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THE IMPACT OF RECEIVING PRICE AND CLIMATE INFORMATION IN THE AGRICULTURAL SECTOR[1]

Adriana Camacho Emily Conover

Abstract

Previous studies indicate that Colombian farmers make production decisions based on informal sources of information, such as family and neighbors or tradition. In this paper we randomize recipients of price and climate information using text messages (SMS technology). Under this experimental design we find that relative to those farmers who did not receive SMS information, the farmers that did had better knowledge of prices and the dispersion in the expected price of their crops was narrower, although we do not see a significant difference in the actual sale price. Farmers also report that text message information is useful and becomes an important source of information for sales. Even though we find significant reduction in crop loss in general and due to weather conditions, we do not find significant changes in their revenues or household expenditures.

Key words: Randomized evaluation, price and climate information in agriculture, bargaining, spillovers, SMS technology.

JEL Classification: D62, Q11, Q12, Q13.

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EL IMPACTO DE RECIBIR INFORMACIÓN DE PRECIOS Y CLIMA EN EL SECTOR AGRÍCOLA[2]

Adriana Camacho Emily Conover

Resumen

Algunos estudios indican que los agricultores colombianos toman sus decisiones de producción y ventas basadas en fuentes de información informales tales como la familia y los vecinos. Este trabajo presenta un experimento de asignación aleatoria de envíos de mensajes de texto con información de precios y clima. En este diseño experimental encontramos que en relación con los agricultores que no recibieron información a través de mensajes de texto, los agricultores tienen un mejor conocimiento de los precios y la dispersión del precio esperado de venta es menor, aunque no vemos una diferencia significativa en el precio de venta real. Los agricultores también reportan que la información de mensajes de texto es útil y se convierte en una importante fuente de información para las ventas. Aunque encontramos una reducción significativa en la pérdida de cultivos en general y debido a las condiciones climáticas, no logramos encontrar cambios significativos en sus ingresos o gastos del hogar.

Palabras clave: evaluación aleatoria, Información de precios y clima, poder de negociación, externalidades, mensajes de texto.

Clasificación JEL: D62, Q11, Q12, Q13.

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I. Introduction

Many agricultural products in Colombia today are not produced, or are commercialized inefficiently due to farmers' lack of information on prices. Access to information in rural areas is limited and costly. A recent study of information demand and supply in the agricultural sector, conducted by USAID-MIDAS (2007-2008), found that the sources of information are not well known (Perfetti et al.,2007)). Small producers usually sell their products in their farms knowing only prices in the local area. Our baseline survey assesses farmer´s knowledge of prices by asking if they had to sell their product today, at what price would they sell it. We find that 26% of farmers do not know the price for their product if someone came to their farm; 43% do not know it for the municipal market; 63% do not know it for Bogotá, and 55% do not know it for the department market. This study provides climate and price information to farmers and determines whether this information improved their welfare.

Colombia's mobile phone technology has almost full connectivity coverage across the population and territory. There were 37.8 Million lines activated during the period of this study, corresponding to a coverage rate of 96% with respect to the total population older than 5[3]. There are two important reasons why SMS is a massive and relatively inexpensive way to disseminate information: first, the cost of a SMS is 40% of the cost of a one minute cell phone call, and second, information can be received by many farmers at the same time. In this study we take advantage of the connectivity in Colombia, and the low cost and high use[4] of SMS technology to estimate the improvement in welfare of randomly selecting farmers who receive detailed weather and national price information via text messages.

We evaluate the impact of the program on 3 types of outcomes: (1) agricultural activities, (2) farmers' welfare, and (3) spillovers effects of the program. In the first group of agricultural activities we include: knowledge of price in different markets, price differential and dispersion with respect to officially reported data and farmers reported data, crop loss, harvest delay, crop storage, SMS as a substitute of sources of information to plant or sell, change in the products that

[3] Population counts in 2008 correspond to the projections reported by Departamento Nacional de Estadisticas (DANE). Number of lines active in the second trimester 2008 comes from the quarterly report from Comisión Regulación Telecomunicaciones (CRT).

[4] In the baseline survey 78% of farmers indicated that they know how to receive and 34% know how to send text messages. This difference is not significant between the treatment and control group.

are planted or markets where products are sold. In the second group of outcomes we include: household revenue and expenditures. In the third group of outcomes we plan to examine externalities of the program by measuring a change in the number of contracts or agreements with other farmers.

The findings of this paper show that providing information on regional prices in a massive and relatively inexpensive way has the potential of increasing farmers' knowledge of prices. Nevertheless, preliminary evidence, in the 4 months of intervention, does not show an increase in farmer's bargaining power and revenues.

This paper is structured as follows: the next section includes a review of the literature on the relation of technology adoption to welfare and peer effects. In section III we provide a detailed description of the experimental design. Section IV describes the data from our two rounds of surveys and other sources of price and climate information that we used. In Section V we explain the empirical specification, followed by the results in Section VI. We conclude in Section VII.

II. Previous Literature

Papers on technology adoption and welfare

Using the roll-out of cell phone coverage as a quasi-experimental design, researchers have looked at cell phones' impact on welfare and price dispersion across markets. These studies found that with the introduction of cell phones, welfare improved and price dispersion diminished (Jensen 2007; Aker, 2008). These improvements appear to be due to a reduction in search costs. Similarly, Beuermann (2010) shows how the introduction of at least on payphone in rural villages in Peru generated great improvements in sale prices and reduction of agricultural production, which in turn reduced the use child labor for agricultural production. Montenegro and Pedraza (2009) suggest that the improvements in speed and quality of communications in Colombia in the period from 2000 to2008 due to cell phones may have resulted in welfare improvement because it can partly explain the fall in kidnapping rates. Their hypothesis is that mobile phone technology improves communication between the targeted individual and the police.

Unlike the papers cited above, in this study rather than using the roll-out of cell phone coverage as a quasi-experimental design, we directly test the hypothesis that reductions in search costs affect welfare by randomly selecting farmers to receive price information for their crops in different markets via text-messages. We then test the extent to which this reduction in search costs affects different measures of farmers' welfare.

Papers on technology adoption and peer effects/externalities

Papers that have looked at peer effects on technology adoption include Foster and Rosenzweig (1995) and Oster and Thorton (2009). The first paper finds that imperfect management of new technologies and farmers experience are barriers for adoption, but own experience and neighbors' experience with technology increases farmers' profitability. The second paper finds that peers provide information about the new technology, but adoption depends on the value given by the individual to the technology.

Like these two papers, we also study the influence of technology adoption by neighbors or relatives.

