the buyers and sellers in the exchanges

Table 1. Sellers' Response Distribution For the Wheat Exchanges at Eskisehir, Polatli, Konya, Edirne and Sanli Urfa

| Questions	Exchanges	Responses					Chi-square
		SD	D	U	A	SA	
My wheat is higher quality than wheat traded at the exchange	Eskisehir	2	3	5	10	15	61.40**
	Polatli	0	3	0	7	1	
	Konya	3	7	4	12	13	
	Edirne	9	0	0	0	18	
	Sanli Urfa	0	0	4	5	1	
Transportation to the exchange limits my ability to use it	Eskisehir	7	14	0	8	5	42.07**
	Polatli	0	1	0	5	4	
	Konya	7	12	0	10	9	
	Edirne	12	0	0	14	2	
	Sanli Urfa	1	9	0	1	1	
Buyers and sellers at the exchange are treated fairly	Eskisehir	3	3	3	16	10	49.70**
	Polatli	0	2	0	2	4	
	Konya	8	6	2	13	10	
	Edirne	14	0	0	2	12	
	Sanli Urfa	0	1	0	12	2	
I receive a higher price by selling wheat away from exchanges	Eskisehir	5	5	0	13	12	51.80**
	Polatli	1	5	1	2	2	
	Konya	7	3	3	9	15	
	Edirne	9	0	2	1	15	
	Sanli Urfa	0	7	0	2	1	
A warehouse receipt system, legally enforceable would encourage me to use the exchange	Eskisehir	6	1	3	14	11	36.92**
	Polatli	1	0	0	3	5	
	Konya	4	4	4	9	18	
	Edirne	0	0	1	16	11	
	Sanli Urfa	0	2	5	6	0	
An accurate and fair wheat grading system would encourage me to use the exchanges	Eskisehir	0	0	1	17	17	51.18**
	Polatli	1	0	0	9	1	
	Konya	0	1	1	8	29	
	Edirne	0	0	0	7	21	
	Sanli Urfa	0	0	2	12	1	

Note: Asterisk (*) indicates significant difference at the .001 level. Response categories are defined as follows: SA = strongly agree, A = agree, U = uncertain, D = disagree, SD = strongly disagree.

Table 2. Buyers' Response Distribution For the Wheat Exchanges at Eskisehir, Polatli, Konya, Edirne, and Sanli Urfa

Questions	Exchanges	Responses					Chi-square
		SD	D	U	A	SA	
Transportation to the exchange limits my ability to use it	Eskisehir	7	2	0	3	2	29.83**
	Polatli	0	2	0	2	1	
	Konya	24	13	1	8	5	
	Edirne	8	0	0	0	0	
	Sanli Urfa	2	10	0	1	1	
Buyers and sellers at the exchange are treated fairly	Eskisehir	0	1	1	6	6	26.07*
	Polatli	0	1	0	3	1	
	Konya	1	6	0	17	29	
	Edirne	0	0	0	1	7	
	Sanli Urfa	0	1	0	13	2	
I pay a lower price by buying directly from farmers	Eskisehir	2	4	1	3	5	37.78**
	Polatli	1	7	0	2	0	
	Konya	14	7	4	13	13	
	Edirne	1	0	0	4	2	
	Sanli Urfa	0	11	0	2	2	
A warehouse receipt system, legally enforceable would encourage me to use the exchange	Eskisehir	3	2	2	4	4	33.43**
	Polatli	0	0	0	4	1	
	Konya	8	1	6	16	17	
	Edirne	0	0	0	1	7	
	Sanli Urfa	0	1	5	6	0	
An accurate and fair wheat grading system would encourage me to use the exchanges	Eskisehir	0	0	0	7	8	43.90**
	Polatli	1	0	0	9	0	
	Konya	1	3	1	14	33	
	Edirne	0	0	0	1	7	
	Sanli Urfa	0	0	2	13	1	

Note: Asterisks (*) and (**) indicate significant difference at the .05 and .001 levels, respectively. Response categories are defined as follows: SA = strongly agree, A = agree, U = uncertain, D = disagree, SD = strongly disagree.