III. Experimental Design of the Project

The study took place in the *departamento* of Boyacá where two irrigation associations, Usochicamocha and Asusa, provide their services. The irrigation associations provided a complete list of users including their cell phone numbers. Among the users there are (crop) farmers and cattle ranchers, but given that our population of interest are farmers, we used the census of economic activity to determine the proportion of farmers in each unit. We then calculated the proportion of surveys needed in each irrigation unit to have a (15%) proportional sample of farmers in each area. Our sample includes 500 surveys, 66% (335) of them in Usochicamocha municipalities and 33% (165) in Asusa municipality.

We isolate the program effect by using random treatment assignment. Specifically, the randomly selected farmers who received the information were assigned to the treatment group, while the farmers who signed up for the initiative but who were not selected, were in the control group. To participate in the study the farmers needed to fulfill the following conditions: (1) cell phone ownership; (2) voluntarily agreement to sign a consent form authorizing us to send text message

with relevant agricultural information; (3) at least half-time employment in commercial farming activities (other than for self-consumption); and (4) belonging to one of the irrigation associations.

At the time of the baseline survey farmers were told that about half of them would be randomly selected to receive the "treatment" (price, weather and administrative information). 255 individual farmers received the treatment. The remaining 245 farmers were assigned to the "control" group. We conducted an additional randomization at the unit level to capture spillover effects of the information shared between neighbors. Each area of irrigation is divided into 11 units, for a total of 22 irrigation units. The 22 units were matched according to their observable characteristics and we chose 143 farmers in 10 of the 22 units as a source of extra-treatment.

The time line for the intervention is given in Figure 1. The baseline was conducted in March-April 2009, before the SMS intervention. Starting on the 29th of July, the treatment group of farmers received the intervention. The first day of the intervention we sent text messages giving instructions on how to read and understand the price and climate information that we would be sending by SMS during the following 6 months. Treated farmers received daily text messages on prices for 3 markets and 8 of the products grown in their region[5]. They also received weekly weather information for a period of 4 months, starting on September 20, 2009. Out of the 185 days of the intervention, all farmers received price information every weekday except for 10 days, when information was not provided to us by the primary source[6]. A total of 72,834 SMS were sent, 79% of these were on prices, 19% on climate, 2% administrative. On average a treated farmer received 144 price messages, 34 climate messages, and 4 administrative messages.[7] The follow-up survey was conducted in November-December 2009, after the farmers had made their decisions on sales and commercialization of their products.

[5] The markets and products were chosen according to the reported relevant market of the area, and conditional on availability of information. The main crops grown in this region in order of importance are: onions, potatoes, corn, beans, peas, beet, lettuce, and broccoli. Since certain crops are sold in specific days of the week, the information sent accounted for the seasonality of products sold in markets.

[6] In these 10 day the person from the CCI at Tunja, our source of information, was not able to send daily prices.

[7] Administrative messages were sent by the irrigation associations and typically meeting or payment reminders.

Source of Data on Prices

The *Corporación Colombiana Internacional* (CCI) administers the System of Price Information in the Agricultural Sector (SIPSA—Acronym in Spanish). SIPSA includes information for more than 700 products in 66 markets in 18 *departamentos*. Each day at 9 am we received information provided by the CCI. This price information corresponds to the average prices of transactions made earlier that day. Markets operate from 11 pm to 5 am. Although the price information provided by the CCI is publicly available by internet at 3 pm[8], the farmers have limited internet access at home and in their village. In the survey, 4% of farmers reported to have access to internet at home and 15% reported access in their village.

Source of Data on Weather

The *Instituto de Hidrología, Metereología y Estudios Ambientales* (IDEAM) provides a weekly report with weather forecasts including minimum and maximum temperatures', probability of rain fall, drought, floods and frost alerts. The IDEAM agreed to include our areas of study within their forecast models, which allow us to provide accurate information for this intervention.

IV. Description of the Baseline and follow-up survey Data

The baseline characteristics, to ensure that the treatment and control groups are similar, were collected in the first round of surveys prior to the intervention and are reported in Table 1. Table 1 also includes some socio demographic characteristics that we were able to match from the Census of the Poor Survey[9]. The baseline survey includes socioeconomic questions, as well as information on agricultural production and commercialization decisions. As Table 1 reports, there is only one significant difference across the treatment and control group, indicating that balance of these two groups was achieved.

[8] Available at: http://www.cci.org.co/cci/cci_x/scripts/home.php?men=101&con=192&idHm=2&opc=199

[9] We have personal identifiers in the Census of the Poor and in the baseline survey which enable us to match the information to the whole family. The match rate was approximately 86% for Asusa and 75% for farmers in Usochicamocha.

The average farmer in our sample is 50 years old, 70% of the farmers are male, with 6 years of education and 29 year of experience in farming activities. They spend 34 hours a week working on agricultural activities.

To ensure the quality of the information collected we asked farmers to keep records on the price, quantity, date and location of the products sold. The second round of surveys collected follow-up information on the key outcome variables: sale price, production, transport, crop information shared with neighbors, crop loses and specific questions about the intervention for those who reported receiving SMS information useful for their agricultural activities. We followed 95% of the people in the second round. To encourage participation there was a raffle of a spraying machine.

Since the price information sent via text messages corresponded to the typical crops grown in the region and not necessarily those grown by an individual farmer, there was variation across farmers on how many crops for which they received prices coincided with the crops actually grown by the farmer. Some farmers may have received information on all of their crops while others on none. We exploit this variation in our analysis.

V. Empirical Specification

Since we observed the same farmer in two periods to evaluate the effect of the text messages we used a difference-in-differences approach, and a first differences with farmer fixed effects. Our estimating difference-in-differences equation is:

$$Y_{iupt} = \beta_0 + \beta_1 T_{it} + \beta_2 Extra_{iut} + \beta_3 Post_t + \beta_4 \Pr od_{ipt} + \beta_5 T_{it} Post_t + \beta_6 T_{it} \Pr od_{ipt} + \beta_7 \Pr od_{ipt} Post_t + \beta_8 T_{it} \Pr od_{ipt} Post_t + \beta_9 X_{it} + \gamma_u + \gamma_p + \varepsilon_{iupt} \quad (1)$$

And our estimating first difference with farmer fixed effects equation is:

$$Y_{iupt} = \beta_0 + \beta_2 Extra_{iut} + \beta_4 \Pr od_{ipt} + \beta_5 T_{it} Post_t + \beta_6 T_{it} \Pr od_{ipt} + \beta_7 \Pr od_{ipt} Post_t + \beta_8 T_{it} \Pr od_{ipt} Post_t + \beta_9 X_{it} + \gamma_i + \gamma_p + \varepsilon_{iupt} \quad (2)$$

Where *i* denotes the individual farmer; *p* denotes the product; *u* denotes the irrigation unit; and *t* denotes the first or second round of surveys. Y_{iupt} corresponds to the outcome of interest. T_{it} is a treatment indicator which takes the value of 1 if the farmer received text message information. $Post_t$ is an indicator variable which takes a value of 1 after the initiation of the program.[10] $Prod_{ipt}$ is an indicator variable which takes a value of 1 if farmer *i* received text message information regarding one of his product. $Extra_{iu}$ corresponds to the number of producers who received treatment in the farmer's irrigation unit. X_{it} is a vector of farmer's characteristics including: education, experience, age, gender, percentage of time dedicated to farming, size of the crop, storage capacity, own means of transport, whether the farmer is credit constrained, distance from the farm to markets, γ_u are irrigation unit indicators to capture any characteristics that are common across irrigation units but do not change over time, γ_p are dummy variables for the importance of the product, within the products of the farmer. Equation 2 includes γ_i farmer fixed effects, therefore we do not control for individual characteristics which do not vary much between both rounds of surveys.

Additionally, we estimate an alternative model where we control for the outcome at baseline as follows:

$$Y_{iupt} = \beta_0 + \beta_1 T_{it} + \beta_2 Extra_{iut} + \beta_3 Y_{iupt-1} + \beta_4 \Pr od_{ipt} + \beta_6 T_{it} \Pr od_{ipt} + \beta_4 X_{it} + \gamma_u + \gamma_p + \varepsilon_{iupt} \quad (3)$$

Where the variables are defined the same way as in equation 1. This specification could help to absorb noise and give more flexibility in the parameter β_3 than the fixed effect specification.

Parallel to the three equations presented above we test for spillover effects, by interacting these same specifications with the following measures: number of text messages received (directly from the program or indirectly from a participant), frequency of visits to neighbor farmers, number of people the farmer knows who are enrolled in the program interacted with frequency of visits to neighbor farmers . All of this different measures are used as proxies for the amount of

[10] We use different definitions of post depending on the timing of the outcome of interest. We use: *post* to take into account the period after the initiation of the program; *post_crop* takes into account that the farmer planted after the initiation of the program; and *post_sale* takes into account that the farmer sold its product after the initiation of the program.

contact with information that an individual can have, and we expect to get from them a measure of the externality effect of the program.

VI. Results

Our outcomes of interest are: knowledge of price in different markets, text message as a substitute of sources of information to plant or sell, price differential and price dispersion with respect to officially reported data and farmers reported data, crop loss.

Knowledge of price in different markets

Knowledge of price corresponds to the simplest possible outcome one can test in this experiment. We want to know whether sending price text message information can have an impact over the self-reported knowledge of prices by product and market. The dependent variable is constructed from the question in the survey where we ask the farmer: "If you would have to sell your product today, what would be the price you think you will get after a negotiation in the farm, municipal market, Bogotá and *departamento* market"? Independent of the accuracy of the value reported, we give the value of 1 if there was a price reported and 0 if they answer they do not know.

Table 2a and 2b include the same empirical specification for the four different markets: farm and municipal market, Bogotá and *departamento* market respectively. Column 1-2 corresponds to the estimation in equation 1, Columns 3 and 4 correspond to the estimation in equation 2, and Columns 5 and 6 correspond to the estimation in equation 3; the difference between each pair of columns is that the second column in each pair includes economic importance of product fixed effect, while the first one does not include this control. On average, treated farmers receiving messages corresponding to their crop are between 20 and 30 percentage points more likely to know the price in all markets except for the *departamental* market.

Text messages as a substitute of sources of information to sell

We test whether the information received by farmers has been useful for their agricultural activities, specifically for sales. In Table 3 we use four different outcome variables: (1) the

farmer reported text messages as a source of information in the follow-up survey; (2) relative to the sources of information reported in the baseline, changes in the source of information used for selling; (3) an interaction of these two outcomes that captures a change in source of information including text messages as an important source of information; and (4) the last column includes changes in the importance of source of information and reports text messages as a new source of information. The table shows that the coefficient related to the treatment effect is positive and significant at the one percent level for all outcomes except for change in source of information (column 2), we also include the treatment interacted with the dummy variable that indicates that the prices sent via text messages coincided with the products that the farmer is planting, but we do not find a differential effect of the treatment for different products.

Our survey also includes data to test whether the information sent affected planting decision or helped in solving problems related to the crop. (This has not been tested yet)

Price differential at the time of sale

We construct the difference between the sale price reported by the farmer and the sale price reported by the official data from CCI in a certain week in Bogotá and Tunja, two markets where these farmers sell and where we have official data from CCI. Table 4 does not show a significant difference, consistent throughout different specifications, in the sale price of treated farmer compared to the farmers in the control group. But it is important to note that there exists a positive and significant effect of the sale prices of the products reported in the text message information for the whole sample, which could be explained as a spillover effect of the program.

Price dispersion and price differential using expected prices

Using the same question as in the outcome of knowledge of price, we construct the difference between the expected sale price reported by the farmer at the moment of the survey and the sale price reported by the official data from CCI in a certain week. We also construct an alternative difference with respect to the price reported by farmer in the survey for a given product in a given market. In the same way as we construct price differential we construct monthly price dispersion with respect to these two sources of information. Results, presented in Table 5a and 5b, show that treated farmers clearly have lower price dispersion in the price they report than the

control group of farmers in the four different markets. Table 6a, 6b, 6c and 6d report expected price differential for our four different markets of study with respect to CCI official prices from Bogotá and Tunja respectively, but we do not find evidence that treated farmers differ much from the control group in the expected price reported.

Crop loss

We constructed the three following measures of Crop loss: (1) dummy variable that takes the value of 1 if the farmer had any type of loss in his crop, (2) a continuous variable corresponding to the percentage of crop loss, (3) dummy variable that takes the value of 1 if the farmer had weather related loss in his crop. The results related to these three varibles are reported in Tables 7a, 7b and 7c respectively. All of the specifications consistently show that treated farmers, compared to the control group, are less likely to suffer a crop loss between 11 and 14 percentage points.

Additional Outcomes

Other outcomes that would be studied in the future include behaviors with respect to harvest delay, crop storage, profits, change in the crops that are planted or markets where products are sold. We did not find significant effect for household revenue and expenditures, this might be due to the short time period of the implementation of the program.

We have explored the externality effect of the program and have some preliminary findings that consistently reach to a positive and significant effect only when one uses the data as a cross-section, but once the individual fixed effect or lagged variable models are used there are no significant effects. Specifically we see positive externality effect in terms of crop loss due to weather. This is consistent with the report that treated farmers say about the usefulness of the information received, where they give a grade of 4.1 out of 5 to the weather information.