Table 3. Buyers and Sellers' Response Distribution about the adequacy of Legal Procedures in the Wheat Exchanges at Eskisehir, Polatli, Konya, Edirne and Sanli Urfa

Group	Exchanges	Responses			Chi-square
		Adequate	Inadequate	No idea	
SELLERS	Eskisehir	11	11	12	
	Polatli	9	2	0	
	Konya	18	10	9	13.95*
	Edirne	16	9	3	
	Sanli Urfa	8	2	5	
BUYERS	Eskisehir	7	5	3	
	Polatli	10	0	0	
	Konya	31	15	7	10.98
	Edirne	6	2	0	
	Sanli Urfa	10	3	4	

Notes: Asterisk (*) indicates significant difference at the 0.1 level. The null hypothesis of responses are not different across the exchanges is rejected for sellers but not for buyers.

Table 4. Buyers and Sellers' Response Distribution for the Question of Should Government Control the Wheat Exchanges at Eskisehir, Polatli, Konya, Edirne and Sanli Urfa

Group	Exchanges	Responses			Chi-square
		Yes	No	No idea	
SELLERS	Eskisehir	28	5	0	
	Polatli	1	0	0	
	Konya	35	4	0	16.67*
	Edirne	24	3	1	
	Sanli Urfa	7	7	1	
BUYERS	Eskisehir	5	9	1	
	Polatli	0	4	0	
	Konya	24	26	3	5.12
	Edirne	4	4	0	
	Sanli Urfa	8	8	1	

Notes: Asterisk (*) indicates significant difference at the 0.05 level. The null hypothesis of responses are not different across the exchanges is rejected for sellers, but not for buyers.

Table 5. Responses of Buyer and Seller about Effects of Price on Exchange Use

		Responses				
Questions	Group	SD	D	U	A	SA
I use the price reported at the exchange to negotiate prices in off-exchange transactions	S	9	23	2	35	48
	B	12	8	2	27	44
Exchange prices are lower than those I receive	S	15	15	7	19	61
	B	24	29	6	19	15
Wheat price information is difficult to interpret because grading is not done	S	3	19	17	35	44
	B	8	14	2	37	30
Wheat price information from the exchange is accurately reported	S	8	9	7	43	50
	B	1	2	3	37	48
Wheat price information form at the exchange is available when I need it	S	4	7	15	45	47
	B	3	1	2	38	46
Prices at exchange are determined competitively	S	9	14	3	51	41
	B	2	6	0	35	50
Prices at exchange would be easier to evaluate if product were graded	S	0	17	0	31	70
	B	3	5	3	37	45
Prices at the exchange accurately reflect the true value of the products bought and sold	S	42	33	2	24	17
	B	5	12	4	42	29
Off-exchange transaction price information is available when I need it	S	13	27	2	29	46
	B	3	4	1	35	50
Large seller at the exchange can set the price they receive	S	27	10	3	26	51
	B	32	18	2	21	18
The large buyer at the exchange set the price paid	S	8	4	3	30	66
	B	6	2	3	16	14
I receive a higher price by selling wheat away from the exchange	S	22	16	6	24	43
I pay a lower price by buying directly from farmers	B	17	23	5	23	22

Notes: S = sellers and B = buyers. Response categories are defined as follows:
SA = strongly agree, A =agree, U = uncertain, D = disagree, SD = strongly disagree

Table 6. Responses of Buyer and Seller about Exchange Facilities and Procedures

Questions	Group	SD	D	U	A	SA
Transportation to the exchange limits my ability to use it	S	27	34	0	35	18
	B	41	25	1	13	8
The exchange is too far away from my farm/processing plant to be useful	S	13	22	5	37	37
	B	34	29	4	13	7
Storage cost at exchange are fair	S	7	9	25	35	41
	B	2	5	4	47	34
A warehouse receipt system that is legally enforceable would encourage me to use the exchange	S	9	7	13	47	40
	B	11	4	13	28	28
If I sell at the exchange I am concerned that I will not be paid for my product	S	56	22	3	13	16
If I buy at the exchange I am concerned that I will not receive my product	B	23	20	3	27	18
Fees charged at the exchange are too high given the service received	S	25	32	7	31	16
	B	23	35	8	16	11
Parking facilities are not sufficient at the exchange	S	19	21	1	20	55
	B	19	19	1	20	30
Buyers and sellers at the exchange are treated fairly	S	25	10	5	45	33
	B	1	8	1	38	44
Products are accurately weighted at the exchange	S	1	4	3	47	64
	B	1	2	0	29	62
An accurate and fair wheat grading system would encourage me to use the exchange	S	1	0	4	46	68
	B	1	3	3	37	49
My wheat is generally higher quality than wheat traded at the exchange	S	14	10	12	28	48
	B	2	10	10	20	7
Storage space is generally easily obtained at the exchange	S	10	7	21	20	9
	B	10	6	10	28	21