VII. Conclusion and Policy Relevance

We tested whether access to price information via text messages changed farmers' behaviors. In particular, we analyzed whether farmers had a better knowledge of prices and therefore extracted higher prices for their products. Even thought the information sent seemed to be making them

change their perceptions of prices, it did not seem to affect their actual sale price. The results of our study indicate that inexpensive technological interventions quickly become useful sources of price information and reduce the probability of weather related crop loss. In terms of welfare improvement we did not find and effect over profits or household expenditures, but this might be due to the short term intervention. In addition we will study the positive externalities that the use of SMS technology has in communities, by encouraging family and neighbors to share information. Our study will explore whether farmers are transporting their products to bigger markets as a result of this information.

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Figures and Tables

Figure 1: Time Line

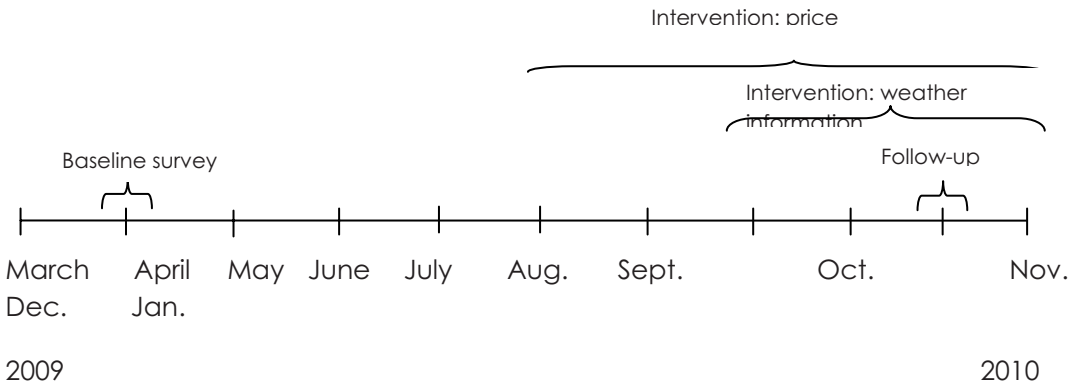

Table 1: Baseline Summary Statistics

Demographic	*Control*	*Treatment*
Producer age	50.36	49.48
Producer is female	0.343*	0.271*
Years of schooling	6.03	5.83
Years of experience	29.59	28.84
Household size	4.22	4.10
Number of hours per week dedicated to farming	34.20	34.29
Income and Poverty indicators		
Finished floors	0.68	0.71
Number of rooms in dwelling	3.05	3.03
Number of people per room	1.55	1.50
Dwelling has permanent electricity	0.99	0.99
Dwelling has land line telephone	0.14	0.11
Dwelling has access to potable water	0.96	0.97
Producer takes public transport to city	0.44	0.43
Cell phone		
Good (or better) quality of cell phone signal	0.97	0.97
Always reads text messages	0.71	0.71
Producer monthly cell phone expenditure (in pesos)	23,762	27,704
Farm		
Household members in agriculture labors	0.80	0.75
Farm area (Ha)	1.40	1.56
Total farm area (Ha)	1.74	2.02
Area - All crops (Ha)	1.10	1.24
Did not store main crop	0.79	0.81
Percent of main crop stored	69.04	62.62
Number of days main crop stored or delayed	27.52	34.06
Loss of any crop	0.49	0.50
Loss of main crop due to weather	0.71	0.77
Number cows and/or horses owned	1.17	1.07
Number of farm equipment (hoses, sprinklers)	5.32	4.79
Farm ownership	0.60	0.61
Number of neighbors or friends mentioned	1.53	1.62
Cost and Prices		
Number of potential buyers that came to the farm	2.07	2.12
Monthly transport costs (in pesos)	128,327	218,414
Neighbors as source of price information	0.10	0.10
No sources of price information	0.07	0.08
Requested credit	0.32	0.29
Denied credit application	0.05	0.06
Distance (Km) nearest department market	17.91	18.31
Road quality	1.96	1.89
Market type		
Collection	0.18	0.18
Department market or Bogota	0.30	0.30
Municipal market	0.18	0.24
Other	0.08	0.08

Note: The unit of observation is the farmer, there are 500 farmers.

* Significant at 10%; ** significant at 5%; *** significant at 1%

Table 2a: Knowledge of Price in the farm and Municipal market

Dependent Variable	Knowledge of price in farm						Knowledge of price in Municipality					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.223***	0.201***			-0.08	-0.098	0.218***	0.201**			-0.133	-0.15
	[0.074]	[0.073]			[0.110]	[0.112]	[0.079]	[0.078]			[0.112]	[0.115]
Extra	0.003	0.003	0.002	0.002	-0.002	-0.003	0.003	0.003	0.003	0.003	-0.004	-0.006
	[0.002]	[0.002]	[0.002]	[0.002]	[0.005]	[0.005]	[0.002]	[0.002]	[0.003]	[0.003]	[0.006]	[0.005]
Post	0.039	0.043					0.139*	0.142*				
	[0.073]	[0.072]					[0.076]	[0.076]				
Prod	0.145**	0.097	0.099	0.061	0.133*	0.095	0.221***	0.184***	0.169**	0.143**	0.159**	0.122
	[0.060]	[0.059]	[0.062]	[0.062]	[0.072]	[0.073]	[0.062]	[0.062]	[0.069]	[0.068]	[0.075]	[0.076]
Treatment*Post	-0.310***	-0.305***	-0.256**	-0.249**			-0.339***	-0.336***	-0.214	-0.209		
	[0.106]	[0.106]	[0.110]	[0.109]			[0.113]	[0.113]	[0.132]	[0.131]		
Treatment*Prod	-0.149*	-0.12	-0.115	-0.085	0.065	0.089	-0.174**	-0.152*	-0.152	-0.131	0.114	0.137
	[0.081]	[0.080]	[0.085]	[0.082]	[0.116]	[0.118]	[0.088]	[0.087]	[0.097]	[0.095]	[0.121]	[0.124]
Prod*Post	-0.041	-0.02	-0.053	-0.037			-0.182**	-0.167**	-0.134	-0.123		
	[0.078]	[0.077]	[0.064]	[0.064]			[0.083]	[0.082]	[0.090]	[0.090]		
Treatment*Prod*post	0.211*	0.207*	0.187*	0.18			0.305**	0.302**	0.191	0.186		
	[0.115]	[0.115]	[0.112]	[0.111]			[0.124]	[0.124]	[0.134]	[0.133]		
Lagged dependent Variable					0.076*	0.067					-0.05	-0.053
					[0.042]	[0.043]					[0.043]	[0.043]
Constant	0.775***	0.962***	1.359	1.364	0.790**	0.972***	0.699***	0.841***	-0.132	-0.129	0.775**	0.947***
	[0.195]	[0.206]	[2.030]	[2.025]	[0.353]	[0.343]	[0.205]	[0.210]	[2.858]	[2.855]	[0.366]	[0.356]
Individual fixed effects	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1813	1813	1813	1813	621	621	1813	1813	1813	1813	621	621
R-squared	0.069	0.085	0.024	0.035	0.126	0.139	0.066	0.073	0.019	0.024	0.076	0.085
Number of form			466	466					466	466		

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 2b: Knowledge of Price in Bogotá and *Departamento* market

Dependent Variable	Knowledge of price in Bogota						Knowledge of price in Department Market					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.124**	0.111*			-0.237**	-0.249**	-0.350**	-0.358**				-1.258***
	[0.062]	[0.061]			[0.095]	[0.097]	[0.173]	[0.173]				[0.195]
Extra	0.003*	0.003*	0.003	0.003	-0.003	-0.004	0.006	0.006	0.011	0.011	0.073***	0.073***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.005]	[0.004]	[0.006]	[0.006]	[0.012]	[0.011]	[0.016]	[0.016]
Post	0.235***	0.237***					-0.552***	-0.558***				
	[0.066]	[0.066]					[0.168]	[0.169]				
Prod	0.231***	0.203***	0.206***	0.187***	0.133*	0.109	-0.014	-0.028	0.038	0.005	-0.109	-0.109
	[0.047]	[0.048]	[0.057]	[0.056]	[0.077]	[0.079]	[0.125]	[0.129]	[0.094]	[0.097]	[0.126]	[0.127]
Treatment*Post	-0.245**	-0.242**	-0.177	-0.173			0.225	0.24	0.218	0.262	-1.276***	
	[0.097]	[0.097]	[0.115]	[0.114]			[0.294]	[0.295]	[0.346]	[0.340]	[0.176]	
Treatment*Prod	-0.130*	-0.113	-0.123	-0.107	0.189*	0.204*	0.289	0.299	0.07	0.091	1.257***	1.236***
	[0.072]	[0.072]	[0.090]	[0.089]	[0.104]	[0.106]	[0.182]	[0.183]	[0.163]	[0.164]	[0.187]	[0.213]
Prod*Post	-0.141*	-0.129*	-0.096	-0.088			0.06	0.074	0.101	0.145		
	[0.073]	[0.073]	[0.085]	[0.084]			[0.180]	[0.181]	[0.162]	[0.166]		
Treatment*Prod*post	0.205*	0.203*	0.133	0.13			-0.117	-0.134	-0.179	-0.223		
	[0.109]	[0.109]	[0.121]	[0.120]			[0.306]	[0.308]	[0.340]	[0.334]		
Lagged dependent Variable					0.031	0.03					0.195**	0.193**
					[0.046]	[0.046]					[0.095]	[0.095]
Constant	0.336*	0.445**	-5.189**	-5.187**	0.614**	0.723**	0.546	0.574	20.224***	21.185***	-0.26	-0.237
	[0.184]	[0.189]	[2.578]	[2.562]	[0.286]	[0.281]	[0.353]	[0.358]	[6.757]	[6.878]	[0.578]	[0.588]
Individual fixed effects	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1813	1813	1813	1813	621	621	378	378	378	378	140	140
R-squared	0.113	0.118	0.033	0.035	0.143	0.147	0.36	0.361	0.207	0.215	0.385	0.385
Number of form			466	466					165	165		

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Text messages as a substitute of sources of information to sell.

Dependent variable	SMS as a source of info useful for selling in follow-up	Relative to baseline, changes in source of info for selling	Change in source of info and including SMS as an important source of info for selling	Change importance of source of info and including SMS as an important source of info for selling
Treatment	0.382***	0.164	0.411***	0.382***
	[0.134]	[0.143]	[0.126]	[0.134]
Extra	0.003**	0.004**	0.004***	0.003**
	[0.001]	[0.002]	[0.001]	[0.001]
Treatment*Prod	-0.057	-0.162	-0.173	-0.057
	[0.148]	[0.159]	[0.139]	[0.148]
Prod	0.006	-0.094	0.023	0.006
	[0.103]	[0.110]	[0.097]	[0.103]
Constant	0.035	0.827***	0.01	0.035
	[0.092]	[0.099]	[0.087]	[0.092]
Observations	475	475	475	475
R-squared	0.166	0.027	0.129	0.166

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Price differential at the time of sale

Dependent Variable	Difference in price from Bogotá				Difference in price from Tunja			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Treatment	37.747	32.374			98.004	93.367		
	[77.275]	[80.200]			[187.433]	[189.366]		
Extra	4.517	4.156			-5.442	-5.153		
	[2.928]	[2.735]			[6.672]	[7.169]		
Post_sale	-276.879**	-273.321**	-285.707*	-271.159*	-397.102	-416.161*	-330.174	-351.610*
	[117.382]	[119.825]	[146.442]	[151.612]	[252.011]	[249.813]	[201.154]	[212.389]
Prod	-310.809***	-322.653***	-359.475***	-381.103***	-112.792	-133.947	-222.41	-238.43
	[64.131]	[68.200]	[95.035]	[95.419]	[170.236]	[172.259]	[171.150]	[173.991]
Treatment*Post_sale	312.873*	305.626	214.542	175.254	221.499	247.937	-1.308	35.45
	[189.543]	[191.960]	[332.134]	[338.346]	[364.585]	[371.074]	[400.401]	[419.246]
Treatment*prod	12.278	16.559	163.374	175.687	-88.779	-87.475	-104.839	-95.758
	[88.951]	[92.099]	[155.304]	[155.083]	[193.979]	[195.401]	[274.145]	[277.075]
Prod*Post_sale	284.413**	285.280**	266.348*	260.140*	580.671**	596.095**	452.105**	478.182**
	[127.632]	[130.303]	[146.496]	[149.955]	[259.077]	[256.415]	[185.957]	[206.426]
Treatment*Prod*Post_sale	-388.158*	-386.304*	-250.627	-228.402	-359.277	-377.94	-260.179	-299.645
	[199.116]	[201.489]	[328.981]	[331.275]	[369.596]	[375.185]	[392.133]	[414.580]
Constant	-135.431	-86.876	43.851	63.702	543.921	586.555	279.205	305.912*
	[275.116]	[273.061]	[176.982]	[176.494]	[486.811]	[497.023]	[180.770]	[183.461]
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Individual fixed effects	No	No	Yes	Yes	No	No	Yes	Yes
Observations	547	547	547	547	347	347	347	347
R-squared	0.217	0.223	0.212	0.235	0.215	0.223	0.191	0.199
Number of form			349	349			256	256