Notes: S = sellers and B = buyers. Response categories are defined as follows:
SA = strongly agree, A =agree, U = uncertain, D = disagree, SD = strongly disagree

Table 7. Estimated Tobit Model, Adoption and Intensity of Seller's Out of the Exchange Market Use in Turkey

Independent Variable	Estimate	Asymptotic t-value	Mean	Elasticities	
				E_1^a	E_2^b
Constant	1.604	1.476	1.000		
Eskisehir	-0.417*	-2.812	0.288	-0.014	-0.019
Konya	-0.122	-1.074	0.312	-0.004	-0.006
Edirne	0.356	-0.333	0.224	0.009	0.012
Urfa	-0.100	0.948	0.056	-0.001	-0.001
Transport	-0.277*	-2.224	2.381	-0.076	-0.102
Credituse	0.603*	2.768	1.445	0.100	0.134
Storage	0.130	0.612	1.654	0.025	0.033
Pricediff	-0.112	-0.984	2.290	-0.029	-0.039
Wareceipt	0.346*	2.289	2.636	0.105	0.141
Qualitydiff	0.251*	1.918	2.454	0.071	0.095
Grading	-0.061	-0.237	2.954	-0.021	-0.028
Legal	0.139	0.686	0.481	0.008	0.010
Education	-0.308*	-2.812	3.627	-0.128	-0.172
Age	-0.133	-1.363	2.681	-0.041	-0.055

Notes: Asterisk (*)indicates statistical significance at the 0.05 level. The null hypothesis is that beta is significantly different from zero. The expected value of all observation, $E(Y)$=33.70 equal to the expected value conditional on being above limit ($E(Y^*)$ = 11.96) times probability of above the limit ($F(z)$ = 0.68). At the sample means, the value of the density function ($f(z)$ = 0.35) while the value of z is 0.49. sigma = 3.36. The effect of the explanatory variable X on the intensity use equal to $dE(Y^*)/dX_i = \beta_i \left[1 - z\, f(z)/F(z) - f(z)^2/F(z)^2\right] = 0.38\beta_i$.

[a] E_1 is elasticity of intensity and equal to $(dEy^*/dX_i)(\overline{X}/Ey^*)$

[b] E_2 is elasticity of adoption and equal to $(dF(z)/dX_i)(\overline{X}/F(z))$

Table 8. Estimated Tobit Model, Adoption and Intensity of Buyers' Out of Exchange Market Use in Turkey

Independent Variable	Estimate	Asymptotic t-value	Mean	Elasticities	
				E_1[a]	E_2[b]
Constant	-1.873	-0.808	1.00		
Eskisehir	-0.806	-0.726	0.144	-0.025	-0.016
Konya	0.984	1.187	0.509	0.106	0.070
Edirne	-0.631	-0.564	0.115	-0.015	-0.010
Urfa	-1.455	-1.309	0.105	-0.032	-0.021
Transport	0.542**	2.643	2.048	0.221	0.145
Credituse	0.886	1.578	0.663	0.048	0.032
Pricediff	0.460**	2.511	3.663	0.429	0.282
Wareceipt	0.173	0.838	0.278	0.134	0.088
Grading	0.103	0.308	2.557	0.062	0.041
Legal	-0.615	-1.237	4.388	-0.083	-0.054
Education	0.220	1.007	2.788	0.122	0.080
Age	-0.394*	-1.677	4.346	-0.123	-0.081

Notes: Asterisks (*) and (**) indicate statistical significance at the 0.10 and 0.01 levels, respectively. The expected value of all observation, *E(Y)*=23.32 equal to the expected value conditional on being above limit (*E(Y*)* = 28.46) times probability of above the limit (*F(z)* = 0.82). At the sample means, the value of the density function (*f(z)* = 0.26) while the value of *z* is 0.92. Sigma = 2.30. The effect of the explanatory variable X on the intensity use equal to $dE(Y^*)/dX_i = \beta_i \left[1 - z\, f(z)/F(z) - f(z)^2/F(z)^2\right] = 0.60\beta_i$.

[a] E_1 is elasticity of intensity and equal to $(dEy^*/dX_i)(\overline{X}/Ey^*)$

[b] E_2 is elasticity of adoption and equal to $(dF(z)/dX_i)(\overline{X}/F(z))$