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, *p<0.1

Table 5a: Price dispersion using expected prices

Dependent variable:	Expected price per kilogram standard deviation in:											
	Farm						Municipality					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-85.999***	-92.778***			-254.514*	-238.104	26.33	50.837*			-322.473***	-292.423***
	[25.181]	[28.115]			[150.146]	[151.124]	[22.469]	[26.486]			[68.472]	[70.515]
Extra	-8.949***	-8.920***	-6.869**	-6.850**	-13.243***	-13.318***	-2.870**	-2.954**	-0.689	-0.792	-3.068	-3.132
	[2.016]	[2.001]	[3.037]	[3.027]	[3.638]	[3.623]	[1.189]	[1.197]	[2.010]	[2.009]	[1.920]	[1.931]
Post	392.754***	392.532***	486.608***	486.682***			293.633***	287.098***	323.488***	318.798***		
	[64.761]	[65.103]	[81.310]	[81.093]			[42.385]	[42.145]	[60.575]	[62.029]		
Prod	352.905***	341.007***	302.464**	275.193**	333.917**	359.596**	493.874***	525.604***	487.471***	521.630***	-31.639	16.731
	[31.834]	[39.539]	[130.833]	[132.779]	[167.537]	[166.368]	[38.916]	[43.118]	[55.867]	[59.990]	[73.229]	[71.221]
Treatment *post	4.072	7.231	-61.921	-52.72			148.201	129.096	74.265	46.267		
	[83.572]	[84.472]	[108.550]	[109.581]			[128.365]	[128.022]	[142.437]	[143.270]		
Treatment *prod	550.385***	559.280***	384.744**	413.943**	-195.658	-219.035	226.315***	195.260***	-16.365	-58.419	403.123***	361.257***
	[58.382]	[62.040]	[159.385]	[163.403]	[217.773]	[216.193]	[54.359]	[58.407]	[106.852]	[108.007]	[86.754]	[87.441]
Prod*post	-61.247	-55.724	-125.21	-112.264			-411.193***	-420.798***	-452.350***	-464.491***		
	[105.339]	[109.416]	[111.155]	[115.140]			[58.355]	[58.807]	[69.239]	[71.494]		
Treatment *prod*post	-757.646***	-760.849***	-739.884***	-748.971***			-353.398**	-333.993**	-279.124*	-251.197		
	[134.148]	[136.427]	[156.203]	[158.969]			[141.900]	[142.162]	[153.088]	[154.613]		
Lagged dependent variable					0.065	0.066					0.099**	0.098**
					[0.041]	[0.040]					[0.045]	[0.044]
Constant	151.462***	184.007***	212.430***	277.227***	676.723***	579.869***	91.746***	-2.803	222.037***	140.885**	439.340***	257.023***
	[22.760]	[66.256]	[70.690]	[88.502]	[101.229]	[193.693]	[12.651]	[35.248]	[47.331]	[57.362]	[68.684]	[86.324]
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Individual fixed effects	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
Observations	1757	1757	1757	1757	564	564	1705	1705	1705	1705	540	540
R-squared	0.046	0.047	0.042	0.043	0.027	0.027	0.088	0.092	0.066	0.07	0.032	0.048
Number of form			499	499					495	495		

Robust Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 5b: Price dispersion using expected prices

Dependent variable:	Expected price per kilogram standard deviation in:											
	Bogotá						Department Market					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-170.564	-162.537			92.233**	136.792	53.033**	49.254			-16.797	-17.973
	[130.498]	[141.739]			[37.682]	[99.061]	[26.865]	[35.874]			[19.166]	[19.235]
Extra	-1.118	-1.219	3.441	3.277	-0.914	-0.984	0.456	0.495	-9.401	-9.628	0.603	0.72
	[1.301]	[1.299]	[2.827]	[2.814]	[2.108]	[2.111]	[1.433]	[1.463]	[22.413]	[22.733]	[1.688]	[1.683]
Post	49.226	10.902	-228.637	-276.160*			316.284***	316.119***	215.355	225.293*		
	[141.282]	[150.875]	[139.304]	[157.937]			[117.794]	[117.945]	[145.588]	[136.094]		
Prod	450.201***	472.297***	171.358	180.736	433.775***	482.162***	318.611***	314.600***	233.529***	268.417***		
	[149.718]	[160.556]	[133.110]	[151.117]	[42.516]	[100.716]	[19.998]	[33.209]	[0.000]	[44.928]		
Treatment *post	-118.753	-94.265	150.655	169.246			-1,277.794***	-1,278.802***	-1,771.479***	-1,765.907***		
	[144.090]	[153.933]	[164.861]	[180.611]			[174.319]	[175.215]	[231.676]	[233.809]		
Treatment *prod	602.822***	584.618***	684.880***	657.229***	-110.500*	-165.748	1,206.171***	1,210.938***	1,565.332***	1,525.841***		
	[162.237]	[172.653]	[193.432]	[205.447]	[62.108]	[109.762]	[175.756]	[180.852]	[245.263]	[257.541]		
Prod*post	-288.332*	-277.393	-34.858	-13.41			-467.812***	-465.327***	-323.546**	-351.896***		
	[162.781]	[169.965]	[149.236]	[164.904]			[119.269]	[120.530]	[128.463]	[119.856]		
Treatment *prod* post	-314.517*	-338.595*	-618.278***	-636.715***								
	[177.196]	[183.318]	[185.712]	[199.304]								
Lagged dependent variable					0.077***	0.077***					0.016	0.015
					[0.025]	[0.025]					[0.010]	[0.010]
Constant	311.127**	190.73	458.765***	361.145***	-0.595	-191.046	0	10.078	98.369	40.663	155.664***	166.185***
	[127.370]	[144.145]	[87.983]	[100.344]	[27.738]	[116.607]	[0.000]	[65.130]	[61.541]	[89.251]	[13.769]	[24.154]
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Individual fixed effects	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
Observations	1624	1624	1624	1624	480	480	310	310	310	310	114	114
R-squared	0.117	0.122	0.109	0.113	0.042	0.06	0.519	0.519	0.596	0.597	0.016	0.018
Number of form			495	495					155	155		

Robust Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 6a: Price differential in farm using expected prices

Dependent Variable	Expected Price Difference in Farm from price in Bogota						Expected Price Difference in Farm from price in Tunja					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	81.454	58.933			-69.549	-35.809	198.059	186.394			-567.971	-493.268
	[141.442]	[142.644]			[208.455]	[203.531]	[376.130]	[378.427]			[378.115]	[389.272]
Extra	-0.858	-0.956	-0.294	-0.531	1.221	0.783	-5.583	-5.445	-1.874	-1.754	12.289	10.618
	[2.438]	[2.426]	[2.556]	[2.568]	[5.333]	[5.388]	[6.492]	[6.521]	[8.896]	[8.917]	[9.950]	[10.893]
Post	124.247	122.211	60.847	51.699			220.3	211.51				
	[141.731]	[143.350]	[163.638]	[170.928]			[283.188]	[283.475]				
Prod	-118.382	-147.341	-182.832	-230.279	74.587	107.69	-54.852	-66.075	-121.724	-119.838	402.096	471.445
	[119.711]	[123.189]	[150.171]	[159.676]	[161.105]	[154.825]	[218.183]	[221.496]	[272.315]	[273.816]	[361.360]	[359.767]
Treatment*Post	-45.641	-28.786	-228.606	-183.646			-463.238	-426.825	-821.719	-779.922		
	[196.106]	[196.814]	[212.657]	[223.087]			[456.258]	[458.904]	[577.984]	[598.461]		
Treatment*Prod	-17.318	6.834	-84.68	-21.684	13.414	-20.843	-173.007	-161.7	-1,031.447*	-1,020.623*	350.301	274.522
	[152.573]	[153.714]	[198.361]	[209.162]	[217.659]	[212.800]	[380.510]	[383.682]	[544.330]	[554.280]	[398.701]	[416.273]
Prod*Post	-77.488	-65.09	-63.564	-42.096			-11.302	-6.152	137.201	138.859		
	[148.679]	[150.133]	[171.933]	[179.155]			[298.766]	[299.036]	[253.343]	[261.582]		
Treatment*Prod *post	-10.641	-27.533	187.782	145.361			307.817	271.437	828.966	785.468		
	[207.599]	[207.913]	[226.262]	[235.361]			[472.278]	[476.527]	[589.838]	[609.766]		
Lagged dependent Variable					0.037	0.04					0.031	0.04
					[0.026]	[0.027]					[0.064]	[0.069]
Constant	-112.355	-30.966	-128.235	-189.053	-446.394	-459.993	172.554	129.587	1,080.10	1,281.72	302.83	341.822
	[467.786]	[479.635]	[483.738]	[494.879]	[473.402]	[486.114]	[327.843]	[332.864]	[7,576.739]	[7,872.178]	[680.756]	[690.599]
Individual fixed effects	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1107	1107	1107	1107	270	270	700	700	700	700	163	163
R-squared	0.05	0.056	0.017	0.028	0.157	0.16	0.068	0.073	0.046	0.049	0.316	0.325

Robust Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 6b: Price differential in municipality using expected prices

Dependent Variable	Expected Price Difference in Municipality from price in Bogota						Expected Price Difference in Municipality from price in Tunja					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	189.741	168.783			-431.85	-362.19	-133.32	-134.167			-1,187.237*	-848.363
	[147.097]	[144.603]			[312.537]	[316.902]	[360.343]	[348.718]			[679.695]	[736.000]
Extra	-4.138	-4.643	0.364	-0.009	4.064	2.049	-11.501*	-11.456*	-3.904	-3.883	19.934	18.245
	[3.058]	[3.042]	[3.926]	[3.873]	[5.436]	[5.679]	[6.757]	[6.723]	[11.890]	[11.806]	[12.982]	[13.869]
Post	344.441**	364.494***		333.022			486.421	519.384	617.426*	664.923*		
	[134.172]	[137.116]		[212.384]			[389.788]	[384.695]	[325.984]	[340.736]		
Prod	15.41	-21.554	-49.512	-106.758	-35.633	22.995	-94.168	-107.986	214.241	154.671	30.753	152.64
	[102.854]	[107.890]	[177.388]	[195.619]	[261.938]	[264.591]	[320.689]	[308.614]	[236.453]	[236.647]	[475.664]	[488.139]
Treatment*Post	-339.485	-323.236	-544.515**	-500.546*			-29.746	21.489	-769.780*	-736.46		
	[206.649]	[205.894]	[261.078]	[268.368]			[504.992]	[494.456]	[426.275]	[448.949]		
Treatment*Prod	-47.756	-22.541	-87.052	-35.89	458.891	394.246	231.182	240.601	-1,275.279**	-1,260.148**	995.782	640.169
	[160.267]	[158.405]	[284.983]	[291.208]	[331.214]	[346.959]	[366.520]	[354.495]	[547.990]	[568.646]	[704.694]	[770.827]
Prod*Post	-279.796**	-276.814*	-308.739	-301.312			-136.563	-160.961	-407.682	-431.747		
	[141.059]	[143.746]	[216.084]	[227.812]			[398.477]	[388.967]	[325.203]	[340.583]		
Treatment*Prod*post	237.949	220.084	484.226*	447.131			-236.426	-296.188	781.372*	732.133		
	[220.051]	[219.118]	[282.100]	[288.711]			[521.887]	[509.968]	[455.129]	[477.323]		
Lagged dependent Variable					0.114	0.101					-0.037	-0.046
					[0.101]	[0.106]					[0.200]	[0.212]
Constant	-383.12	-341.971	-6,965.15	-524.681	-306.713	-381.488	-320.889	-297.282	2,043.175**	2,037.595**	539.664	620.121
	[280.972]	[279.618]	[4,524.345]	[484.501]	[692.507]	[745.574]	[424.620]	[435.724]	[966.114]	[988.625]	[1,003.188]	[1,040.711]
Individual fixed effects	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	865	865	865	865	156	156	550	550	550	550	98	98
R-squared	0.067	0.077	0.027	0.048	0.209	0.226	0.091	0.101	0.055	0.068	0.405	0.411

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 6c: Price differential in Bogotá using expected prices

Dependent Variable	Expected Price Difference in Bogota from price in Bogota						Expected Price Difference in Bogota from price in Tunja					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	353.579*	305.313			6.189	14.328	-637.024	-650.267			-33.611	-22.709
	[204.056]	[212.477]			[110.517]	[113.538]	[618.723]	[608.069]			[220.743]	[193.179]
Extra	-4.11	-4.3	-0.467	-0.99	5.341	5.551	9.332	9.581	25.570*	28.601**	17.397	0.045
	[3.286]	[3.275]	[4.557]	[4.887]	[7.059]	[8.167]	[9.669]	[9.885]	[13.196]	[13.371]	[11.182]	[12.955]
Post	518.011**	472.708*	369.883	330.072			43.144	47.306	97.248			
	[245.085]	[243.372]	[360.757]	[384.941]			[663.903]	[672.434]	[296.260]			
Prod	181.837	144.9	11.561	-35.746	407.968*	432.313*	-615.211	-650.334	-195.972	-268.044	613.667	914.837**
	[199.887]	[206.723]	[350.255]	[386.202]	[237.803]	[258.111]	[563.951]	[559.493]	[284.691]	[276.487]	[397.152]	[448.067]
Treatment*Post	-551.530*	-495.991	-877.852*	-772.901			-158.355	-168.971	-398.544	-299.875		
	[327.410]	[320.640]	[449.870]	[479.337]			[853.182]	[848.891]	[737.528]	[817.440]		
Treatment*Prod	-249.53	-203.498	-568.066	-453.462			883.489	906.009	-358.335	-242.172		
	[220.575]	[228.448]	[408.143]	[451.299]			[653.031]	[648.627]	[746.193]	[791.486]		
Prod*Post	-504.110**	-457.986*	-515.229	-472.512			144.759	157.743	-375.837	-326.351		
	[252.156]	[249.902]	[371.277]	[397.458]			[675.728]	[676.071]	[341.754]	[365.040]		
Treatment*Prod*post	457.904	409.757	948.184**	853.255*			-269.45	-259.816	473.969	378.444		
	[343.253]	[336.028]	[459.958]	[489.255]			[874.011]	[871.068]	[780.409]	[869.399]		
Lagged dependent Variable					-0.01	-0.012					-0.036	-0.052
					[0.019]	[0.021]					[0.052]	[0.048]
Constant	-355.934	-370.304	46.213	-186.136	-188.331	-257.29	666.172	773.703	4,422.173***	2,962.52	-132.505	118.711
	[349.978]	[353.403]	[724.397]	[796.178]	[537.488]	[579.126]	[793.387]	[780.680]	[1,118.928]	[9,392.038]	[842.429]	[851.320]
Individual fixed effects	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	714	714	714	714	114	114	416	416	416	416	61	61
R-squared	0.071	0.088	0.045	0.077	0.327	0.332	0.147	0.152	0.053	0.062	0.572	0.652

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 6d: Price differential in *Departamental* market using expected prices

Dependent Variable	Expected Price Difference in Department Market from price in Bogota						Expected Price Difference in Department Market from price in Tunja					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	37.079	-49.101			-146.490*	-166.100*	372.627**	388.203**			-149.24	-145.445
	[240.503]	[241.571]			[78.891]	[93.753]	[181.983]	[173.630]			[86.158]	[100.442]
Extra	-5.492	-5.339	12.815	13.469	13.531	12.663	1.026	-1.018	14.917	14.085	-12.316	-10.836
	[9.109]	[9.114]	[11.317]	[11.472]	[11.108]	[11.677]	[9.146]	[9.157]	[9.954]	[9.949]	[11.500]	[13.122]
Post	-281.911	-333.044					36.958	124.083				
	[219.871]	[220.489]					[122.093]	[124.953]				
Prod	-215.39	-303.325	-208.281	-319.075	384.333**	363.923**	327.797***	365.434**	383.406***	365.691**	340.202	333.844
	[180.710]	[197.177]	[272.934]	[290.543]	[173.682]	[169.549]	[121.891]	[152.497]	[81.364]	[145.144]	[213.233]	[243.863]
Treatment*Post	-338.145**	-355.546**	-441.612***	-477.761***			-128.949	-122.758	-279.181	-269.761		
	[149.940]	[154.198]	[163.060]	[168.167]			[112.766]	[118.284]	[177.931]	[178.855]		
Treatment*Prod	212.537	305.998	105.994	260.51			-316.869	-329.587	17.89	-18.811		
	[269.223]	[275.699]	[633.461]	[651.783]			[201.312]	[200.796]	[171.539]	[302.911]		
Prod*Post	343.011	437.741*	144.882	289.271			-24.454	-95.174	-100.901	-117.016		
	[241.552]	[254.978]	[283.208]	[268.974]			[169.359]	[192.434]	[134.160]	[218.892]		
Lagged dependent Variable					0.181*	0.197*					-0.032	-0.039
					[0.092]	[0.102]					[0.046]	[0.055]
Constant	468.527	581.351*	8,273.62	10,539.10	-718.077**	-670.320*	-367.66	-408.274	3,866.930**	2,829.60	-479.235	-494.548
	[336.390]	[344.311]	[6,663.672]	[6,378.679]	[297.614]	[358.983]	[228.374]	[268.039]	[1,736.369]	[2,180.712]	[373.517]	[419.028]
Individual fixed effects	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	220	220	220	220	45	45	150	150	150	150	37	37
R-squared	0.212	0.228	0.134	0.16	0.688	0.702	0.26	0.288	0.28	0.314	0.691	0.704

Robust Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Table 7a: Dummy Crop loss

Dependent Variable	Loss Dummy					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.044	0.042			-0.172**	-0.173**
	[0.036]	[0.036]			[0.070]	[0.071]
Post weather	0.157***	0.158***	0.026	0.03		
	[0.037]	[0.038]	[0.059]	[0.059]		
Treatment*Post weather	-0.118**	-0.115**	-0.143**	-0.140**		
	[0.051]	[0.051]	[0.060]	[0.060]		
Constant	0.258	0.254	5.629***	5.601***	0.279	1.208***
	[0.213]	[0.216]	[1.685]	[1.695]	[0.290]	[0.336]
Individual fixed Effects	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes
Observations	1405	1405	1405	1405	197	197
R-squared	0.062	0.063	0.054	0.057	0.354	0.376
Number of form			487	487		

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 7b: Percentage of Crop loss

Dependent Variable	Loss Percentage*100					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	2.082	1.996			-2.579	-2.566
	[2.243]	[2.231]			[3.479]	[3.446]
Post weather	3.345	4.013*	0.728	1.379		
	[2.196]	[2.201]	[3.261]	[3.264]		
Treatment*Post weather	-6.826**	-6.720**	-7.795**	-7.628**		
	[2.963]	[2.958]	[3.356]	[3.337]		
Constant	15.038	13.189	154.383**	157.802**	0.002	-23.947
	[14.975]	[15.177]	[73.271]	[74.111]	[15.196]	[17.497]
Individual fixed Effects	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes
Observations	1440	1440	1440	1440	205	205
R-squared	0.058	0.061	0.021	0.025	0.229	0.246
Number of form			487	487		

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 7c: Percentage of Crop loss due to weather

Dependent Variable	Loss Percentage due to weather*100					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.895	0.942			-3.443	-3.414
	[1.758]	[1.752]			[2.286]	[2.312]
Post weather	4.872***	4.731**	3.488	3.465		
	[1.869]	[1.898]	[3.129]	[3.154]		
Treatment*Post weather	-6.899***	-6.894***	-7.660***	-7.586***		
	[2.436]	[2.437]	[2.748]	[2.750]		
Constant	-11.003*	-10.299	100.262	98.278	-34.643**	-37.780**
	[6.513]	[6.630]	[82.500]	[82.731]	[15.712]	[15.216]
Individual fixed Effects	No	No	Yes	Yes	No	No
Importance product fixed effects	No	Yes	No	Yes	No	Yes
Observations	1405	1405	1405	1405	197	197
R-squared	0.062	0.063	0.018	0.02	0.258	0.265
Number of form			487	487		

Robust Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1